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Do Family-Owned Firms Perform Better than Non-Family-Owned Firms?

An Empirical Study of Norwegian Firms

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Oslo, June 2018


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Abstract

This thesis examines the performance of family-owned and non-family-owned firms in Norway from 2000-2015. The performance differences are compared using return on assets (ROA) as the indicator of firm performance. The thesis also takes a closer look at performance in family and non-family firms within five different industries: Retail, shipping, architecture, financial services and IT.

The research is mainly based on OLS panel regression, where the analysis is divided into four models. To verify the data robustness of the results from the main specification, two additional robustness checks using the generalized method of moments (GMM) and panel OLS controlling for industry specific effects are performed.

On average, family-owned companies tend to perform better than non-family-owned companies. From the four regression models representing the main specification, the results show that family ownership does not affect firm performance for the population as a whole. The robustness check incorporating GMM also confirms this. The results suggest that the family-owned companies tend to perform better because they have smaller boards and a higher degree of inside power, rather than the family ownership itself. Unlike previous research, this thesis also looks at differences within industries. The results presented find that family ownership has a positive, significant effect on firm performance within the architectural industry. For companies within shipping, this relationship is the opposite, and family ownership is shown to have a significant, adverse effect on firm performance. This contradicts what we found when analysing the population as a whole.

Indeed, our results indicate that the effect of family ownership on firm performance relies on the industry which the firm is located within. The results presented also suggests that the reason for these results may be due to different industries being exposed inversely to agency conflicts. Compared to previous studies done on family firms in Norway, this thesis neither rejects nor confirms previous research and is best seen as complementary.

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1 Introduction

On a global scale, corporate governance and its connection to firm performance has been thoroughly studied. There are many examples of studies focusing on characteristics of the board of directors, board structure, ownership structure and how the power of different stakeholders is connected to ownership distribution (Blair, 1995; Jensen & Meckling, 1976; Salancik & Pfeffer, 1980).

Within studies focusing on corporate governance, several studies have been conducted concentrating on the relationship between family ownership and firm performance. Studies both focusing on different levels of family ownership (Che & Langli, 2015), and the performance of family-owned firms vs. non-family-owned firms (Berzins & Bøhren, 2013) have been performed. Many of the studies conducted globally are focusing on firms which are public, but there is an increased demand for understanding firms which are private (Chrisman et al., 2007).

1.1 Motivation

Approximately 70-95% of all firms world-wide are family-owned, and together they create between 50% and 80% of all jobs (Family Firm Institute, 2015). In the US, the portion of family-owned firms account for 80% of all firms, and they contribute to between 50% and 60% of the US gross domestic product (Daily & Dollinger, 1992; Francis, 1993). Similar numbers have been found in the UK, Western Europe and Australia (Stoy Hayward & The London Business School 1989, 1990; Lank, 1995; Smyrniotis & Romano, 1994). Similar numbers also apply for Norway (Berzins & Bøhren, 2013). Hence, family firms play an important role in the global economy and in society in general.

In Norway, a diminishing 0,015% of family firms are public (Berzins & Bøhren, 2013). Given that private family firms represent such a large portion of the economy, we find it interesting that there hasn't been conducted more research to understand their characteristics, and whether their governance system has an impact on performance.

1.2 Research question

This thesis is looking to expand on previous research investigating the relationship between family ownership and performance done on Norwegian companies by Berzins & Bøhren (2013) and Che & Langli (2015). Unlike previous research, this thesis focuses on specific industries and the relationship between family ownership and firm performance within and between these industries. In short, the research question can be summed up to:

Do family-owned firms perform better than non-family-owned firms?

We believe this thesis will give a deeper insight into the characteristics of family-owned firms in Norway and how they are governed. We deem a distinction between industries to be of value, since companies located in capital intensive industries are governed differently than firms which rely heavily on human resources. Perhaps one could expect that it is easier to inherit the skill to run a more traditional firm (i.e. firm with a lot of assets). We have decided to divide our analysis into the following sectors: Retail, shipping, architecture, financial services and IT.

In addition, this thesis is exploring whether the potential effect of family ownership can be attributed to a casual effect. A large portion of the empirical research suggesting that certain governance structures drive improved performance are victims of endogeneity issues, which makes us unable to claim a casual effect (Wintoki et al., 2012). Section 5.0 of this thesis will go more in depth on how to deal with this problem.

The results from this thesis indicate that the effect of family ownership on firm performance relies on the industry which the firm is located within. Some industries seem to hold characteristics which favors family ownership, while other industries appear to have characteristics which disfavors family ownership. We believe these results give a deeper insight into the inner workings of the effect of family ownership on firm performance than previously uncovered.

2 Theoretical Framework

In the following section, the thesis discusses what previous studies have discovered when researching corporate governance and the connection between family ownership and firm performance.

2.1 Family Firms

There is no exact definition of “family firms.” Two questions therefore need to be considered:

1. Who is to be considered as “family?”
2. What should the family’s role in the firm be in order to qualify it as a family firm?

Prior research provides only limited guidance on how to ascertain family firms. Anderson & Reeb (2003) use the fractional equity ownership of the founding family or the presence of family members on the board of directors to identify family firms. However, they are not assessing how large this fraction should be. They are also raising the issue that differences in ownership levels among family firms may not represent the influence that family members employ on the firm (Anderson & Reeb, 2003). In this thesis, the definitions employed by Berzins & Bøhren (2013) are used. A family is considered as a group which is connected through marriage or kinship in a straight line including great-grandparents or in side-line even with cousins. Regarding question 2, the family needs to own more than 50% of the firm’s shares in order to have majority ownership and full control rights. Full control rights give the family opportunities to decide the composition of the board and further choose the strategic direction. This thesis’ definition is therefore that in family businesses, more than 50 % of the shares is held by individuals which are married, in in-laws or in kin with each other (Berzins & Bøhren, 2013).

2.2 Population

In theory, one could choose to include all registered Norwegian firms in the data set. However, employing different types of filtering before running the analyses can be deemed beneficial. As an example, this thesis is looking to track and compare firms' operating performance. In order to do this, one would need to remove "sleeping" firms which are no longer operating. To obtain a representative data set which includes relevant and operating companies, we have decided to filter down the firm population using the same criteria as Berzins & Böhren (2013):

1. The firm is not a subsidiary
2. The firm has consistent accounting
3. The firm has revenues
4. The firm has employees

2.3 Firm Performance

To measure firm performance, this thesis will examine return on assets (ROA), which is the most common accounting profitability ratio. In order to measure performance, it is also possible to use metrics such as sales growth, asset growth and CAPEX/Sales. These operating measures focus on how fast firms grow. However, ROA better capture the operating profitability of a firm (Birley et al., 1999). According to Chen & Shimerda (1981), return on assets can be computed by dividing earnings before interest and tax (EBIT) in year t on the book value of assets in year t . This method measures how effectively a firm generates returns before debt- and tax obligations are deducted:

$$ROA = \frac{EBIT}{Total\ assets}$$

Chen & Shimerda (1981) argue that EBIT/Total Assets is the preferred measure of profitability. Some also use the average total value of assets in the denominator. Tobin's Q is also a widely used performance indicator in corporate governance research. Because this thesis is largely examining private firms, calculating Tobin's Q would be impossible since this indicator uses market value of

assets in its calculations (Anderson & Reeb, 2003). As operating profitability is the main focus of this thesis, ROA will be employed.

2.4 Agency Theories

Jensen & Meckling (1976) argued that the agency relationship can be defined as a contract where the principal (owner) hires an agent (manager) to perform a task. The principal will then delegate some decision power to the agent. Agency theory plays a vital role in corporate governance and its theory is used when a firm's ownership and management are separated and there exists deviating goals between the shareholders and managers in a firm (Fama & Jensen, 1983). Agency theory assumes that economic agents prefer to choose actions that maximize their own utility (Denis et al., 1999).

In Corporate Governance, there are four main types of agency conflicts (Bøhren, 2011):

- Between Shareholders and Managers
- Between Majority and Minority Shareholders
- Between Owners and Creditors
- Between Owners and Stakeholders

Agency Conflict 1 – Between Shareholders and Managers

The separation of ownership and control plays an essential role in corporate governance and agency theory. Eugene Fama (1980) argued scepticism about the power of shareholders in a firm. Small shareholders need to cooperate in order to get the majority of votes and influence.

Low ownership concentration and low insider ownership create greater agency conflicts between shareholders and managers (Berzins & Bøhren, 2013). Conflicting interests and asymmetric information between shareholders and managers will also affect the relationship (Healy & Palepu, 2001).

Managers may:

- Benefit from perquisites – such as famous private jets and golf club membership (Yermack, 2006).
- Boost short-term results at the expense of long-term performance (Narayanan, 1985).
- Build empires: Managing a larger firm gives higher salaries and perks (Jensen & Meckling, 1976).
- Prefer the “quiet life” and allow costs to drift upwards (Bertrand & Mullainathan, 2003).

All the examples above can potentially create conflicts between shareholders and managers. Shareholders are interested in efficient operations to maximize return on their investments. It’s therefore imminent that managers work for shareholders’ interests by focusing on shareholder value (Ravenscraft, 1996). The cost of a typical conflict of interest between managers and shareholders can be defined as *representing the difference between the value of an actual firm and the value of a hypothetical firm which would exist in a more perfect world where the incentives of managers and the shareholders are perfectly aligned* (Grinblatt & Titman, 2004).

| Type | Insider-share (%) | The largest owner is on the board (yes, %) | The largest owner’s share of boardroom (%) | The largest owner is chair (yes, %) | The largest owner is CEO (yes, %) | Largest owner is chair and CEO (yes, %) |
|------------------|-------------------|--|--|-------------------------------------|-----------------------------------|---|
| Family firms | 96 | 94 | 86 | 89 | 83 | 75 |
| Non-family firms | 54 | 66 | 36 | 38 | 39 | 14 |

Table 1: Board and management in family firms, compared to non-family-owned firms. Data from Norway (Böhren, 2011).

The table above shows that on average, 83% of the largest owner in family firms is the CEO. In non-family-owned firms, the CEO is the largest owner in only 39% of the cases. Hence, in almost all family firms, there exists no agency conflicts between owners and managers. Ownership, board involvement and management are intertwined, which means that the board have an advisory role, and not a controlling function (Böhren, 2011).

Demsetz & Lehn (1985) argue that a high ownership concentration and control of management, combined with a founding family's historical presence, give an advantage in monitoring firms. Large family firms have more incentives compared to other firms to avoid conflicts between owners and shareholders, in order to maximize firm performance. A family's wealth is based on the family firm's performance and this will reduce the free-rider problem associated with a diverse ownership structure (Lee, 2006). Findings from Burkart, Panunzi & Shleifer (2003) show that active involvement by the founding family increases the financial performance. This is further supported by Maury (2006) as well as Anderson & Reeb (2003).

Agency Conflict 2 – Between Majority and Minority Shareholders

The critical issue in conflicts between majority and minority shareholders is the gap between cash flow rights and voting rights. If you own 51 % of the shares, you make decisions regarding the firm, but you only receive 51% of the dividend. Therefore, you have an incentive to fit cash flows through private benefits and the likelihood of agency conflict 2 is therefore high (Bøhren, 2011).

This problem is also made worse by pyramiding, dual-class shares and weak legal protection (Barclay & Holderness, 1989). Villalonga & Amit (2006) argue that the conflict between majority and minority shareholders is widespread in family firms. Further, this occurs because the majority shareholders may use their position to extract private benefits at the expense of the minority shareholders (Villalonga & Amit, 2006).

Agency conflict 2 will increase with high ownership concentration and be eliminated when a family holds 100% of the shares. In Norwegian family firms, the largest shareholder owns 79% of the shares and the family collectively holds 93% of the shares, on average. In this case, conflicts of interest and the need for monitoring the controlling family might be high, as fear of agency conflicts and destructive relationships are prominent (Berzins & Bøhren, 2013).

Agency Conflict 3 – Between Owners and Creditors

This conflict stereotypically occurs when firms have more debt than equity on their balance sheet. Owners prefer a high return, which is associated with a higher level of risk. On the other hand, creditors are interested in low risk and repayment of their debt (Bøhren, 2011). Family firms tend to be more risk-averse than privately held firms, and they also tend to avoid debt (McConaughy & Mishra, 1999). Besides, family firms also bend towards having a low willingness to raise new capital, which increases the incentives to have a healthy relationship with banks and other credit institutions. This may reduce the conflicts of interest between owners and creditors (Ampenberger et al., 2012).

