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How board dynamics affect a firm's performance: Evidence from Norway

Master Thesis

By

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MSc in Business – Finance

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Abstract

This paper examines whether there is a connection between board dynamics, board characteristics and a firm's performance. The sample is made up of companies with specific qualities. We have examined private companies in the Norwegian region between the period 2000-2020, where companies that have sold a minimum of 20% of their shares have been tracked. From this, using dummy variables, we assigned the company's board-specific control variables based on if the company was controlled by insiders, outsiders or shared equally by both parties. Results from the panel regression suggest that the more the largest family owns there more like there is Inside Control, but we can conclude that there more likely are Shared Control and Investor Control that will be the setup in the years after the transfer event. Further, we discover that board composition does not have a significant effect on firm performance, nor does board size. Lastly, we have discovered that there are signs that firm-specific characteristics can have significant explanatory power on the firm's performance, of which firms with high leverage perform poorly.

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Table of Contents

1. Introduction

A successful firm can be considered a living, breathing organism that increases the quality of life and wealth of all involved. But many firms never succeed, and a common reason for this is that they have not been able to finance their daily operations. There exists extensive research on how the board dynamics in these companies play out when capital is raised. Broughman (2013) examines the tiebreaking role of an independent director, based on a study by Aghion and Bolton (1992). Ewens and Malenko's (2021) result further indicates that the composition of the board changes when external financing is provided. Further results show also that the presence of an independent board member has a positive influence when it comes to operating as efficiently as possible.

This paper aims to examine the board dynamics of Norwegian private companies and how the performance of these companies unfolds. The closest paper to our work is Ewens and Malenko's paper (2021) on board dynamics in startups, where we do similar research on Norwegian private firms. We study the relationship between the private firms and the investors, and how the board structure develops as outside financing is granted. Further, we study if these board characteristics, together with firm characteristics, influence these firms' performance. We include other empirical research to capture important aspects. Due to limited research on board dynamics across Norwegian private firms, research on other geographical areas and similar topics make up the majority of the academic foundation of this paper.

In this paper, we find evidence that board dynamics and composition of the board change over time after the first initial transfer. Regarding board composition and firm performance, our findings are contradictory to earlier research as it indicates that board composition does not affect firm performance nor does board size. However, our research finds good indications that the right firm characteristics can have a significant effect on efficiency and performance.

This paper has the following structure: First, we review and discuss current literature on financial contracts, board dynamics and firm performance. Secondly, we construct hypotheses in the same section based on the review. Furthermore, in section 3, we present the research model along with the variables of interest and the data sources. Variables are selected based on the hypotheses, previous research, and the interrelations between the variables. Section 4 presents some descriptive statistics on the variables together with the empirical results from the regression and an explanation of the statistical model that follows. Finally, Section 5 summarizes the findings, as well as makes recommendations for further research.

2. Literature Review and Hypotheses Development

This chapter summarizes important theories and empirics on financial contracting, board dynamics and firm performance. Finally, we will discuss the development of our hypotheses for this paper.

2.1 Financial Contracting

There is existing previous research on financial contracting theory, which emphasizes that remaining control can affect ex-post results and ex-ante investments (Aghion & Bolton, 1992). Earlier research treats control as an indivisible right that can be held at any given time by either the firm's entrepreneur or its investors (Kirilenko, 2001). The main ideas underlying this theory can be illustrated with the example of an entrepreneur who needs to raise funds to finance an investment project, implying that the entrepreneurs are wealth constrained. A contract between the entrepreneur and investor would be seen as incomplete as they may have conflicting objectives regarding the future developments of the project as future decisions cannot be perfectly determined in the initial contract (Aghion & Bolton, 1992). The conflict builds on the interest of the two parties, where the entrepreneurs both have private- and monetary benefits but the investors only have the monetary benefits. Here Aghion and Bolton (1992) present two forms of control allocations that may be efficient: unilateral control and contingent allocation of control.

Broughman (2013) discusses in his research paper another form of control allocations that may be efficient. Here he examines the tiebreaking role an independent director can have in the conflicts that may erupt between the entrepreneur and the investor. Here a research paper done by Kaplan and Strömberg (2003) is interesting as they found that a firm's VC investors control the board 25% of the time, and the entrepreneurs control the board only 14% of the time. In the remaining firms, 61% of the sample, board control is shared with a mutually appointed independent director holding the tiebreaking vote (Broughman, 2013).

Using a bargaining process similar to final offer arbitration (Stevens, 1966), Broughman (2013) shows that an independent director as a tiebreaker can reduce holdup by moderating each party's ex-post threat position. The independent director must choose between one of the proposals from either the entrepreneur or the investor if they do not agree on this beforehand. Both must propose actions that would be endorsed by the independent director as they have an incentive to converge toward the action most preferred by the independent director. This result is analogous to the convergence of political platforms predicted by the median voter theorem (Downs, 1957). The entrepreneur and investor effectively create a median voter by adding an independent director to the board. Under the presence of an independent director, the parties commit to follow the independent director's preferred action whenever renegotiation breaks down. While this does not necessarily lead to the first best, it thus can reduce the threat of holdup and potentially expand the range of early firms that receive external financing.

2.2 Board Dynamics

Further research by Ewens and Malenko (2021) done on board dynamics proves that independent directors could play a unique role on private firm boards, especially for startups. This is as firms in their early stages, backed by investors, face neither the regulatory requirements nor a major separation of ownership and control of their public peers. Their research documents new facts about board composition, allocation of control and dynamics, and examine the roles of independent directors.

Findings from their data, which consists of 7.201 US startups, show that the dynamics of board composition over time and across startups are consistent with independent directors playing a tiebreaking role between the entrepreneurs and the investors (Broughman, 2013; Ewens & Malenko, 2021). Their results are consistent with their prediction that the control over the board will shift from (1) entrepreneur control in early financing rounds; (2) shared control in subsequent financing rounds, and (3) investor control in late financing rounds.

There exists also some research on board characteristics done on 86,000 Norwegian family firms in the period 2000-2015. This research is interesting for us as our study includes Norwegian private firms, where we have included some measures which could be relatable for this study. Results from the study show that the controlling family holds at least half the seats in 83%, and holds every seat in 76% (Berzins et al., 2018). Further results show also that directors own more shares in family firms than in non-family firms, 90% and 68%, respectively.

2.3 Firm Performance

Ewens and Malenko (2021) made it clear that the independent director can make a significant contribution to a firm's efficiency. The independent directors can help mediate conflicts between investors and entrepreneurs on the board, which can increase the ex-post efficiency of decisions taken by the firm. This is also mentioned by Jensen and Meckling (1976) in their study. Independent directors may create firm value due to potential conflicts of interest between the manager who runs the firm and the owners who delegate control rights to the manager (Bøhren & Staubo, 2016)

A recently published paper, conducted by Berzins, Bohren and Stacescu (2022), presents new research on firm performance. To specify, they compare the return on assets of family firms and non-family firms using data on all Norwegian limited-liability firms from 2000-2019. Their findings show that the average book return on assets is 1.4% higher per year in family firms than in non-family firms.

Their findings are stable across the business cycle, and the premium persists when they control for firm characteristics from asset pricing theory, such as the firm's risk, size, leverage, growth, and industry. Further, their findings support that the family firm premium is positively associated with lower agency conflicts.

Yermack (1996) presents evidence consistent with theories that small boards of directors are more effective. His study consisted of 452 large U.S. industrial companies between 1984 and 1991, which is based on Lipton and Lorsch's (1992) and Jensen's (1993) criticism of large board's performance, stating that problems of poor communication and decision-making overwhelm the effectiveness of such groups. To this problem, Lipton and Lorsch (1992) propose that the size of a board should be limited to a maximum, with a ratio of at least two independent directors to any directors who has a connection with the company. A smaller board would most likely allow directors to get to know each other well, have more effective discussions with all directors contributing, and reach a true consensus from their deliberations. Yermack (1996), as a result of his study, finds evidence consistent with this theory. He finds an inverse association between board size and firm value. The result is robust to numerous controls for company size, industry membership, inside stock ownership, growth opportunities, and alternative corporate governance structures.

2.4 Hypothesis Development

Taking the existing literature into account and looking at previous research on board dynamics and firm performance, the hypotheses of the paper are formed. For the board dynamics part, the thesis mainly follows the methods and empirical research of Ewens and Malenko (2021) and will be grounded in their examination of the subject. From this approach, the first thesis hypothesis is formed. Research has mainly shown that for companies that obtain financing from outside, the board structure develops in step with the usual grants. Previous research also shows that an independent director plays an important role as an intermediary, which results in the companies operating most efficiently. Thus, it is not unlikely that the same relationship exists for Norwegian data as well. Hence, the first hypothesis is developed:

Hypothesis 1:

For Norwegian Private firms, the board control and its dynamics change over time after outside financing are granted.

Whereas board dynamics is the main focus of this paper, we will by introducing firm performance be able to investigate wider aspects of Ewans and Malenko's (2021) research. By combing their theories regarding board composition and substitute theories from the well-documented research area, we will be able to understand if different board characteristics, together with firm characteristics, can have a beneficial effect on a firm's performance. For the second part of this paper, we will follow the methods of Bersenz, Bohren and Stacescu (2022). This paper will therefore expand the aforementioned model a bit with the addition of variables related to a corporate governance structure. Hence, the second hypothesis is developed:

Hypothesis 2:

For Norwegian Private firms, board and firm characteristics have a positive effect on firm performance

3 Methodology and Data

In this section, we select the sample and define insiders, investors, and independent directors. Further, we will define our allocation of the different directors, and how the different board control compositions are distributed. Lastly, we will discuss our methodology and the different variables included.

3.1 Firm Sample

Our selection started with a sample of 193,600 Norwegian companies, where the largest family had been the majority owner for at least three years and owns 50% or more of the company.

As we were only interested in companies where the largest owner had been diluted, we had to create some sort of measurement to be able to retrieve these companies from the sample. Here our measurement was that the stake of the largest family had to be diluted by 20%, which later will be referred to as the first initial transfer. Since we wanted to create a sample of companies that had received funding from external investors, this measurement worked just like a proxy for this. We were now able to retrieve our companies based on this measurement and ended up with a new sample of 6,139 companies. These companies were the ones we used in our further research.

3.2 Allocation of the board

We will measure board mechanisms in line with previous research, which classifies board members as either inside, investor or independent (Adams & Ferreira, 2009; Baysinger & Butler, 1985; Bøhren & Staubo, 2016; Millstein & MacAvoy, 1998; Weisbach, 1988). Inside directors are full-time employees, former employees, or employees of closely related firms. An investor has professional relationships with management or is likely to have business relationships with the firm. Independent directors are neither inside nor an investor (Bøhren & Staubo, 2016).

