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Understanding Society

The effect of board characteristics on dividend policy

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Abstract

This thesis investigates the effect of board characteristics on dividend policy. Dividend policy and the board are substitutes to control agency cost, which is used as an indicator for board performance. Five characteristics are taken into account: board size, the percentage of inside Directors, the percentage of women, insiders' ownership and Directors' tenure. Using a sample of S&P 500 firms, both cross-sectional and fixed effects tests are performed in line with Farinha (2003). I find a positive and significant relation between board size and dividend policy, indicating that a larger board will have a negative influence on board performance. After cross-sectional tests, the four other characteristics are significant. However, they do not pass robustness and firm fixed effects tests.

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Chapter 1: Introduction

"Far too many executives have become more concerned with the 'four P's'- pay, perks, power and prestige, rather than making profits for shareholders"

(by: T Boone Pickens; CEO BP Capital Equity Fund)

The board of Directors has been of great interest for the past decades, standing as an important line of defense for keeping the firm performing well. One of the most important tasks of a (one-tier) board is to monitor the CEO and to lower the agency costs (Jensen & Meckling, 1976). The board is an important tool to control the agent and will thus reduce the agency costs. (Fama & Jensen, 1984). Besides monitoring, the focus of the board is giving advice and providing oversight and support. (Finkelstein & Moony, 2006).

In 2002, Bryne called boards "ornaments on a corporate Christmas tree." Lorsch and Malcver (1989) concluded that Directors look more like pawns than safeguards. This indicates that Directors are blamed for not doing their work properly and that the board is seen as an institution with only a ceremonial function (Drucker 1974). The performance of the board will be studied in this thesis.

Besides the board, there is another tool to reduce agency cost, which is paying dividend to the shareholders (Easterbrook, 1984). Paying dividend, as will be explained in chapter two, will reduce agency cost for two reasons. Firstly, by paying dividend, the free cash flow will be lower and secondly, it will cause companies to raise money from the equity market. However, paying dividend comes at a cost, which is the transaction cost associated with paying dividend (Rozeff, 1982). Therefore, the amount of dividend paid is a tradeoff between reducing agency cost and transaction costs.

Paying dividend and having a good board are two methods to lower agency cost and can therefore be seen as substitutes (Fernandez & Arrondo, 2005). If the board is performing well and, consequently, the agency costs are low, there is less need to pay dividend. Therefore, it is possible to test how the board is performing by looking at the effect of different board characteristics on the amount of dividend paid.

Five characteristics will be taken into account to test whether they influence the amount of dividend paid. If these characteristics improve the performance of the board, the need for dividend will be lower and vice versa. For instance, a positive effect between the number of Directors and the amount of dividend paid indicates the board is not performing well.

1.2 Problem statement

In order to test the performance of the board, the central question in this thesis is as follows:

What is the effect of board characteristics on dividend policy?

1.3 Research questions

In order to be able to solve the problem statement, I will use the following research questions:

- What is the effect of board size on dividend policy?
- What is the effect of board composition on dividend policy?
- What is the effect of gender diversity on dividend policy?
- What is the effect of Directors' ownership on dividend policy?
- What is the effect of tenure on dividend policy?

1.4 Structure

To answer the raised research questions, the following structure is used: in chapter two, the theoretical framework will be presented. In this chapter, a closer look to dividend and the board will be taken and after that, each research question will be explained. This chapter will be followed by the research methodology which is accompanied by the descriptive statistics. In chapter four, the results of the tests will be presented and, finally, chapter five will contain a conclusion, discussion and some limitations.

Chapter 2: Literature review

"There are as many opinions as there are experts."

(Franklin D. Roosevelt, former US President)

In this thesis, the effect of board characteristics will be tested on dividend policy. In particular, there are five different characteristics which will be described in this chapter. Many studies have been performed looking at the effect of board characteristics. As stated in the quote above, this also results in a lot of different opinions. These opinions will be described in the paragraphs about the different board characteristics.

2.1 Agency cost and controlling mechanism

"Men? Men are weak."

(Elrond in the film version of Lord of the Rings)

Agency theory indicates that the goals of the managers, who are pursuing their self-interest, are not aligned with the goals of the owner of the company, the shareholder. Because managers know more about the company than the shareholder, information asymmetry arises. This information asymmetry will make managers able to chase their own goals, which comes at a cost, the agency cost (Jensen & Meckling, 1976).

There are several methods to reduce agency cost. Besides paying dividend and the board, takeover threat and market scrutiny and disclosure are also methods to reduce agency cost.

Takeover threat is the risk the manager has to be ousted by the shareholders when share prices go down when they are not performing optimally (Grossman and Hart, 1980). Market scrutiny is the monitoring performed by (potential) investors (Loderer& Waelchi, 2010). The results of firm decisions are visible in the stock price and managers will therefore behave differently (Fama & Jensen, 1983).

2.1.1 Dividend

"Cash is a fact, profit is an opinion."

(Alfred Rappapor, Professor at Northwestern University)

Miller and Modigliani's (1961) irrelevance theorem states that paying dividend is irrelevant when determining the value of the firm as a shareholder is indifferent about whether he will get dividend paid or not. Despite this irrelevance theory, companies keep paying high amounts of dividend to their shareholders, which is called the dividend puzzle (Black, 1976). There are three theories which explain the dividend puzzle.

The signaling theory states that when a firm is optimistic about the future, it will pay more dividend to signal this optimism to its shareholders. (Linter, 1956; Hobbs & Schneller, 2012; Benartzi, Michaely & Thaler, 1997) A second theory is the catering theory (Baker & Wurgler, 2004), which is dividend paid by managers when shareholders demand it.

The final theory is the agency theory of dividend. There are two reasons why dividend will lower agency cost. First, it will lower free cash flow, which is one of the drivers of agency cost. Too much free cash flow could be bad for a company, since it gives the manager an opportunity to make investments which are not in line with the goals of the shareholders (Jensen, 1986).

Next to that, dividend will lower agency cost because it will force managers to raise money on the equity market. When this happens, the monitoring will increase because financial institutions, which are willing to lend the money, will investigate the management. This increased monitoring will lead to less agency costs (Easterbrook, 1984).

There are also characteristics of the firm that influence the dividend decision. Institutional ownership influences the amount of dividend paid. Institutional owners monitor the company and the need for dividend is lower. However, there are also institutional owners that do not want to monitor and instead ask for more dividend (Farinha, 2003). Size is also a factor that influences the dividend decision; larger companies will pay more dividends (Smith & Watts, 1992).

However, paying dividend comes at a cost. When a company pays dividend, there is less liquidity available for investments. The firm has to go to the capital market to raise money and this is costly. These costs are called transaction costs and, according to Rozeff (1982), the amount of dividend paid is a tradeoff between the benefits of paying dividend on the one hand and transaction costs on the other.

Dividend policy has been an important topic over the years. There are several theories to explain the use of dividend. In this thesis, the agency theory of dividend will be used.

2.1.2 Board

"Well, you're only the President of the company. What the hell do you know, anyway?"

(Bud Fox in the film Wall street)

On May 27th 2013 in Het Financieele Dagblad, a column was written by Simon Johnson, Professor at MIT, with the title: "Boards on Their Backs." In this column, it was made clear that board of Directors are failing and, moreover, that the CEO is not examined closely. This column indicates that it is important to improve the performance of the board.

The board has two functions. First, it has to monitor the managers and it also has to give advice, oversight and support. To be as effective as possible in the two main tasks stated above, there are five requirements that should be met (Finkelstein & Mooney, 2006):

- Engage in constructive conflict
- Avoid destructive conflict
- Work together as a team
- Know the appropriate level of strategic involvement
- Address decisions comprehensively

The board is an important tool to control the agent and will thus reduce the agency costs (Fama & Jensen, 1984). Since this paper will focus on the US, it will only look at one-tier boards.
In the next paragraphs, the main indicators of a well-performing board will be discussed.

2.2 Board size and dividend policy

"I've been on enough sports teams in my life to have experienced the magic of what can happen when a group of people care for and love each other. "

(Tim Ryan, American Footballer)

The first aspect of interest is the influence of board size on dividend policy. The optimal board size is according to Jensen (1993) seven to eight and according to Lipton and Lorsch (1992) eight to nine. No research has been done on the influence of board size on dividend policy. However, research has been done on the influence of board size on firm performance. The main assumption in these studies

is that a well-performing board will result in higher firm performance. A smaller board results in a higher firm performance (Yermack, 1996; Eisenberg, 1988; Guest, 2009; Nguyen & Faff, 2012).

 As stated before, the function of the board is, besides monitoring, to give advice and oversight and thereby contribute to the firms' performance.

Guest (2009) indicates that there are three reasons why a larger board will perform worse: the free-riders problem (Daves, 1980; Eckel, Grosman & Johnston, 2005), a decreasing cohesiveness (Carron, 1982; Casey-Campbell & Martens, 2009; Mullen & Coppen, 1995; Judge & Zeithaml, 1992) and coordination and communication problems (Guest, 2009; Jensen, 1993). The CEO has the possibility to control a larger board more easily and, consequently, agency cost increases (Lipton & Lorch, 1992). A further elaboration on why these problems exist is included in appendix A.

I conclude from above that a smaller board will perform better. As explained before, dividend and the board are substitutes for controlling agency cost. When the board is too large, I expect that the dividend payments will be higher. The hypothesis will therefore be:

H1: There is a positive relation between board size and dividend payments

2.3 Board composition and dividend policy

"The most courageous act is still to think for yourself. Aloud."

(Coco Chanel)

The second board characteristic of interest is the number of insiders. Outside Directors are believed to be more independent and, therefore, better able to protect the interests of the shareholders (Rosenstein & Wyatt, 1990) Next to that, outside Directors have a reputational risk and they will therefore react differently than inside Directors (Borokhovic, Parrino & Trapani 1996; Fama and Jensen 1983).

However, there are also reasons why outside Directors could have a negative impact on the performance of the board. Bhagat and Black (2000) call outside Directors lapdogs rather than watchdogs. According to Klein (1998), outside Directors will have less firm-specific expertise and knowledge about the company. Next to that, they can spend less time than inside Directors and, consequently, they will not be able to make decisions as good as inside Directors.

Again, I will use evidence based on firm performance. Mixed results are found and there is no consensus amongst scientists. A negative relation on board composition is found (Ezzamel & Watson, 1993; Baysinger & Butler, 1985; Perce & Zahra, 1992), as well as a positive relation (Donaldson, 1990;

Donaldson & Davis, 1994; Boyd, 1994) and finally, no relation (Daily & Dalton, 1993; Dalton, Daily, Ellstrand & Johnson 1998; Finkelstein & Mooney, 2003).

The evidence of the effect of outside Directors on performance is mixed. However, I expect that in the case of controlling agency cost, independence is the most important factor. The hypothesis will therefore be:

H2: There is a positive effect between the number of inside Directors and dividend policy

2.4 Gender diversity and dividend policy

"What characterizes a member of a minority group is that he is forced to see himself as both exceptional and insignificant, marvelous and awful, good and evil."

(Norman Mailer, winner of two Pulitzer Prizes)

The third board characteristic of interest is the percentage of women on the board. The economic effect of women on the board is not determined, since the results are mixed and not conclusive. Some research finds a negative relation (Schrader, Blackburn & Iles, 1997), while other research finds no significant relation (Zahra & Stanton, 1998), or a positive relation (Carter, Simkins & Simpson, 2003; Francoeur, Labelle & Sinclair- Desgagné, 2008).

There are differences between men and women. Women are more risk averse than men (Croson & Gneezy, 2009). Women will make less aggressive strategy choices and will invest in more sustainable projects (Apesteguia, Azmat, & Iriberri, 2012). Terjesen, Sealy and Singh (2009) and Singh, Terjesen and Vinnicombe (2008), found that women more often have an MBA and more international experience than men.