Agency Conflict 4 – Between Owners and Stakeholders

The fourth agency conflict is concerning conflicts with stakeholders that are not mentioned in the conflicts above. These stakeholders can be employees, suppliers, customers and society as a whole (Bøhren, 2011). Employees seek job security and high salaries. This may be conflicting with the owner's interest to achieve a high return on invested capital. In Norway, the majority of family firms are small (Berzins & Bøhren 2013) and hence the conflict level could be reduced if the environmental impact is low.

Stewardship Theory

Stewardship theory defines situations where managers are not motivated by individual goals, but rather are stewards whose motives are aligned with the objectives of their principals (Davis et al., 1997). Researchers have further used stewardship arguments from Davis et al. (1997) to suggest that family involvement in management improves firm performance (Charbel et al., 2013; Hoffmann et al., 2016).

Hoffmann et al. (2016) further argue that family managers act as stewards because their personal goals are associated with the family's goals. In addition, family managers are highly motivated, and their long-term perspectives reduce potential hazardous actions. Their bonds with the rest of the family can also reduce opportunism (Corbetta & Salvato, 2004). Other researchers have also used stewardship arguments to explain the negative effect of family involvement in

management. Family managers may be stewards of the family rather than the firm (Miller et al., 2013).

3 Literature Review

Countless academic scholars and studies have investigated the relationship between different governance mechanisms and firm performance. Previous studies have highlighted how the board of directors and ownership structure are among the main governance mechanisms that could affect firm performance (Blair, 1995; Jensen & Meckling, 1976). Despite this, there is no consensus on how this is related (Anderson & Reeb, 2004; Eisenberg et al., 1998). Studies have also shown a positive relationship between family ownership and firm performance in public family firms (Anderson & Reeb, 2003; Lee, 2006; Maury, 2006). Anderson & Reeb (2003) found that family firms perform better than non-family firms among the S&P 500. They also found a non-linear relationship between family holdings and firm performance. Overall, Anderson & Reeb (2003) suggest that family ownership is an effective organizational structure, which is inconsistent with the minority shareholders hypothesis. Anderson & Reeb (2003) use the instrumental variable approach to back their claim of a causal relationship between firm performance and family ownership in public family firms. But, a justification for the instrument used in this analysis is lacking. Finding a valid instrument for these types of analyses can be very difficult, and the results will not be valid if the instruments don't fulfill a set of quite strict assumptions (Woolridge, 2015). Thus, in order to better validate their results, a more comprehensive discussion around this theme should have been present.

The reason for the positive relationship between family-owned firms and firm performance can be explained, according to some scholars, by the family firms' ability to accumulate and utilise their resources (Habbershon & Williams, 1999; Sirmon & Hitt, 2003). A large part of scholars who have been trying to explain why family firms perform better than non-family firms do so by drawing upon a resource-based view of the firm. The followers of the resource-based view of family firms as an explanation for their over performance, point out five main resources typically contained inside family firms: Human capital, social capital, patient financial capital, survivability capital and governance structure & costs. These five resources highlight how their extraordinary commitment can characterize families, how they are not accountable to strict short-term results due to their generational

outlook and how trust and family bonds reduce governance costs (Sirmon & Hitt, 2003).

Carney (2005) debates the vision of resource advantages and argues that family-controlled firms' competitive advantage arises from their system of corporate governance. Meaning their incentives, authority patterns and norms of legitimation that generate particular organizational propensities to create competitive advantages and disadvantages. Carney (2005) argues that the unification of ownership and control incorporates organizational authority into the hands of the entrepreneur, his or her family, or a coalition of families, and that this governance system generates three dominant propensities: Parsimony, personalism and particularism.

The advantage with regards to parsimony comes from the notion that people are more prudent with their own, as opposed to "other people's", money. Uniting ownership and control mitigates the agency problems (Jensen & Meckling, 1976). Personalism represents organizational authority in the person of an owner-manager or family. Subsequently, these agents operate under fewer internal restrictions as they may exclude themselves from internal bureaucratic constraints that limit managerial authority. Indeed, it is this personalization of authority in the family firm that allows the family to project its own vision onto the business (Chua, Chrisman, & Sharma, 1999). For particularism, the liberty in family firms often results in greater variability in the exercise of authority. It stems from the tendency of the owner-managers to view the firm as "our business." Firm decisions can for example be made upon improving their social status, and not strictly for reasons maximizing profit (Palmer & Barber, 2001).

But, academic literature is divided. The weight of academic literature finds no relationship or negative relationship between family ownership and firm performance for public family firms (Stewart & Hitt, 2012). Scholars have argued that there are severe social and economic constraints on families that limit their growth and longevity, mainly caused by altruism, nepotism and weak risk-bearing attributes (Carney, 2005). Academics who find a negative relation between family-owned firms and performance argue that conflicts arise as families attempt to manage an enterprise (Faccio, Lang & Young, 2001). A typical argument is that

family firms should replace family members in the firm's leadership positions with professional managers who can function with more objectivity and skill (Levinson, 1971). We also see evidence that non-family firms may fare much better compared to self-interested family firms, which have significant agency costs and family liabilities (Dyer, 2006). Here, self-interested family firms are defined as family firms based on utilitarian and altruistic relationships (Etzioni, 1961). Typically, particularistic criteria are used in employee selection, evaluation and promotion to benefit the family and individual family members (Dyer, 2006).

Another heavily investigated aspect when comparing performance between family-owned firms, is the effect of having family member CEO relative to having a non-family member CEO. When it comes to compensation fee, research papers have documented that in founding-family-controlled firms, family member CEOs have fewer pay-based incentives than non-family CEOs. These results follow the hypothesis that founding family CEOs have superior incentives for maximizing firm value (McConaughy, 2000). Other studies also find that a family CEO has a positive effect on accounting profitability for family-owned firms, relative to having a non-family CEO (Anderson & Reeb, 2003). This indicates that inside power has an effect on firm performance for family-owned firms.

Plenty of studies focus on family ownership in public firms, but similar studies on private firms are somewhat limited. Also, the studies that have been conducted on private firms find no connection between family ownership and firm performance in general (Sciascia & Mazzola, 2008; Westhead & Howorth, 2006). Even fewer studies have been conducted on private family firms in Norway. Che & Langli (2015) did a large study where they compared performance between private Norwegian family firms with different percentage of family ownership. They found that family firms with small ownership (50-67%) and large ownership (100%) performed better than family firms with ownership portion in between. Hence, they found a U-shaped relationship between family ownership and firm performance in private Norwegian family firms.

Berzins & Bøhren (2013) conducted a similar study on all registered firms in Norway, both public and private. They found that family-owned firms have a significantly higher profitability than other firms. However, this difference is reduced by 2/3 when controlling for other drivers of profitability. Controlling for other variables, they find no difference in return on invested capital between family-owned firms and non-family-owned firms, except for small family firms with one owner, which have slightly higher return on invested capital. It is important to note that they used return on invested capital as their proxy for performance, while this thesis employs return on assets. Thus, the results presented in this thesis may not be easily compared to the results obtained by Berzins & Bøhren. As return on assets seems to be the most commonly used proxy for firm performance by scholars internationally, we believe this to be the more appropriate performance indicator. Both because comparing results becomes less complicated, but also because it may indicate that return on assets is the best proxy for reflecting firm performance.

4 Data

This section provides a description of the data material used in the analyses, the methodology behind the sample selection process as well as descriptive statistics of the final sample employed.

4.1 Sample selection

| | Number of companies |
|---------------------------|--------------------------------|
| Raw data | 478 249 |
| Not subsidiaries | 331 737 |
| Has consistent accounting | 307 805 |
| Has revenues | 216 241 |
| Has employees | 164 072 |
| Are family-owned | 124 373 |

Table 2: The selection/filtering process of the raw data. “Has employees” includes missing values, since not including missing values deleted all data after 2005. “Has employees” does not include missing values on family ownership.

Further, this thesis is looking to employ a panel data analysis which allows for studying several phenomena for each firm over a more extended period. To do this, companies with company data ranging across several years is needed. The data sample is not consistent across all years for all companies, which results in an unbalanced panel data regression (See 5.0 Empirical Approach). Companies which don’t have at least four years of continuous data have been discarded, as discontinuous data may fundamentally change our econometric methods (Arellano & Bond, 1991). For companies which have two “blocks” of consecutive data (i.e. one block from 2004-2010 and one block from 2012-2015), only the longest period of consecutive years has been kept in order to prevent “jumps” in the dataset, which could potentially bias the regression estimates. In cases where the two different consecutive periods for a company have the same length, the most recent period is kept. The most extreme values of ROA have also been discarded. More precisely, the 2% most extreme values in both directions have been deleted, as these extreme

values (such as a ROA of 15 200%) potentially can bias the regression estimates and subsequent results.

4.2 Descriptive Statistics

After applying the above-mentioned selection process, 35 569 different companies are left in the data sample, out of which 27 891 companies are family-owned (or have been at one or more times during the time period). This equals 78,41% of all companies, which can be deemed representative for the population as a whole (Family Firm Institute, 2016). Further, we are grouping our data into five different industries: Retail, shipping, architectural, financial services and IT. This is to track whether there are differences across industries, as well as across the sample as a whole.

| | Number of companies | Number of Family-owned | Percentage Family-owned |
|----------------------|----------------------------|-------------------------------|--------------------------------|
| All companies | 35 569 | 27 891 | 78,41% |
| Retail | 5 532 | 4 765 | 86,14% |
| Shipping | 137 | 92 | 67,15% |
| Architecture | 4 649 | 3 535 | 76,04% |
| Financial Services | 216 | 187 | 86,57% |
| IT | 1 128 | 694 | 61,52% |

Table 3: Summary statistics of family ownership within industries. Missing values on family ownership is not included. Family-owned companies include all companies that have been family-owned at least once across the sample period.

As Table 3 shows, the concentration of family ownership varies across industries. Retail and financial services are the two industries with the largest portions of family ownership, with 86,14% and 86,57%, respectively. IT and shipping are the two studied industries with the lowest portion of family ownership, with 61,52% and 67,15% of companies having been family-owned one or more times across the time period. This is 16,89 and 11,26 percentage points below the data set average. Family ownership among architecture companies is placed approximately at the data set average.

Further, a summarization of differences in performance between family-owned and non-family-owned companies within the different industries is presented.

| | Average ROA | | Median ROA | |
|----------------------|------------------|---------------|------------------|--------------|
| | Non-family-owned | Family-owned | Non-family-owned | Family-owned |
| All companies | 10,24% | 10,56% | 9,28% | 9,70% |
| Retail | 7,34% | 8,28 % | 7,57% | 8,11 % |
| Shipping | 6,24% | 8,49% | 4,45% | 8,53% |
| Architecture | 15,65% | 16,15% | 15,48% | 15,84% |
| Financial Services | 4,10% | 5,29% | 1,02% | 1,54% |
| IT | 13,01% | 15,64% | 12,83% | 15,20% |

Table 4: Average and median ROA for family-owned and non-family-owned companies within different industries.

As Table 4 shows, there are differences in firm performance (ROA) between family-owned and non-family-owned companies within the different industries. Across all companies (the whole sample), both average ROA and median ROA are slightly higher for family-owned companies, compared to non-family-owned companies. We can thus conclude that on average, family-owned companies are performing better than non-family-owned companies. The same conclusion can also be drawn within the different industries. An interesting observation is that the differences between family-owned and non-family-owned firms are larger within the different industries than for the sample as a whole. For the industries exemplified in this thesis, architecture and IT have the highest median return on assets for family-owned firms (15,84% and 15,20%, respectively). Shipping is the industry with the largest difference in median ROA between family-owned and non-family-owned firms, with a difference of 4,08 percentage points. As the sample size within the industries vary, we have decided to mainly focus on median ROA, instead of average ROA.

| | Min ROA | | Max ROA | | Std.Dev ROA | |
|----------------------|------------------|----------------|------------------|---------------|------------------|---------------|
| | Non-family-owned | Family-owned | Non-family-owned | Family-owned | Non-family-owned | Family-owned |
| All companies | -74,76% | -74,73% | 65,87% | 65,88% | 20,37% | 20,30% |
| Retail | -74,67% | -74,73% | 64,54% | 65,88% | 18,10% | 17,04% |
| Shipping | -55,14% | -73,91% | 60,51% | 61,48% | 16,24% | 17,13% |
| Architecture | -74,06% | -74,73% | 65,74% | 65,88% | 22,34% | 23,31% |
| Financial services | -29,40% | -73,47% | 45,92% | 60,61% | 14,88% | 16,69% |
| IT | -74,45% | -73,56% | 65,58% | 65,52% | 24,04% | 24,26% |

Table 5: Min/Max and standard deviation of ROA for family-owned and non-family-owned companies within different industries.