Since our focus is on the composition of the board and who the board is controlled by, we had to make a kind of measurement so that we could assign the board control to either the insiders, investors, or both (shared). Here, shared control is defined as equal control between insiders and investors. The composition can either consist of only the two parties, who share the board seats equally, but also of independent board members, where the independent board members act as an intermediary. As we were not able to access complete board data on which firms the different board members were belonging to, we had to create some measurements based on the data available. Here we used a data set that contained information about each board member, where they were given a dummy variable whether they were affiliated with the largest family, were the CEO, belonged to the CEO's extended family, were affiliated with a minority family, or were a minority family member.

Based on these dummy variables, we mapped different combinations presented in Table 3, where our focus was to distribute which party the individual board member belonged to. Here, the individual member would either be considered as an internal member, investor member or an individual member. From this setup, we were able to tie every single individual on the board to one of the three different parties, for each year. Furthermore, we summed up each member of the existing firm for each year, together with two other dummy variables that consisted of whether the insider or the investor changed status between L1 and YTD for the current year. By knowing which group each individual was affiliated with for the current year and the year before, we were able to track when an individual from the largest family became an outsider and an individual from the investors become part of the largest family. We now had enough information variables on each board so we could allocate each firm for each year into the different board variables: Insider Control, Investor Control and Shared Control. For our construction, we now had to combine the different variables. For a firm to be defined as controlled by insiders, we had to do two measures to capture this.

The first measure was that the sum of inside board members had to be greater than the sum of investor board members, and the number of investors who changed status to insider between L1 and YTD was divided by the sum of inside board members, which had to be greater than or equal to 0.5. Here we had some errors as you can't divide zero on each other, we thus replaced these errors with 0. This measure was not enough to capture if the board control should've been allocated to the insiders, hence a second measure was created. For this measure, the sum of insiders changing status to investor between L1 and YTD had to be greater than or equal to our first measure Inside Control, plus greater than 1. If one of these measurements was given a dummy value, we considered that the board of the company was controlled by the insiders. For the Investor Control variable, we operated with the same measurements, just opposite.

We accounted for the board members who along the way changed status from Insider to Investor. Lastly, for the Shared Control variable, we had to create three measurements. Under the first measurement, the sum of inside board members had to be equal to the sum of investor board members and the sum of changes (L1 to YTD) for these two had to be equal to each other. This measure also included the firms, which for the current year only had independent board members. These few cases were recorded as shared. For our second measurement, if the sum of board members changing status from Investor to Insider divided by the sum of Insider was equal to 0.5, at the same time as the sum of Investors were equal to zero, we declared the board control as shared. Our third measurement had the same recipe as our second measurement, just opposite for board members changing status from Insider to Investor. If one of these measurements were given a dummy variable, we considered that the board of the firm was shared between the Insiders and Investors.

3.3 Methodology

An empirical study is conducted in this paper and a panel of longitudinal data is represented. A panel of data will embody information across both time and space. Importantly, a panel keeps the same individuals or entities and measures some quantity above them over time. There are broadly two classes of panel estimator approaches than can be employed in financial research; fixed-effects models and random effects models, whereas for our model, we will be incorporating a fixed-effect model. We will be using entity-fixed effects for industry and time-fixed effects for years. An entity-fixed effect model allows the intercept in the regression model to differ cross-sectionally but not over time, while all the slope estimates are fixed both cross-sectionally and over time.

Further, a time-fixed effect model allows the intercept to vary over time but would be assumed to be the same across entities at each given point in time (Brooks, 2019). The industry codes are based on the Standard Industrial Classification 2007 (*Classification of Standard Industrial Classification - Statistics Norway*).

Model 1

During the section on hypothesis development, it was emphasized that our first model would originate from the research of Ewens and Malenko (2021). Under this model, we will focus on the board dynamics in the companies and see if external financing entails changes in the composition. From this aspect, model 1[1] is constituted:

$$Y_{it} = \beta_0 + \sum_{s=1}^{10} \rho_s 1_{YST_{it}=s} + \beta_1 Age_{it} + \beta_2 LFstake_{it} + \beta_3 lnTPIC_{it} + X_{it} + \epsilon_{it}$$

Y_{it} is one of the three indicators for board control, where chapter 3.2 describe how the various control variables have been incorporated into our research. When reviewing and evaluating the data, we were met with certain data limitations, which means that we were forced to adjust the model to better fit our data. Given that there is no type of register in Norway where we have the opportunity to get specified information on how much capital has been invested in the Norwegian companies, we used the log of *total paid-in capital* as a substitute. Here logarithms were used so we would be able to express large numbers. This resulted in a snowball effect since the next variable reflects the rounds of financing. Here we constructed a variable to represent the time after the initial transfer of shares. We are comfortable that these two work as good proxies, where both mainly represent the same variables as Ewens and Malenko (2021) use, only that there are slight differences in the grouping. LFstake is introduced to measure the degree of ownership and its effect on the different setups of board control. Lastly, X_{it} contains industry and year fixed effects.

Model 2

The basic idea behind model 2 is to understand whether different characteristics in a company can have a direct effect on performance. We have therefore chosen to include both board and firm characteristics in model 2, based on inspiration from two different research articles.

[1] See Table 1 for a short and consistent description.

For this model, the variables under board characteristics will be represented by including the control variables from model 1. In addition, we will incorporate board size, which Yermack (1993) has previously researched. For firm characteristics, we have incorporated some of the variables Bersenz, Bohren and Stacescu (2022) use in their model. These two characteristics will hopefully give us an indication of how they affect the firm's performance, and because of this, we will potentially be able to conclude whether the various characteristics can have a beneficial effect on the firm's performance or not.

In earlier research, there are multiple measurements to capture firm performance. Measurements are used as profitability ratios to evaluate a firm's efficiency. Two highly common measurements are return on assets (ROA) and return on equity (ROE). For this paper, we will be using ROA as the performance measure as it has the benefit of reflecting the returns to all capital providers. In addition to that, it is not directly affected by financial leverage (Berzins et al., 2022). From these aspects, model 2[2] is constituted:

$$ROA = \beta_0 + \beta_1 BC_{it} + \beta_2 BoardSize_{it} + \sum_{s=1}^{4} \rho_s 1_{Ownership_{it}=s} + \beta_3 Age_{it} + \beta_4 FirmSize_{it} + \beta_4 GrowthOpp_{it} + \beta_5 Leverage_{it} + \beta_6 AssetLiq_{it} + \beta_7 CapitalInt_{it} + X_{it} + \epsilon_{it}$$

Y_{it} represent ROA, which has been derived from taking net income divided by total assets. BC is abbreviated for board control and represents the three board control variables; Inside Control, Shared Control and Investor Control. Board size is the total number of board members. Ownership is the dummy for whether the insider owns s relative to the percentiles of 25% increments. Further, we describe the firm's characteristic-specific variables. Age is the log of the total number of years since the company was founded. Log is used to exclude extreme values. Firm Size is the log of a firm's sales. Growth Opportunities is the ratio of sales to assets.

[2] See Table 2 for a short and consistent description. The tables also refer to the firm-specific characteristics taken from the Bersenz, Bohren and Stacescu (2022) study.

Leverage is the ratio of liabilities less cash to total assets less cash. Asset Liquidity is cash to assets. Capital Intensity is the log of assets to employees. Lastly, we incorporate X_{it} which contains industry and year fixed effects.

4 Empirical Results

In this section, we will present descriptive statistics on our firm sample and highlight different statistics on both individual and company levels. Furthermore, we will present our regression results and discuss the subsequent results. Finally, we will present the results from our robustness tests.

4.1 Descriptive Statistics

4.1.1 Individual Level

The database consists of 277,461 individuals, each of whom can be registered several times as our board data runs over several years after the transition event. As described earlier, each person is either registered as an insider, investor or independent director. From Table 6, we can see a different distribution of the individual in YTD and L1. This table does not cover the trend by year, it only illustrates the general trend. We can see that there is a clear predominance of individuals belonging to Insiders in YTD. We observe that between YTD and L1 both inside and investor increase, but investors have the largest increases in percentage.

Independent directors are not included in L1 for the simple reason that an independent director is characterized in the dummy table as 0-0-0-0-0. This means that this person can either be an independent director before the period, or it can be a new member during this period.

In Table 4 and Table 5 we have only included the firms with data registered from YST = -1 and onwards. Here we present an overview of the activity related to the years after the shares of the largest family have been diluted by 20%. First, we can see from Table 4 that the majority of firms are only tracked in the first years after the initial year of financing, thus the number of individual board members decreases. What is interesting to observe here is that new board members make up only 7% of the board on average. This means that the firm's board mostly consists of existing board members, which we can also see from Table 4 - that the existing board members make up 93% of the board composition. Here it is important to mention that for each subsequent year, the new board member's previous years are counted as an existing, thus new board members can over time replaces the existing one. We have therefore taken a closer look at who these new board members were affiliated with.

In Table 5, we present a more detailed overview. Here we placed each member under Inside, Investor or Independent, based on our board member mapping description from earlier. We observe that the distribution between the three parties remains even with the years after the largest family got diluted. On average, we see that 31% of the new board members were Insiders, 17% were Investors and as many as 52% were Independent. Later in the article, we will discuss how the actual control over the board develops, it will then be interesting to see if these results correlate with the later regressions regarding this. For the firms that are followed over many years, we see that the majority of new board members are categorized as Insiders. The samples decrease a lot over the years; thus, they cannot be seen as significant.

In Table 6, we present more details about each board member. This table consists of the complete board data, with the data also registered before the largest family got diluted. From here we see that it is approximately 7,100 individuals who change the party from Insider to Investor at any given time. This means that the largest family lost its share of the majority to an outsider who is not affiliated with the family. Furthermore, we can also observe that around 6,300 investors become an Insider. In these cases, the largest family lost the majority of the shares. In percentage terms, the changes are 3% and 2%, respectively.

4.1.2 Company Level

At a company level, we have decided to distinguish between three different subsets as displayed in Table 7. This is done to illustrate the various changes happening from the first initial transfer and the effect this has on the composition of the company's board. All three different levels contain the same number of companies, the only thing that distinguishes them is the number of data points. As mentioned earlier, our complete company sample consists of 277,461 individuals, and these individuals can be allocated to 6,139 different companies. For simplicity, Subset 1 refers to the entire sample, Subset 2 refers to the sample with YST = – 1, and Subset 3 refers to YST = 0.

