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Abstract

This paper investigates the relation between leverage and dividend in the case of Norwegian firms. In addition, the influence of ownership and growth opportunities is investigated.

A relation between dividend and leverage is found; high leverage results in high dividend, while high dividend leads to low leverage. This can be explained in the context of the agency problem between shareholders and debtholders.

Ownership is found to have a significant effect on both dividend and leverage. The more dispersed ownership structure, the lower is the dividend payments. The results also indicate that more concentrated ownership structure leads to lower leverage.

Investigating the influence of growth opportunities on leverage, a positive relationship is found. This does not support the original expectation, but can be viewed as evidence of the pecking order theory.

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1. Introduction

In this paper we investigate the relationship between debt capacity and payout policy, in the case of Norwegian firms in the time period 2000-2008. In specific; "The ways in which debt capacity and payout policy affects private firms, most importantly how the firm's capital structure and its payout policy interacts, and whether growth opportunities and ownership influence these."

A potential contribution of this paper is to create a greater understanding of the dynamics of payout policy in relation to capital structure, in terms of Norwegian firms.

Debt capacity and payout policy have often been presented as two separate topics, but little has been done on the relation between them; hence this represents a relatively new angle of research. The relationship between capital structure and payout policy is of interest because the topic connects many important theories in the field of corporate finance, and enables tests of several hypotheses.

The data is obtained from the CCGR database. The majority of this database consists of nonlisted firms that create a unique opportunity to investigate these, which is quite rare in the existing literature. In addition, the results of this study may indicate the potential importance of ownership structure.

The main purpose of this paper is to study the relationship between leverage and dividend. In addition, the influence of two possible determinants of dividend and leverage, ownership and growth opportunities will be investigated. The paper is constructed around these topics, which will be the foundation of the 6 hypotheses investigated.

The outline of the paper is as follows: Chapter 2 reviews the most prominent literatures written within this field. Chapter 3 presents the hypotheses. Chapter 4 provides an overview of the methodology and the testable implications for the hypotheses. Chapter 5 gives a description of the data applied and the variables constructed. Chapter 6 presents the empirical results, while chapter 7 concludes.

2. Literature review

The modern corporate finance literature is based on the theorem of Modigliani and Miller (1961), which states that leverage and payout policy are irrelevant for firm value. There exists a large amount of literature on this topic which implies the opposite, and suggests that the Modigliani and Miller theorem is not a good description of reality. As a result, later work has tried to improve this theorem.[1] Nevertheless, the Modigliani and Miller theorem is the basis of later work on payout policy and capital structure, which is the foundation of this paper.

There exist several theories around capital structure and payout policy. The most prominent theories are presented below; the agency theory, the pecking order theory and the signalling theory.

2.1 Agency Theory

Some of the capital structure studies consider agency problems that arise because of asymmetric information and conflicting interests. While there are several types of agency problems, Jensen and Meckling who initiated this research, derived two of them in the paper from 1976[2]. Harris and Raviv (1991) give an overview of this research; "Jensen and Meckling argue that an optimal capital structure can be obtained by trading of the agency cost of debt against the benefit of debt."

The first type of agency problem outlined by Jensen and Meckling is the conflict between the manager and the shareholders. This principal-agent conflict arises due to the possibility of the manager to follow a personal agenda instead of maximizing firm value, which results in firm inefficiency. According to Stulz (1990), managers might choose to invest even in the absence of positive net present value, NPV, projects. This will not only affect the firm's earnings, but also affect the possibility to attract external equity financing.

[1] Hart (2001, 1080)
[2] Harris and Raviv (1991, 300)

"No investor is willing to hold outside equity when management has the ability to divert cash flows as private benefits and when managerial manipulation of cash flow is costly to verify".[3] The firm can solve this agency problem by limiting the free cash flow. An aspect of this is outlined in Jensen's free cash flow hypothesis which states that firms will prefer higher debt and thereby lower their free cash flow in the presence of agency problems.[4] This reduces the cash available for the manager, and will as a result limit the possibility for investing in non profitable investment projects and perks. In contrast Myers (1977) states that too much debt, can lead to underinvestment due to the lack of financial resources. This indicates that there exists a trade off concerning the optimal degree of leverage in the capital structure.