The standard deviation of ROAs for family-owned companies are slightly lower than for non-family-owned companies. Interestingly, the only industry that reflect the sample average is retail, with a standard deviation among family-owned firms which is 1,06 percentage points lower than for non-family-owned firms. Hence, within shipping, architecture, financial services and IT, family-owned firms have a higher standard deviation of ROA than non-family-owned firms. We can see that the minimum and maximum values of ROA are approximately equal for all industries and the sample average as a whole.

| Means | Non-Family-owned | Family-owned | NF-F | t-statistic | p-value |
|--------------------------------------|------------------|--------------|------------------|-------------|---------|
| Firm Age | 10,84 | 12,33 | -1,49*** | -13,07 | 0,000 |
| Board Size | 3,04 | 1,64 | 1,39*** | 126,34 | 0,000 |
| Inside Power | 36,90 | 79,13 | -42,24*** | -1,4e+02 | 0,000 |
| Number of Owners | 5,30 | 1,81 | 3,50*** | 52,68 | 0,000 |
| Largest Family Number of Board Seats | 0,97 | 1,38 | -0,41*** | -55,76 | 0,000 |
| Size | 6,68 | 6,45 | 0,22*** | 36,42 | 0,000 |
| Leverage | 0,11 | 0,13 | -0,02*** | -5,33 | 0,000 |
| Family Power | 0,64 | 0,98 | -0,34*** | -1,3e+02 | 0,000 |

Table 6: Hypothesis testing of differences in means for selected variables between non-family-owned and family-owned firms being different from zero. *** mark differences which are significantly different from zero on a 1% level.

When comparing the mean of the different variables used in our regression analyses (See discussion under 5.4 Our Model) for non-family-owned and family-owned firms, it is observed that the differences between the means are statistically different from zero for all variables. This implicates that there are differences between the characteristics of non-family-owned and family-owned firms. Family-owned firms tend to be older, have smaller boards, a higher degree of inside power, fewer owners and a higher number of family members on the board. They also tend to be smaller and have higher leverage.

5 Empirical Approach

In this section, a description of the empirical framework used to conduct the analyses is presented. The framework includes different variations of OLS panel regressions as well as the generalized method of moments (GMM). This section also introduces and describes the variables employed in the analyses.

Empirical Framework

5.1 OLS regression

In order to estimate the effect of family ownership on firm performance, the method of ordinary least squares (OLS) can be applied. OLS estimation is used to estimate the slope and intercept parameters in the population model. OLS estimation accomplishes this by minimizing the sum of the squared residuals. By including a dummy variable, one will be able to estimate the difference between companies which are family-owned and those which are not. Dummy variables can be used as “proxy” variables or numeric stand-ins for qualitative facts in a regression model. By including family ownership as a dummy variable, one will be able to see how much the expected average value of firm performance changes with a change from non-family to family-owned (Wooldridge, 2015). Doing this for different sectors will also give us the ability to compare results and isolate sector-specific differences.

This regression model is commonly known as the classical linear regression model (CLRM) and is typically denoted:

$$y_i = \beta_0 + \beta_1 x_{i1} + \beta_2 x_{i2} + \dots + \beta_p x_{ip} + u_i$$

y_i is the dependent, or endogenous, variable. It represents the variable we want to explain (here: firm performance) using other variables. $x_{i1}, x_{i2}, \dots, x_{ip}$ are called independent, or explanatory, variables. β is an estimate that approximates the average effect of the independent variable on the dependent variable. u_i is an error term and captures all the other factors which affect the dependent variable y_i other than the regressors $x_{i1}, x_{i2}, \dots, x_{ip}$.

Since y_i also depends on u_i , we must be specific about how u_i is generated. Assumptions about the unobservable error terms u_i :

- (1) $E [u_i] = 0$
- (2) $\text{Var} [u_i] = \sigma^2$
- (3) $\text{Cov} [u_i, u_j] = 0$
- (4) $\text{Cov} [u_i, x_{ip}] = 0$
- (5) $u_i \sim N(0, \sigma^2)$

Assumption (1) states that the error u_i should have an expected value of zero. Assumption (2) implicates that the error u has the same variance given any value of the explanatory variable. This is also known as the homoscedasticity assumption. Assumption (3) assumes that there is no serial correlation between the error terms. Assumption (4) and (5) assumes that the errors are independent of x_{ip} and are independently and identically distributed as Normal. We only need assumption (1) to establish unbiasedness of OLS, but if all assumptions (1) to (4) hold, then the estimators determined by the OLS are known as "Best Linear Unbiased Estimators" (BLUE) (Woolridge, 2015).

5.2 Panel data regression

In the empirical analysis, an extension of the classical linear regression model, which also uses the method of OLS, called panel data regression is employed. The data consists of company data ranging across several years, which is why a panel data regression may be applicable. A panel data set consists of a time series for each cross-sectional member in the data (Woolridge, 2015). Doing this regression is quite beneficial and might yield results that the standard OLS regression described above cannot capture. Having multiple observations on the same units allows to control for certain time-constant, unobserved characteristics of firms which we think might be correlated with the explanatory variables in our model (Woolridge, 2015). Some have also claimed that causal inference requires following the same individuals over time (Woolridge, 2015; Wunsch et al., 2010). A simple panel data regression is written in a similar fashion as the simple linear regression, except that it includes a time parameter, t :

$$y_{it} = \beta_0 + \beta_1 X_{1it} + u_{it}$$

Ideally, you would like to have a balanced set of panel data. That is, you have observations for each company i for all time observations t . The data set analyzed in this thesis is an unbalanced panel, because certain years of data is missing for some cross-sectional units. Consecutive observations on individual companies are available, but the number of time periods vary from company to company as well as the years to which the observations correspond.

Fixed effects

For unbalanced panels, nothing fundamental changes in the econometric methods provided a minimal number of continuous time periods are available on each company (Arellano & Bond, 1991). Nonetheless, there are a couple of things one needs to be aware of. Fixed effects methods for unbalanced panels are usually required, as fixed effects incorporate the data's panel structure, but ignores the correlation between the lagged dependent variable and the regression error (Woolridge, 2015; Judson & Owen, 1999). A fixed effect model is written in the following way:

$$y_{it} = (\alpha + u_i) + X'_{it}\beta + v_{it}$$

Where u_i is the fixed effect specific to an individual (group) or time period that is not included in the regression, and errors are independent identically distributed, $v_{it} \sim IID(0, \sigma_v^2)$.

Fixed group effect model studies individual distinctions in intercepts, assuming the same slopes and constant variance across individuals. An individual specific effect is time invariant and considered a part of the intercept, u_i . It is thus allowed to be correlated with other regressors. Assumption (4) is therefore not violated (Park, 2011). Generally, the implication of this method is that it controls for firm specific characteristics that may have an impact on the explanatory variable. It is thus appropriate if these firm specific effects are likely to correlate with the explanatory variable (Torres-Reyna, 2007). This is why panel data may be significantly beneficial, compared to a regular cross-sectional OLS, as earlier discussed (Woolridge, 2015).

Interaction Terms

Interaction terms can be used to test for partial effect in OLS regressions. In some cases, it is natural to test if the dependent variable with respect to an explanatory variable depend on the magnitude of yet another explanatory variable. These types of models are formulated as follows:

$$y_{it} = \beta_0 + \beta_1 x_{1t} + \beta_2 x_{2t} + \beta_3 x_{1t} x_{2t} + u_{it}$$

It is also important to note that the interpretation of the original variables can be challenging when an interaction term is included. As an example, the above equation shows how β_2 is the partial effect of x_{2t} on y_{it} when $x_{1t} = 0$ (Woolridge, 2015).

5.3 Generalized Method of Moments

Determining a causal relationship is the goal of most empirical studies in economics, and rarely can we run a controlled experiment that allows a simple correlation analysis to uncover causality. What we instead can do, is to use econometrics methods to effectively hold other factors fixed. Since economic variables are properly interpreted as random variables, we should use ideas from probability to formalize the sense in which a change in one variable causes a change in another variable (Woolridge, 2002).

The generalized method of moments (GMM) provides a computationally convenient method of obtaining consistent and asymptotically normally distributed estimators of the parameters with statistical models. The cornerstone of GMM estimation is the population moment condition (Hall, 2005):

$$E[f(v_t, \theta_o)] = 0$$

If θ_o is a vector of unknown parameters which are to be estimated, v_t is a vector of random variables and $f(\cdot)$ a vector of functions, then a population moment condition takes the form of the equation above.

The Generalized Method of Moments estimator based on the equation above is the value of θ which minimizes:

$$Q_T(\theta) = g_T(\theta)'W_Tg_T(\theta)$$

Where W_T is known as the weighted matrix and is restricted to be a positive semi-definite matrix that converges in probability to W , some positive definite matrix of constants.

Using other estimation methods than the OLS can be beneficial when assumptions such as homoscedasticity or no serial correlation are breached. Basic econometric methods can be used with robust inference techniques that allow for arbitrary heteroscedasticity or serial correlation, so the gain of using other estimation techniques may be small. However, significant improvements using the generalized method of moments (GMM) can be obtained in panel data with neglected serial correlation. GMM is more indispensable for more sophisticated applications, including dynamic unobserved effects panel data models (Woolridge, 2001).

Further, this thesis will present the variables used in the empirical models, and also a justification for their inclusion.

5.4 Our Model

$$\begin{aligned}
 ROA_{it} = & \beta_0 + \beta_1 Family_Owned_{it} + \beta_2 Leverage_{it} + \beta_3 Size_{it} \\
 & + \beta_4 Firm_Age_{it} + \beta_5 Inside_Power_{it} + \beta_6 Board_Size_{it} \\
 & + \beta_7 Number_of_Owners_{it} + \beta_8 Family_Power_{it} \\
 & + \beta_8 Largest_Family_Number_of_Board_Seats_{it} + u_{it}
 \end{aligned}$$

Dependent Variable

ROA

Return on assets is defined as discussed in the theoretical framework under section 2.3 of this thesis:

$$ROA = \frac{EBIT}{Total\ assets}$$

Explanatory Variables

Family-Owned

Dummy variable which equals 1 if one family owns more than 50% of the shares, 0 otherwise. A family is considered as a group which is connected through marriage or kinship in a straight line including great-grandparents or in side-line even with cousins.

Control Variables

Leverage

The capital structure tells us how a firm finances its assets with respect to debt and equity (Baker and Martin, 2011). Capital structure is a widely examined topic around the world, but no theory states a firm's optimal capital structure (Ampenberger et al., 2012). This thesis defines leverage as Long-Term Debt/Book Value of Total Assets. There are several studies emphasizing the effect debt can have on performance. Ilyukhin (2015) suggests that an increase in debt will increase performance. El-Sayed Ebaid (2009) found that capital structure had a weak-to-no impact on firm performance. Long-term debt is more commonly used than total

debt since short-term debt consists of mostly trade credit, which may produce unreliable results because trade credit is not influenced by the same determinants as leverage's determinants (Harrison & Widjaja, 2013; De Jong et al., 2008). Jensen (1986) emphasizes the importance of debt in an agency perspective, claiming that debt motivates managers and their organizations to be more efficient. While this is an interesting variable to control for, we believe that the results from our analyses will be in line with El-Sayed Ebaid (2009), i.e. that debt has a weak-to-no impact.

Size

Firm size is also controlled for in the regression analyses. Firm size is proxied by using the natural logarithm of revenues (sales). This has commonly been used in previous, similar studies (Padachi, 2006; Rao et al., 2007). Larger firms can enjoy economies of scale which may positively impact profitability (Penrose, 1959). Larger firms may also be capable of leveraging their market power, which in return can yield positive benefits (Shepherd, 1986). We thus expect size to have a positive impact on firm performance.

Firm Age

Previous academic research has provided robust results showing how firm profitability declines with firm age. Two non-exclusive explanations for this phenomenon have been suggested: Corporate aging could reflect a cementation of organizational rigidities over time. Secondly, older firms could advance the diffusion of rent-seeking behavior inside the firm. This is supported by the poorer governance, larger boards and higher CEO pay observed in older firms (Loderer & Waelchli, 2010). We thus believe that firm age will have a negative impact on firm performance.