In Subset 1, we can observe 59,412 data points and a general skewed distribution between the different control variables. If we look at the company level, we can observe that 97% of all companies at some point have Insider Control. We also observe that at least one-third of all companies at some point also have both Investor Control and Shared Control. Furthermore, we can observe that there are a good number of companies that in this period have a change in control between Inside → Investor Control and Inside → Shared Control. Furthermore, we see that just over 10% have both Investor Control and Shared Control and that only 10% of all companies at one point have been affiliated with all three control variables.

In Subset 2, we observe a reduction in just over 22,000 data points. We observe that the distribution between the data points evens out somewhat but is still relatively skewed towards Inside Control. At a company level, we can observe an almost equal percentage reduction across the board.

In Subset 3 the reduction in data points is not as great as in Subset 2. This is explained by our filtering process, as we filtered out only one year for each company. We observe that the distribution of the data points remains almost the same as in the previous Subset (2). But if we look at the different Subsets, we can observe a large reduction in the number of companies that at some point have Inside Control - while the other two control variables almost remain the same.

To emphasize, the number of companies that have Inside Control, at a given time, is still high. We also observe that around 20% of companies at some point switch between Inside → Investor Control and Inside → Shared Control. Almost 10% changes between Investor → Shared Control. Lastly, only 5% of the companies can be classified as the "ideal company", which means that at some point they have been affiliated with all the three different control variables.

Summary

By observing the three different Subsets, we can see that the closer we move towards YST = 0, the more evenly the data points are distributed between the different control variables. Still, there is a large predominance of Inside Control and the data is still relatively skewed. However, if we look at the company level as a percentage, we can observe that the Inside Control has decreased, but the other two have almost remained at the same level.

4.1.3 Turnover

In Table 8, we have captured the effect the first initial transfer had on the companies with Insider Control. A total of 634 companies were experiencing changes that were large enough to affect the composition of the board and push these companies into one of the other two control variables. 453 changes from Inside Control to Shared Control and 181 of them from Inside Control to Investor Control. This transfer of board control accounts for 12% of the companies that originally had Inside Control in YST = -1. Furthermore, we observe that 26% of the 634 companies managed to acquire Inside Control later. Finally, a total of 166 companies would at some point after or equal to YST = 1 return to Inside Control.

In Table 9, we present the distribution of when the 166 companies return to Inside Control. We observe that there is a predominance of companies returning to Inside Control relatively quickly. Over the next two years after the first initial transfer, 55% of the 634 companies return to Inside Control. If we also include the next three years, almost 85% of the companies go back to Inside Control.

4.1.4 Board Control Development

Figure 1 presents two graphs, where we see how the board control on average develops the years after the first initial transfer of 20%. In the figure, we have chosen to compare two different samples, where on the left we have the entire firm sample consisting of the 6,139 firms and on the right, we have created Subset 4 which consists of the ideal firms - firms that have had all three different types of board control. This subset consists of 591 firms. The main observation here is that the board control under the subset unfolds almost as we aligned with Ewens and Malenko's (2021) study. The two main control variables, Inside and Investor Control, move in opposite directions, with the companies moving from Inside Control to Investor Control relatively early after the first initial transfer. For the entire firm sample, we see that Insider Control is the most common control setup. Investor Control and Shared Control increases some over the years but not so much that it makes a difference.

In Table 11, we present an overall distribution of the control variables between the firms annually. Here we see that on average 75% of the firms have Inside Control, 15% have Shared Control and 10% of the firms have Investor Control at all times in the sample. The first two years stand out from the rest, as the distribution is a little more skewed. This is also the two years with the lowest number of firms tracked, and this may be the reason why these two years differ from the rest. Another reason may be that our firm sample consists of firms where the largest family has been the majority owner for at least three years, thus fewer companies between 2000 and 2002.

4.1.5 Board Size Development

Board Size by Age

Figure 2 presents two graphs, where we see a similar development over the next two decades. Here we have the whole sample on the left side and Subset 4 on the right side. We observe that both samples hovered around a fixed level in the first decade, where both fall drastically in recent years.

From the graphs, we can see that the trend in Subset 4 is that they have around 0.5 more people on the board at any given time during the two decades except at the end of the sample, where it seems that the difference between the two samples is reduced.

Board Size by YST

Figure 3 presents another aspect than Figure 2, namely the development of board size to years. Here we see a steep increase in the number of board members right after the first initial transfer. Furthermore, we observe that in both cases both samples hold at approximately the same level, where it is approximately 0.5 seats that separated the board size between the two samples at the average level. In this case, we observe a continuous increase in board size since the first initial financing - in contrast to when we looked at the development every year, where we had an almost continuous decline.

4.1.6 Relation between Ownership and Board Control

In Table 12, we present the relationship between the size of ownership of the largest family and the various board controls. Here we observe that the size of the ownership has a direct bearing on how the board is controlled. When the largest family owns more than 50% of the shares, we observe Inside Control in 79% of the cases. Shared Control and Investor Control have 16% and 7%, respectively. When ownership changes and the largest family owns less than 50% of the shares, we observe a drastic decline in cases where insiders have control over the board. There is still board control in more than 50% of the cases, but there is a 27% decrease in the total percentage. There is also a decrease in the number of cases with Shared Control, but an overall increase in the percentage. While the other two control variables decrease in the number of cases, we can now observe an increase in boards with Investor Control. We can also observe an increase in the overall percentage.

In Table 13, we present the same relationship but now for Subset 4. Here we observe the same trend but with a much stronger effect. When the largest family owns more than 50% of the shares, we observe Inside Control in 100% of the cases. When the largest family owns less than 50% of the shares, we observe here as well a drastic decline in cases where insiders have control over the board.

4.2 Regression Results

4.2.1 Model 1

Table 14 presents the results of the multiple panel regression from our first model. For this model, we estimated a fixed effect regression of Y_{it} on the other variables with industry and year fixed effects. The two tables display the results of running the independent variables YST, Age, LFstake, and lnTPIC on the dependent variable Y_{it} (Inside, Shared and Investor Control).

Under Table 14, the entire corporate sample is represented on the left-hand side, and Subset 4, which consists of the "ideal" firms, on the right-hand side. This is done to see if we see any differences between these two datasets.

Whole sample

The regressions return a R^2 of 0.106, 0.040 and 0.067, which implies that the regressors explain 10.6%, 4% and 6.7% of the variation in the dependent variables. Looking at the adjusted R^2 is more reliable, giving rates of 10.2%, 3.8% and 6.6%. A high number does not necessarily mean that you use the correct set of regressors, nor does a low adjusted R^2 mean that you have an inappropriate set of regressors. It serves as a tool for analysing a regression's first fit but should be weighed along with data availability, economic theory, and the nature of the research question (Stock & Watson, 2020). In this case, the relatively low adjusted R^2 indicates that a small part of the variation in the dependent variables is explained by the regressors. By comparing our values to the model of Ewens and Malenko (2021), we see that they have some higher values for the R^2.

The three F-statistics from the model are 175.15, 33.46 and 141.16, with all a p-value equal to zero. The joint hypothesis for the F-test states that the R^2 is equal to zero. By looking at our results, we can thus declare our model as statistical significance at any of the commonly used levels of statistical significance: 1%, 5% and 10%, indicating that the independent variables influence the dependent variables. The result from the regressions supports the first hypothesis of this paper. We can see that the i.YST is nearly monotonically decreasing for Inside Control (becoming more negative) and monotonically increasing for Investor Control (where YST = 0 is the base period). We can also see for Shared Control that i.YST is slightly monotonically increasing. The independent variable YST is with a p-value of 0 for all years under the three different regressions, statistically significant at all levels. Age has a positive relationship with Inside Control and a negative with Shared Control and Investor Control. Here an explanation could be that younger companies often need more capital, thus seats around the table are required by the investors but there could be other explanations as well. There Age has a p-value equal to zero except under Investor Control, where the p-value is 0.006. This indicates that the independent variables are statistically significant at all levels, except for 1% under Investor Control.

The interpretation of LFstake says that the higher the ownership share of the largest family in the company, the more likely there is Inside Control and less likely Shared Control and Investor Control. This is an interesting observation. If the largest family owns a high proportion of the shares, the results can be expected and adjusted to the results from Berzins, Bohren and Stacescu (2018) regarding family firms. Here the independent variables have a p-value equal to zero for all regressions, stating it is statistically significant at all levels. Lastly, lnTPIC has a positive relationship with Inside Control, negative with Shared Control, and non-relation with Investor Control.

This is not as expected as we here would think that the relationships were opposite. Since this variable works as a proxy for the financing, Inside Control should have a negative relationship with lnTPIC, and Shared Control and Investor Control should have a positive relationship. Here the p-value is equal to zero for all three, stating it is statistically significant at all levels.

The results of the regression analysis should be viewed with caution. There may be correlations between some of the independent variables. If this is the case, there might be a multicollinearity problem for these variables that can affect the precision of the coefficient estimates. In Table 16, we can see how the independent variables correlate with each other. By this, we can assess the possibility of multicollinearity. As Table 16 shows, most of the variables have weak to moderate positive correlations. We can also see that some of the variables also are negatively correlated with each other. Since none of the variables can be seemed to have a high correlation with each other, but rather a weak moderate positive correlation, this implies a low degree of multicollinearity. In Table 18, we also present a variance inflation factor for each regressor.

A VIF above 1 indicates that collinearity is present, and a VIF above 10 indicates so high collinearity that the standard error of the coefficient is excessively inflated, and it is likely that the coefficient is not precisely estimated (Ferré, 2009). Here we see that the VIF values are quite low for most of the regressors but high for Age, LFstake and lnTPIC. This could imply perfect multicollinearity and thus be influencing our estimates.

Subset 4

By comparing the results from the main sample with Subset 4, we can observe some minor changes[3]. Firstly, for Investor Control, we observe that R^2 and adjusted R^2 have decreased. The F-test is 17.37 with a p-value equal to zero. This implies that the model is statistically significant at all levels. Further, for the regressors, we see that the trend is somewhat equal, but that some of the results are hovering around a higher level, especially i.YST. This is also expected because it implies a more negative effect. Further, we observe that all variables are significant at all levels besides Age. Since the sample is quite smaller, this can make sense as we observe that young and middle firms are more predominance here. The results from this regression were expected as we now are running the model on the ideal firms.

[3] See Table 14 for results.

Secondly, when comparing Shared Control with each other, we observe a decrease in R^2 and adjusted R^2. The F-test is 2.72 and has a p-value equal to zero, which implies that the model is only statistically significant at the levels of 5% and 10%. For the explanatory variables, we now see that more variables are no longer significant at all levels. This implies that Shared Control is less likely in the later years and that LFstake and lnTPIC have no explanatory power on the control variable.