The second type of agency problems outlined by Jensen and Meckling is between debtholders and shareholders. An aspect of this conflict appears because of their different attitude towards risk. Shareholders might want to invest in risky projects were the profit is potentially large; this is especially the case for firms that are close to bankruptcy or that face financial distress. This is in conflict with the debtholders interests. Shareholders capture the gain earned above the face value of the debt, having in mind that the firm's liabilities must be paid first, and will therefore benefit from large profits. In the case when investments fail, the debtholders bear the consequences. As a result, the upside risk more than offsets the downside risk for the shareholders.[5] However, the shareholders reputational considerations can reduce this problem, by avoiding default investments and having a good history of repaying debt with the intention to attract potential lenders.

2.2 Pecking Order Theory

Myers and Majluf (1984) developed a pecking order theory. This theory can explain a tendency in corporate financing behaviour to rely on internal sources of funds and when external financing is necessary, debt is preferred over equity.

[3] Fluck, Zsuzsanna (1998,404)
[4] Dessi and Robertson (2003, 903)
[5] Harris and Raviv (1991, 301)

The pecking order theory relates to the capital structure of the firm and the order of financing, with the assumption of asymmetric information between the firm and its external investors. Own funds will be used first, followed by debt and then equity. The pecking order theory has in recent years been developed further, as Mjøs (2008) writes in his article. For instance, Halov and Heider (2004) developed the theory to also concern risk. "They find that firms prefer to issue equity when risk matters relatively more and debt otherwise".[6]

The pecking order theory is even more credible for private nonlisted firms since there is a greater asymmetric information problem present. For private nonlisted firms debt is the most important source of external capital. Since this is expensive, it may lead to lower dividends. In addition, debtholders might also want to prevent excessive dividend payouts and set restrictions.

The static trade-off theory is a rival theory, which was introduced by Kraus and Litzenberger (1973). This theory considers the impact of taxes on the capital structure. The benefits of tax savings by having debt need to be balanced with the higher probability of bankruptcy cost that comes from having high debt. This indicates that the optimal degree of leverage should be higher as the tax advantages of debt increases.

2.3 Signalling theory

The most known signalling models are developed by Bhattacharya (1979), Miller and Rock (1985) and John and Williams (1985).[7] In general, signalling theory implies that signalling through dividends give an indication of the firm's value, based on the assumption of asymmetric information. In signalling models the firms are fully equity financed. The models predict that a high dividend or a rise in dividend typically signals good future prospects for the firm. The idea of these models is to explain the purpose of why firms pay a larger part of their earnings as dividends, which actually is more costly, and why there are positive share price reactions to higher dividends.

[6] Mjøs, Aksel (2008, 5)
[7] Allen and Michaely (2002, 52)

Bhattacharya (1979) developed a signalling model that explains why firms in despite of tax disadvantages still choose to pay dividends. "The major signalling costs that lead dividends to function as signals arise because dividends are taxed at the ordinary income tax rate, whereas capital gains are taxed at a lower rate".[8] As Allen and Michaely (2002) explain the Miller and Rock theory: "The basic story, that firms shave investment to make dividends higher and signal high earnings, is entirely plausible".

An element to have in mind is whether or not a high dividend policy actually is a reflection of high firm value. A high dividend payout may also for instance be a result of limited growth opportunities and the firm might just function as a cash cow. According to Allen and Michaely (2002), dividends contain two separate elements of information; an increase in dividend can imply that the firms risk has decreased, but on the other hand profits might have declined.