Inside Power

Inside power is classified as the total number of shares held by the CEO using direct ownership. The goal is to distinguish between effects on ROA being caused by the influence of the CEO, as opposed to the controlling family. Studies related to corporate governance claim that this is one of the core prerequisites of being a family-owned firm and how it significantly reduces agency conflict and positively affects firm performance, as ownership and management are intertwined into each

other in a way that significantly reduces agency costs (Bøhren, 2011). Inside power could therefore have a positive impact on firm performance.

Board Size

Board size is the number of board members on the board. Studies have claimed that larger board size enables key board functions, but that larger boards are prone to suffer from coordination and communication problems and thus board ineffectiveness (Lipton and Lorsch, 1992; Jensen, 1993). Guest (2009) claims that a majority of studies report a significantly negative relation between board size and corporate performance. It would seem that larger boards represent inefficient governance, and that board size therefore should have a negative impact on firm performance.

Number of Owners

Number of owners is the total number of owners using ultimate ownership. The inclusion of this variable is related to the discussion done under section 2.4 Agency Theories of this thesis. Low ownership concentration and low insider ownership create greater agency conflicts between shareholders and managers, and thus increase agency conflict 1 (Berzins & Bøhren, 2013). We consequently believe that a small number of owners (a high ownership concentration) affect firm performance in a positive way. However, this variable has the potential to effect firm performance in both directions, since a high ownership concentration also can increase agency conflict 2.

Family Power

Dummy variable which equals 1 if either the CEO or the chairman of the board belongs to the controlling family, 0 otherwise. This variable is also connected to the discussion surrounding agency conflicts and agency costs done under “Inside Power.” Carney (2005) states that unification of ownership and control incorporates organizational authority into the hands of the entrepreneur, his or her family, or a coalition of families, and that this has a positive effect on firm performance.

Largest Family Number of Board Seats

This variable represents the number of board members in the family with the largest ultimate ownership. Table 1 in section 2.4.1 shows that the largest owner's share of the board room is 86% for family firms and 36% for other firms. According to Bøhren (2011), this means that in family firms, board involvement and management are intertwined, which means that the board have an advisory role, instead of a control function, which is typical for non-family-owned firms. In a research-paper conducted by Anderson and Reeb (2004), it is concluded that the most valuable public firms on the S&P 500 are those in which independent board members balance family board representation. Firms with continued founding-family ownership and few independent board members tends to perform significantly worse. Another characteristics is that families often seek to minimize the presence of independent board members, while outside shareholders want the opposite. These findings show, according to Anderson and Reeb (2004), the importance of independent board members in order to mitigate agency conflicts. An increase in this variable may thus have a negative impact on ROA.

6 Results

In the following section, the results from the main OLS panel regressions is presented. The analyses are divided into four models, all using different specifications and variations of fixed effects.

6.1 Model 1: Firm-Fixed Effects OLS Panel Regression

The Hausman's Specification Test returns a test statistic equal to 1411,48 with a corresponding p-value of 0,000, which implies that cross-sectional fixed effects should be used at the expense of random effects. The regression is performed using heteroscedasticity robust standard errors in order not to breach Assumption (2) of the CLRM, which is also recommended for fixed effect models with a large number of observations by Stock & Watson (2008).

| Dependent Variable: ROA | Coefficient | p-value |
|--------------------------------------|--------------------|----------------|
| Firm Age | -0,0894*** | 0,000 |
| Board Size | -0,0060*** | 0,004 |
| Inside Power | 0,0001** | 0,048 |
| Number of Owners | 0,0001 | 0,590 |
| Largest Family Number of Board Seats | 0,0020 | 0,464 |
| Size | 0,2022*** | 0,000 |
| Leverage | -0,1223*** | 0,000 |
| Family Power | 0,0028 | 0,399 |
| Family-owned | 0,0022 | 0,627 |
| Constant | -1,0862*** | 0,000 |
| <hr/> | | |
| Adjusted R^2 | 7,36% | |
| Sample Range | 2000 - 2015 | |
| Number of Cross Sections | 30 038 | |
| Observations | 138 750 | |

*Table 7: Panel data regression with White heteroscedastic robust standard errors and firm fixed effects. *** mark coefficients which are significant on a 1% level, ** 5% level and * 10% level.*

From the results, “Firm Age”, “Board Size” and “Leverage” have a negative effect on firm performance. Meaning that older firms, larger boards and higher leverage decrease ROA. “Inside Power” and “Size” positively influences firm performance.

Hence, larger firms where the CEO holds a higher fraction of shares tend to perform better. The Adjusted R^2 shows a value of 7,36%.

A regression of the estimated residuals on their lagged value show a significantly positive effect on a 1%-level (Appendix 6). Thus, it seems that the residuals are auto correlated, which violates Assumption (3). Hence, a regression with clustered standard errors on company level to account for this must be performed. This should make the SE estimates robust to disturbances being both heteroscedastic and auto correlated (Hoechle, 2007). Time fixed effects is also incorporated into the model. This is based on a suspicion of time series variations in ROA being explained by overall time trends or other time series patterns. Indeed, the influence of these aggregated trends needs to be controlled for.

6.2 Model 2: Firm – and Time Fixed Effects OLS Panel Regression

| Dependent Variable: ROA | Coefficient | p-value |
|--------------------------------------|-------------------|---------|
| Firm Age | -0.0068 | 0,108 |
| Board Size | -0,0060*** | 0,004 |
| Inside Power | 0,0002** | 0,043 |
| Number of Owners | 0,0001 | 0,715 |
| Largest Family Number of Board Seats | 0,0020 | 0,455 |
| Size | 0,2014*** | 0,000 |
| Leverage | -0,1230*** | 0,000 |
| Family Power | 0,0022 | 0,502 |
| Family-Owned | 0,0038 | 0,400 |
| Constant | -1,0986*** | 0,000 |
| <hr/> | | |
| Adjusted R^2 | 7,77% | |
| Sample Range | 2000 - 2015 | |
| Number of Cross Sections | 30 038 | |
| Observations | 138 750 | |

Table 8: Panel data regression with clustered standard errors on company level and firm- and time fixed effects. *** mark coefficients which are significant on a 1% level, ** 5% level and * 10% level.

As one can see from Table 8, “Firm Age” now has an insignificant effect on firm performance. The correlation between firm age and ROA from Model 1 thus seem to be spurious. The real effect wasn’t caused by how old the firm was, but specific, unobserved effects on ROA obtained within the specific years.

From the regression in Table 8, the mean of the estimated residuals is 0,000. A hypothesis test of the mean being equal to 0 returns a test statistic of 0,0000 with a corresponding p-value of 1,000, indicating that we keep H_0 of the mean of the residuals being equal to 0. Hence, Assumption (1) of the CLRM is not violated.

When looking at the correlation matrix between the independent variables and the estimated residuals, one can see that there is a non-negligible level of correlation between the residuals and some of the independent variables (Appendix 2). For example, the correlation between the residuals and “Size” is -0,3538. Thus, the

residuals are not independent from the explanatory variables and Assumption (4) of the CLRM is violated.

As Assumption (4) is violated, the regression does not qualify as BLUE (Woolridge, 2015). It is likely that not all relevant variables are included in the regression. Variables which are correlated with the dependent variable and independent variables are left in the error term, and the regression suffers from omitted variable bias. This is also confirmed by the Adjusted R^2 , which only returns 7,77%. Hence, the variation in the variables included in the regression only account for 7,77% of the variation in ROA. Clearly, there are several factors and important variables which are not included in the regression. The regression coefficients are thus biased and not reliable. An implication of this is that even though an increase in “Size” appears to increase ROA, it suffers from an endogeneity issue (Angrist & Krueger, 2001), and one cannot claim any causal effect as the correlation runs a high risk of being spurious (Woolridge, 2015).

However, the most interesting variable for this thesis, “Family-Owned”, has a correlation with the estimated residuals of 0,065 (Appendix 2). This is close to zero, which indicates that there is little to no endogeneity issues when interpreting this variable. An instrumental variable approach could have been useful to isolate the effect of “Family-Owned” in the case of endogeneity and omitted variable bias, but it does not seem to be a prominent problem when interpreting this variable (Angrist & Krueger, 2001; Woolridge, 2015).

Further, different industries are added as interaction terms into the regression analysis, i.e. the isolated effect of family ownership within the different industries on ROA. This is done to see if the results obtained from the variable “Family-Owned” in the sample as a whole (Table 8) also hold within the different industries.

6.3 Model 3: Firm – and Time Fixed Effects OLS Panel Regression using Interaction Terms

| Dependent Variable: ROA | Coefficient | p-value |
|--------------------------------------|-------------------|---------|
| Firm Age | -0,0068 | 0,107 |
| Board Size | -0,0060*** | 0,004 |
| Inside Power | 0,0002** | 0,046 |
| Number of Owners | 0,0001 | 0,729 |
| Largest Family Number of Board Seats | 0,0020 | 0,465 |
| Size | 0,2014*** | 0,000 |
| Leverage | -0,1230*** | 0,000 |
| Family Power | 0,0022 | 0,498 |
| Family-Owned | 0,0014 | 0,774 |
| Retail | -0,0317*** | 0,007 |
| Financial Services | -0,0066 | 0,852 |
| Architecture | -0,0206** | 0,019 |
| Shipping | 0,0789* | 0,071 |
| IT | 0,0243 | 0,127 |
| Family-Owned*Retail | 0,0103 | 0,291 |
| Family-Owned*Financial Services | 0,0161 | 0,658 |
| Family-Owned*Architecture | 0,0191** | 0,045 |
| Family-Owned*Shipping | -0,0778** | 0,046 |
| Family-Owned*IT | -0,0310 | 0,106 |
| Constant | -1,0925*** | 0,000 |
| <hr/> | | |
| Adjusted R^2 | 7,76 % | |
| Sample Range | 2000 - 2015 | |
| Number of Cross Sections | 30 038 | |
| Observations | 138 750 | |

Table 9: Panel data regression with interaction terms, clustered standard errors on company level and firm- and time fixed effects. *** mark coefficients which are significant on a 1% level, ** 5% level and * 10% level.

As presented in the table above, both “Family-Owned*Architecture” and “Family-Owned*Shipping” appear to have an effect of ROA. Family ownership seems to have an effect within the architectural - and shipping industry. Interestingly enough, family ownership within the architectural industry has a significantly positive effect on ROA, while family ownership within the shipping industry has a significantly negative effect on ROA. “Family-Owned*Architecture” has a correlation with the

estimated residual of 0,14, which may indicate that the positive effect observed for family ownership may be caused by omitted variables in the error term, and not the family ownership itself. For “Family-Owned*Shipping”, however, the correlation with the estimated residual is 0,0054, which indicates that almost all relevant factors are controlled for (Appendix 3).

From the results in Table 9, one can also see that non-family-owned firms in retail and architecture tend to perform worse than family-owned firms, while non-family-owned firms in shipping tend to perform better than family-owned firms (even though this is only significant on a 10%-level). Retail is the only industry of these industries where the opposite claim cannot be made, i.e. that family ownership has a positive effect on ROA. The results from the IT - and financial service industry are inconclusive. I.e., a claim stating that family ownership affects firm performance within these industries cannot be made.

6.4 Model 4: Firm – and Time Fixed Effects OLS Panel Regression using Interaction Terms

| Dependent Variable: ROA | Coefficient | p-value |
|--------------------------------------|-------------------|---------|
| Firm Age | -0,007 | 0,105 |
| Board Size | -0,0060*** | 0,005 |
| Inside Power | 0,0002** | 0,028 |
| Number of Owners | 0,00003 | 0,879 |
| Largest Family Number of Board Seats | 0,0020 | 0,449 |
| Size | 0,2013*** | 0,000 |
| Leverage | -0,1230*** | 0,000 |
| Family Power | 0,0021 | 0,511 |
| Family-owned | 0,0014 | 0,763 |
| Architecture | -0,016 | 0,373 |
| Shipping | 0,1763* | 0,072 |
| Family-Owned*Architecture | 0,0276** | 0,016 |
| Family-Owned*Shipping | -0,0902* | 0,068 |
| Number of Owners*Architecture | 0,0008 | 0,373 |
| Number of Owners*Shipping | -0,0388** | 0,026 |
| Inside Power*Architecture | -0,0002 | 0,306 |
| Inside Power*Shipping | -0,0005 | 0,544 |
| Board Size*Architecture | 0,0001 | 0,975 |
| Board Size*Shipping | 0,0205 | 0,343 |
| Constant | -1,0964*** | 0,000 |
| <hr/> | | |
| Adjusted R^2 | 7,75 % | |
| Sample Range | 2000 - 2015 | |
| Number of Cross Sections | 30 038 | |
| Observations | 138 750 | |

Table 10: Panel data regression with interaction terms, clustered standard errors on company level and firm- and time fixed effects. *** mark coefficients which are significant on a 1% level, ** 5% level and * 10% level.