The reason why the evidence is not conclusive is, according to Joecks, Pull and Vetter (2012), that there is a U-shaped relation. The reason for this relation lies in group theories which is stated by Kanter (1977). If the percentage of women on the board is small, there will be a negative effect on firm performance. If this percentage increases, it will become an advantage to have women on the board and the performance of the board will go up. In appendix A, more information on this effect can be found. This theory explains that the performance of the board will go down to a certain point when more than 40% of the board is women. After this point the performance will go up.

The effect of women on the board is expected to be u-shaped. Rozeff's (1982) tradeoff theory suggests that when the board is performing poorly, more dividend needs to be paid. Therefore, I expect that the amount of paid dividend will go up. When 20% to 40% of the board consists of

women, I expect the amount of dividend to go down again and, consequently, the effect is an inverted U-shape relation. Therefore, the hypothesis is:

H3: There is an inverted U-shaped effect between the percentage of women and paying dividend.

2.5 Director ownership and dividend policy

"The new world economic order is not an exercise in philanthropy, but in enlightened self-interest for everyone concerned."

(Carlos Fuentes, writer)

The fourth characteristic of interest is the percentage of options held by the board. Again, I will take firm performance instead of dividend policy, due to a lack of research about dividend. There is a non-linear relation between firm performance and director ownership. In the first instance, the firm value increases, then decreases and finally increases again (Morck, Schleifer & Vischney,1988; Griffith, 1999; Ghosh & Sirmans, 2006).

When Directors have shares and options of a company, it has an impact on their performance. By owning a part of the company, the interests of Directors are aligned with shareholders. (Morck et al., 1988). This decreases agency costs (Ghosh & Sirmans, 2006).

However, when the Directors have a large part of the shares, the takeover threat will reduce and the Directors will get entrenched (Morck et al., 1988). Extensive research has been done on the consequences of entrenchment on agency costs. First, leverage will be lower than optimal (Brounen, de Jong & Koedijk, 2006), debt will have longer maturity (Guney & Ozkan, 2005), larger amounts of cash will be held (Ozkan & Ozkan, 2004) and there will be overinvestment (Pawlina & Renneboog, 2005).

The evidence given above indicates that the agency cost will decrease when the percentage of shares increases. When managers get entrenched, agency cost will start to increase again. I expect dividend payment will follow the same pattern. The hypothesis is the following:

H4: There is a U-shaped effect of director's ownership on dividend.

2.6 Director tenure and dividend policy

"Fredo, you're my older brother, and I love you. But don't ever take sides with anyone against the family again. Ever."

(Michael Corleone in the movie The Godfather)

The last characteristic of interest is the tenure of the Directors. Tenure is the number of years a director is working at the company. The evidence on this topic is limited. Byrd Cooperman and Wolfe (2010) find a negative relation between tenure and governance. Berberich and Niu (2011) find a positive relation between board tenure and governance issues.

A positive relation between tenure and the performance of the board (and thus a negative relation with the amount of dividend paid), can be explained by the expertise hypothesis (Vance, 1983). Directors with a longer tenure will have more expertise and greater commitment. Next to that, they will put more effort in the firm (Buchanan, 1974). Moreover, Vafeas (1999) found that a more experienced board will lead to better monitoring.

However, according to Bebchuk Friend and Walker (2002), there is a chance that long tenure board members become friends with the CEO. Therefore, they are not able to monitor the CEO properly. In 2003, Vafeas found that outside Directors with a longer tenure will find it harder to confront the CEO because their loyalty is shifting towards the CEO instead of the shareholder. Finally, Katz and Allen (1982) found that tenure will disturb the group process because it will reduce intra-group communication.

It is not clear what effect tenure will have on the performance of the board. As stated earlier, the way a board is performing will influence the amount of dividend that should be paid. I expect that the board will become less independent and agency costs will go up. Therefore, the amount of dividend has to go up as well. The hypothesis is the following:

H5: There is a positive effect between the director's tenure and dividend policy

Chapter 3: Research Methodology

The data to perform this research is obtained from two different databases. Corporate Library is used for the variables about the board characteristics. Compustat was used to collect the necessary information about dividend and the control variables. In the dataset all S&P 500 firms between 2008 and 2011 are taken into account. Because of data constraints, it was not possible to take a sample which consisted of more than four years. In Corporate Library, data about Directors is only available from 2008 until 2011; data for 2012 is not yet available.

Firms with SIC codes between 6000 and 6999 (financial firms) are excluded from the dataset. They are excluded because financial firms have different accounting and reporting rules. This will lead to statistical problems as the data is difficult to compare with the non-financial firms in the dataset (Fama & French, 2002).

Next to that, firm years with missing observations are also dropped from the dataset. The total number of firms is 436, with a total number of 1350 yearly firm observations. Below, the division of the firms over different industries can be found. As shown, a large percentage of companies is manufacturing. This is a possible selection bias when performing tests and, thus has to be tested.

Table 1

Industry distribution

Sector distribution of sample according to SIC Codes

Code	Industry Title	count	percentage
41518	Agriculture, Forestry & Fishing	1	0%
41913	Mining	33	8%
15-17	Construction	5	1%
20-39	Manufacturing	216	50%
40-49	Transportation, Communications, Electric, Gas & Sanitary Services	64	15%
50-51	Wholesale Trade	9	2%
52-59	Retail Trade	47	11%
60-67	Finance, Insurance & Real Estate	0	0%
70-89	Services	60	14%
91-99	Public Administration	1	0%
	Total	436	100%

3.1 Model, variable definition and expectations

To calculate the effect of the characteristics on dividend policy, a model, in line with Farinha (2003), is used. In this formula, there are two quadratic functions. A quadratic function will be used to test a U-shaped function, in line with Joecks, Pull and Vetter (2012). Next to that, a quadratic function will be used to calculate this non-linear relation between Directors' ownership and dividend, which is in line with Ghosh and Sirmans (2006). First, the model is presented and, after that, an explanation of the variables will be given in Chapter 3.1.2.

$$Dividend = \alpha + \beta_1\, Cash + \beta_2\, ROA + \beta_3\, Institutionalownership + \beta_4 Booktomarketratio \\ + \beta_5\, debt + \beta_6\, TotalDirectors + \beta_8\, womenpctg + \beta_9 womenpctg^2 \\ + \beta_{10}\, insiderspctg + \beta_{11}\, insiderspctg^2 + \beta_{12} directorsinside$$

3.1.2 Dependent variable

The variable of interest is the amount of dividend paid for each company. In line with Rozef (1982), a five year average is preferred. This average is divided by a five year mean of net income. The main advantage of using a five year average is that the data will be less noisy. In line with Farinha (2003), dividend ratios smaller than zero or in excess of one are dropped because of the lack of statistical and economic significance. Next to that, a different calculation of dividend will be used in line with Andres, Betzer, Goergen and Renneboog (2009). Total dividend will be divided by market capitalization.

3.1.3 Independent variables

The variable *logtotal* is the natural logarithm of the total number of Directors on the board. Because the number of Directors is a non-zero large number, the variable is skewed. The problem with a skewed variable is that it is difficult to have precise and unbiased outcomes (Manning & Mullahy, 2001). To deal with this problem, a natural logarithm of the number of Directors is taken (Garg, 2007; Farinha, 2003). A disadvantage of using a log is that it is difficult to interpret the results.

It is expected that if the number of Directors increases, dividend payments will go up. If there are too many Directors, problems are likely to incur and the CEO is therefore harder to monitor. Dividend will be a good substitute to lower agency cost. A positive sign is thus expected.

Insiderspctg is the percentage of inside Directors on the board. A positive correlation is expected because insiders are expected to be less independent. Therefore, they are willing to support the CEO and monitor less. A rise in agency cost will be the consequence and this will be compensated with the dividend policy.

Directorswomenpctg is the percentage of women on the board. When women are in a clear minority, the performance of the board is expected to weaken and dividend will go up. If the percentage of women on the board increases, the performance is expected to improve and, consequently, the amount of dividend paid will go down. This results in an inverted U-shaped relation.

The variable *directorsinsidepct* is the percentage of shares, which is owned by the Directors. The relation with dividend is expected to be U-shaped. First, the amount of dividend paid is expected to go down and, after a certain turning point, it is expected to go up again.

The variable *directorsover10yrstenurepct* is the percentage of Directors who have a tenure of more than ten years on the board. It is expected that if there are more of these Directors, the performance of the board will decrease.

3.1.4 Control variables

Table 2
Dividend theory and control variables

Theory	Control variable
Signalling theory	ROA
Agency theory	Debt, Cash
Future growth	Market to book ratio
Ownership	Dinstitutional
size	Log market value

In line with Farinha (2003), *book market ratio* is taken as a proxy for future growth. When the company is expected to have large growth opportunities for the coming years, less dividend will be paid. After all, the money is needed for future investments. Therefore, a negative correlation is expected between future growth and the amount of dividend paid.

ROA, return on assets, will be used as a proxy for profitability. Companies pay dividend to signal to shareholders how the company is performing. If the company is performing well, this will be communicated to investors by paying more dividend. A positive relation is thus expected between ROA and the amount of dividend paid.

Debt will be used as a proxy for agency cost. If the amount of debt rises, monitoring by financial institutions will be higher. Because of this increased monitoring, agency costs will go down and the need for paying dividend will be lower. Therefore, a negative relation between debt and dividend is expected.

Cash is calculated as the five year mean of cash and cash equivalents, divided by the total assets of the firm, which is in line with Farinha (2003). According to Jensen (1983), a high free cash flow will lead to higher agency costs. By paying dividend, the free cash flow and thus the agency costs decrease. Therefore, the sign of this correlation is expected to be positive.

Dinstitutional is a dummy variable, indicating if there is an institutional majority. In case of an institutional majority, there will be more monitoring (Qiu, 2006) and it is therefore expected that the agency cost will be lower. A negative sign is expected.

Table 3

Expectations of the variables

variable	expectation
LOGTOTAL	-
insideowner	U-shaped
directorswomen	Inverted U-shape
insiderspctg	+
Directors10yearpctg	+
Bookmarketratio	-
Cash	+
ROA	+
dinstitutional	-
Logmarketvue	+
Debt	-

3.2 Hypotheses

3.2.1 Board size

The first hypothesis looks at the effect of board size on dividend policy. It is expected that a larger number of Directors will have a negative effect on the performance of the board, which leads to less monitoring and the increase of agency costs. According to Rozeff's tradeoff theory, dividend payments have to go up in order to lower the agency costs. The first research question is stated below with the formula.

H1: There is a positive relation between board size and dividend policy.

$$Dividend = \alpha + \beta_1 \, Cash + \beta_2 \, ROA + \beta_3 \, Institutionalownership + \beta_4 Booktomarketratio + \beta_5 \, debt + \beta_6 \, assets + \beta_7 \, TotalDirectors$$

3.2.2 Inside Directors

The second hypothesis looks at the number of inside Directors on the board. More inside Directors means a less independent board, resulting therefore in higher agency costs. Consequently, the amount of dividend paid has to increase. To test for this effect, the following hypothesis will be tested:

H2: There is a positive relation between the percentage of inside Directors on dividend policy.

$$Dividend = \alpha + \beta_1 \, Cash + \beta_2 \, ROA + \beta_3 \, Institutionalownership + \beta_4 Booktomarketratio + \beta_5 \, debt + \beta_6 \, assets + \beta_7 insiderspctg$$

3.2.3 Gender diversity

The third hypothesis that will be tested is the effect of the percentage of women on the board on the dividend. When the percentage of women is small, it is expected that the performance of the board will go down. When the number increases, a certain turning point will be reached and the performance is expected to go up. Dividend is expected to behave the opposite and will have the shape of an inverted U-shaped curve. The research question will be the following:

H3: There will be an inverted U-shaped relation between gender diversity and dividend policy.

$$Dividend = \alpha + \beta_1 \, Cash + \beta_2 \, ROA + \beta_3 \, Institutionalownership + \beta_4 Booktomarketratio + \beta_5 \, debt + \beta_6 \, assets + \beta_7 womenpctg + \beta_8 womenpctg^2$$

3.2.4 Directors' ownership

The fourth hypothesis which will be tested is the effect of Director's ownership on dividend policy. Incentives will change when Directors get a share of the company. When the managers get entrenched, the direction of the coefficient will change from negative to positive.