So why are dividend payouts such a desirable characteristic? An explanation is that news about reduced risk is more important than the reduction in profitability. A risk averse investor is more concerned about the potential downside risk involved in the investment than a possible decrease in payout.

In the case of private nonlisted firms, this theory can seem less relevant because these firms do not issue equity that often. On the other hand, when ownership changes in these firms, it tends to be a large change, and the use of signalling through high dividend can be important.

[8] Bhattacharya, Sudipto (1979, 259)

3. Hypotheses

This section provides an overview of the hypotheses in this paper, in terms of definitions and theoretical expectations. The main purpose of this paper is to investigate the relationship between capital structure and payout policy, which is the focus in hypothesis 1. For the remainder of the paper two of the possible determinants of dividend and leverage, ownership and growth opportunities, will be investigated in more depth. The influence of ownership will be investigated in hypothesis 2, 3 and 4, while hypothesis 5 and 6 examines the influence of growth opportunities.

3.1 Dividend and Leverage

3.1.1 Hypothesis 1

The relationship between dividend and leverage can be viewed on the basis of many important theories in the field of corporate finance. Three main theories; the agency theory, the pecking order theory and the signalling theory will be used to examine the different aspects and expectations of the relationship from a theoretical point of view. Based on this, an overall statement regarding the expected theoretical relation between leverage and dividend will be drawn, which defines the first hypothesis.

Norwegian limited liability firms must be audited by law; nevertheless there often exists a lack of transparency. Because of this, the firm's lenders can face large informational disadvantages. These informational asymmetries combined with conflict of interests between the firm and its debtholders can give rise to agency problems. This is the most relevant agency problem in this context and will be elaborated below.

The existence of agency problems between shareholders and debtholders can be an explanation of why outside capital is considered more expensive than internal funds. These agency problems can lead to a need for more monitoring by the lenders, i.e. higher agency costs, which again leads to a presumably lower supply of debt. This implies that leverage is to some degree exogenous, not decided by the firm but by the lenders, i.e. the capital structure will not entirely be the firm's choice. Further, the lenders will most likely restrict the dividend payments to secure their positions, concerning the possibility of default. Therefore, one would expect to observe a negative relationship between dividend and leverage.

Most of the firms included in this paper are private nonlisted firms where debt, mainly bank debt, is the most important source of external financing. This debt dependence is mainly caused by limited internal resources. In the case of loan approval, especially for debt dependent firms, the lender will have a larger negotiation power which is likely to restrict the dividend payments. Based on this aspect, and the pecking order theory, one would expect to find a negative relationship between dividend and leverage. This indicates that firms with a high degree of leverage are most likely to have lower dividend payouts.

Another agency problem concerns the free cash flow problem between the manager and the shareholders. This principal-agent conflict occurs due to the possibility of the manager to follow a personal agenda instead of maximizing firm value. As a consequence, managers may want to overinvest, i.e. invest despite a lack of positive NPV projects, and they may distribute retained earnings for their personal benefits.

A remedy for the agency problem, between the shareholders and the manager, is to limit the free cash available to the manager. This can be done by increasing the amount of leverage in the capital structure. Such a remedy commits the managers to pay out cash in the future; which reduce the incentive for managers to follow personal agendas, since they want to avoid bankruptcy. Another remedy that also can be used to reduce the amount of free cash is to increase the dividend payout policy. This implies that leverage and dividend can be viewed as complements in solving agency problems, given that both higher dividends and higher leverage reduces the agency problem. If they are used together, they are complements as

described here, and one would observe a positive relationship. However, if using one of them excludes the need to use the other, they are substitutes, and one would observe a negative relationship.

The firm has to take the signalling theory into consideration and decide who it wants to signal to, when deciding its payout policy. On a general basis, high and attractive dividend payments can be used to signal when the intention is to attract new equity investors, or restrictive dividends can be used to signal to attract lenders. Since most of the firms in this paper rely mainly on debt financing, signalling to debtholders might be more relevant in this context. Since lenders want to avoid high dividend payouts, firms should signal restricted dividend payouts in order to attract lenders. As a result, one would expect that firms with a greater need for external financing have lower dividend payments, in the context of signalling theory.