When isolating some of the control variables for shipping and architecture, one can see that “Number of Owners” affects firms within the two industries differently. An increase in the number of owners have a negative effect on firm performance within shipping only. When controlling for this variable, it appears that the negative effect of family ownership on firm performance within shipping becomes less significant compared to Model 3. None of the included interaction terms for architecture has

any effect on firm performance, and the effect of family ownership on firm performance becomes slightly more significant compared to Model 3.

7 Robustness Checks

In order to verify the robustness of the results from the main specification, two additional tests are performed. First, the generalized method of moments is employed, which uses a completely different methodology than the more commonly used OLS, as discussed under 5.0 Empirical Approach. Secondly, a panel OLS controlling for industry specific effects is performed. If these tests give the same results as our main specification, it strengthens the internal validity of the results.

7.1 Generalized Method of Moments (GMM)

A motivation for using dynamic panel estimators is that it is designed for situations with small number of time periods, and a large number of individuals, a linear function relationship, a single left-hand-side variable that is dynamic, depending on lagged values of itself, independent variables that are not strictly exogenous, fixed individual effects and heteroscedasticity and autocorrelation within individuals, but not across them. This method is based on the notion that there exists predictive power in the lagged variable of the dependent variable. The problem with including the lagged, dependent variable in the regular OLS using fixed effects, is that this lagged variable is endogenous to the fixed effects in error term, which gives rise to “dynamic panel bias” (Roodman, 2006). This method can also help to account for the endogeneity issues related to the previous discussion under the main specification (Dustmann & Rochina-Barrachina, 2007).

7.2 Dynamic Panel Data Estimation, Two-Step System GMM

| Dependent Variable: ROA | Coefficient | p-value |
|--------------------------------|--------------------|----------------|
| L.ROA | 0,1385*** | 0,000 |
| Size | 0,2799*** | 0,000 |
| L.Size | -0,1899*** | 0,000 |
| Number of Owners | -0,0006*** | 0,000 |
| Firm Age | -0,0009*** | 0,000 |
| Year | -0,0016*** | 0,000 |
| Family-Owned | 0,0071 | 0,126 |
| Constant | 2,7506*** | 0,000 |

| | |
|--------------------------|-------------|
| Number of Instruments | 507 |
| Sample Range | 2000 - 2015 |
| Number of Cross Sections | 35 455 |
| Observations | 142 466 |

*Table 11: Dynamic Panel Data Estimation using two-step system GMM with robust estimators and orthogonal deviations. *** mark coefficients which are significant on a 1% level*

The lagged value of ROA, “Size” and the lagged value of “Size” are treated as endogenous variables, while “Firm Age” and “Year” is treated as strictly exogenous. “Number of Owners” and “Family-Owned” are treated as not strictly exogenous but predetermined.

One can see from the results that ROA slightly decreases with an increase in “Number of Owners”, “Firm Age” and “Year.” One can also see that an increase in the lagged value of “Size” decreases the present value of ROA. An increase in the lagged value of ROA and present value of “Size” increases the present value of ROA. Family ownership appears to have no effect on ROA.

7.3 Industry-, Firm – and Time Fixed Effects OLS Panel Regression

| Dependent Variable: ROA | Coefficient | p-value |
|--------------------------------------|-------------------|---------|
| Firm Age | -0,0034*** | 0,000 |
| Board Size | -0,0017 | 0,676 |
| Inside Power | 0,0001 | 0,652 |
| Number of Owners | -0,0003 | 0,540 |
| Largest Family Number of Board Seats | 0,0019 | 0,696 |
| Size | 0,2290*** | 0,000 |
| Leverage | -0,1133*** | 0,001 |
| Family Power | 0,0051 | 0,406 |
| Family-Owned | 0,0171** | 0,047 |
| Constant | -1,2857*** | 0,000 |
| <hr/> | | |
| Adjusted R^2 | 8,82% | |
| Sample Range | 2000 - 2015 | |
| Number of Cross Sections | 9 821 | |
| Observations | 40 566 | |

Table 12: Panel data regression with clustered standard errors on company level and firm-, time- and industry fixed effects. *** mark coefficients which are significant on a 1% level, ** 5% level and * 10% level.

When controlling for industry-fixed effects, family ownership seems to have a positive effect on ROA. ROA also seems to decrease with a firm's age. The correlation between firm age and the estimated residual is only 0,06, which would indicate that endogeneity is not largely present when interpreting this variable. The correlation between "Family-Owned" and the estimated residuals is 0,036, which is almost half the size of the correlation in Model 2 (Appendix 4). Adjusted R^2 increases from 7,76% to 8,82%.

8 Discussion

In the following section, a discussion of the results and how they can be interpreted is provided. The results are also connected to existing theory on corporate governance and family ownership.

8.1 Discussions of the Results from our Main Specification

From the four models representing the main specification, one can see that family ownership does not affect firm performance for the population as a whole. The results thus show no relationship between family ownership and firm performance in general. This is also confirmed by the robustness check applying GMM in 7.2. This result is thus valid using two entirely different types of methodologies, which increases the internal validity. This result is also in line with what the weight of academic literature finds when researching the relationship between family and non-family firms (Stewart & Hitt, 2012).

Burkart et al. (2003) argue that active involvement by the founding family increases financial performance. Within stewardship theory, it is argued that family managers are more motivated than non-family managers because their personal goals are associated with the family's goals. The following long-term perspective further reduces potential hazardous actions (Hoffmann et al., 2016). Carney (2005) argues that family firms' competitive advantage arises from a governance system that generates three dominant propensities: Parsimony, personalism and particularism. On the other hand, it has been pointed out that families have severe social and economic constraints that limit their growth and longevity, mainly caused by altruism, nepotism and weak risk-bearing attributed (Carney, 2015). They are also prone to having high agency costs (Dyer, 2006). As theory shows, there are both positive and negative consequences of being a family-owned firm. This thesis' results support this notion, as the effect of family ownership on firm performance comes out as inconclusive, in general.

From the final regression in the Main Specification, 6.4, one can see that “Board Size” has a significant negative effect on firm performance. This supports previous research suggesting that larger boards are prone to suffer from coordination and communication problems (Lipton & Lorsch, 1992; Jensen, 1993, Guest, 2009). From the same model, we see that “Inside Power” has a small, but significant and positive effect on firm performance. This result is in line with theory highlighting how inside power significantly reduces agency conflict and positively affect firm performance as ownership and management are intertwined in a way which significantly reduces agency costs (Böhren, 2011). “Size” also has a significantly positive effect on firm performance. This result is also what was reported as expected in 5.4 Our Model. Larger firms can take advantage of economies of scale, and they are also capable of leveraging their market power, which in return can yield positive benefits (Penrose, 1959; Shepherd, 1986). The variable “Leverage” demonstrates to have a negative, significant effect on firm performance. This contradicts previous studies, which find debt to have a weak-to-no impact on firm performance (El-Sayed Ebaid, 2009). It also partly contradicts Jensen (1986), which states that that debt motivates managers and their organizations to be more efficient. Both “Firm Age”, “Number of Owners”, “Largest Family Number of Board Seats” and “Family Power” proves to have no effect on firm performance, which contradicts the hypotheses outlined in 5.4 Our Model.

As pointed out in 4.2 Descriptive Statistics, family-owned firms perform better than non-family-owned firms, on average. As Table 6 shows, family-owned firms have smaller boards and a higher degree of inside power. It may seem like this is part of the reason for why they are performing better than non-family-owned firms and not the family ownership in itself. The same table also shows how family-owned firms are smaller and have higher leverage, which, to the contrary, would suggest that family-owned companies should be performing worse. The difference between family-owned firms and non-family-owned firms when looking at these variables is, however, small. The difference between the two is more significant when looking at board size and inside power, which may be the reason for why these variables are having a more significant impact, resulting in family-owned companies performing better on average.

However, the results from the main specification also show that family ownership is having a positive effect on firm performance within architecture. Likewise, non-family-owned companies within retail is performing worse than their family-owned peers. For companies within shipping, this relationship is the opposite, and family ownership is having a negative impact on firm performance. It may thus seem that the different industries hold characteristics which influence the effect family ownership has on ROA. This is also confirmed by the robustness check in 7.3 incorporating industry fixed effects into the panel OLS and reducing the sample only to include the specified industries. The results show that when controlling for these industry specific effects, family ownership is having a positive effect on firm performance. It would, therefore, appear that family ownership has an effect on firm performance only for certain industries, but not in general.

It appears that specific industries hold characteristics which both favours and disfavours family ownership, which is expressed in the complete opposite effect of family ownership on firm performance between architectural companies and companies located in shipping. One of the substantial differences between these industries is the qualities needed to govern them. For architectural firms, creative and artistic characteristics are highly valued, while shipping is a more conventional and capital intense industry which sets high demands to managing financing decisions. Perhaps artistic and creative characteristics are more easily inherited and taught through childhood years, which makes family succession more successful. This may also help explain the high correlation between “Family-Owned*Architecture” and the estimated residuals. Governing and managing a successful architectural firm requires many undefined characteristics which are difficult to control for and thus left in the error term. It should also be noted that within architectural firms, the total sample includes 4 649 companies, while it is only 137 companies within shipping (Table 3). The difference in sample size may affect the outcome of the analyses.

A justification for why family ownership has an effect only in specific industries can potentially be explained by the degree of agency conflicts present in the industry. It might be the case that specific industries are more exposed to the different agency conflicts relative to other industries. One could, for example, imagine that the need for outside monitoring is higher in capital intense industries.

The regression in Model 4 partly confirms the notion of industries being exposed differently to agency conflicts. One can see that an increase in the number of owners has an adverse effect on firm performance within shipping while having no effect within architecture. This supports the concept of agency conflict 1 stating that low ownership concentration creates greater, costly agency conflicts. However, low ownership concentration also decreases agency conflict 2, which further should have a positive impact on ROA. The number of owners can thus both increase and decrease agency costs. This is also reflected in the results, as the number of owners appear to have a different impact on firm performance based on the nature of the industry. We believe that more research is needed to understand the inner workings and characteristics of the different industries and how they are affected by the different agency theories.

These results are, to a certain degree, in line with what Anderson & Reeb (2003) found in their study covering publicly traded firms on the S&P 500, where family-owned companies were reportedly outperforming their industry peers. Our results also partly contradicts research done by Berzins & Bøhren (2013), who found no difference in return on invested capital between family-owned firms and non-family-owned firms in Norway, except for small family firms with one owner, which have a slightly higher return on invested capital. Che & Langli (2015) found a U-shaped relationship between family ownership and firm performance in private Norwegian family firms.

When comparing to other studies done on family firms in Norway, this thesis' results are best seen as an addition to previous research. The results from this thesis neither rejects nor confirms previous studies and is best seen as complementary. The literature should be seen as a whole to better understand the inner workings of family firms and how governance affects firm performance. It's a complicated theme which is not understood by reading one study or investigating one aspect.

As Table 6 shows, the companies compared in this thesis (i.e. family-owned and non-family-owned firms) have entirely different characteristics. This can potentially bias the results. A suggestion to future research would involve reducing the sample to only include as similar companies as possible.

Factors affecting ROA and R²

According to this thesis' definition of ROA, the profitability ratio depends mathematically on only EBIT and total assets. A problem is that both EBIT and total assets are affected by hundreds of factors. For example, a high efficiency among employees will influence ROA positively, but it is difficult to proxy. Many textbooks divide ROA into profit margin and asset turnover, which gives the following formula:

$$ROA = Profit\ margin * Asset\ Turnover$$

Selling & Stickney (1989) define the components in the above formula in the following way: *profit margin indicates the ability of a firm to generate operating profit from a given level of revenues, asset turnover indicates its ability to manage the level of investment in assets for a given level of revenues.* The formula explains the value creation in a good manner. A company can have a low profit margin, but still have a high ROA if asset turnover is high. The retail-segment is typically a business with low profit margins. Actors with a high asset turnover, like NorgesGruppen and ReitanGruppen, will still be profitable as the value creation formula above shows. Selling & Stickney (1989) argue that a firm can pursue a higher ROA by increasing profit margins via product differentiation strategies or by increasing asset turnover via cost leadership strategies. These are just a few examples of factors which can influence ROA. Hence, it is difficult for a regression to capture all of the relevant variables. This partly explains why the regression analyses in this thesis return a low adjusted R^2 .