H4: There will be a U-shaped effect between Directors' ownership on dividend policy.

$$Dividend = \alpha + \beta_1\, Cash + \beta_2\, ROA + \beta_3\, Institutionalownership + \beta_4 Booktomarketratio + \beta_5\, debt + \beta_6\, assets + \beta_7 Directorsinsidepct + \beta_8\, Directorsinsidepct^2$$

3.2.5 Directors' tenure

The fifth hypothesis that will be tested is the effect of tenure on dividend. Because of data constraints, it is only possible to look at the percentage of Directors with more than ten years of tenure. These managers have more experience. However, it is expected that these Directors are less independent. Therefore, they will not able to monitor properly and, as a result, dividend will go up. The hypothesis will be the following:

H5: There is a positive relation between the Director's tenure and dividend policy.

$$Dividend = \alpha + \beta_1\, Cash + \beta_2\, ROA + \beta_3\, Institutionalownership + \beta_4 Booktomarketratio + \beta_5\, debt + \beta_6\, assets + \beta_7\, directorsover10yrstenurepct$$

3.3 Research method

Two different models will be used to test the hypotheses. First, a cross sectional OLS regression, in line with Farinha (2003), will be performed. After that, there will be several tests to check the robustness of the results. Finally, a fixed effects regression will be performed. In the table below, a small selection of authors, who used one of two methods, can be found.

Table 4

Overview research

In this table, an overview is presented of authors who performed their research using either cross-sectional tests or fixed effects tests.

Cross-sectional	Fixed effects
Klein (2002)	Cheng (2008)
Vafeas (1999)	Cornett , Marcus, Saunders &Tehranian (2007)
Farinha (2003)	Himmelburg (1999)
Barnhart& Rosenstein (1998)	Chen, Cheung & Stouraitis (2005)
Morck Schleifer Vishney (1988)	Adams & Fereira (2009)
McConnell & Servaes (1990)	

3.3.1 Cross sectional test

To test the hypotheses, an Ordinary Least Square (OLS) regression will be used. Rozeff's tradeoff theory is important in building the models. The formulas, as presented in chapter 3.2, will be taken into account.

To check the robustness of the results, several tests will be performed. First, a test with a dummy variable is used to indicate if the company is a dividend payer or not. Because there are different methods to calculate dividend, a second method will be used. Dividend will be divided through market capitalization instead of net income. Finally, two different appROAches will be used to check whether the interpretation of the tests is correct. First, the board characteristics will be tested on performance of the firm. An extensive overview can be found in the Appendix M. Next to that, tests will be performed on share repurchases. According to Grullon and Michaely (2002), dividend and share repurchases are substitutes and therefore the results are expected to be similar. To test this, tests will be done in line with Owald and Young (2007).

3.3.2 Firm Fixed effects

"All progress is precarious,
and the solution of one problem brings us face to face with another problem."

(Martin Luther King Jr.)

Using a cross sectional regression might lead to statistical problems. There is a possibility that there are unobserved firm-specific elements which affect the dividend decision. (Himmelburg, Hubia & Pallard, 1999). These unobserved factors influence the relation between performance and ownership, which leads to endogeneity. Because these factors are unobserved, they are not taken into account

when looking at the effect of board characteristics on dividend. The coefficients used in a cross-sectional test may therefore be biased.

To solve this problem, a regression will be performed, using firm fixed effects. This test has the benefit of examining firm-specific effects of the regressions. Using this model, all firm-specific effects that influence the dependent variable are captured in the error term (Verbeek, 2008). This is done via a regression model in which the intercept terms vary over time and firms (Verbeek, 2008).

This method is in line with Hausman and Taylor (1981), who found that tests with fixed effects are an unbiased method to check for omitted variables. It is also possible to use random effects. A random effect model assumes that there are random factors that are identically and independently distributed over individual firms. Although it is not likely that a test with random effects has to be performed, a Hausman test will test this.

The same formulas as stated in Chapter 3.2 will be used, even though the error terms will be year and firm-specific. Finally, it is expected that the model with firm fixed effects will have less explanatory power, since firm-specific effects are taken into account.

3.4 Descriptive statistics

Below, the descriptive statistics can be found. In Appendix C, the distributions of the five characteristics are visually presented. The minimum number of Directors is five. The implication is that it is not possible to see what the effect is on a board with less than five. Moreover, most companies have a minimum of seven Directors. The percentage of inside Directors has a maximum of one; however, looking at the graph, it can be seen that this is an outlier. The percentage of women has a maximum of five; therefore, it is not possible to test what will happen if the percentage of women increases. This also applies for Directors' ownership. The maximum percentage of shares owned by the Directors is 44%.

Table 5

Descriptive statistics

Averagedividend is a five year average of the amount of dividend paid divided by net income. Bookmarketratio is market capitalization of equity added with book value of assets minus book value of equity, divided by book value of total assets. Cash is a five year average of cash in millions. Roa is the return on assets. Dinstitutional with the value one if there is an institutional majority. Logmarketvalue is the natural logarithm of the market value in millions. Debt is the five year average debt in thouands. Directorstoal is the number of directors on the board. Insiderpctg is the percentage of inside directors, directorswomenpct is the percentage of women on the board. Directorsinsidepct is the percentage of shares held by the board. Finally directrosover10yrstenurepct is the percentage of directors who are on the board for more than ten year.

Variable	Obs	Mean	Std. Dev.	25% percentile	75% percentile
Averagedividend	1350	.25	.2617707	0	.99
Bookmarketratio	1350	.45	.30	.25	.61
Cash	1315	1680	4617	286	1571
Roa	1350	.069	.07	0.03	0.11
Dinstitutional	1350	.82	.37	1	1
Debt	1344	5042	19786	525	4767.5
Logmarketvalue	1346	1606	1181	1529	1674
Logtotal	1325	10	2.7	9	12
Insiderspctg	1350	6%	13%	0.6%	49%
Directorswomenpct	1325	15%	8%	9%	20%
Directorsinsidepct	1325	14%	7%	9%	17%
Directorsover10yrstenurepct	1325	32%	18%	20%	44%

Chapter 4 Results

4.1 Cross sectional test on average dividend

Table 6

Regressions results for cross-sectional test

This table presents, in line with Farinha (2003), the cross-sectional tests on dividend policy. Regression two and five are performed with robust standard errors. The dependent variable is a five year average of the amount of dividend paid divided by net income. The independent variables are Bookmarketratio (market capitalization of equity added with book value of assets minus book value of equity divided by book value of total assets), which indicates the future growth of the company. Cash is calculated as a five year average divided by total assets and is taken into account as a proxy agency cost. ROA is the return on assets and is used as a proxy for the signaling theory. Dinstitutional is a dummy that equals one if there is an institutional majority. Debt is calculated as the five year average of debt and it indicates agency cost. Logtotal is a variable indicating the natural logarithm of the number of Directors on the board. Insiderspctg is a variable that indicates the percentage of inside Directors on the board. Directorswomenpct and women2 are looking at a non-linear relation of the percentage of women on the board. Directorsinsidepct and dir2 measure a non-linear relation of the percentage of shares owned by Directors. Finally, directorsover10yrstenurepct measures the percentage of Directors with more than ten years tenure.

VARIABLES	Average dividend	Average dividend	Average dividend	Average dividend	Average dividend	Average dividend
Bookmarketratio	-0.0281	-0.00852	0.000420	-0.0186	-0.0138	-0.0232
	(0.0245)	(0.0246)	(0.0251)	(0.0252)	(0.0247)	(0.0244)
cash	-1.70e-05***	-1.94e-05***	-2.09e-05***	-1.99e-05***	-2.08e-05***	-1.69e-05***
	(6.41e-06)	(6.56e-06)	(6.57e-06)	(6.59e-06)	(6.54e-06)	(6.35e-06)
ROA	0.110	0.0160	0.0268	0.0411	-0.0521	0.103
	(0.105)	(0.0947)	(0.107)	(0.108)	(0.0977)	(0.105)
dinstitutional	0.0582***	0.0833***	0.0741***	0.0765***	0.0792***	0.0506***
	(0.0187)	(0.0182)	(0.0190)	(0.0191)	(0.0181)	(0.0185)
Logmarketvalue	0.0255***	0.0407***	0.0399***	0.0386***	0.0456***	0.0216***
	(0.00688)	(0.00659)	(0.00680)	(0.00690)	(0.00670)	(0.00687)
debt	1.60e-06***	2.13e-06***	2.05e-06***	2.00e-06***	2.15e-06***	1.46e-06***
	(4.26e-07)	(3.78e-07)	(4.33e-07)	(4.35e-07)	(3.81e-07)	(4.22e-07)
logtotal	0.347***					0.320***
	(0.0359)					(0.0381)
insiderspctg		-0.160***				-0.189***
		(0.0439)				(0.0534)
directorswomenpct			0.875***			0.343
			(0.207)			(0.212)
women2			-1.449**			-0.322
			(0.576)			(0.576)
directorsinsidepct				-1.245***		-0.787*
				(0.428)		(0.416)
dir2				2.165**		1.732
				(1.082)		(1.060)
directorsover10yrstenurepct					0.105***	0.149***
					(0.0401)	(0.0361)
Constant	-1.008***	-0.463***	-0.544***	-0.309***	-0.575***	-0.889***
	(0.116)	(0.104)	(0.107)	(0.119)	(0.105)	(0.131)
Observations	1,280	1,305	1,280	1,280	1,280	1,280
R-squared	0.152	0.097	0.112	0.105	0.096	0.181

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Since the t-statistics are relatively high, tests are performed to check for heteroskedacity. In case of heteroskedacity, the variance is not constant and this will lead to biased t-statistics (Verbeek, 2008). A solution to this problem is using White (1982) robust standard errors. After performing these tests, signs of heteroskedacity were found at regression two and five; therefore, these regressions are performed using robust standard errors. There are no signs of multicollinearity as can be seen in Appendix E.

The R-square lies between 0.096 and 0.18, which is relatively low. This implicates that only ten to eighteen percent of the variation in the dependent variable can be declared by the independent variables. Although almost all variables are significant, the explanatory power of these tests is relatively low.

Control variables

The control variables *bookmarketratio, ROA* and *logmarketvalue* are in line with expectations and are thus significant. *Bookmarketratio*, indicating future growth, has a negative sign as expected. The reason is that the company will need liquidity to pay for future investments to facilitate the growth. *ROA* (return on assets), which is a proxy for signaling theory, has a positive sign, though the effect is close to zero. Finally, *logmarketvalue* is positive and significant, which indicates that the size of the firm has a positive effect on the amount of dividend paid.

The coefficients of *cash* and *debt* are close to zero and therefore have virtually no effect. The dummy variable indicating an institutional majority is positive. A negative sign was expected, since an institutional majority would increase. However, this positive relation is also found by Farinha (2003). He argues that it might be too costly for an institutional investor to monitor the firm. To cover this problem, the institutional investor could ask the company to pay dividend. There will be increased monitoring via another controlling mechanism.