Thirdly, comparing Investor Control, we observe more similar behaviour as with Inside Control. The R^2 is at the same level but adjusted R^2 is a bit lower. The F-test is still high, implying a statistically significant model. Further, we observe that it is more common with Investor Control for these firms after the first initial transfer. This is expected as we run the regression on the ideal firms. The p-value is also equal to zero for all i.YST, saying it is statistically significant at all levels. Lastly, we observe that lnTPIC has a negative relationship, implying that an increase in finances has a negative effect on Investor Control. Here we would expect the opposite.

We here observe a decrease in the R^2 for all three regressions (4, 5 and 6). This might indicate that the overall model fits the whole sample better than the subset. If we also compare the standard errors to each coefficient between the two samples. The trend is that there is an overall minor increase in the standard errors in all variables, except sh_fam which is 0 in all variables except Inside Control (1). By incorporating standard errors, the assertion according to R^2 strengthened. From this, it seems that model 1 fits the whole sample better.

We must also here be cautious due to correlations between some of the independent variables. In Table 17, we see that the variables have weak to moderate positive correlations. We can't observe any major values indicating that there exists multicollinearity. In Table 18, we observe that the Age, LFstake and lnTIPC have high VIF values, which could imply perfect multicollinearity and thus be influencing our estimates.

4.2.2 Model 2

Whole sample

As seen in Table 19, the regressions (1, 2 and 3) from model 2 return a R^2 of 11% and an adjusted R^2 of 10.09%. Further, we can see that the F-test is equal for all regressions, namely 326.42. We can thus declare the model as statistically significant at all levels as the p-value is equal to zero. From our results, we see that Shared Control, at a 10% level, is the only board control variable that has any explanatory power. This variable has a negative relationship with the return on assets, which indicates that an increase in Shared Control is negative for the company. This is not as expected as Ewens and Malenko's (2021) results prove that the company is most efficient when the control is equally shared between the insiders and investors. Yermack (1993) emphasize that smaller board size has an effect on performance but from our results, we see that this is not the case, as the board size has no effect. We further observe that several of the independent variables have explanatory power. Here, Growth Opportunities, which have a negative relationship with the return on assets, may be explained by companies with higher growth having invested more, which influences the overall performance negatively.

For the variables that have a statistically significant relationship with the return on assets, we register that both Leverage and Asset Liquidity have a negative relationship. The interpretation of Leverage says the higher the liabilities the worse is the performance of the company, and the interpretation of Asset Liquidity says the more a company holds back on its investments, the performance will not be able to get better. Lastly, we observe that Capital Intensity has a positive relationship under the three different regressions. This implies that companies with a higher value of assets relative to the number of employees have a better performance.

To check whether there exists a correlation between some of the independent variables, we have for this model measured multicollinearity through a VIF. Table 21 presents the results, and here we observe that there is some multicollinearity present.

The average VIF is respectively 7.70, 7.21 and 7.20 for the three regressions. Age and Capital Intensity have both a VIF above 10, which indicates so high collinearity that, likely, the coefficients are not precisely estimated (Ferré, 2009).

Subset 4

From the three regressions (4, 5 and 6), we can see that non of the control variables has any explanatory power on a firm's return on assets, nor does the Board Size. This implies that the companies qualified as the ideal companies based on theory from Malenkos's paper will not have any significant explanatory power on a company's return on assets. Further, we can observe that the variables that are significant under running the model on the whole sample are still significant, but with increased explanatory power. In addition to this, Growth Opportunities obtain now a significant of 1% on all three regressions and the same applies to the age variable, but at the significant level of 10%. Both variables have a relatively high explanatory power. With 1.72 and 1.23, respectively, on all three regressions.

In Subset 4, we observe a higher R^2 which implies that the model has an overall better fit on Subset 4. But if we look at the standard errors for the coefficients, they are relatively higher on all the coefficients which are contradictory and indicate that the coefficients are less reliable and the fit does not might be as good as the initial assessment. In addition, from Table 22, we can see that there exists some multicollinearity for this model as well.

4.3 Robustness Tests

In this section, we run a robust regression to test whether the standard errors from the above regressions are robust or not[4]. This is by the assumption that the errors are heteroskedastic. Stock and Watson (2006) state in their introductory econometrics textbook that economic theory rarely gives any reason to believe that errors are homoskedastic.

[4] See Table 15 and Table 20 for complete results.

Therefore, it is wise to assume that the errors can be heteroskedastic unless you have compelling reasons to believe otherwise. If homoskedasticity and heteroskedasticity's robust standard errors are the same, nothing is lost by using heteroskedasticity's robust standard errors; However, if they are different, you should use the more reliable ones that allow heteroskedasticity. The simplest is then always to use heteroskedasticity's robust standard errors.

Model 1

For model 1, we run a robust regression to test for robust standard errors. Here, our results show that we achieve approximately the same values for both samples, but now they account for autocorrelation and heteroskedasticity within each unit. We can also observe that the coefficients are still statistically significant at the same levels. From these results, we can argue that we can rely on our hypothesis test based on our results.

Model 2

For model 2, we observe that the robust standard errors differ greatly from the first regression we ran on the two samples. Furthermore, we observe that several of the coefficients are now not statistically significant. This suggests that the estimators are not the best linear objective estimator (BLUE), which indicates that their variance is not the lowest of all other unbiased estimators.

5 Conclusions

5.1 Conclusion

This article examines the relationship between the composition of the board after the first transfer of shares from the largest family to an external investor and the extent to which these different compositions can affect the performance of a company. The study was conducted at Norwegian private firms from the period 2000-2020. Furthermore, it has been investigated whether there is any connection between a firm's performance and board and/or firm characteristics. Under the first model, we determined that in Norwegian private firms, the dynamics and board compositions change with time after the first transfer event. Here we see that the investors are more likely to control the board in the recent years after the initial transfer, whereas the effect of insiders losing control is increasing the longer we move away from the initial transfer. Shared Control has also a positive relationship, we thus can declare our hypothesis on board dynamics as we see that the Inside Control will change to either Shared Control or Investor Control after outside financing is granted. We thus see that the ownership share of the largest family has an effect on Inside Control, which means that it is more likely that the insiders will control the board the higher their ownership share. This finding expands on Ewens and Malenko's (2021) findings and emphasizes that parts of their research are adaptable for private firms in the Norwegian region. Further, for firm performance, we conclude that board characteristics do not have any influence, whereas firm characteristics have. Here we see that firms with high leverage will perform worse than firms with lower leverage. In addition, we can conclude that firms that hold cash instead of investing in the company with more assets, which implies the willingness to grow, will perform worse. Lastly, firms with fewer employees who possess a lot of assets, also have a significant effect on ROA, suggesting a firm is performing well.

However, there are some differences in our data. Since they mainly look at startups supported by Venture Funds. Due to data limitations, it is not possible to have such specific data with our accesses. Considering that Norway is a relatively small country, it is difficult to obtain similar data due to other rules on the registration of data.

It may be reasonable to draw parallels to this as we find further conflicting results in terms of board composition and company performance. However, our research finds good indications that the right business characteristics can have a significant effect on efficiency and performance

5.2 Suggestions for Further Research

For this study, research on board dynamics across Norwegian private firms was conducted, and consistent results were obtained. Further research could examine whether characteristics within gender and diversity could as in December of 2005, Norway passed a quota law requiring that women make up a minimum of 40% of corporate boards.

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7 Appendix

Figure 1

This figure shows how the board control on average develops the years after the first initial transfer of 20% (shares)

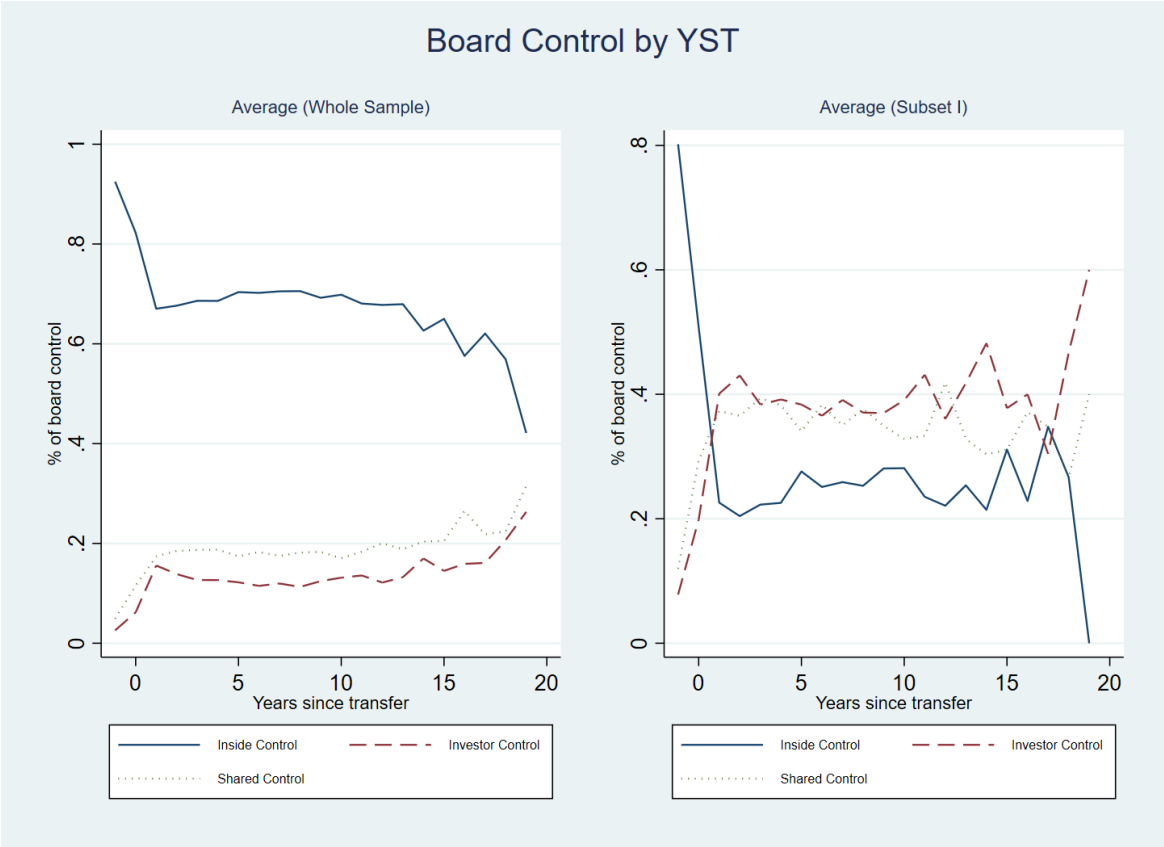

Figure 2

This figure shows how the board size on average develops over the period from 2000-2020