9 Limitations

In the following section, some of the limitations of the analyses that may threaten the external validity of the obtained results are presented.

9.1 Attrition

As discussed earlier, the analyses are conducted using an unbalanced panel data set. There are many reasons for why a panel data set is unbalanced. Respondents may move, find the cost of responding being too high, lose the survey form etc. Missing data is only a problem if they are missing for nonrandom reasons. The data presented in this thesis have several instances where an entire year is skipped for different companies. This, however, should not be a problem as this type of sample selection, i.e. entire years missing, can be assumed exogenous (Woolridge, 2015). Another common problem is attrition: Units that were in a random sample at the beginning of the survey leave for various reasons in later years. Attrition has a great potential for creating biased statistical estimates that could result from overlooking it. The nature of attrition makes it prone to be caused by nonrandom reasons (Young & Johnson, 2015). In medical clinical trials, the dropouts may have been persons for whom the treatment was failing or who experience side effects (National Research Council, 2010). For the accounting data presented in this thesis, companies who drop out may drop out because they went bankrupt or are exposed to some sort of financial trouble. In this case, the attrition/missing data will be nonrandom and thus bias the regression estimates.

9.2 Sample Selection

Sample selection bias arises when we do not observe a random sample of the population of interest. Specifically, when the selected observations are not independent of the outcome variable, which will lead to biased inferences (Winship & Mare, 1992). As discussed earlier, the selection process used involves deleting all observations that wasn't part of at least four consecutive time periods. This is necessary in order to perform a panel data regression where the econometric methods do not fundamentally change (Arellano & Bond, 1991). Further, a panel data regression has its clear benefits given that having multiple observations on the

same units allows us to control for certain time-constant, unobserved characteristics of firms which we think might be correlated with the explanatory variables in the model (Woolridge, 2015). The downside, however, is that one cannot rule out the possibility that characteristics with the companies that does not have data on a continuous basis are correlated with the dependent variable, ROA. If companies are not reporting on a continuous basis because they have their hands full trying to save the company from bankruptcy, for example, this will clearly bias the sample (and thus the estimates) in a similar way as attrition.

9.3 Inconsistencies in Reported and Calculated ROA

When calculating ROA using the formula reported by the CCGR, the results obtained slightly differ from the reported ROA in the data set. When manually calculating, the results obtained were identical to the database's reported ROA in approximately 40% of the cases. This makes one wonder whether the reported or the manually calculated ROA is the most applicable. For this thesis, it was decided to use the manually calculated ROA since this eliminated missing data, which occurred with some frequency in the reported ROA.

9.4 Missing Values

The data set has missing values for different variables at different points in time. As previous discussion has shown, it is critical that these values are missing for random reason, rather than nonrandom reasons. A way to test this is by employing Little's MCAR (missing completely at random) test. We say that data on y are missing completely at random if the probability that data is missing on y depends on neither Y nor X (Allison, 2003).

When doing the MCAR test on the variables used, the EM (expectation maximization) means are significant on a 1% level, meaning the null hypothesis of the data being missing completely at random is rejected (Appendix 5).

It should also be mentioned that, for most variables, missing data does not constitute a large portion of the data sample (Appendix 7). But, for some variables, the number of missing data is non-negligible. For example, "Inside Power" has 27,8% of all observations missing, and data on family ownership is missing in 9,0% of the cases.

A way to deal with data which is not missing at random, is to employ maximum likelihood. This model is however very difficult to implement and are prone to under identification. It is not recommended if one doesn't have a good understanding of the mechanism by which the data is missing (Allison, 2003).

The challenges listed under section 9.1 – 9.4 above can broadly be classified as selection bias, which is a common challenge in scientific research. The implications of the potential biased estimates resulting from selection bias is that external validity is undermined (Berk, 1983). I.e., we fail to claim that the results of the study can be generalized to other companies and other situations.

9.5 Multicollinearity

A frequently discussed data problem in multivariate analysis is multicollinearity among the explanatory variables. When two independent variables are highly correlated, it can be challenging to estimate the partial effect of each, but the actual magnitude is not well defined. One should also note that this correlation does not violate any of the OLS assumptions (Woolridge, 2015).

There are many possible approaches to deciding whether multicollinearity is a problem in an analysis, or not. One could say that if any simple correlation is greater than 0,8, the impact of multicollinearity is significant (Heise, 1969). A problem with this methodology is that two simple correlations of 0,6 might be as harmful as one of 0,8, and a multiple correlation of 0,7 among three or more explanatory variables might be worse than a bivariate relation of 0,9 (Rockwell, 1975). In general, multicollinearity is still considered a poorly understood issue and many claim that one cannot detect and correct for multicollinearity (Woolridge, 2015). In Model 1, there are five instances where the correlation between the explanatory variables are above or equal to 0,4 in absolute terms, where two of the instances have a correlation above 0,5 (Appendix 1). Hence, we acknowledge the presence of some level of multicollinearity, even though the extent to which degree this affects the results are unclear.

10 Conclusion

For the sample as a whole, one can see from the descriptive statistics in 4.2 that family-owned firms are performing slightly better than non-family-owned firms. We are, however, not able to claim that the family ownership itself causes this difference. This is confirmed by two different types of methodologies, which strengthens the internal validity of the result. The results from this thesis suggest that the reason for why family-owned companies, on average, perform better than non-family-owned companies stems from their tendency to have smaller boards and a higher degree of inside power. This comes from the notion that larger boards are prone to suffer from coordination and communication problems, and thus represent inefficient governance (Lipton & Lorsch, 1992; Jensen, 1993; Guest, 2009). A high degree of inside power has the effect of significantly reducing agency conflict 1 because ownership and management are intertwined with each other in a way that significantly reduces agency costs (Bøhren, 2011).

However, within specific industries, family ownership seems to affect firm performance. For architectural firms, family ownership has a significant positive effect on firm performance. For shipping, this relationship is the opposite, and family ownership has a significant adverse effect on firm performance. Family ownership thus affects firm performance in different ways across different industries. Our study hence complements previous studies done on family ownership and firm performance, which have found evidence of the relationship going both ways.

Our study indicates that different industries are exposed to agency conflicts in different ways and that this can help explain why different industries might be inversely affected by family ownership. In shipping, an increase in the number of owners has an adverse effect on firm performance, while the number of owners is an insignificant factor for firm performance for architectural firms. In theory, a high ownership concentration should reduce agency conflicts between owners and managers. This is supported by the results showing that an increase in the number of owners (i.e. a decrease in ownership concentration) has an adverse effect on firm performance within shipping. However, a high ownership concentration should also

increase agency conflict 2. It seems like these opposing effects are affecting architectural and shipping companies differently. More research on this theme is needed to understand the differences and inner workings properly.

We believe our internal validity is satisfactory, given that we obtain the same results employing different sets of methodologies. We are, however, reluctant to claim a robust external validity for our results, given the vast potential for sample selection bias discussed under 9.0 Limitations. Nonetheless, the sample employed is relatively large, which indicates a potential for valid results. Endogeneity issues regarding a claim of causality is also always an issue. We have tried to address and control for endogeneity, but eliminating this 100% is difficult. One should therefore interpret the results regarding causality with caution.

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12 Appendix

Appendix 1: Correlation Matrix for Model 1

| | ROA | Firm Age | Number of Board Members | Inside Power | Number of Owners | Largest Family Number of Board | Size | Leverage | Family Power | Family-owned | Residual |
|--------------------------------------|---------|----------|-------------------------|--------------|------------------|--------------------------------|---------|----------|--------------|--------------|----------|
| ROA | 1 | | | | | | | | | | |
| Firm Age | -0.0461 | 1 | | | | | | | | | |
| Number of Board Members | -0.0233 | 0.0546 | 1 | | | | | | | | |
| Inside Power | 0.0122 | -0.0364 | -0.5769 | 1 | | | | | | | |
| Number of Owners | -0.0219 | 0.0237 | 0.2847 | -0.3176 | 1 | | | | | | |
| Largest Family Number of Board Seats | -0.0225 | 0.1161 | 0.4637 | -0.1812 | 0.0180 | 1 | | | | | |
| Size | 0.1590 | 0.1016 | 0.2321 | -0.1896 | 0.0783 | 0.0414 | 1 | | | | |
| Leverage | -0.1217 | -0.0017 | 0.0272 | -0.0287 | 0.0042 | 0.0481 | -0.0264 | 1 | | | |
| Family Power | -0.0026 | 0.0230 | -0.2879 | 0.3336 | -0.1656 | 0.1626 | -0.0872 | 0.0067 | 1 | | |
| Family-owned | -0.0045 | 0.0641 | -0.4016 | 0.5631 | -0.2044 | 0.2308 | -0.1406 | 0.0151 | 0.4411 | 1 | |
| Residual | 0.7633 | 0.3122 | -0.0739 | 0.0511 | -0.0359 | 0.0252 | -0.3352 | 0.1076 | 0.0335 | 0.0693 | 1 |

Appendix 2: Correlation Matrix for Model 2

| | ROA | Firm Age | Number of Board Members | Inside Power | Number of Owners | Largest Family Number of Board | Size | Leverage | Family Power | Family-owned | Residual |
|--------------------------------------|---------|----------|-------------------------|--------------|------------------|--------------------------------|---------|----------|--------------|--------------|----------|
| ROA | 1 | | | | | | | | | | |
| Firm Age | -0.0461 | 1 | | | | | | | | | |
| Number of Board Members | -0.0233 | 0.0546 | 1 | | | | | | | | |
| Inside Power | 0.0122 | -0.0364 | -0.5769 | 1 | | | | | | | |
| Number of Owners | -0.0219 | 0.0237 | 0.2847 | -0.3176 | 1 | | | | | | |
| Largest Family Number of Board Seats | -0.0225 | 0.1161 | 0.4637 | -0.1812 | 0.0180 | 1 | | | | | |
| Size | 0.1590 | 0.1016 | 0.2321 | -0.1896 | 0.0783 | 0.0414 | 1 | | | | |
| Leverage | -0.1217 | -0.0017 | 0.0272 | -0.0287 | 0.0042 | 0.0481 | -0.0264 | 1 | | | |
| Family Power | -0.0026 | 0.0230 | -0.2879 | 0.3336 | -0.1656 | 0.1626 | -0.0872 | 0.0067 | 1 | | |
| Family-owned | -0.0045 | 0.0641 | -0.4016 | 0.5631 | -0.2044 | 0.2308 | -0.1406 | 0.0151 | 0.4411 | 1 | |
| Residual | 0.7848 | 0.2249 | -0.0840 | 0.0606 | -0.0387 | 0.0125 | -0.3538 | 0.1095 | 0.0329 | 0.0645 | 1 |

Appendix 3: Correlation matrix for Model 3

| | | | | | | | | | | | | | | | | | | | |
|---------------------------------|--------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|--------|--|--|--|--|--|--|--|--|
| | Family-owned | | | | | | | | | | | | | | | | | | |
| Family-owned | 1 | | | | | | | | | | | | | | | | | | |
| Retail | 0.0657 | 1 | | | | | | | | | | | | | | | | | |
| Financial services | 0.0182 | -0.0211 | 1 | | | | | | | | | | | | | | | | |
| Architecture | -0.0142 | -0.1469 | -0.0168 | 1 | | | | | | | | | | | | | | | |
| Shipping | 0.0014 | -0.0232 | -0.0027 | -0.0184 | 1 | | | | | | | | | | | | | | |
| IT | -0.0547 | -0.0710 | -0.0081 | -0.0565 | -0.0089 | 1 | | | | | | | | | | | | | |
| Family-owned*Retail | 0.2001 | 0.9128 | -0.0193 | -0.1341 | -0.0212 | -0.0648 | 1 | | | | | | | | | | | | |
| Family-owned*Financial services | 0.0244 | -0.0205 | 0.9712 | -0.0163 | -0.0026 | -0.0079 | -0.0187 | 1 | | | | | | | | | | | |
| Family-owned*Architect ure | 0.1517 | -0.1278 | -0.0146 | 0.8700 | -0.0161 | -0.0492 | -0.1166 | -0.0142 | 1 | | | | | | | | | | |
| Family-owned*Shipping | 0.0247 | -0.0208 | -0.0024 | -0.0165 | 0.8964 | -0.0080 | -0.0190 | -0.0023 | -0.0144 | 1 | | | | | | | | | |
| Family-owned*IT | 0.0682 | -0.0574 | -0.0066 | -0.0457 | -0.0072 | 0.8084 | -0.0524 | -0.0064 | -0.0397 | -0.0065 | 1 | | | | | | | | |
| Residual | 0.0680 | -0.0885 | 0.0124 | 0.1327 | 0.0025 | 0.0374 | -0.0838 | 0.0116 | 0.1354 | 0.0054 | 0.0616 | | | | | | | | |