Hypothesis 1:

The coefficient logtotal is both positive and significant. This indicates that if the number of Directors increases, dividend also increases. This is in line with the expectations. A larger board will be easier for the CEO to control and this has to be compensated by paying more dividend. However, it is important to note that the minimum amount of Directors in the sample is five.

Hypothesis 2:

Hypothesis two looks at the effect of the percentage of inside Directors on dividend policy. Insidepctg has a negative and significant coefficient, indicating that the correlation between the percentage of inside Directors on the board and dividend is negative. An independent board would require less monitoring; therefore, this relation is not as expected. A negative sign is in line with Klein's argumentation (1998), which can be found in the literature review. As stated earlier, inside Directors will have more firm specific information and are therefore more able to monitor the CEO. This could improve the performance of the board and consequently, dividend goes down.

Hypothesis 3:

Directorswomenpctg has a positive sign and women2 has a negative sign; both are significant. This indicates that there is a non-linear , inverted U-shape relation between the percentage of women on the board and the amount of dividend paid. In Appendix D, this relation is visually presented. As can be seen, the turning point lies at 29%, which is in line with Joecks, Pull and Vetter(2012), who report a turning point at 30%.

Hypothesis 4:

Directorsinsidepctg and dir2 look at a non-linear effect between the percentage of shares held by inside Directors and the amount of dividend paid. As expected, there is a U-shaped relation between these two variables. The entrenchment level lies at 28%. This level is in line with Farinha (2003), who finds a turning point between 25% and 32% over different years. In Appendix D, this relation is visually presented.

Hypothesis 5:

There is a positive relation between the tenure of the director and the amount of dividend paid. Keeping in mind that the data is limited, this indicates a long tenure will lead to a decrease in performance. The independence of the director will go down and, consequently, monitoring will be less. To compensate for this, the amount of dividend paid increases.

4.1.1 Interaction test

In the literature (Vafeas, 2003) a possible interaction between board tenure and inside Directors was found. Tenured outside Directors could be less independent than an outside director with less tenure. To test this, an interaction term is created. As can be seen in Appendix F, there is no significant relation between Directors tenure and being an inside or outside director.

4.1.2 Conclusion

In this paragraph, cross-sectional tests have been performed to test the effect of board characteristics on dividend policy. Against expectations, a negative relation is found between inside Directors and dividend policy. This implies that inside Directors will improve firm performance. All other variables are significant and in line with expectations.

The R-square of the tests is relatively low and this has a negative impact on the explanatory power. Therefore, additional tests have to be performed to confirm the results; these tests will be performed in Chapters 4.2 and 4.3

4.2 Robustness

Because the explanatory power of the results is low, several tests will be performed to check for robustness. A different method to calculate dividend is used. Instead of the dependent variable average dividend, a dummy variable is used. This variable indicates a firm as a dividend payer or as a non-dividend payer. In Appendix K, the results of a Tobit regression can be found. All results found in the regression are in line with the finding of Chapter 4.1.

Next, tests for firm performance and share repurchases are performed and can be found in the Appendix L. In these appendices, there is an extensive elaboration on these two topics, including method, results and interpretations. The test on firm performance reveals one unexpected result, which is the effect of tenure on firm performance. There is a positive effect, while a negative effect was expected. Moreover, the test on share repurchases find no significant relation for the test on inside Directors.

There are indications that the results found in Chapter 4.1 are not robust. Therefore, more tests will be performed to control the robustness of the results obtained in Chapter 4.1

4.2.1 Tests with dividend champions

A special file exists on the internet with the, so-called dividend champions. These champions are companies, which have been paying high dividends for more than 25 years. An online database is presented by Fish. According to this database, 49 firms in this dataset are dividend champions. When regressions are performed with dividend champions, no significant results are expected. These companies are paying high dividends, irrespective of the characteristics of the board. As can be seen in Appendix H, this is the case. The board characteristics are no longer significant.

4.2.2 Tests with and without manufacturing companies

As stated before, a large part of the dataset consists of manufacturing firms and this could lead to a sample bias (Verbeek, 2008). Therefore, tests without manufacturing firms are performed to see if the results are robust. The results of these tests can be found in Appendix G.

Directorsinsidepct, which indicates the percentage of Directors' ownership, is not significant when the manufacturing firms are not taken into account. When looking at the tests with only manufacturing firms, the percentage of women and the percentage of inside Directors is not significant. There are clear differences between manufacturing and non-manufacturing firms. These results are not as expected and, moreover, there are no signs in the literature that could explain these deviations.

A possible explanation could be that manufacturing firms pay a different amount of dividend compared to non-manufacturing firms. As can be seen from the graph below, the difference in the amount of dividend payment is small. A t-test also proves that there are no significant differences between the manufacturing and non-manufacturing firms.

Figure 1

Difference between manufacturing and non-manufacturing firms

In this graph, the difference between the means of the variable averagedividend is presented for manufacturing firms and non-manufacturing firms. Averagedividend is calculated as a five year average of dividend, divided by net income. The left bar (0) presents the non-manufacturing firms and the right bar (1) presents the manufacturing firms.
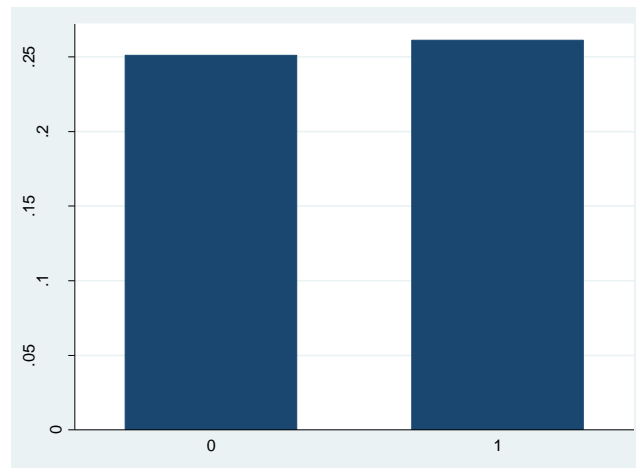
To test possible differences between the independent variables, t- tests are performed, which are presented in appendix I. A T-statistic above 1.96 indicates a significant difference between manufacturing and non- manufacturing firms. As can be seen, four variables are different, bookmarketratio, ROA, debt and directorsinsidepct. This could implicate that there are differences between industries. Therefore, tests with industry fixed effects can be found in Appendix J. All results in the industry fixed effects test are in line with expectations, except the percentage of women and insiders ownership. No significant results are found for these two variables.

4.2.3 Conclusion

Several tests have been performed in this paragraph. Tests on firm performance, share repurchases and dummy variable have confirmed the results found in chapter 4.1. However, tests with industry fixed effects showed that the percentage of women and insiders 'ownership are not significant. The implication is that the results found in chapter 4.1 are not robust.

4.3 Test with firm fixed effects

"It takes time to connect the dots, I know that. But I also know that there can be a day of reckoning when you wish you had connected the dots more quickly."

(By Al Gore, Nobel Peace prize winner)

In chapter three, it was indicated that there might be unobserved characteristics that could explain the determinants of dividend. To test this, tests with fixed effects will be performed. Before that, it is possible to check whether tests with random effects or with fixed effects are preferred in Stata. This is done via a Hausman test. These results indicate that all tests should be performed with fixed effects as was anticipated.

Table 7

Regressions results with firm fixed effects

This table presents the fixed effect tests on dividend policy. The dependent variable is a five year average of the amount of dividend paid, divided by net income. The independent variables are Bookmarketratio (market capitalization of equity added with book value of assets minus book value of equity, divided by book value of total assets), which indicates the future growth of the company. Cash is calculated as a five year average divided by total assets and is taken into account because it indicates agency cost. ROA is the return on assets and is used as a proxy for the signaling theory. Dinstitutional is a dummy that equals one if there is an institutional majority. Debt is calculated as the five year average of debt and it indicates agency cost. Logtotal is a variable indicating the natural logarithm of the number of Directors on the board. Insiderspctg is a variable that indicates the percentage of inside Directors on the board. Directorswomenpct and women2 are looking at a non-linear relation of the percentage of women on the board. Directorsinsidepct and dir2 measure a non-linear relation of the percentage of shares owned by Directors. Finally, directorsover10yrstenurepct measures the percentage of Directors with more than ten years tenure.

VARIABLES	(1) averagedividend	(2) averagedividend	(3) averagedividend	(4) averagedividend	(5) averagedividend	(6) averagedividend
Bookmarketratio	-0.0481**	-0.0476**	-0.0515**	-0.0500**	-0.0487**	-0.0526**
	(0.0205)	(0.0202)	(0.0205)	(0.0206)	(0.0206)	(0.0207)
cash	-1.74e-06	-1.90e-06	-2.08e-06	-2.02e-06	-2.00e-06	-1.70e-06
	(3.13e-06)	(3.09e-06)	(3.13e-06)	(3.13e-06)	(3.14e-06)	(3.13e-06)
ROA	-0.00936	-0.0183	-0.0145	-0.0139	-0.0167	-0.00751
	(0.0549)	(0.0523)	(0.0548)	(0.0550)	(0.0550)	(0.0550)
dinstitutional	-0.00926	-0.00869	-0.00857	-0.00955	-0.0101	-0.00796
	(0.00958)	(0.00938)	(0.00960)	(0.00961)	(0.00960)	(0.00965)
Logmarketvalue	0.00229	0.00358	0.00185	0.00185	0.00266	0.000860
	(0.00764)	(0.00750)	(0.00765)	(0.00770)	(0.00768)	(0.00775)
debt	-1.40e-08	1.51e-07	2.82e-07	1.32e-07	1.53e-07	3.99e-08
	(1.20e-06)	(1.18e-06)	(1.19e-06)	(1.20e-06)	(1.20e-06)	(1.20e-06)
logtotal	0.0649**					0.0608*
	(0.0317)					(0.0327)
insiderspctg		0.133				0.115
		(0.0941)				(0.0959)
directorswomenpct			0.327*			-0.0395
			(0.182)			(0.0817)
women2			-1.137**			
			(0.470)			
directorsinsidepct				-0.232		-0.214
				(0.239)		(0.240)
dir2				0.308		0.306
				(0.617)		(0.623)
directorsover10yrstenurepct					0.0201	0.0278
					(0.0301)	(0.0305)
Constant	0.0999	0.220*	0.243*	0.283**	0.239*	0.145
	(0.143)	(0.125)	(0.126)	(0.130)	(0.127)	(0.149)
Observations	1,280	1,305	1,280	1,280	1,280	1,280
R-squared	0.016	0.013	0.019	0.014	0.012	0.022
Number of firms	432	432	432	432	432	432
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes

Standard errors in parentheses

The R-square is close to zero; 1% to 2% of the variation is explained by the independent variables. Because unobserved variables are taken into account via the error term, this low R-square indicates that the independent variables are responsible for a small part of the variation in dividend. This implicates that there are many unobserved factors that influence the amount of dividend paid. Moreover, the robustness tests in Chapter 4.2 strengthen this finding. The explanatory power of the tests is therefore low.

All control variables are insignificant, except for Bookmarketratio. This variable has a negative and significant coefficient. This is in line with the results found in Chapter 4.1. Bookmarketratio is a proxy for future growth and indicates that when the company is expected to expand for the coming years, less dividend will be paid. The other control variables, which were significant in Chapter 4.1 have lost their statistical power.

The coefficient of logtotal is positive and significant. Therefore, the results found in Chapter 4.1 are robust. When the size of board gets larger, it will be easier for the CEO to control the board. As a result, the amount of dividend paid has to increase in order to reduce agency costs.

The variables directorswomenpct and women2 are significant at a 10% level and there is an inverted U-shaped relation. In Chapter 4.1, the turning point lies at 29%; however, in this test, the results lies lower at 14%. Apart from the board size and the percentage of women, the board characteristics are not significant.