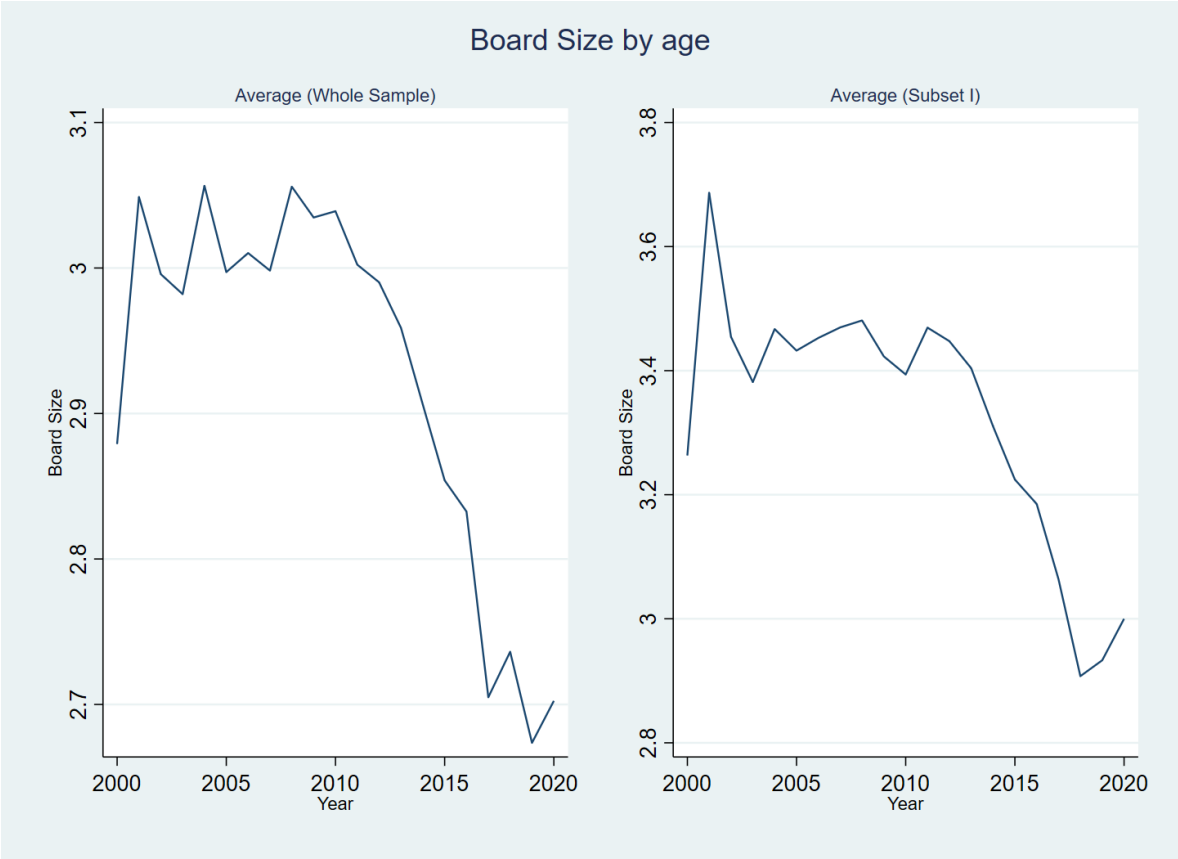

Figure 3

This figure shows how the board size on average develops after the first initial transfer of 20% (shares)

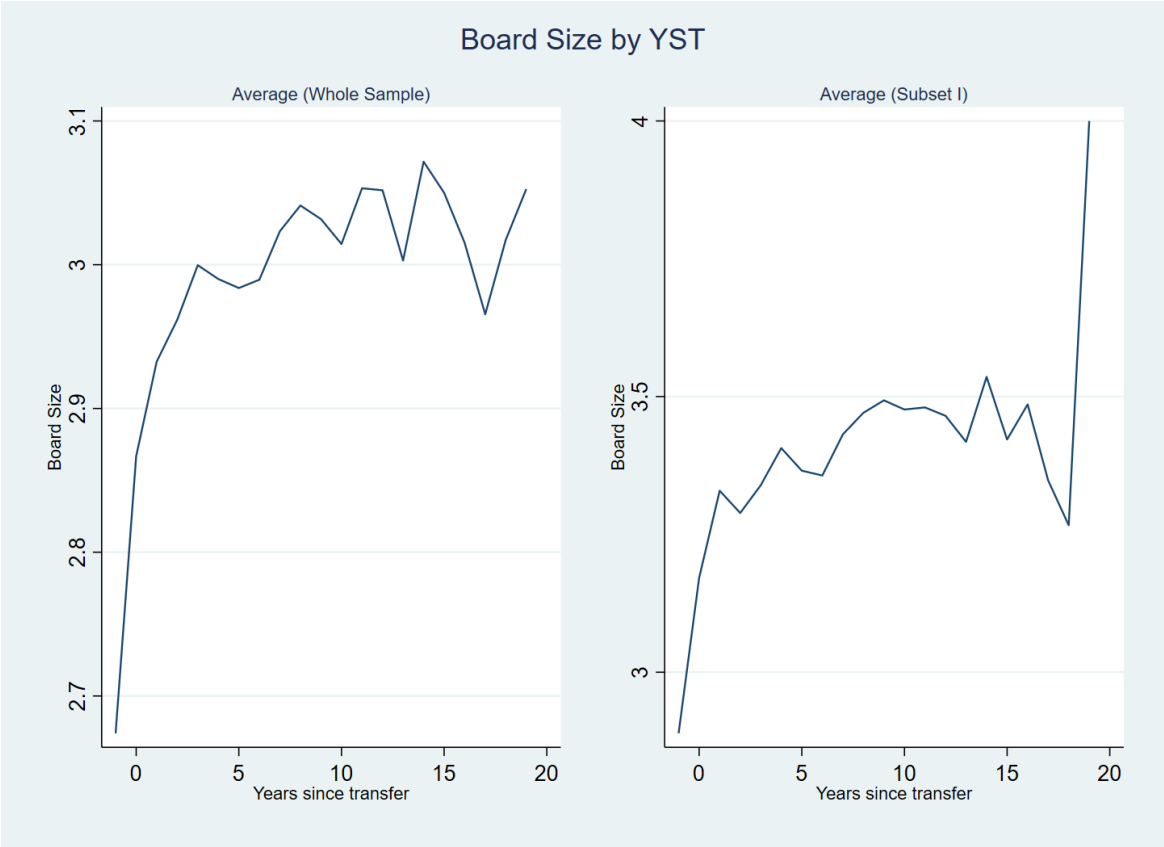

Table 1 – Variables for Model 1

This table shows the definition of the different variables included in Model 1

Variable	Definition	Measurement
Dependent variable		
ISC	Inside Control	
SHC	Shared Control	
IVC	Investor Control	
Independent variable		
YST	Years since transition	Dummy variable: 1, 2, ..., 10
Age	Log of the years since founded	
LFstake	Ownership stake of the largest family	
lnTPIC	Log of total paid in capital	
Industry FE	Industry Fixed Effects	YES
Yr FE	Year Fixed Effects	YES

Table 2 – Variables for Model 2

This table shows the definition of the different variables included in Model 2. Here Board Control and Board Size represents the board characteristics, whereas Age, Firm Size, Growth Opportunities, Leverage, Assets Liquidity, and Capital Intensity represents the firm characteristics.

Variable	Definition	Measurement
Dependent variable		
ROA	Return on Assets	
Independent variable		
Board Control	Inside, Shared or Investor Control	One regression for each
Board Size	Number of directors	
Ownership	Ownership stake of the largest family	Four percentiles: 25% → 100%
Age	Log of the years since the founding	
Firm Size	Log of the firm's sales	
Growth Opportunities	The ratio of sales to assets	
Leverage	The ratio of liabilities less ash to total assets less cash	
Assets Liquidity	The ratio of cash to assets	
Capital Intensity	Log of the ratio of assets to employees	
Industry FE	Industry Fixed Effects	YES
Yr FE	Year Fixed Effects	YES

Table 3 – Mapping structure of the board control variables

This table shows the mapping behind the construction of the control variables. Each combination represents different individual properties, where there are 29 different potential combinations. In the last column, we have described which party that combination is assigned to.

d_lg_fam	d_ceo	d_ceo_fam	d_minown	d_minown_fam	Allocation
1	0	0	0	0	Insder
1	1	0	0	0	Not found
1	0	1	0	0	Insider
1	0	0	1	0	Not found
1	0	0	0	1	Insider
1	1	1	0	0	Insider
1	1	0	1	0	Not found
1	1	0	0	1	Not found
1	0	1	1	0	Not found
1	0	1	0	1	Insider
1	0	0	1	1	Not found
1	1	1	1	0	Not found
1	1	1	0	1	Insider
1	1	1	1	1	Not found
0	2	0	0	0	Not found
0	2	2	0	0	Insider
0	2	0	2	0	Not found
0	2	0	0	2	Not found
0	2	2	2	0	Not found
0	2	2	0	2	Investor
0	2	2	2	2	Investor
0	0	3	0	0	Insider
0	0	3	3	0	Not found
0	0	3	0	3	Investor
0	0	3	3	3	Investor
0	0	0	4	0	Not found
0	0	0	4	4	Investor
0	0	0	0	5	Investor
0	0	0	0	0	Independent

Table 4 – Number of total board members

This table shows the total number of board members that have been periodically allocated based on the years after the initial transfer. From the table, we can read the total number of board members for each period, and further observe the relationship between existing and new board members.

	Board Members			Percentage	
YST	**Total**	**Existing**	**New**	**Existing**	**New**
0	17335	14751	2584	85 %	15 %
1	17402	15570	1832	89 %	11 %
2	13449	12597	852	94 %	6 %
3	9590	9039	551	94 %	6 %
4	7514	7131	383	95 %	5 %
5	5890	5621	269	95 %	5 %
6	4577	4350	227	95 %	5 %
7	3764	3567	197	95 %	5 %
8	3099	2950	149	95 %	5 %
9	2483	2370	113	95 %	5 %
10	2089	1984	105	95 %	5 %
11	1664	1573	91	95 %	5 %
12	1355	1273	82	94 %	6 %
13	1021	970	51	95 %	5 %
14	814	769	45	94 %	6 %
15	610	570	40	93 %	7 %
16	398	367	31	92 %	8 %
17	258	240	18	93 %	7 %
18	175	155	20	89 %	11 %
19	58	51	7	88 %	12 %
				93 %	***7 %***

Table 5 – Distribution of new board members

This table is an extension of Table 4, where this table shows the distribution of the new board members in the various variables. This table is also periodically merged based on years since the first transfer. The table shows both the numerical allocation and the relationship between the various control variables.