Appendix 4: Robustness check

| | ROA | Firm Age | Number of Board Members | Inside Power | Number of Owners | Largest Family Number of Board | Size | Leverage | Family Power | Family-owned | Residual |
|--------------------------------------|---------|----------|-------------------------|--------------|------------------|--------------------------------|---------|----------|--------------|--------------|----------|
| ROA | 1 | | | | | | | | | | |
| Firm Age | -0.0651 | 1 | | | | | | | | | |
| Number of Board Members | -0.0227 | 0.0186 | 1 | | | | | | | | |
| Inside Power | 0.0113 | -0.0197 | -0.5762 | 1 | | | | | | | |
| Number of Owners | -0.0274 | 0.0071 | 0.2440 | -0.2650 | 1 | | | | | | |
| Largest Family Number of Board Seats | -0.0426 | 0.0892 | 0.4635 | -0.1674 | -0.0021 | 1 | | | | | |
| Size | 0.1082 | 0.0923 | 0.1693 | -0.1339 | 0.0516 | 0.0167 | 1 | | | | |
| Leverage | -0.1420 | 0.0162 | 0.0079 | -0.0153 | -0.0100 | 0.0506 | -0.0101 | 1 | | | |
| Family Power | -0.0137 | 0.0211 | -0.2992 | 0.3333 | -0.1484 | 0.1590 | -0.0848 | 0.0189 | 1 | | |
| Family-owned | -0.0127 | 0.0654 | -0.4428 | 0.5673 | -0.1819 | 0.2129 | -0.1175 | 0.0223 | 0.4418 | 1 | |
| Residual | 0.7869 | 0.0612 | -0.0996 | 0.0702 | -0.0393 | -0.0366 | -0.4664 | 0.0289 | 0.0242 | 0.0361 | 1 |

Appendix 5: Test on Autocorrelation in Residuals

| Residual | Coefficient | p-value |
|----------|-------------|---------|
| L1 | -0,1044 | 0,000 |
| Constant | 0,0070 | 0,154 |

Appendix 6: Little's MCAR Test

| | Chi-Square | DF | p-value |
|--------------------|------------|----|---------|
| Little's MCAR test | 50 190,73 | 87 | 0,000 |

Appendix 7: Missing Values

| | N | Missing | |
|--------------------------------------|---------|---------|---------|
| | | Count | Percent |
| ROA | 196 004 | 0 | 0,0% |
| Firm Age | 193 085 | 2 919 | 1,5% |
| Board Size | 195 238 | 766 | 0,4% |
| Inside Power | 141 541 | 54 463 | 27,8% |
| Number of Owners | 196 004 | 0 | 0,0% |
| Largest Family Number of Board Seats | 178 405 | 17 599 | 9,0% |
| Size | 196 004 | 0 | 0,0% |
| Leverage | 196 004 | 0 | 0,0% |
| Family Power | 178 405 | 17 599 | 9,0% |
| Family-owned | 178 405 | 17 599 | 9,0% |

Appendix 8: Preliminary Master Thesis Report

ID number: 0998541
0998376

BI Norwegian Business School -
Preliminary Master Thesis Report

Does family-owned firms perform better than non- family-owned firms? An Empirical study of Norwegian firms.

Hand-in date:
15.01.2018

Campus:
BI Oslo

Examination code:
GRA 19502

Supervisor:
Siv Jønland Staubo

Programme:
Master of Science in Business, Major in Finance

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In the following section, we are looking to introduce our topic, our motivation for choosing this topic, our research question and the objectives of our thesis.

1.0 Introduction

On a global scale, corporate governance and its connection to firm performance has been thoroughly studied. There are many examples of studies focusing on characteristics of the board of directors, board structure, ownership structure and how the power of different stakeholders is connected to ownership distribution (Blair, 1995; Jensen & Meckling, 1976; Salancik & Pfeffer, 1980).

Within studies focusing on corporate governance, several studies have been conducted concentrating on the relationship between family ownership and firm performance. Comparing both different levels of family ownership to each other (Che & Langli, 2015) and also comparing the performance of family-owned firms to nonfamily-owned firms (Berzins & Bøhren, 2013). Many of the studies conducted globally are focusing on firms which are public, and there is an increased demand for understanding firms which are private (Chrisman et al., 2007).

1.1 Motivation

About 70-95% of all firms world-wide are family-owned and together they create between 50% and 80% of all jobs (Family Firm Institute, 2016). In the US, the portion of family-owned firms account for 80% of all firms, and they contribute to between 50% and 60% of the US gross domestic product (Daily & Dollinger, 1992; Francis, 1993). Similar numbers have been found in the UK, Western Europe and Australia (Stoy Hayward and The London Business School 1989, 1990; Lank, 1995; Smyrnios and Romano, 1994; Smyrnios & Tanweski, 1997). Similar numbers also apply for Norway (Berzins & Bøhren, 2013). Hence, family firms play an important role in the global economy and in society in general.

In Norway, a diminishing 0,015% of family firms are public (Berzins & Bøhren, 2013). Given that private family firms represent such a large portion of the economy, we find it interesting that there hasn't been conducted more research to

understand their characteristics, and whether their governance has any impact on the way they perform.

1.2 Research question

In our thesis, we are looking to expand on previous research done on the relationship between family-owned firms and performance in Norway conducted by Berzins & Bøhren (2013) and Che & Langli (2015). Unlike previous research, we would like to divide our data by industry and see if there is any difference in the relationship between family ownership and firm performance compared to nonfamily-owned firms between the different industries. We will also explore how the size of family ownership effects the result. In short, our research question can be summed up to:

Are there differences in firm performance between family-owned and nonfamily-owned firms between different sectors in Norway?

We believe this research will expand on previous research and give a deeper insight into the characteristics of family-owned firms in Norway and how they are governed. We believe this will be of value, as companies with a lot of assets (i.e. car importers, shipping, tank) are governed differently than firms which rely on human resources (technology, architecture). Perhaps one could expect that it is easier to inherit the skill to run a more traditional firm (i.e. firm with a lot of assets). We are also hoping this will shed a light on why some industries are dominated by family ownership, while others are not. In addition, we would like to see whether the potential effect of family ownership can be attributed to a casual effect. A large portion of the empirical research suggesting that certain governance structures drive improved performance are victims of endogeneity issues, which makes us unable to claim a casual effect (Wintoki et al., 2012). We will go more into detail in section 4.0 on how we will try to overcome this problem.

In the following section, we will discuss what previous studies have found when researching corporate governance and the connection between family ownership and firm performance.

2.0 Literature review

Previous studies have highlighted how the board of directors and ownership structure are among the main governance mechanisms that could affect firm performance (Blair, 1995; Jensen & Meckling, 1976). Studies have also shown a positive relationship between family ownership and firm performance in public family firms (Anderson & Reeb, 2003; Lee, 2006; Maury, 2006). Anderson & Reeb (2003) found that family firms perform better than nonfamily firms among the S&P 500. They also found a non-linear relationship between family holdings and firm performance, and that family members as CEO positively affect firm performance for these firms compared to having outside CEO. Overall, Anderson & Reeb (2003) suggest that family ownership is an effective organizational structure, which is inconsistent with the minority shareholders hypothesis. There has been argued that family-owned firms have governance advantages in terms of their propensities for value creation (Carney, 2005).

But, academic literature is divided. Some studies find no relationship or negative relationship between family ownership and firm performance for public family firms (Stewart & Hitt, 2012). Scholars have argued that there are severe social and economic constraints on families that limit their growth and longevity (Carney, 2005). A lot of studies have also been conducted on how board characteristics are associated with firm performance. Despite this, there is no consensus on how this is related (Anderson & Reeb, 2004; Eisenberg et al., 1998).

A lot of studies focus on family ownership in public firms, but similar studies on private firms are somewhat limited. Also, the studies that have been conducted on private firms find no connection between family ownership and firm performance in general (Sciascia & Mazzola, 2008; Westhead & Howorth, 2006). Even less studies have been conducted on private family firms in Norway. Che & Langli (2015) did a large study where they compared performance between private

Norwegian family firms with different percentage of family ownership. They found that family firms with small ownership (50-67%) and large ownership (100%) performed better than family firms with ownership portion in between. Hence, they found a U-shaped relationship between family ownership and firm performance in private Norwegian family firms.

Berzins & Bøhren (2013) conducted a similar study on all registered firms in Norway, both public and private. They found that family-owned firms have a significantly higher profitability than other firms. However, this difference is reduced by 2/3 when controlling for other drivers of profitability. Controlling for other variables, they find no difference in return on invested capital between family-owned firms and nonfamily-owned firms, except for small family firms with one owner, which have slightly higher return on invested capital.

In the following section, we will discuss the theoretical frameworks which lay the foundation for our research.

3.0 Theoretical framework

3.1 Family Firms

There is no exact definition of what classifies as “family firms.” We therefore need to consider two questions:

1. Who is to be considered as “family?”
2. What should the family do in the firm in order to qualify it as a family firm?

Prior research provides only limited guidance on how to ascertain family firms. Anderson & Reeb (2003) use the fractional equity ownership of the founding family or the presence of family members on the board of directors to identify family firms. However, they are not assessing how large this fraction should be. They are also raising the issue that differences in ownership levels among family firms may not represent the influence that family members employ on the firm (Anderson & Reeb, 2003). The EU defines businesses controlled by people to be family businesses, no matter the relationship between these people. We have decided to use the definition used by Berzins & Bøhren (2013). On the first question, we would consider a family as a group which is connected through marriage or kinship in a straight line

including great-grandparents or in side-line even with cousins. To answer the last question, the family need to own more than 50% of the firm's shares, in order to have majority ownership and full control rights. Full control rights give the family opportunities to decide the composition of the board and further choose the strategic direction. Our definition is therefore that in a family businesses, more than 50 % of the shares is held by individuals which are married, in in-laws or in kin with each other (Berzins & Bøhren, 2013).

3.2 Population

In theory, we could choose to include all registered firms in Norway in our data set. However, we believe it to be beneficial to filter down the companies to some extent. As the succeeding section will elaborate on, we are looking to track and compare firms' operating performance. Thus, we will seek to avoid, among others, holding firms and "sleeping" firms which are no longer operating, but still are registered in the database. To accomplish this, we have decided to filter down the firm population using the same criteria as Berzins & Bøhren (2013):

- (1) The firm is not a subsidiary
- (2) The firm has consistent accounting
- (3) The firm has revenues
- (4) The firm has employees

3.3 Firm Performance

To measure firm performance, we will examine return on equity (ROE) and return on assets (ROA), which are two of the most common accounting profitability ratios. In order to measure performance, it is also possible to use metrics such as sales growth, asset growth and CAPEX/Sales. These operating measures focus on how fast firms grow. However, ROA and ROE better capture the profitability of a firm (Birley et al., 1999).

According to Anderson & Reeb (2003), we can compute return on assets in two different ways. The first method is to divide earnings before interest, tax, depreciation and amortization (EBITDA), in year t , on the average book value of assets in year t and $t-1$. This method measures how effectively a firm generates

returns before debt obligations, tax obligations, depreciation and amortizations are deducted:

$$ROA = \frac{EBITDA}{Total\ assets}$$

The second method to obtain ROA is calculated by dividing net income in year t on the average book value of assets in year t and t-1. ROA indicates how profitable a company is relative to its assets (Anderson & Reeb, 2003):

$$ROA\ 1 = \frac{Net\ income}{Total\ assets}$$

The last performance measure we are going to use is ROE, which measures a company's profitability by looking at how much profit a company generates with the money shareholders have invested:

$$ROE = \frac{Net\ income}{Shareholder's\ equity}$$

Tobin's Q is also a widely used performance indicator in corporate governance research. Because we are going to examine private firms, calculating Tobin's Q would be difficult, since this indicator uses market value of assets in its calculations (Anderson & Reeb, 2003).

Since our main focus is operating profitability, we want to use ROA as our core performance indicator.