After taking the different theories above into consideration when investigating the potential relationship between dividend and leverage, we expect that there exist a relationship. This is the basis of the first hypothesis defined below, and will be tested with a two-tailed test. If there is found a relationship, as expected, there will be interesting to see whether they function as substitutes or complements, this is tested with a one-tailed test.

$H1_0$: There is not a relationship between dividend and leverage.
$H1_A$: There is a relationship between dividend and leverage.

3.2 Ownership

The hypotheses in this section investigate the implications of ownership on dividend and leverage. Since ownership influences dividend and leverage through agency problems, the ownership structure and the relevant agency problems need to be considered in order to examine these relationships.

Two important agency problems generated by a firm's ownership structure are A1 and A2. The first group of agency problems, A1, concerns the conflict between the manager and the shareholders. The other group of agency problems, A2, concerns the conflict between majority and minority shareholders.

Hypothesis 2 investigates the relationship between dividend and ownership in the case of dispersed ownership, where A1 is of relevance. Hypothesis 3 considers the same relationship in the case of concentrated ownership, where A2 is the relevant agency problem. Hypothesis 4 examines the relationship between leverage and ownership.

To see how the relevant agency problems affect the dividend policy, hypothesis 2 and 3 will be elaborated on the basis of two scenarios; the outcome scenario and the substitution scenario.

3.2.1 Hypothesis 2

This hypothesis considers the influence of ownership on dividend, in the case of dispersed ownership. The agency problem between the managers and shareholders, A1, is of interest in this case. The agency problem between the majority and the minority shareholders, A2, is not relevant when the ownership structure is dispersed since there is no controlling shareholder. Therefore, by investigating the firms with dispersed ownership separately, the problem of A2 is removed and the effects of A1 can be taken into consideration.

The agency problem between the manager and the shareholders, A1, is mainly caused by large informational asymmetries and arises due to conflict of interests. In a firm with a dispersed ownership structure, i.e. not any controlling shareholder, it can be difficult for the shareholders to control the management's behaviour, thus there exists a great risk of moral hazard. This implies that it is easier for the manager to follow a personal agenda. The more dispersed ownership, the larger informational asymmetries exist between the manager and the shareholders, i.e. the larger is the potential agency problem.

Outcome Scenario

The outcome scenario is linked to the potential problems arising with free cash. The conflict between the manager and the shareholders arise because managers hold less than 100 percent of the residual claim in the firm, according to Jensen and Meckling (1976). This enhances a restriction on their effective gain from value increasing activities.[9] Consequently, there exists an incentive for the manager to reduce the effort in managing the firm and transfer the firm's resources to increase personal benefits. The presence of this agency problem limits the cash available for dividend payments. Therefore, when considering this agency problem, one would expect lower dividends.

Overall, one would therefore expect that the presence of A1 will lead to lower dividend payouts from the outcome scenario's point of view. A1 is more relevant in the case of dispersed ownership; therefore more dispersed ownership leads to lower dividend payments. As the ownership structure becomes more concentrated, A1 have less relevance, thus the negative impact on dividend payments decrease and one should expect higher dividends. As a result, one would expect a positive coefficient in the empirical results, when looking at the firms with dispersed ownership, since an increase in the ownership variable indicates more concentrated ownership.

Substitution Scenario

The substitution scenario is linked to reputational considerations, in specific that managers are concerned about their career and reputation. Taking these aspects into consideration, a manager will suffer greatly in the case of bankruptcy, and therefore have an incentive to act in accordance to the firm's best interest. For instance, with the intention of building a firm reputation and to attract new equity investors, the manager might prefer a high payout ratio to signal high firm value. There can be many explanations for why managers might prefer higher dividend payments, but the overall incentive is the creation of a reputation both in the aspect of the firm and the managers, not only externally but also internally.