Board Members					Percentage		
YST	**New**	**Inside**	**Investor**	**ID**	**Inside**	**Investor**	**ID**
0	2584	517	782	1285	20 %	30 %	50 %
1	1832	507	547	778	28 %	30 %	42 %
2	852	221	193	438	26 %	23 %	51 %
3	551	144	110	297	26 %	20 %	54 %
4	383	88	81	214	23 %	21 %	56 %
5	269	80	52	137	30 %	19 %	51 %
6	227	74	38	115	33 %	17 %	51 %
7	197	54	37	106	27 %	19 %	54 %
8	149	48	24	77	32 %	16 %	52 %
9	113	26	21	66	23 %	19 %	58 %
10	105	32	16	57	30 %	15 %	54 %
11	91	26	12	53	29 %	13 %	58 %
12	82	26	11	45	32 %	13 %	55 %
13	51	18	9	24	35 %	18 %	47 %
14	45	14	8	23	31 %	18 %	51 %
15	40	16	3	21	40 %	8 %	53 %
16	31	9	7	15	29 %	23 %	48 %
17	18	9	0	9	50 %	0 %	50 %
18	20	7	3	10	35 %	15 %	50 %
19	7	3	0	4	43 %	0 %	57 %
					31 %	***17 %***	***52 %***

Table 6 – Distribution of individuals for YTD and L1

This table shows the total number of observations at the individual level and how these are distributed between the various control variables. The table is divided between year to date (YTD) and the period before (L1). This table also shows the total number of transitions between Insider and Investor and the changes in the total number of observations. Finally, the table shows the changes within the different groups between YTD and L1.

Individual level					
YTD	**Insider**	**Investor**	**ID**	**Total**	
n	172025	36929	68508	277462	
%	62 %	13 %	25 %		
L1	**Insider**	**Investor**	**ID**	**Total**	
n	163757	33804		197561	
%	83 %	17 %	0		
Changes between groups				**Total**	**Change (%)**
Inside → Investor				7092	3 %
Investor → Inside				6280	2 %
Changes within groups	**Insider**	**Investor**	**ID**	**Total**	
n	8268	3125	0	11393	
%	5 %	9 %	0		

Table 7 – Distribution of companies between the various control variables

This table shows the companies' distribution between the various control variables. First, the table shows the total number of data points and the different allocations. Second, the table is divided into three different subsets. Subset 1: the whole sample, Subset 2: YST = -1 and onwards, Subset 3: YST = 0 and onwards. Finally, in addition to the allocation of companies between the various control variables, the table shows the total number of companies that have been allocated to more than one group: Inside and Shared Control, Investor and Shared Control, Inside and Investor Control, and Inside, Investor and Shared Control (the ideal firm).

Company level								
Whole sample - Subset 1								
Data points	**Inside Control**	**Shared Control**	**Investor Control**	**Total**				
n	48604	6436	4372	55040				
%	88 %	12 %	8 %					
Companies	**Inside Control**	**Shared Control**	**Investor Control**	**Inside & Shared Control**	**Investor & Shared Control**	**Inside & Investor Control**	**Inside, Shared & Investor Control**	**Total Companies**
n	5947	1917	1722	1756	695	1587	591	6139
%	97 %	31 %	28 %	29 %	11 %	26 %	10 %	
With YST = -1 - Subset 2								
Data points	**Inside Control**	**Shared Control**	**Investor Control**	**Total**	**Changes**			
n	27754	5639	3971	33393	-21647			
%	83 %	17 %	12 %		-39 %			
Companies	**Inside Control**	**Shared Control**	**Investor Control**	**Inside & Shared Control**	**Investor & Shared Control**	**Inside & Investor Control**	**Inside, Shared & Investor Control**	**Total Companies**
n	5808	1815	1618	1558	600	1402	591	6139
%	95 %	30 %	26 %	25 %	10 %	23 %	10 %	
YST = 0 - Subset 3								
Data points	**Inside Control**	**Shared Control**	**Investor Control**	**Total**	**Changes**			
n	22424	5356	3823	27780	-5613			
%	81 %	19 %	14 %		-17 %			
Companies	**Inside Control**	**Shared Control**	**Investor Control**	**Inside & Shared Control**	**Investor & Shared Control**	**Inside & Investor Control**	**Inside, Shared & Investor Control**	**Total Companies**
n	5334	1745	1592	1159	539	1140	591	6139
%	87 %	28 %	26 %	19 %	9 %	19 %	10 %	

Table 8 – Changes in Inside Control after the initial transfer

This table shows the changes in Inside Control after the first transfer of shares. It shows the total number of companies that change board control to either Shared or Investor Control. The table also captures the number of companies that return to Inside Control at a later date, plus the relationship between these and the companies that initial change.

Inital loss of Inside Control after initial transfer of shares					
Companies	**Inside Control**	**Shared Control**	**Investor Control**	**Total**	**%**
YST = -1	5330				
YST = 0		453	181	634	12 %
Turnover YST>=1				166	26 %

Table 9 – Return of companies to Inside Control

This table is an extension of the previous table, and it shows the distribution of the companies that go back to Inside Control.

Turnover back to Inside Control																
YST	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**Total**
n	60	31	20	17	11	6	5	5	4	3	1	2	0	0	1	166
%	36 %	19 %	12 %	10 %	7 %	4 %	3 %	3 %	2 %	2 %	1 %	1 %	0 %	0 %	1 %	
Cumulative																
n	60	91	111	128	139	145	150	155	159	162	163	165	165	165	166	
%	36 %	55 %	67 %	77 %	84 %	87 %	90 %	93 %	96 %	98 %	98 %	99 %	99 %	99 %	100 %	

Table 10 – Distribution of control variables after YST (Company level)

This table shows the allocation of companies between the various control variables from YST = -1 to YST = 19. The reason why it is based on Subset 2 is to capture the effect of the first transfer.

YST	Inside Control	Inside Control %	Shared Control	Shared Control %	Investor Control	Investor Control %	Total
-1	5330	93 %	283	5 %	148	3 %	5761
0	4974	82 %	699	12 %	374	6 %	6047
1	3978	67 %	1032	17 %	924	16 %	5934
2	3072	68 %	840	18 %	629	14 %	4541
3	2194	69 %	598	19 %	405	13 %	3197
4	1723	69 %	471	19 %	318	13 %	2512
5	1389	70 %	344	17 %	241	12 %	1974
6	1075	70 %	280	18 %	176	11 %	1531
7	878	71 %	218	18 %	149	12 %	1245
8	719	71 %	185	18 %	115	11 %	1019
9	567	69 %	150	18 %	102	12 %	819
10	484	70 %	118	17 %	91	13 %	693
11	371	68 %	100	18 %	74	14 %	545
12	301	68 %	89	20 %	54	12 %	444
13	231	68 %	64	19 %	45	13 %	340
14	166	63 %	54	20 %	45	17 %	265
15	130	65 %	41	21 %	29	15 %	200
16	76	58 %	35	27 %	21	16 %	132
17	54	62 %	19	22 %	14	16 %	87
18	33	57 %	13	22 %	12	21 %	58
19	8	42 %	6	32 %	5	26 %	19

Table 11 – Distribution of control variables during individual years (Company level)

This table shows the companies' distribution between the various control variables during individual years. It shows the total number of companies, the distribution, and the ratio.

Year	Inside Control	Inside Control %	Shared Control	Shared Control %	Investor Control	Investor Control %	Total
2000	290	92 %	18	6 %	6	2 %	314
2001	584	82 %	76	11 %	56	8 %	716
2002	930	78 %	138	12 %	123	10 %	1191
2003	1116	74 %	207	14 %	181	12 %	1504
2004	1328	73 %	266	15 %	227	12 %	1821
2005	1356	76 %	256	14 %	173	10 %	1785
2006	1326	76 %	244	14 %	179	10 %	1749
2007	1257	74 %	206	12 %	241	14 %	1704
2008	1302	76 %	241	14 %	174	10 %	1717
2009	1312	76 %	242	14 %	174	10 %	1728
2010	1294	75 %	259	15 %	163	9 %	1716
2011	1737	80 %	265	12 %	181	8 %	2183
2012	1695	79 %	252	12 %	188	9 %	2135
2013	1699	76 %	270	12 %	267	12 %	2236
2014	1654	76 %	288	13 %	231	11 %	2173
2015	1656	75 %	331	15 %	219	10 %	2206
2016	1258	68 %	370	20 %	218	12 %	1846
2017	1917	74 %	430	17 %	239	9 %	2586
2018	1489	70 %	420	20 %	214	10 %	2123
2019	1283	62 %	483	23 %	293	14 %	2059
2020	870	59 %	377	26 %	224	15 %	1471

Table 12 - Distribution of Board Control for the entire sample

This table shows the distribution of board control based on who owns the majority of the shares for the whole sample. The table is divided into two groups, whether the majority owners are insiders or not. The table also captures the effect of when the insider "loses" the majority.

Whole Sample				
Insider as Majority owner	**Inside Control**	**Shared Control**	**Investor Control**	**Total**
n	15792	2953	1231	18745
%	84 %	16 %	7 %	
Insider as Minority owner				
n	4297	1847	1353	7497
%	57 %	25 %	18 %	
Changes				
n	-11495	-1106	122	
%	-27 %	9 %	11 %	

Table 13 – Distribution of Board Control for Subset 4

This table shows the distribution of board control based on who owns the majority of the shares for Subset 4. The table is divided into two groups, whether the majority owners are insiders or not. The table also captures the effect of when the insider "loses" the majority.

Subset 4				
Insider as Majority owner	**Inside Control**	**Shared Control**	**Investor Control**	**Total**
n	504	0	0	504
%	100 %	0 %	0 %	
Insider as Minority owner				
n	456	736	525	1717
%	27 %	43 %	31 %	
Changes				
n	-48	736	525	
%	-73 %	43 %	31 %	

Table 14 – Regression results from Model 1

This table shows the result of regressing YST, Age, sh_fam and lnTPIC on the three different control variables. The sample begins to register from the initial transfer, i.e.. excludes data from before YST = 0. The population is Norwegian private companies, where the largest family has been the majority owner for the past three years and then sells at least 20% of their shares during the transfer event.