4.4 Conclusion

In this chapter, several statistical methods are used to test the effect of board characteristics on dividend policy. The results in the cross-sectional test are all in line with expectations and are significant; the model seems useful. However, after performing robustness tests and fixed-effects tests, the results are not significant. Below, the results of all tests can be found.

Table 8
Summary of tests

Characteristic	Cross-sectional test	Robustness tests	Firm fixed effects test
H1:Board size	Significant	Significant	Significant
H2: Inside Directors	Significant	Not significant	Not significant
H3: Gender	Significant	Not significant	Significant
H4: Directors' ownership	Significant	Not significant	Not significant
H5: Tenure	Significant	Significant	Not significant

As can be seen, one variable is significant and robust for all tests, which is board size. All other characteristics are not significant or robust. The relation between board size and dividend is, as expected, positive. A larger board will be easier for the CEO to control and this has to be compensated by paying more dividend.

The number of inside Directors and Directors' ownership are significant when performing the cross-sectional test. However, these results are not robust, since both fail on the robustness tests and on the firm-fixed effect test. The percentage of women is significant for the cross-sectional test and for the firm fixed effects test; however, it fails the robustness test. Therefore, it is not possible to make assumptions about the effect on dividend. Finally, tenure is significant in the cross-sectional test and in the robustness tests; however, it is not significant in the firm fixed effects test.

Chapter 5: Conclusion, further research and limitations

5.1 Conclusion

This thesis provides empirical explanations for the effect of board characteristics on dividend policy for S&P 500 firms for the years 2008-2011. This study contributes to current research, since earlier research focuses mainly on the effect of board characteristics on firm performance rather than on dividend.

The board and paying dividend are substitutes to lower agency cost. If the board performs well, less dividend has to be paid and vice versa. Therefore, I test the effect on board performance by looking at the effect of different board characteristics on dividend policy. The characteristics of interest are: the board size, the percentage of inside Directors, the percentage of women, Directors' ownership and Directors' tenure.

The results of the cross-sectional tests are significant and in line with expectations. However, after robustness tests and firm fixed effects tests, only board size is robust and significant. Therefore, the hypotheses, regarding the percentage of inside Directors, the percentage of women, insiders' ownership and director tenure are rejected.

Except for hypothesis one, the tests fail to find robust and significant results. Moreover, the R-squares are small and the explanatory power of the tests is low. Firm fixed effects take unobserved factors into account. The low statistical power indicates that there are unobserved effects that are responsible for the dividend policy.

Hypothesis one is not rejected. Cross-sectional tests, as well as firm fixed effects tests, prove a positive and significant relation between the board size and dividend payments. This implies that agency cost increase when the board gets larger as the CEO will find it is easier to control the board. When the board size increases, several problems are likely to occur. There will be free-riders problems, the cohesiveness of the group will decrease and communication problems will arise. Consequently, the performance of the board goes down.

5.2 Further research and limitations

The explanatory power of the tests is low, therefore, in future research, different methods have to be used. As stated by Finkelstein and Mooney (2003), the best way to understand how the board will perform optimally, is to look at the processes rather than the characteristics. This can be done by performing interviews with board members. When these interviews are performed, one could truly understand methods to make the board to perform optimally.

Next to that, a Generalized Method of Moments (GMM) could be used to test the relations. This kind of research has been performed by, for instance, Crespi and Renneboog (2010). In this thesis, it was not possible to use a GMM, because lagged variables (by two periods) are needed, which is not possible with this dataset.

A limitation in this study is the available data. Because of data constraints in Corporate Library, it was not possible to get a dataset containing data from prior to 2008. Therefore, only four firm years are taken into account. Moreover, the years that are covered by Corporate Library are during the financial crisis and this could bias the results. Next to that, only the S&P 500 firms are used and therefore, a larger dataset with more companies could increase the statistical power. Besides, there are no family owned firms in the S&P 500, therefore the maximum amount of shares owned by the board was only 44%. Adding family firms would solve this problem. These factors could be taken into account in further research. Secondly, the number of variables is limited. Other variables could be taken into account, for instance the number of board meeting, the legal system, two-tier boards and CEO duality.

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Appendix A: extensive theory

Board size

In Chapter 2.2, I found that a larger board will lead to problems. The first problem is the free-riders problem. According to Daves (1980), interacting in a group is a social dilemma in which one has to choose between personal and public gains. If the group is getting larger, other people will have the opportunity to contribute to the public gain and this is seen as a substitute for their own contribution. Since their own contribution is no longer important, free riding will be the consequence. (Eckel, Grosman and Johnston, 2005)

A second problem is the decreasing cohesiveness of larger groups. *" Cohesiveness is a dynamic process which is reflected in the tendency for a group to stick together and remain united in the pursuit of its goals and objectives" (Carron, 1982, p. 124).* There is a positive relation between cohesion and performance of a group (Casey-Campbell & Martens, 2009; Mullen & Coppen, 1995; Judge & Zeithaml, 1992).

Inside Directors

In Chapter 2.3, I stated that inside Directors might lead to a distortion in the group process. In the psychology, a lot of research has been performed, which looks at the effect of expertise in groups. According to Stasser, Taylor and Hanna (1989), if only one person knows information, there is a bigger chance that he or she will not share it. In group decision processes, factions exist between groups with different opinions and these factions will defend their position. Information that supports the opinion of the largest group will have the preference. (Schulz-Hardt, Frey, Lutghgens & Moscovi, 2000). The implication is that if there are more inside Directors, information is better known and therefore will not be kept private. This will contribute to the decision process and thus to the monitoring.

Gender

In Chapter 2.4, I expected an inverted U-shape between the percentage of women on the board and the amount of dividend. The reason for this lies in a theory proposed by Kanter (1977), who states that there are four kind of groups when dealing with diversity. The first kind of groups are universal groups, which consist, in this case, only of men. The second kind of groups are skewed groups, which are groups with one dominant type, that is, men. The third are tilted groups, which are groups which are less skewed and balanced . The two groups of interest when looking at the board are the skewed and tilted groups.

Having a skewed group will lead to a less performing board. According to Kanter (1977), there are three possible ways interaction can arise. First is that the differences will be visible. The second possibility is one of polarization while the last one is assimilation. Consequently, women will behave differently; they will either behave the same as men or they will hide behind stereotypes. If the percentage of women on the board is rising there will be a tilted group. According to Joecks, Pull and Vetter (2012), this is the case if there is a percentage of women between 20% to 40%. When this is the case, women will be differentiated and therefore their views and opinions will be taken into account. The consequence is that the board will be better performing.

Appendix B: Correlation matrix

	dividend	bookmarketratio	cash	ROA	institutitional	marketvalue	debt	assets	logtotal	insiderspctg	directorswomenpct	directorsinsidepct	directorsover10yrspct
dividend	1												
bookmarketratio	-0.0469	1											
cash	0.0571	-0.0532	1										
ROA	0.0343	-0.3679	0.0476	1									
institutitional	0.1644	0.0340	0.0374	-0.0249	1								
marketvalue	0.2433	-0.2657	0.2937	0.2772	0.2171	1							
debt	0.1666	0.0589	0.5759	-0.0936	0.0533	0.2697	1						
assett	0.1991	0.0589	0.5724	-0.0385	0.0974	0.4843	0.8987	1					
logtotal	0.3511	0.0449	0.1335	-0.0698	0.1794	0.3211	0.2596	0.3229	1				
insiderspctg	-0.1192	0.0391	-0.0032	0.0228	-0.0474	-0.1240	-0.0443	-0.0581	0.0195	1			
directorswomenpct	0.1819	-0.0872	0.0650	-0.0019	0.0778	0.1521	0.1040	0.1309	0.2593	-0.0106	1		
directorsinsidepct	-0.1608	-0.0494	-0.0553	0.0922	-0.0806	-0.1649	-0.1201	-0.1565	-0.2315	0.3521	-0.1879	1	
directorsover10yrspct	0.0639	-0.0043	0.0131	0.1148	0.0136	-0.0363	-0.0167	-0.0301	-0.0628	0.0547	-0.0937	0.1638	1

Appendix C: Descriptive statistics

Figure 2
Distributions of board characteristics
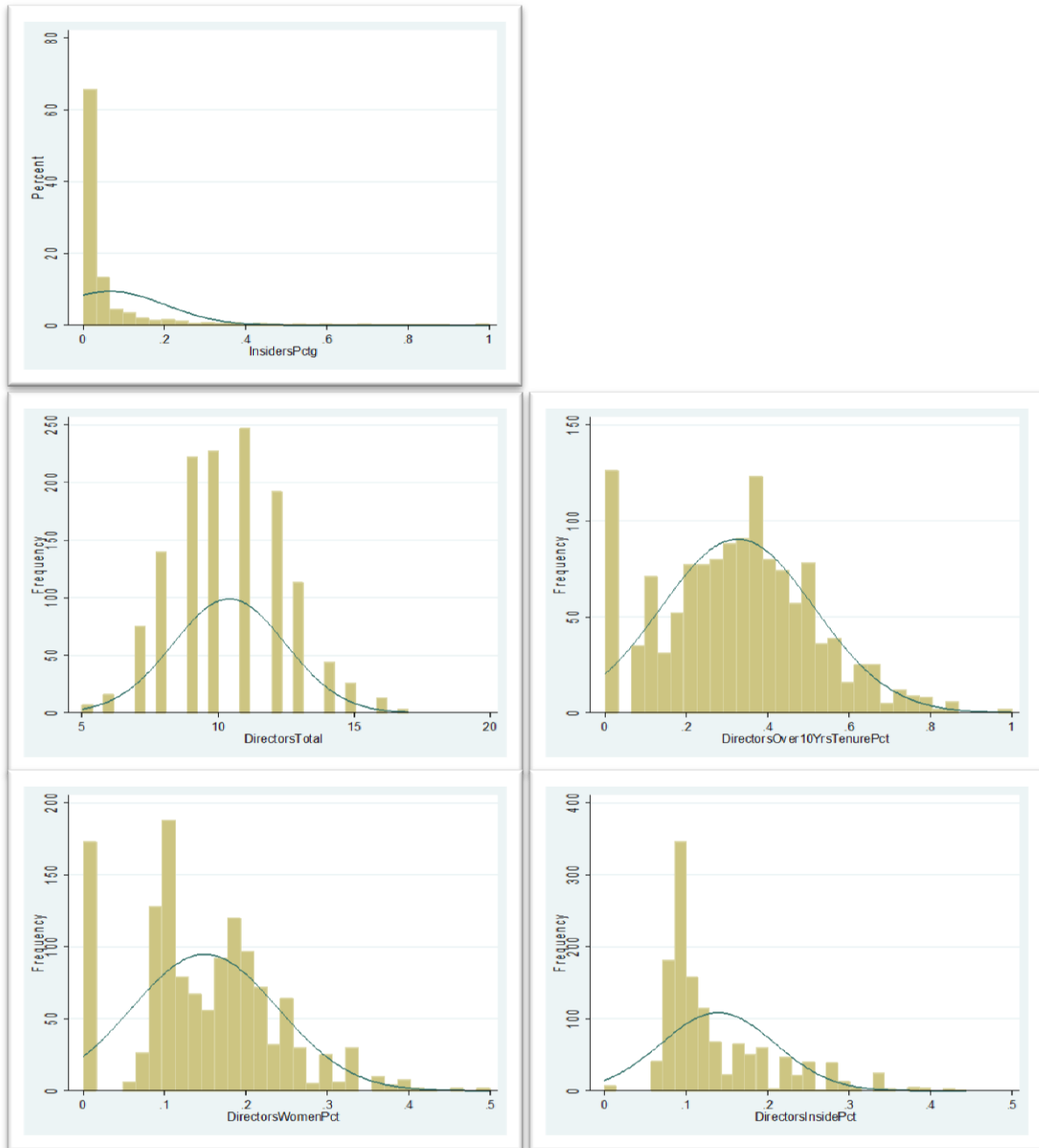
Appendix D: Critical entrenchment levels