3.3 Agency Theories

Jensen and Meckling (1976) argued that the agency relationship can be defined as a contract where the principal (owner) hires an agent (manager) to perform a task. The principal will then delegate some decision power to the agent. Agency theory plays an important role in corporate governance and is used when a firm's ownership and management are separate and there are deviating goals between the shareholders and managers in a firm (Fama & Jensen, 1983). Agency assumes that

economic agents prefer to choose actions that maximizes their own utility (Denis et al., 1999).

In Corporate Governance, there are four common types of agency conflicts (Bøhren, 2011):

- between owners and managers
- between major and minor shareholders
- between owners and creditors
- between owners and stakeholders

3.3.1 Agency conflict 1 – between owners and managers

Separation between ownership and control plays an essential role in corporate governance and agency theory. Eugene Fama (1980) argued skepticism about the power of shareholders in a firm. Small shareholders need to cooperate in order to get the majority of votes and influence. Low ownership concentration and insider ownership create greater agency conflicts between owners and managers (Berzins & Bøhren, 2013). Conflicting interests and asymmetric information between shareholders and managers will also affect the relationship (Healy & Palepu, 2001).

Managers may:

- Benefit from perquisites – such as famous private jets and golf club membership (Yermack, 2006).
- Boost short-term results at the expense of long-term performance (Narayanan, 1985).
- Build empires: Managing a larger firm gives higher salaries and perks (Jensen & Meckling, 1976).
- Prefer the “quiet life” and allow costs to drift upwards (Bertrand & Mullainathan, 2003).

| Type | Insider-share (%) | The largest owner is in the board (yes, %) | The largest owner's share of boardroom (%) | The largest owner is chair (yes, %) | The largest owner is CEO (yes, %) | Largest owner is chair and CEO (yes, %) |
|--------------|-------------------|--|--|-------------------------------------|-----------------------------------|---|
| Family firms | 96 | 94 | 86 | 89 | 83 | 75 |
| Other firms | 54 | 66 | 36 | 38 | 39 | 14 |

Figure 1: Board and management in family firms, compared to other firms. Data from Norway (Bøhren, 2011).

The table above shows that on average, 83 % of the largest owners in family firms is the CEO. In other firms, the CEO is the largest owner in only 39 % of the cases. This means that in almost all family firms, there exists no agency conflicts between owners and managers. Ownership, board involvement and management are intertwined into each other, which means that the board have an advisory role, and not a control function (Bøhren, 2011).

3.3.2 Agency conflict 2 – between majority and minority shareholders

The key issue of the conflicts between majority and minority shareholders are the gap between cash flow rights and voting rights. If you own 51 % of shares, you make decisions regarding the firm, but you only receive 51% of the dividend. Therefore, you have an incentive to fit cash flows through private benefits and the likelihood for agency conflict 2 is thus high (Bøhren, 2011). This problem is also made worse by pyramiding, dual-class shares and weak legal protection (Barclay & Holderness, 1989). Villalonga & Amit (2006) argue that the conflict between major and minor shareholders is widespread in family firms. Further, this occurs because the majority shareholder may use their position to extract private benefits at the expense of the minority shareholders (Villalonga & Amit, 2006).

3.3.3 Agency conflict 3 – between owners and creditors

This conflict stereotypically occurs when firms have more debt than equity on their balance sheet. Owners prefer high return, which is associated with a higher level of risk. On the other hand, creditors are interested in low risk and the repayment of debt (Bøhren, 2011). Family firms tend to be more risk averse than privately held firms and they also tend to avoid debt (McConaughy & Mishra, 1999). In addition, they also bend towards having a low willingness to raise new capital, which increases the incentives to have a strong relationship to banks and other credit institutions. This may reduce the interest conflicts between owners and creditors (Ampenberger et al., 1999).

3.3.4 Agency conflict 4 – between owners and the stakeholders

The fourth agency conflict is about conflicts with stakeholders that are not mentioned in the conflicts above. These can be employees, suppliers, customers and society (Bøhren, 2011). Employees want to have a safe job and a high salary, which may be conflicting with owner's interest to achieve a high return on their invested capital.

In this section, we will provide an overview of the empirical framework we will use to conduct our analyses. And also, potential framework which may be applicable.

4.0 Empirical framework

4.1 OLS regression

In order to estimate the effect of family ownership on firm performance, the method of ordinary least squares (OLS) can be applied. OLS estimation is used to estimate the slope and intercept parameters in the population model. OLS estimation accomplishes this by minimizing the sum of the squared residuals. This method can also be used to estimate the effect of different portions of family ownership (eg. 50% vs 70%) on firm performance. By including a dummy variable, one will also be able to see the difference between companies which are family-owned and those which are not. Dummy variables can be used as a “proxy” variables or numeric stand-ins for qualitative facts in a regression model. By including family ownership as a dummy variable, we will be able to see how much the expected average value of firm performance changes with a change from nonfamily to family-owned (Woolridge, 2015). Doing this for different sectors will also give us the ability to compare results and isolate sector-specific differences.

This regression model is commonly known as the classical linear regression model (CLRM) and is typically denoted:

$$y_i = \beta_1 x_{i1} + \beta_2 x_{i2} + \dots + \beta_p x_{ip} + u_i$$

y_i is the dependent, or endogenous, variable. It represents the variable we want to explain (here: firm performance) using other variables. $x_{i1}, x_{i2}, \dots, x_{ip}$ is called independent, or explanatory, variables. β is an estimate that estimates the average effect of the independent variable on the dependent variable. u_i is an error term and captures all the other factors which effect the dependent variable y_i other than the regressors $x_{i1}, x_{i2}, \dots, x_{ip}$.

Since y_i also depends on u_i , we must be specific about how u_i is generated. Assumptions about the unobservable error terms u_i :

- (1) $E [u_i] = 0$
- (2) $\text{Var} [u_i] = \sigma^2$
- (3) $\text{Cov} [u_i, u_j] = 0$
- (4) $\text{Cov} [u_i, x_{ip}] = 0$
- (5) $u_i \sim N(0, \sigma^2)$

If assumptions (1) to (4) hold, then the estimators determined by the OLS are known as "Best Linear Unbiased Estimators" (BLUE) (Brooks, 2014).

Family-owned firms may hold characteristics which cause positive effects on firm performance other than the fact that they are family-owned. One can, for example, state that family-owned firms tends to cooperate better (or poorer) than nonfamily-owned firms, which is the real, underlying reason for the effect on firm performance. Hence, variables correlated with both the dependent and the independent variable are left in the error term. The OLS estimator will then be a victim of omitted variable bias, causing the problem of endogenous independent variables in the regression model. If these variables could be measured and held constant in a regression, the omitted variables bias would be eliminated. In practice, it's not specified which variables that should be held constant, and it's difficult to measure all of the relevant variables even when specified (Angrist & Krueger, 2001). Thus, estimating the effect of family ownership on firm performance using OLS will only be able to estimate correlation, and not causal effect (Woolridge, 2015).

A way to overcome this problem is by using a method called the instrumental variables approach, which we will explore in more detail in section 4.3. Recent academic work uses instrumental variables to overcome omitted variables problems in estimates of causal relationships (Angrist & Krueger, 2001).

4.2 Panel data regression

Since we have company data over several years (See "5.0 Data Collection") we will also apply panel data regression on our data. A panel data set consists of a

time series for each cross-sectional member in the data (Woolridge, 2015). Doing this regression is quite beneficial, and might yield results that the standard OLS regression described above cannot. Having multiple observations on the same units allows us to control for certain time-constant, unobserved characteristics of firms which we think might be correlated with the explanatory variables in our model (Woolridge, 2015). Some have also claimed that causal inference requires following the same individuals over time (Woolridge, 2015; Wunsch et al., 2010). A simple panel data regression is written in a similar fashion as the simple linear regression, except that it includes a time parameter, t :

$$y_{it} = \beta_0 + \beta_1 X_{1it} + u_{it}$$

4.3 Method of Instrumental Variables

This approach leaves the unobserved variable in the error term and uses an estimation method that recognizes the presence of the omitted variable. To illustrate how this method works, we start with a general linear regression written as

$$y = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + u$$

By substituting z as a proxy variable for x_2 we will, under certain assumptions, get a consistent estimator of β_1 from the regression of

$$y \text{ on } x_1, z$$

If there is no proxy available for x_2 , then we put x_2 in the error term and are left with the simple linear regression model

$$y = \beta_0 + \beta_1 x_1 + u$$

where u contains x_2 . Estimating this equation using OLS will naturally lead to a biased and inconsistent estimator of β_1 if x_1 and u are correlated (also shown in assumption 4 of the OLS regression above). There is however a way to use the above simple linear regression as the basis for estimation, given that we find an

instrumental variable for x_1 . In order to obtain consistent estimates, this instrumental variable, z , needs to satisfy the following two assumptions:

(1) z is uncorrelated with u : $\text{Cov}(z, u) = 0$

(2) z is correlated with x_1 : $\text{Cov}(z, x_1) \neq 0$

Assumption (1) is often referred to as instrument exogeneity, which means that z should have no partial effect on y , and z should be uncorrelated with the omitted variables. Since u is unobservable, this cannot be tested, but must be claimed using economic behavior and theory. Assumption (2) is often classified as instrument relevance. This assumption states that z must be related, either positively or negatively, to the endogenous explanatory variable x_1 . In contrast to assumption (1), this assumption can be statistically tested. This is done by taking a random sample from the population and regressing x on z

$$x = \theta_0 + \theta_1 z + v$$

If there is a correlation between the instrument variable and the explanatory variable, i.e. $\theta_1 \neq 0$, we have obtained instrument relevance (Wooldridge, 2015).

4.4 Possible extensions and analyses

In addition to the classical linear regression, panel data regression and applying the instrumental variable approach, we will consider employing a couple of more extensions and analyses. Employing all of the following methods will most likely not be beneficial, as many of them serve the same purpose. Which method we will end up using depends on the results of our previous analyses, and also the nature of the data we get access to. It can also be meaningful to perform some of the following methods as robustness tests in order to see if our obtained results hold using other methods.

For example, when analyzing panel data, we cannot assume that the observations are independently distributed across time. First differencing or fixed effects estimations estimates the effects of time-varying independent variables in the presence of time-constant omitted variables. Panel data does us little good if we are

interested in the effect of variable that does not change over time (Woolridge, 2015). In classical linear regression, there is basic econometric methods that can be used with robust inference techniques to allow for heteroscedasticity or serial correlation. But, for panel data, significant improvements can be obtained using the generalized method of moments (GMM) when serial correlating error terms are present, something which may be highly relevant for our data (Woolridge, 2001).

Earlier, it was expressed how instrumental variables possibly could eliminate endogeneity and bring us closer to concluding on the presence of a causal effect. A second approach to estimate the causal effect of family ownership on firm performance is called difference-in-differences (DID). This is approach explores differences in outcome between a treatment and a control group, where the “treatment” hits the whole treatment group simultaneously. The DID approach is based on comparing the treatment group to a control group that displays what would have happened to the treatment group in the absence of treatment (Angrist and Pischke, 2015). In our case, this could be done by comparing similar companies over time, where the treatment group went from nonfamily-owned to family-owned (or the other way around) at a specific point in the time series. The challenge would be that this “treatment” needs to happen to the whole treatment group simultaneously, which may become a practical challenge, as company ownership changes randomly across companies.

In the following section, we are discussing how we will proceed to collect our data.

5.0 Data collection

We will collect secondary data from the Centre for Corporate Governance Research (CCGR) at BI Norwegian Business School. CCGR focuses on empirical research of Norwegian firms. The data available from CCGR contains unusually detailed ownership data for listed firms and high-quality accounting data for non-listed firms. The CCGR specializes on the private industry in general and non-listed firms and family firms in particular, which resonates well with the main focus of this thesis. The data provided by CCGR contains accounting data from 1994 to 2015 and governance data from 2000 to 2015. The data allows us to acquire up to 15 corporate governance variables including ownership structure, board composition and CEO. We believe this data will be satisfactory to perform a sufficient and meaningful statistical analysis in order to provide answers to the research question presented previously.

In the following section, we include a table to show our preliminary implementation plan.

6.0 Implementation plan

| | |
|---------------------------|--|
| February 1 st | Feedback from advisor Access to CCGR database |
| February 17 th | All necessary data collected |
| March 15 st | Statistical analysis is done |
| April 1 st | Feedback on first draft |
| May 1 st | First version of thesis finished |
| June 1 st | Planned finished |
| September 1 st | Deadline final thesis |

7.0 References

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