The table distinguishes between the entire sample and Subset 4. "Age" is the log of the number of years since the company was founded. "YST" (years since transition) is the number of years since the first initial transfer of shares. Here, values above 10 are winsorized to 10 and YST = 0 is the base. "Sh_fam" is the percentage ownership of the largest family. And "lnTPIC" is the log of total paid-in capital. In parentheses, we have reported the standard errors.

Statistical significance at 10%, 5% and 1% levels are indicated by *, **, ***, respectively.

	Whole sample			**Subset 4**		
	Inside Control	Shared Control	Investor Control	Inside Control	Shared Control	Investor Control
	(1)	(2)	(3)	(4)	(5)	(6)
YST = 1	-0.18***	0.08***	0.11***	-0.29***	0.08**	0.21***
	(0.008)	(0.007)	(0.006)	(0.026)	(0.029)	(0.028)
YST = 2	-0.18***	0.08***	0.10***	-0.32***	0.07**	0.25***
	(0.009)	(0.008)	(0.007)	(0.027)	(0.030)	(0.030)
YST = 3	-0.19***	0.09***	0.10***	-0.31***	0.10**	0.22***
	(0.010)	(0.008)	(0.007)	(0.029)	(0.032)	(0.032)
YST = 4	-0.21***	0.10***	0.11***	-0.32***	0.08**	0.24***
	(0.011)	(0.009)	(0.008)	(0.031)	(0.034)	(0.034)
YST = 5	-0.20***	0.09***	0.11***	-0.27***	0.04	0.24***
	(0.012)	(0.010)	(0.009)	(0.033)	(0.037)	(0.036)
YST = 6	-0.21***	0.10***	0.11***	-0.30***	0.08*	0.22***
	(0.013)	(0.011)	(0.010)	(0.036)	(0.040)	(0.039)
YST = 7	-0.21***	0.010***	0.11***	-0.30***	0.04	0.25***
	(0.014)	(0.012)	(0.010)	(0.038)	(0.042)	(0.042)
YST = 8	-0.22***	0.11***	0.11***	-0.31***	0.07	0.24***
	(0.015)	(0.013)	(0.011)	(0.040)	(0.045)	(0.044)
YST = 9	-0.23***	0.11***	0.12***	-0.27***	0.03	0.24***
	(0.017)	(0.014)	(0.012)	(0.043)	(0.050)	(0.047)
YST = 10	-0.25***	0.11***	0.14***	-0.27***	0.01	0.26***
	(0.011)	(0.010)	(0.008)	(0.032)	(0.035)	(0.034)
Age	0.03***	-0.03***	-0.01**	0.01	0.00	-0.01
	(0.004)	(0.003)	(0.003)	(0.012)	(0.013)	(0.013)
sh_fam	0.01***	0.00***	0.00***	0.00***	0.00***	0.00***
	(0.002)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
lnTPIC	0.01***	-0.01***	0.00***	0.02***	0.00	-0.01**
	(0.002)	(0.001)	(0.001)	(0.005)	(0.021)	(0.005)
Observations	31,601	31,601	31,601	3,991	3,991	3,991
R-squared	0.106	0.040	0.067	0.086	0.027	0.062
Adj. R-squared	0.102	0.038	0.066	0.075	0.017	0.050
F-test	175.15	33.46	141.16	17.37	2.72	12.22
Industry FE	Y	Y	Y	Y	Y	Y
Year FE	Y	Y	Y	Y	Y	Y

Table 15 – Robust regression results from Model 1

This table shows the result of regression of the same variables as before, but this time a robust regression is run. This is to get robust standard errors. See Table 14 for further descriptions of the variables.

Statistical significance is indicated by *, **, *** at the 10%, 5% and 1%, respectively. Robust Standard Errors are reported in parentheses.

	Whole sample			**Subset 4**		
	Inside Control	Shared Control	Investor Control	Inside Control	Shared Control	Investor Control
	(1)	(2)	(3)	(4)	(5)	(6)
YST = 1	-0.18***	0.07***	0.11***	-0.29***	0.08**	0.21***
	(0.008)	(0.007)	(0.006)	(0.028)	(0.028)	(0.027)
YST = 2	-0.18***	0.08***	0.10***	-0.32***	0.07**	0.25***
	(0.009)	(0.007)	(0.006)	(0.028)	(0.030)	(0.029)
YST = 3	-0.19***	0.09***	0.10***	-0.31***	0.10**	0.22***
	(0.010)	(0.008)	(0.007)	(0.031)	(0.032)	(0.030)
YST = 4	-0.21***	0.10***	0.11***	-0.32***	0.08**	0.24***
	(0.010)	(0.009)	(0.008)	(0.032)	(0.034)	(0.033)
YST = 5	-0.20***	0.09***	0.11***	-0.27***	0.04	0.24***
	(0.011)	(0.010)	(0.008)	(0.036)	(0.036)	(0.035)
YST = 6	-0.21***	0.10***	0.11***	-0.30***	0.08*	0.22***
	(0.013)	(0.011)	(0.009)	(0.037)	(0.040)	(0.038)
YST = 7	-0.21***	0.010***	0.11***	-0.30***	0.04	0.25***
	(0.014)	(0.012)	(0.010)	(0.039)	(0.042)	(0.041)
YST = 8	-0.22***	0.11***	0.11***	-0.31***	0.07	0.24***
	(0.015)	(0.013)	(0.011)	(0.041)	(0.045)	(0.043)
YST = 9	-0.23***	0.11***	0.12***	-0.27***	0.03	0.24***
	(0.016)	(0.014)	(0.012)	(0.044)	(0.047)	(0.045)
YST = 10	-0.25***	0.11***	0.14***	-0.27***	0.01	0.26***
	(0.011)	(0.010)	(0.008)	(0.033)	(0.035)	(0.033)
Age	0.03***	-0.03***	-0.01**	0.01	0.00	-0.01
	(0.004)	(0.003)	(0.003)	(0.012)	(0.013)	(0.013)
sh_fam	0.01***	0.00***	0.00***	0.00***	0.00***	0.00***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
lnTPIC	0.01***	-0.01***	0.00***	0.02***	0.00	-0.01**
	(0.001)	(0.001)	(0.001)	(0.005)	(0.005)	(0.005)
Observations	31,601	31,601	31,601	3,991	3,991	3,991
R-squared	0.104	0.040	0.067	0.086	0.027	0.062
Industry FE	Y	Y	Y	Y	Y	Y
Year FE	Y	Y	Y	Y	Y	Y

Table 16 – Correlation matrix for the entire sample (Model 1)

This table shows a correlation matrix for the whole sample, where one can observe whether there is a kind of correlation between the independent variables.

e (V)	1. YST	2. YST	3. YST	4. YST	5. YST	6. YST	7. YST	8. YST	9. YST	10. YST	Age	LFstake	lnTPIC
1. YST	**1.0000**												
2. YST	0.4824	**1.0000**											
3. YST	0.4419	0.4253	**1.0000**										
4. YST	0.4076	0.3993	0.3754	**1.0000**									
5. YST	0.3782	0.3728	0.3528	0.3408	**1.0000**								
6. YST	0.3394	0.3383	0.3204	0.2128	0.3001	**1.0000**							
7. YST	0.3188	0.3124	0.3000	0.2910	0.2817	0.2633	**1.0000**						
8. YST	0.2942	0.2938	0.2767	0.2728	0.2626	0.2477	0.2357	**1.0000**					
9. YST	0.2699	0.2687	0.2549	0.2478	0.2417	0.2262	0.2172	0.2080	**1.0000**				
10. YST	0.4051	0.4081	0.3862	0.3805	0.3687	0.3456	0.3299	0.3171	0.2991	**1.0000**			
Age	-0.0681	-0.1054	-0.1472	-0.1728	-0.1929	-0.2006	-0.2027	-0.2034	-0.1966	-0.3534	**1.0000**		
LFstake	-0.0552	-0.0737	-0.0768	-0.0965	-0.0908	-0.0873	-0.0806	-0.0787	-0.0720	-0.1036	-0.0355	**1.0000**	
lnTPIC	-0.0070	-0.0158	-0.0188	-0.0238	-0.0215	-0.0211	-0.0267	-0.0344	-0.0359	-0.0418	-0.0764	0.0825	**1.0000**
Cons	-0.1388	-0.1027	-0.0685	-0.0385	-0.0249	-0.0107	0.0017	0.0164	0.0225	0.0424	-0.2590	-0.3495	-0.8620

Table 17 – Correlation matrix for Subset 4 (Model 1)

This table shows a correlation matrix for Subset 4, where one can observe whether there is a kind of correlation between the independent variables.

e (V)	1. YST	2. YST	3. YST	4. YST	5. YST	6. YST	7. YST	8. YST	9. YST	10. YST	Age	LFstake	lnTPIC
1. YST	**1.0000**												
2. YST	0.4986	**1.0000**											
3. YST	0.4704	0.4763	**1.0000**										
4. YST	0.4396	0.4517	0.4434	**1.0000**									
5. YST	0.4170	0.4260	0.4220	0.4133	**1.0000**								
6. YST	0.3899	0.4023	0.3967	0.3928	0.3807	**1.0000**							
7. YST	0.3686	0.3828	0.3804	0.3736	0.3661	0.3534	**1.0000**						
8. YST	0.3512	0.3632	0.3632	0.3612	0.3506	0.3433	0.3327	**1.0000**					
9. YST	0.3338	0.3467	0.3456	0.3444	0.3364	0.3271	0.3195	0.3154	**1.0000**				
10. YST	0.4630	0.4888	0.4868	0.4873	0.4781	0.4662	0.4556	0.4498	0.4412	**1.0000**			
Age	-0.0671	-0.1129	-0.1651	-0.2050	-0.2205	-0.2418	-0.2395	-0.2552	-0.2535	-0.4185	**1.0000**		
LFstake	-0.0488	-0.4888	-0.0590	-0.0802	-0.0761	-0.0810	-0.0683	-0.0898	-0.1022	-0.1396	0.0149	**1.0000**	
lnTPIC	-0.0225	-0.0296	-0.0262	-0.0384	-0.0322	-0.0379	-0.0554	-0.0662	-0.0764	-0.1048	-0.0573	0.2002	**1.0000**
Cons	-0.1335	-0.1110	-0.0844	-0.0461	-0.0389	-0.0157	0.0018	0.0289	0.0466	0.0843	-0.2743	-0.4114	-0.8773

Table 18 – Variance Inflation Factor (Model 1)

This table shows the result of the Variance Inflation Factor (VIF) for both samples. This test is used to check whether there is an indication of multicollinearity or not. The test applies to model 1.