Figure 3

Critical entrenchment level directorswomenpct

This graph illustrates the effect of women on the amount of dividend paid. As can be seen it is an inverted U-shaped relation. The turning point lies at 29%
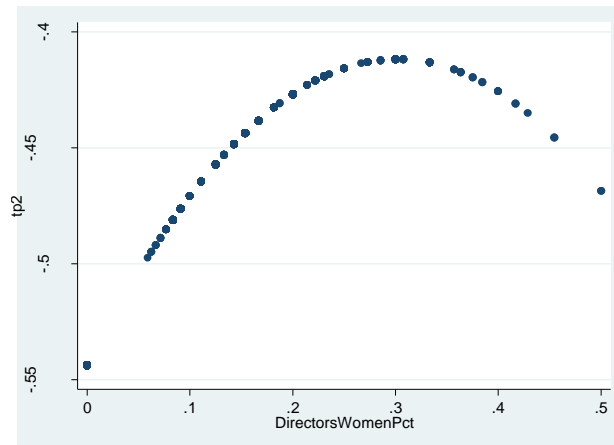
Figure 4

Critical entrenchment level directorsinsidepct

This graph illustrates the effect of Directors 'ownership on the amount of dividend paid. As can be seen it is a U-shaped relation. The turning point lies at 28%
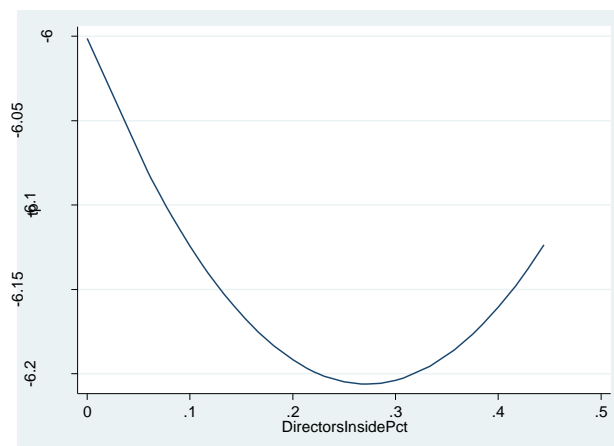
Appendix E: Check for multicollinearity and heteroskedasticity

Table 9
Check for multicollinearity

Variable	VIF	1/VIF
dltt	1.63	0.614125
cash	1.56	0.639294
Logmarketv~e	1.50	0.666383
logtotal	1.32	0.756334
directorsi~t	1.29	0.772476
ROA	1.29	0.777021
Bookmarket~o	1.24	0.807575
insiderspctg	1.18	0.850686
directorsw~t	1.13	0.887271
dinstituti~l	1.09	0.921264
d~0yrstenu~t	1.05	0.953126
Mean VIF	1.30	

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
Ho: Constant variance
Variables: fitted values of averagedividend

$\text{chi2}(1) = 2.51$
$\text{Prob} > \text{chi2} = 0.1131$

Appendix F: Interaction term

Table 10

Regressions results for cross-sectional test with interaction term

This table presents a cross-sectional tests on dividend policy and the interaction effect between inside Directors and the tenure of Directors. The dependent variable is a five year average of the amount of dividend paid divided by total assets. The independent variables are Bookmarketratio (market capitalization of equity added with book value of assets minus book value of equity, divided by book value of total assets), which indicates the future growth of the company. cash is calculated as a five year average divided by total assets and is taken into account because it indicates agency cost. ROA is the return on assets and is used as a proxy for the signaling theory. Dinstitutional is a dummy that equals one if there is an institutional majority. Debt is calculated as the five year average of debt and it indicates agency cost.. Insiderspctg is a variable that indicates the percentage of inside Directors on the board. Directorsover10yrstenurepct is the percentage of Directors with more than 10 years tenure. Interaction is a variable where insiderspctg is multiplied with directorsover10yrstenurepct, to indicate the possible interaction between insidedirectors and tenure

VARIABLES	(1) averagedividend
Bookmarketratio	-0.0113
	(0.0252)
cash	-2.00e-05***
	(6.61e-06)
ROA	-0.0320
	(0.109)
dinstitutional	0.0777***
	(0.0192)
Logmarketvalue	0.0432***
	(0.00688)
debt	2.11e-06***
	(4.35e-07)
insiderspctg	-0.192*
	(0.104)
directorsover10yrstenurepct	0.103**
	(0.0427)
interaction	0.0921
	(0.302)
Constant	-0.527***
	(0.110)
Observations	1,280
R-squared	0.103
Number of gvkey	
Standard errors in parentheses	
*** p<0.01, ** p<0.05, * p<0.1	

Appendix G: Test with and without manufacturing

Tests performed without manufacturing companies

Table 11

Regressions results for cross-sectional test

This table presents the cross-sectional tests on dividend policy with non-manufacturing firms. The dependent variable is a five year average of the amount of dividend paid divided by total assets. The independent variables are Bookmarketratio (market capitalization of equity added with book value of assets minus book value of equity, divided by book value of total assets), which indicates the future growth of the company. cash is calculated as a five year average divided by total assets and is taken into account because it indicates agency cost. ROA is the return on assets and is used as a proxy for the signaling theory. Dinstitutional is a dummy that equals one if there is an institutional majority. Debt is calculated as the five year average of debt and it indicates agency cost. Logtotal is a variable indicating the natural logarithm of the number of Directors on the board. Insiderspctg is a variable that indicates the percentage of inside Directors on the board. Directorswomenpct and women2 are looking at a non-linear relation of the percentage of women on the board. directorsinsidepct and dir2 measure a non-linear relation of the percentage of shares owned by Directors. Finally, directorsover10yrstenurepct measures the percentage of Directors with more than ten years tenure

VARIABLES	(1) averagedividend	(2) averagedividend	(3) averagedividend	(4) averagedividend	(5) averagedividend	(6) averagedividend
Bookmarketratio	0.0195	0.0628*	0.0689*	0.0350	0.0447	0.0367
	(0.0353)	(0.0344)	(0.0361)	(0.0363)	(0.0346)	(0.0341)
cash	-2.75e-05***	-2.98e-05***	-3.49e-05***	-3.07e-05***	-3.35e-05***	-2.73e-05***
	(8.91e-06)	(7.50e-06)	(9.08e-06)	(9.15e-06)	(8.40e-06)	(7.86e-06)
ROA	0.0557	0.0851	-0.00852	0.0800	-0.105	0.0523
	(0.182)	(0.172)	(0.185)	(0.188)	(0.178)	(0.173)
dinstitutional	0.0696***	0.0988***	0.0939***	0.0995***	0.0893***	0.0683***
	(0.0260)	(0.0251)	(0.0263)	(0.0266)	(0.0253)	(0.0253)
Logmarketvalue	0.0180*	0.0363***	0.0336***	0.0309***	0.0415***	0.0203**
	(0.0104)	(0.00931)	(0.0103)	(0.0105)	(0.00962)	(0.00980)
dltt	1.82e-06***	2.25e-06***	2.40e-06***	2.22e-06***	2.39e-06***	1.70e-06***
	(5.13e-07)	(3.65e-07)	(5.19e-07)	(5.23e-07)	(4.06e-07)	(3.78e-07)
logtotal	0.370***					0.323***
	(0.0506)					(0.0531)
insiderspctg		-0.300***				-0.235***
		(0.0484)				(0.0531)
directorswomenpct			1.613***			1.017***
			(0.315)			(0.319)
women2			-4.105***			-2.816***
			(0.941)			(0.848)
directorsinsidepct				-0.751		-0.0763
				(0.635)		(0.608)
dir2				0.394		-0.315
				(1.561)		(1.383)
directorsover10yrstenurepct					0.115**	0.171***
					(0.0561)	(0.0526)
Constant	-0.978***	-0.442***	-0.530***	-0.263	-0.555***	-0.997***
	(0.175)	(0.146)	(0.165)	(0.182)	(0.151)	(0.169)
Observations	643	655	643	643	643	643
R-squared	0.168	0.123	0.135	0.122	0.104	0.218

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Tests performed with manufacturing firms

Table 12

Regressions results for cross-sectional test

This table presents the cross-sectional tests on dividend policy with only manufacturing firms. The dependent variable is a five year average of the amount of dividend paid divided by total assets. The independent variables are Bookmarketratio (market capitalization of equity added with book value of assets minus book value of equity, divided by book value of total assets), which indicates the future growth of the company. cash is calculated as a five year average divided by total assets and is taken into account because it indicates agency cost. ROA is the return on assets and is used as a proxy for the signaling theory. Dinstitutional is a dummy that equals one if there is an institutional majority. Debt is calculated as the five year average of debt and it indicates agency cost. Logtotal is a variable indicating the natural logarithm of the number of Directors on the board. Insiderspctg is a variable that indicates the percentage of inside Directors on the board. Directorswomenpct and women2 are looking at a non-linear relation of the percentage of women on the board. directorsinsidepct and dir2 measure a non-linear relation of the percentage of shares owned by Directors. Finally, directorsover10yrstenurepct measures the percentage of Directors with more than ten years tenure

VARIABLES	(1) averagedividend	(2) averagedividend	(3) averagedividend	(4) averagedividend	(5) averagedividend	(6) averagedividend
Bookmarketratio	-0.0908**	-0.0876**	-0.0694*	-0.0822**	-0.0843**	-0.0843**
	(0.0354)	(0.0380)	(0.0358)	(0.0360)	(0.0383)	(0.0370)
cash	-3.00e-06	-3.81e-06	-3.31e-06	-3.99e-06	-3.66e-06	-2.45e-06
	(9.34e-06)	(8.87e-06)	(9.47e-06)	(9.51e-06)	(8.77e-06)	(7.85e-06)
ROA	0.208	0.117	0.138	0.135	0.102	0.200*
	(0.131)	(0.120)	(0.132)	(0.133)	(0.123)	(0.115)
dinstitutional	0.0489*	0.0743***	0.0546**	0.0640**	0.0685***	0.0447*
	(0.0269)	(0.0258)	(0.0273)	(0.0274)	(0.0255)	(0.0251)
Logmarketvalue	0.0176*	0.0284**	0.0263***	0.0274***	0.0290**	0.0123
	(0.00989)	(0.0122)	(0.00981)	(0.00992)	(0.0125)	(0.0103)
dltt	6.07e-06***	8.16e-06**	7.59e-06***	7.52e-06***	8.09e-06**	5.58e-06**
	(1.85e-06)	(3.18e-06)	(1.83e-06)	(1.86e-06)	(3.18e-06)	(2.34e-06)
logtotal	0.287***					0.267***
	(0.0515)					(0.0591)
insiderspctg		0.0277				-0.131*
		(0.0663)				(0.0703)
directorswomenpct			0.476*			0.163
			(0.275)			(0.252)
women2			-0.0909			0.506
			(0.722)			(0.614)
directorsinsidepct				-1.678***		-1.398***
				(0.578)		(0.515)
dir2				4.204***		3.887***
				(1.507)		(1.366)
directorsover10yrstenurepct					0.0882	0.109*
					(0.0564)	(0.0601)
Constant	-0.726***	-0.257	-0.281*	-0.0997	-0.288	-0.559***
	(0.171)	(0.187)	(0.151)	(0.164)	(0.191)	(0.191)
Observations	639	652	639	639	639	639
R-squared	0.166	0.125	0.149	0.136	0.129	0.195