[9] Harris and Raviv (1991)

Overall, one would expect that the presence of A1 leads to higher dividend payouts from the substitution scenario's point if view. This indicates that more dispersed ownership leads to higher dividend payments, since A1 is more relevant. Further, the more concentrated ownership the lower dividend payouts.

It is important to have in mind that this paper includes mostly private nonlisted firms, and signalling to debtholders might therefore be more relevant. These firms are often debt dependent and they do not issue equity that often. This can alter the expectations above and lead to a reduced dividend payout ratio for these firms. Nevertheless, when ownership changes in these firms, it tends to be a large change, and the use of signalling through high dividend can be important.

Overall Expectations

Considering firms with a dispersed ownership structure, our overall expectations is that more dispersed ownership leads to lower dividend payouts in the outcome scenario, and higher dividend payouts under the substitution scenario. These theoretical expectations will be investigated in this hypothesis, where the null hypothesis supports the substitution scenario and the alternative hypothesis supports the outcome scenario.

$H2_0$: More dispersed ownership in the firm does not lead to lower dividends.
$H2_A$: More dispersed ownership in the firm lead to lower dividends.

3.2.2 Hypothesis 3

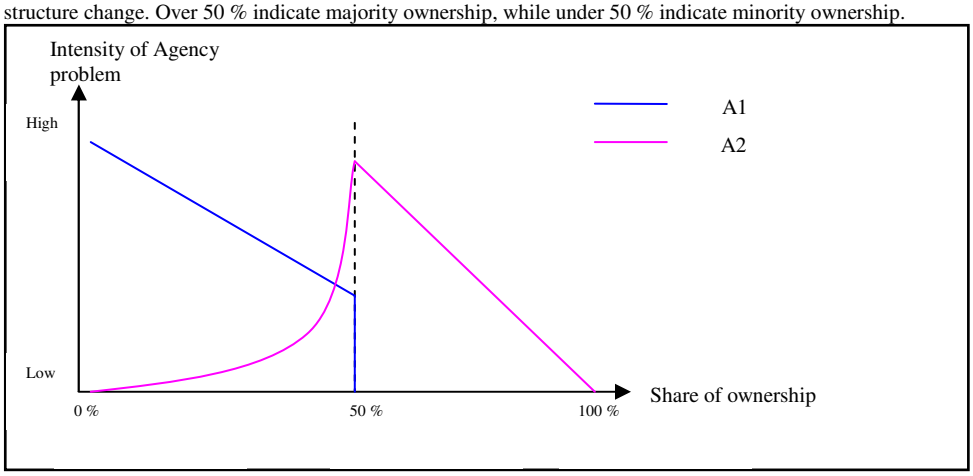
This hypothesis considers the influence of ownership on dividend in the case of concentrated ownership. The agency problem between majority and minority shareholders, A2, is of interest in this case. The agency problem between the manager and the shareholders, A1, is not relevant when the ownership structure is concentrated because managers can be controlled or easily fired. When the main shareholder controls just above 50 percent, the conflict between the manager and the shareholders, A1, falls close to 0. Therefore, by investigating the firms with

concentrated ownership separately, the problem of A1 is removed and the effect of A2 can be taken into consideration.

The conflict between majority and minority shareholders, A2, is mainly induced by informational asymmetries and differences in control. The informational asymmetries can be large between these parties, concerning investment decisions and the utilization of the company's financial resources, which can aggravate the potential agency problems.

The problem of A2 is relatively small up to 50 percent, but peaks right after 50 percent when one shareholder has the controlling rights. When the majority shareholder holds just above 50 percent, this shareholder can restrict the distribution of the firm's retained earnings; hence control the payout policy. As a result, the intensity of the agency problem will be maximized at this point. After the peak, the intensity of A2 decreases and tends toward 0 at 100 percent ownership concentration. This is because as the share of the controlling shareholder increases, the share of the minority shareholders decreases, and as a consequence the intensity of the agency problem decreases. At the end, there is only one owner left, and the problem is eliminated.