Whole Sample			**Subset 4**		
Variable	*VIF*	*1/VIF*	*Variable*	*VIF*	*1/VIF*
YST			YST		
1	1.96	0.51	1	1.95	0.51
2	1.76	0.57	2	1.87	0.53
3	1.57	0.64	3	1.73	0.58
4	1.47	0.68	4	1.66	0.60
5	1.39	0.72	5	1.56	0.64
6	1.31	0.76	6	1.49	0.67
7	1.27	0.79	7	1.43	0.70
8	1.23	0.82	8	1.40	0.72
9	1.19	0.84	9	1.35	0.74
10	1.69	0.59	10	2.50	0.40
Age	13.70	0.07	Age	16.62	0.06
LFstake	8.58	0.12	LFstake	6.72	0.15
lnTPIC	16.43	0.06	lnTPIC	17.32	0.06
Mean VIF	***4.12***		**Mean VIF**	***4.43***	

Table 19 – Regression results from Model 2

This table shows the result of regressing the different board and firm characteristics on return on assets (ROA). The sample consists of firms registered one year before the first transfer, ie. excludes data from before YST = -1. The population is Norwegian private companies, where the largest family has been the majority owner for the past three years and then sells at least 20% of their shares during the transfer event.

The table is separated between the entire selection and Subset 4. "OW_INC" is a dummy variable, where ownership is grouped within an interval of 25%: 0-25 → 1, 25-50 → 2 and so on. Here, the first interval is the base. "Age" is the log of the number of years since the company was founded. Board size is the total number of board members. Firm size is the log of a company's sales. Growth opportunities are the relationship between sales and assets. Leverage is the ratio between liabilities less cash and total assets less cash. Asset liquidity is cash on assets. And Capital intensity is the log of the ratio of assets to employees. In parentheses, we have reported the standard errors.

Statistical significance at 10%, 5% and 1% levels are indicated by *, **, ***, respectively.

	Whole sample			**Subset 4**		
	ROA	ROA	ROA	ROA	ROA	ROA
	(1)	(2)	(3)	(4)	(5)	(6)
Inside Control	0.35			-0.89		
	(0.503)			(1.002)		
Shared Control		-1.25*			0.92	
		(0.586)			(0.921)	
Investor Control			1.10			-0.18
			(0.694)			(0.939)
Board Size	0.00	0.00	-0.05	0.10	0.17	0.15
	(0.206)	(0.205)	(0.206)	(0.393)	(0.392)	(0.397)
OWN_INC = 2	-1.22	-1.22	-1.42	-0.58	-0.44	-0,40
	(1.075)	(1.072)	(1.075)	(1.803)	(1.795)	(1.802)
OWN_INC = 3	0.22	0.27	0.26	-0.98	1.05	1.14
	(0.987)	(0.988)	(0.988)	(1.790)	(1.785)	(1.785)
OWN_INC = 4	0.55	0.55	0.70	1.15	1.08	1.10
	(1.085)	(1.083)	(1.085)	(2.293)	(2.292)	(2.294)
Age	*-0.32*	-0.33	-0.32	1.23*	1.23*	1.23*
	(0.309)	(0.310)	(0.309)	(0.672)	(0.672)	(0.673)
Firm Size	0.01	0.02	0.01	-0.19	-0.19	-0.19
	(0.048)	(0.048)	(0.048)	(0.122)	(0.121)	(0.122)
Growth Opportunities	-0.08	-0.08	-0.08	1.72***	1.72***	1.72***
	(0.046)	(0.046)	(0.046)	(0.149)	(0.149)	(0.149)
Leverage	-0.21***	-0.21***	-0.21***	-0.33***	-0.33***	-0.33***
	(0.004)	(0.004)	(0.004)	(0.008)	(0.008)	(0.008)
Asset Liquidity	-2.06**	-2.06**	-2.05**	-5.52**	-5.47**	-5.50**
	(0.768)	(0.768)	(0.768)	(1.778)	(1.779)	(1.779)
Capital Intensity	1.03***	1.03***	1.06***	1.45***	1.45***	1.46***
	(0.142)	(0.142)	(0.142)	(0.352)	(0.352)	(0.352)
Observations	31,311	31,311	31,311	3,969	3,969	3,969
R-squared	0.110	0.110	0.110	0.339	0.338	0.338
Adj. R-squared	0.109	0.109	0.109	0.338	0.338	0.338
F-test	326.42	326.42	326.42	194.23	194.25	194.11
Industry FE	Y	Y	Y	Y	Y	Y
Year FE	Y	Y	Y	Y	Y	Y

Table 20 – Robust regression results from Model 2

This table shows the result of regression of the same variables as before, but this time a robust regression is run. This is to get robust standard errors. See Table 19 for further descriptions of the variables.

Statistical significance is indicated by *, **, *** at the 10%, 5% and 1%, respectively. Robust Standard Errors are reported in parentheses.

	Whole sample			Subset 4		
	ROA	ROA	ROA	ROA	ROA	ROA
	(1)	(2)	(3)	(4)	(5)	(6)
Inside Control	0.35			-0.89		
	(0.549)			(0.703)		
Shared Control		-1.25			0.92	
		(0.907)			(0.646)	
Investor Control			1.10**			-0.18
			(0.480)			(0.406)
Board Size	0.00	0.00	-0.05	0.10	0.17	0.15
	(0.134)	(0.133)	(0.136)	(0.240)	(0.244)	(0.244)
OW_INC=2	-1.22*	-1.22*	-1.42*	-0.58	-0.44	-0,40
	(0.643)	(0.669)	(0.745)	(0.793)	(0.767)	(0.756)
OW_INC=3	0.22	0.27	0.26	-0.98	1.05	1.14
	(0.276)	(0.296)	(0.282)	(0.887)	(0.890)	(0.910)
OW_INC=4	0.55	0.55	0.70	1.15	1.08	1.10
	(0.387)	(0.396)	(0.435)	(0.979)	(0.956)	(0.963)
Age	*-0.32*	-0.33	-0.32	1.23	1.23	1.23*
	(0.242)	(0.247)	(0.241)	(1.005)	(1.007)	(1.007)
Firm Size	0.01	0.02	0.01	-0.19	-0.19	-0.19
	(0.061)	(0.061)	(0.064)	(0.415)	(0.415)	(0.415)
Growth Opportunities	-0.08	-0.08	-0.08	1.72	1.72	1.72
	(0.208)	(0.208)	(0.208)	(1.546)	(1.547)	(1.546)
Leverage	-0.21	-0.21	-0.21	-0.33	-0.33	-0.33
	(0.166)	(0.166)	(0.166)	(0.250)	(0.250)	(0.250)
Asset Liquidity	-2.06	-2.06	-2.05	-5.52	-5.47	-5.50
	(1.376)	(1.376)	(1.374)	(3.572)	(3.542)	(3.560)
Capital Intensity	1.03**	1.03**	1.06**	1.45	1.45	1.46
	(0.419)	(0.418)	(0.426)	(1.194)	(1.194)	(1.194)
Observations	31,311	31,311	31,311	3,969	3,969	3,969
R-squared	0.110	0.110	0.110	0.338	0.338	0.338
Industry FE	Y	Y	Y	Y	Y	Y
Year FE	Y	Y	Y	Y	Y	Y

Table 21 – Variance Inflation Factor (Model 2)

This table shows the result of the Variance Inflation Factor (VIF) for the whole sample. This test is used to check whether there is an indication of multicollinearity or not. The test applies to model 2.

Whole Sample			Whole Sample			Whole Sample		
Variable	*VIF*	*1/VIF*	*Variable*	*VIF*	*1/VIF*	*Variable*	*VIF*	*1/VIF*
Inside Control	3.69	0.27	Shared Control	1.22	0.81	Investor Control	1.23	0.81
Ownership (2)	3.80	0.26	Ownership (2)	3.80	0.26	Ownership (2)	3.84	0.26
Ownership (3)	9.76	0.10	Ownership (3)	9.77	0.10	Ownership (3)	9.73	0.10
Ownership (4)	3.67	0.27	Ownership (4)	3.62	0.28	Ownership (4)	3.63	0.28
Age	11.73	0.09	Age	11.71	0.09	Age	11.71	0.09
Board Size	8.58	0.12	Board Size	8.54	0.12	Board Size	8.69	0.12
Firm Size	7.41	0.13	Firm Size	7.39	0.14	Firm Size	7.34	0.14
Growt Opp.	1.23	0.81	Growt Opp.	1.23	0.81	Growt Opp.	1.23	0.81
Leverage	1.01	0.99	Leverage	1.01	0.99	Leverage	1.01	0.99
Assets Liq.	1.81	0.55	Assets Liq.	1.81	0.55	Assets Liq.	1.81	0.55
Capital Int.	32.01	0.03	Capital Int.	29.05	0.03	Capital Int.	29.11	0.03
Mean VIF	***7.70***		**Mean VIF**	***7.20***		**Mean VIF**	***7.21***	

Table 22 – Variance Inflation Factor (Model 2)

This table shows the result of the Variance Inflation Factor (VIF) for Subset 4. This test is used to check whether there is an indication of multicollinearity or not. The test applies to model 2.

Subset 4			Subset 4			Subset 4		
Variable	*VIF*	*1/VIF*	*Variable*	*VIF*	*1/VIF*	*Variable*	*VIF*	*1/VIF*
Inside Control	1.42	0.27	Shared Control	1.57	0.27	Investor Control	1.68	0.27
Ownership (2)	5.28	0.26	Ownership (2)	5.26	0.26	Ownership (2)	5.32	0.26
Ownership (3)	6.87	0.10	Ownership (3)	6.88	0.10	Ownership (3)	6.87	0.10
Ownership (4)	1.99	0.27	Ownership (4)	1.99	0.27	Ownership (4)	1.99	0.27
Age	12.98	0.09	Age	12.99	0.09	Age	12.99	0.09
Board Size	9.54	0.12	Board Size	9.45	0.12	Board Size	9.65	0.12
Firm Size	15.11	0.13	Firm Size	15.09	0.13	Firm Size	15.10	0.13
Growt Opp.	1.88	0.81	Growt Opp.	1.88	0.81	Growt Opp.	1.88	0.81
Leverage	1.11	0.99	Leverage	1.10	0.99	Leverage	1.11	0.99
Assets Liq.	2.17	0.55	Assets Liq.	2.17	0.55	Assets Liq.	2.17	0.55
Capital Int.	35.87	0.03	Capital Int.	35.21	0.03	Capital Int.	34.66	0.03
Mean VIF	***8.55***		**Mean VIF**	***8.51***		**Mean VIF**	***8.49***	