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Appendix H: Test with dividend champions

Table 13

Regressions results for cross-sectional test

This table presents the cross-sectional tests on dividend policy without dividend champions. The dependent variable is a five year average of the amount of dividend paid divided by total assets. The independent variables are Bookmarketratio (market capitalization of equity added with book value of assets minus book value of equity, divided by book value of total assets), which indicates the future growth of the company. cash is calculated as a five year average divided by total assets and is taken into account because it indicates agency cost. ROA is the return on assets and is used as a proxy for the signaling theory. Dinstitutional is a dummy that equals one if there is an institutional majority. Debt is calculated as the five year average of debt and it indicates agency cost. Logtotal is a variable indicating the natural logarithm of the number of Directors on the board. Insiderspctg is a variable that indicates the percentage of inside Directors on the board. Directorswomenpct and women2 are looking at a non-linear relation of the percentage of women on the board. directorsinsidepct and dir2 measure a non-linear relation of the percentage of shares owned by Directors. Finally, directorsover10yrstenurepct measures the percentage of Directors with more than ten years tenure

VARIABLES	(1) averagedividend	(2) averagedividend	(3) averagedividend	(4) averagedividend	(5) averagedividend	(6) averagedividend
Bookmarketratio	-0.00162	0.0182	0.0250	0.00725	0.0140	-0.00201
	(0.0253)	(0.0258)	(0.0260)	(0.0260)	(0.0260)	(0.0252)
cash	-1.30e-05	-1.55e-05*	-1.81e-05**	-1.68e-05**	-1.78e-05**	-1.41e-05*
	(7.95e-06)	(8.18e-06)	(8.15e-06)	(8.16e-06)	(8.20e-06)	(7.91e-06)
ROA	0.0568	-0.0405	-0.0341	-0.0178	-0.106	0.0515
	(0.108)	(0.109)	(0.110)	(0.111)	(0.111)	(0.108)
dinstitutional	0.0381*	0.0652***	0.0551***	0.0568***	0.0593***	0.0337*
	(0.0196)	(0.0198)	(0.0200)	(0.0200)	(0.0201)	(0.0194)
Logmarketvalue	0.0263***	0.0401***	0.0406***	0.0380***	0.0449***	0.0230***
	(0.00766)	(0.00761)	(0.00765)	(0.00772)	(0.00767)	(0.00766)
dltt	1.45e-06***	1.97e-06***	1.97e-06***	1.86e-06***	2.04e-06***	1.35e-06***
	(4.76e-07)	(4.85e-07)	(4.84e-07)	(4.85e-07)	(4.87e-07)	(4.72e-07)
logtotal	0.338***					0.319***
	(0.0379)					(0.0408)
insiderspctg		-0.141***				-0.171***
		(0.0529)				(0.0555)
directorswomenpct			0.646***			0.103
			(0.216)			(0.223)
women2			-0.918			0.245
			(0.618)			(0.619)
directorsinsidepct				-1.504***		-0.940**
				(0.450)		(0.442)
dir2				2.870**		2.101*
				(1.125)		(1.110)
directorsover10yrstenurepct					0.0986**	0.141***
					(0.0389)	(0.0378)
Constant	-1.010***	-0.466***	-0.548***	-0.291**	-0.574***	-0.885***
	(0.129)	(0.121)	(0.120)	(0.132)	(0.122)	(0.145)
Observations	1,129	1,153	1,129	1,129	1,129	1,129
R-squared	0.135	0.079	0.090	0.090	0.079	0.160
Firm FE				Yes		

Standard errors in

parentheses

Table 14
Regressions results for cross-sectional test

This table presents the cross-sectional tests on dividend policy. The dependent variable is a five year average of the amount of dividend paid divided by total assets. The independent variables are Bookmarketratio (market capitalization of equity added with book value of assets minus book value of equity, divided by book value of total assets), which indicates the future growth of the company. cash is calculated as a five year average divided by total assets and is taken into account because it indicates agency cost. ROA is the return on assets and is used as a proxy for the signaling theory. Dinstitutional is a dummy that equals one if there is an institutional majority. Debt is calculated as the five year average of debt and it indicates agency cost. Logtotal is a variable indicating the natural logarithm of the number of Directors on the board. Insiderspctg is a variable that indicates the percentage of inside Directors on the board. Directorswomenpct and women2 are looking at a non-linear relation of the percentage of women on the board. directorsinsidepct and dir2 measure a non-linear relation of the percentage of shares owned by Directors. Finally, directorsover10yrstenurepct measures the percentage of Directors with more than ten years tenure

VARIABLES	(1) averagedividend	(2) averagedividend	(3) averagedividend	(4) averagedividend	(5) averagedividend	(6) averagedividend
Bookmarketratio	-0.428***	-0.430***	-0.396***	-0.431***	-0.427***	-0.413***
	(0.0878)	(0.0874)	(0.0863)	(0.0896)	(0.0876)	(0.0880)
cash	-1.27e-05	-1.02e-05	-1.34e-05	-1.28e-05	-1.19e-05	-9.26e-06
	(9.34e-06)	(9.58e-06)	(9.07e-06)	(9.34e-06)	(9.36e-06)	(9.47e-06)
ROA	-0.968**	-0.947**	-0.953**	-1.020**	-0.997**	-1.094**
	(0.432)	(0.429)	(0.418)	(0.440)	(0.431)	(0.436)
dinstitutional	0.180***	0.163***	0.191***	0.185***	0.177***	0.170***
	(0.0516)	(0.0541)	(0.0501)	(0.0520)	(0.0515)	(0.0538)
Logmarketvalue	-0.0141	-0.0205	-0.0136	-0.0104	-0.0134	-0.0163
	(0.0160)	(0.0164)	(0.0150)	(0.0159)	(0.0155)	(0.0175)
dltt	6.17e-06***	7.01e-06***	6.63e-06***	5.92e-06***	6.21e-06***	7.95e-06***
	(2.17e-06)	(2.32e-06)	(2.16e-06)	(2.17e-06)	(2.17e-06)	(2.40e-06)
logtotal	-0.00888					0.0213
	(0.0902)					(0.0909)
insiderspctg		-0.176				-0.295
		(0.188)				(0.196)
directorswomenpct			2.109***			2.353***
			(0.678)			(0.696)
women2			-4.841***			-5.443***
			(1.544)			(1.587)
directorsinsidepct				-0.835		0.507
				(1.698)		(1.712)
dir2				3.631		-0.401
				(5.421)		(5.430)
directorsover10yrstenurepct					0.0712	0.128
					(0.0934)	(0.0950)
Constant	0.743**	0.845***	0.495**	0.702**	0.693***	0.412
	(0.289)	(0.267)	(0.248)	(0.280)	(0.246)	(0.344)
Observations	151	152	151	151	151	151
R-squared	0.274	0.277	0.321	0.282	0.277	0.347
dividend champion	Yes	Yes	Yes	Yes	Yes	Yes

Standard errors in parentheses

Appendix I: T-tests

Table 15

T-tests between manufacturing and non-manufacturing firms

This table presents t-tests performed between manufacturing and non-manufacturing firms. When the T-statistic is higher than 2 or lower than two, there are significant differences between the averages of manufacturing and non-manufacturing firms.

Variable	T-statistic
Bookmarketratio	4,2425
cash	-0.2650
ROA	-2.7654
institutional	-1.8461
logmarketvalue	0.3963
debt	3.4098
insiderspctg	1.3440
directorswomenpct	0.0044
directorsinsidepct	2.7213
Directorsover10yrstenurepct	-0.3310

Appendix J: Industry fixed effects

Table 16

Regression on dividend with industry fixed effects

This table presents the industry-fixed effects tests on dividend policy. The dependent variable is a five year average of the amount of dividend paid divided by total assets. The independent variables are Bookmarketratio (market capitalization of equity added with book value of assets minus book value of equity, divided by book value of total assets), which indicates the future growth of the company. cash is calculated as a five year average divided by total assets and is taken into account because it indicates agency cost. ROA is the return on assets and is used as a proxy for the signaling theory. Dinstitutional is a dummy that equals one if there is an institutional majority. Debt is calculated as the five year average of debt and it indicates agency cost. Logtotal is a variable indicating the natural logarithm of the number of Directors on the board. Insiderspctg is a variable that indicates the percentage of inside Directors on the board. Directorswomenpct and women2 are looking at a non-linear relation of the percentage of women on the board. directorsinsidepct and dir2 measure a non-linear relation of the percentage of shares owned by Directors. Finally, directorsover10yrstenurepct measures the percentage of Directors with more than ten years tenure

VARIABLES	(1) averagedividend	(2) averagedividend	(3) averagedividend	(4) averagedividend	(5) averagedividend	(6) averagedividend
Bookmarketratio	-0.0588**	-0.0447*	-0.0488**	-0.0519**	-0.0480**	-0.0535**
	(0.0230)	(0.0230)	(0.0232)	(0.0232)	(0.0231)	(0.0230)
cash	-3.27e-06	-3.37e-06	-4.09e-06	-3.95e-06	-3.45e-06	-2.12e-06
	(5.06e-06)	(5.10e-06)	(5.13e-06)	(5.13e-06)	(5.12e-06)	(5.05e-06)
ROA	0.251***	0.210**	0.203**	0.210**	0.179**	0.219**
	(0.0873)	(0.0867)	(0.0879)	(0.0880)	(0.0882)	(0.0874)
dinstitutional	-0.00159	0.0146	0.00496	0.00684	0.00559	-0.00321
	(0.0152)	(0.0150)	(0.0153)	(0.0153)	(0.0152)	(0.0152)
Logmarketvalue	0.0401***	0.0493***	0.0488***	0.0487***	0.0500***	0.0385***
	(0.00709)	(0.00682)	(0.00698)	(0.00697)	(0.00691)	(0.00709)
dltt	3.65e-06***	4.68e-06***	4.52e-06***	4.53e-06***	4.72e-06***	3.66e-06***
	(1.05e-06)	(1.04e-06)	(1.06e-06)	(1.05e-06)	(1.05e-06)	(1.05e-06)
logtotal	0.177***					0.191***
	(0.0331)					(0.0350)
insiderspctg		-0.104**				-0.111**
		(0.0486)				(0.0521)
directorswomenpct			0.269			0.0871
			(0.182)			(0.189)
women2			-0.562			-0.219
			(0.497)			(0.506)
directorsinsidepct				-0.276		-0.179
				(0.341)		(0.341)
dir2				0.337		0.365
				(0.854)		(0.865)
directorsover10yrstenurepct					0.0781**	0.117***
					(0.0326)	(0.0330)
Constant	-0.805***	-0.557***	-0.567***	-0.514***	-0.591***	-0.833***
	(0.116)	(0.107)	(0.109)	(0.114)	(0.109)	(0.125)
Observations	1,280	1,305	1,280	1,280	1,280	1,280
R-squared	0.165	0.146	0.145	0.145	0.147	0.178
Number of sic	173	173	173	173	173	173
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes

Standard errors in parentheses
*** $p<0.01$, ** $p<0.05$, * $p<0.1$

Appendix K: Robustness check

Table 17

Regressions results for robustness test

This table presents a tobit regressions on dividend policy. The dependent variable is a dummy variable which takes the value one if the company is paying dividend. The independent variables are Bookmarketratio (market capitalization of equity added with book value of assets minus book value of equity, divided by book value of total assets), which indicates the future growth of the company. cash is calculated as a five year average divided by total assets and is taken into account because it indicates agency cost. ROA is the return on assets and is used as a proxy for the signaling theory. Dinstitutional is a dummy that equals one if there is an institutional majority. Debt is calculated as the five year average of debt and it indicates agency cost. Logtotal is a variable indicating the natural logarithm of the number of Directors on the board. Insiderspctg is a variable that indicates the percentage of inside Directors on the board. Directorswomenpct and women2 are looking at a non-linear relation of the percentage of women on the board. directorsinsidepct and dir2 measure a non-linear relation of the percentage of shares owned by Directors. Finally, directorsover10yrstenurepct measures the percentage of Directors with more than ten years tenure

VARIABLES	(1) model	(2) model	(3) model	(4) model	(5) model	(6) model
Bookmarketratio	0.124***	0.157***	0.172***	0.143***	0.148***	0.138***
	(0.0426)	(0.0436)	(0.0433)	(0.0437)	(0.0438)	(0.0423)
cash	-1.39e-05	-1.82e-05	-1.81e-05	-1.80e-05	-1.98e-05*	-1.36e-05
	(1.12e-05)	(1.15e-05)	(1.13e-05)	(1.15e-05)	(1.15e-05)	(1.10e-05)
ROA	0.196	0.0341	0.0586	0.0697	-0.0477	0.198
	(0.183)	(0.186)	(0.185)	(0.188)	(0.189)	(0.182)
dinstitutional	0.0971***	0.141***	0.124***	0.131***	0.133***	0.0856***
	(0.0326)	(0.0330)	(0.0328)	(0.0332)	(0.0333)	(0.0321)
Logmarketvalue	0.0555***	0.0821***	0.0783***	0.0790***	0.0879***	0.0495***
	(0.0120)	(0.0118)	(0.0117)	(0.0120)	(0.0119)	(0.0119)
dltt	4.60e-07	1.34e-06*	1.04e-06	1.20e-06	1.36e-06*	1.88e-07
	(7.41e-07)	(7.56e-07)	(7.47e-07)	(7.56e-07)	(7.58e-07)	(7.32e-07)
logtotal	0.571***					0.500***
	(0.0625)					(0.0649)
insiderspctg		-0.179**				-0.231**
		(0.0892)				(0.0929)
directorsinsidepct				-0.636***		-1.390*
				(0.177)		(0.724)
dir2						3.187*
						(1.840)
directorswomenpct				0.893***		0.638***
				(0.135)		(0.137)
directorsover10yrstenurepct					0.114*	0.188***
					(0.0648)	(0.0627)
Constant	-1.658***	-0.790***	-0.868***	-0.650***	-0.915***	-1.416***
	(0.202)	(0.188)	(0.185)	(0.196)	(0.191)	(0.227)
Observations	1,280	1,305	1,280	1,280	1,280	1,280

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Appendix L: Share repurchases

Table 18

Regression for share repurchases

This table presents a tobit regression on share repurchases. Share repurchases are calculated by subtracting the redemption value of preferred stock from the repurchases of common stock. Dummycfo is a dummy variable which takes the value of one if there is excess of operating cash flow. Cash is a five year average of cash and cash equivalents. Bookmarketratio is the market capitalization of equity added with book value of assets minus book value of equity, divided by book value of total assets. Debt is the five year average of debt. Dinstitutional is a dummy that equals one if there is an institutional majority. Debt is calculated as the five year average of debt and it indicates agency cost. Logtotal is a variable indicating the natural logarithm of the number of Directors on the board. Insiderspctg is a variable that indicates the percentage of inside Directors on the board. Directorswomenpct and women2 are looking at a non-linear relation of the percentage of women on the board. Directorsinsidepct and dir2 measure a non-linear relation of the percentage of shares owned by Directors. Finally, directorsover10yrstenurepct measures the percentage of Directors with more than ten years tenure.

VARIABLES	Share repurchase	Share repurchase	Share repurchase	Share repurchase	Share repurchase	Share repurchase
dummycfo	-0.0389	-0.0537	-0.149	-0.0321	-0.0410	-0.146
	(0.0730)	(0.0717)	(0.101)	(0.0726)	(0.0730)	(0.0966)
cash	2.57e-05	2.35e-05	4.15e-05	2.09e-05	2.45e-05	2.58e-05
	(1.95e-05)	(1.95e-05)	(2.69e-05)	(1.95e-05)	(1.95e-05)	(2.59e-05)
dinstitutional	0.0679	0.0923*	-0.428***	0.0688	0.0930*	-0.309***
	(0.0572)	(0.0558)	(0.0780)	(0.0563)	(0.0564)	(0.0757)
Logmarketvalue	-0.0299	-0.0153	0.249***	-0.0271	-0.0205	0.305***
	(0.0194)	(0.0189)	(0.0258)	(0.0189)	(0.0189)	(0.0255)
debt	-1.13e-06	-6.36e-07	-8.76e-06***	-8.91e-07	-7.05e-07	-6.21e-06***
	(1.26e-06)	(1.25e-06)	(1.72e-06)	(1.25e-06)	(1.25e-06)	(1.67e-06)
bookmarketratio	0.0588	0.0664	-0.0793***	0.0859*	0.0638	-0.0837***
	(0.0424)	(0.0496)	(0.0213)	(0.0519)	(0.0486)	(0.0204)
logtotal	0.263**					-1.526***
	(0.107)					(0.149)
insiderspctg		0.137				0.187
		(0.145)				(0.208)
directorsinsidepct			3.045***			2.206***
			(0.405)			(0.424)
directorswomenpct				2.356***		0.373
				(0.604)		(0.316)
women2				-4.338***		
				(1.672)		
directorsover10yrstenurepct					-0.286***	
					(0.107)	
Constant	0.824**	1.163***	-2.386***	1.154***	1.352***	0.181
	(0.341)	(0.304)	(0.419)	(0.303)	(0.306)	(0.473)
Observations	1,204	1,228	1,204	1,204	1,204	1,204

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

As stated before in chapter three, dividend and share repurchases can be seen as substitutes. Therefore it is interesting to see what the effects are of the board characteristics on share repurchases. Moreover, the results should be the same as the tests performed on dividend payments.

To test this relation, the method performed by Oswald and Young (2008) will be followed. Share repurchases are retrieved from Compustat and are computed by subtracting the redemption value of preferred stock from the repurchases of common stock. In line with Oswald and Young (2008) a tobit regression will be used. The following formula will be used to perform the test.

$$excess\ CFO = \frac{CFO}{assets_{t-1}} - \frac{\left\{ \frac{CFO_{t-1}}{Assets_{t-2}} + \frac{CFO_{t+1}}{assets} \right\}}{2}$$

$$share\ repurchases = \alpha + \beta_1\ cash + \beta_2\ dinstitutional + \beta_3\ logmarketvalue + \beta_4\ debt + \beta_5\ bookmarketratio + \beta_6\ dumymcfo + \beta_7\ board\ characteristics$$

Dummycfo is a dummy variable indicating whether there is excess operating cash flow. This is calculated using the following formula:

As can be seen the results above, the most variables are in line with the results from the tests on dividend. The turningpoint of the percentage of women on the board lies at 28%, which is almost the same as the turning point for dividend (29%).

There is however one problem regarding the robustness of the tests. When looking at directorsover10yrstenurepct, it can be seen that this variable is negative instead of positive. There is no clear reason why this could be the case, except from the fact that the measure tenure could not measure the tenure of the board properly. The reason for this is that because of data constraints only a percentage of Directors with more than 10 years tenure could be measured. This is a limitation that could be taken into account for further research.

Appendix M: Firm performance

Table 19

Regression on tobin's Q

This table presents the cross-sectional OLS regressions on Tobin's Q. All regressions are performed using robust standard errors. ROA is return on assets and LagROA is the lag of the return on assets. Capx is the capital expenditure. Logtotal is a variable indicating the natural logarithm of the number of Directors on the board. Insiderspctg is a variable that indicates the percentage of inside Directors on the board. Directorswomenpct and women2 look at a non-linear relation of the percentage of women on the board. Directorsinsidepct and dir2 measure a non-linear relation of the percentage of shares owned by Directors. Finally, directorsover10yrstenurepct measures the percentage of Directors with more than ten years tenure

VARIABLES	tobinq	tobinq	tobinq	tobinq	tobinq	tobinq
ROA	6.259***	6.436***	6.276***	6.477***	6.376***	6.082***
	(0.697)	(0.719)	(0.712)	(0.731)	(0.732)	(0.691)
capx	-3.27e-05***	-4.99e-05***	-4.35e-05***	-4.95e-05***	-4.92e-05***	-2.95e-05***
	(5.26e-06)	(6.39e-06)	(6.15e-06)	(6.26e-06)	(6.36e-06)	(5.34e-06)
lagROA	2.906***	3.002***	2.983***	3.018***	2.996***	2.880***
	(0.508)	(0.515)	(0.533)	(0.538)	(0.535)	(0.505)
logtotal	-1.062***					-0.954***
	(0.133)					(0.138)
insiderspctg		0.269				0.111
		(0.178)				(0.189)
directorsinsidepct			6.079***			4.233***
			(1.559)			(1.448)
dir2			-10.50***			-7.610**
			(3.973)			(3.717)
directorswomenpct				-0.466*		0.388
				(0.247)		(0.248)
directorsover10yrstenurepct					0.353**	0.223*
					(0.141)	(0.134)
Constant	3.423***	0.944***	0.368***	1.021***	0.844***	2.638***
	(0.324)	(0.0565)	(0.126)	(0.0692)	(0.0645)	(0.354)
Observations	1,317	1,342	1,317	1,317	1,317	1,317
R-squared	0.346	0.303	0.329	0.308	0.310	0.359

Robust standard errors in parentheses

As stated before, the board has two functions. The first is to monitor and the second is to give advice. Monitoring is already tested via looking at the effect on dividend. To check for robustness, the effect on firm performance will also be tested. With this check, it can be seen if the explanations of the variables given on dividend are consistent with the findings on firm performance.

To test this, the same method as Yermack (1996) will be used by testing the characteristics on Tobin's Q and some control variables. Tobin's Q is calculated via the following formula:

$$\text{Tobin's Q} = \frac{\text{market value of equity} + \text{the market value of liabilities}}{\text{book value of equity} + \text{book value of equity}}$$

The effects will be tested separately, like the tests performed on dividend. The following formula will be used

$$Firm\ performance$$
$$= \alpha + \beta_1\ Roa + \beta_2\ lag(roa) + \beta_3\ capitalexpenditure$$
$$+ \beta_4\ board\ characteristics$$

Since the literature is not inconclusive about the effects of the different characteristics, tests will be performed on firm performance. The advantage of these extra tests is that it will become clear if the conclusions made based on the earlier regressions will be consistent with these new findings. It is expected that the direction of the coefficient is the opposite from the tests on dividend. The reason for this is that when there is a positive relation between firm performance and board characteristics, one could assume that the board is performing well. If the board is performing well, dividend payments will go down. In line with Yermack (1996) robust standard errors are used.

As can be seen there is a negative correlation between board size and firm performance, which is in line with the expectations. Having more board members will lead to a less efficient board.

The percentage of inside Directors has a positive correlation with firm performance. This is in line with the results showed before, stating that inside Directors will be better informed and are therefore more competent than outside Directors. Therefore the firm will be better performing.

The relation between director's percentage of shares and firm performance is an inverted U-shaped relation,. This inverted relation is the opposite to the effect on the amount of dividend paid. The turning point of this firm performance relation lies at 24.75%, this is slightly less than the turning point for dividend payments which lies at 28%. This is consistent with the theory that after a certain level the goals of the Directors are no longer in line with the other shareholders.

Next is the percentage of women on the board. As expected the percentage of women will have a negative effect on firm performance. However as can be seen in regression 6, if all other characteristics are taken into account, the coefficient becomes positive instead of negative.

Finally, the percentage of Directors who are on the board for more than ten years is positive. Since the coefficient of dividend is also positive, this is not what is expected.