Figure 1 – The importance of the agency problems over the different ownership structures
The figure displays how the importance and the likelihood of the two agency problems change when the ownership structure change. Over 50 % indicate majority ownership, while under 50 % indicate minority ownership.



Outcome Scenario

In the outcome scenario, which relates to the free cash problem, the agency problem accelerates as the controlling shareholder tries to get hold of the free cash in the firm. The majority shareholder has an incentive and an opportunity to take the firm's cash in other ways than through dividend payments in order to maximize personal gain. If the cash were to be paid out as dividends, the majority shareholder would have gained less since the dividends have to be divided among all the shareholders. If the controlling shareholder runs away with the cash, the amount of cash available will be limited, thereby restricting or even eliminating the possibility of dividend payments. One would therefore expect that the presence of A2 leads to lower dividend payments.

As stated above, one would expect that private nonlisted firms often have quite concentrated ownership structures. There are often strong family relations and relatively few owners in these firms. As a consequence, the majority shareholder is more likely to have a strong personal connection towards the firm; hence the moral hazard problem is reduced. In the case where there are no outsiders as minority shareholders, the majority shareholder are less likely to run away with the cash and rather focus on the firm's best interest, i.e. the influence of A2 is reduced. Nevertheless, one would expect that firms with a dominant shareholder and hereby a concentrated ownership structure, have lower dividends in the presence of A2.

Overall, the expectation is that the presence of A2 leads to lower dividend payouts, from the outcome scenario's point if view. Since the presence of A2 is largest when the majority shareholder holds just above 50 percent of the shares, the theoretical expectation is that this is where the dividend payouts should be at the lowest. As the share of the majority shareholder increase and approaches 100 percent, the problem with A2 decreases and the dividend payout policy is less affected, and should therefore increase. As a result, one would expect a positive coefficient in the empirical results when only looking at firms with majority ownership, since an increase in the ownership variable used in this paper indicates more concentrated ownership.

Substitution scenario

In the substitution scenario, the aspect that the majority shareholder cares about the firm's reputation is taken into consideration. In case of bankruptcy, the majority shareholder suffers to a great extent, creating an incentive to act in the firm's best interest. As a result, the majority shareholder might want to pay out high dividends to attract external equity investors in addition to keep the minority shareholders in the firm. In general, one would expect that the presence of A2 will lead to a higher dividend payout in the substitution scenario.

Overall, the expectation is that the presence of A2 will lead to higher dividend payouts from the substitution scenario's point if view. As illustrated in figure 1, the presence of A2 is largest when the majority shareholder holds just above 50 percent; hence this is where the dividend payouts should be at the highest. As the share of the controlling shareholder increases and approaches 100 percent, the problem with A2 decreases. As an effect, dividend payout policy is less affected and should decline. As a result, one would expect a negative coefficient in the empirical results.

Overall Expectations

When only investigating firms with a majority shareholder, we expect that firms with more concentrated ownership have higher dividend payouts in the outcome scenario, since the problem of A2 is reduced as the majority share increases. Under the substitution scenario more concentrated ownership leads to lower dividend payouts. These theoretical expectations will be investigated in this hypothesis, where the null hypothesis supports the substitution scenario and the alternative hypothesis supports the outcome scenario.

$H3_0$: More concentrated ownership in the firm does not lead to higher dividends.
$H3_A$: More concentrated ownership in the firm does lead to higher dividends.

3.2.3 Hypothesis 4

This hypothesis investigates the influence of ownership on leverage. When considering this relationship, the relevant agency problem is the conflict between the manager and the shareholders. There is not expected to be any connection between ownership and leverage in the absence of this agency problem.

The agency problem between the manager and the shareholders are as elaborated in hypothesis 2 caused by conflict of interests and informational asymmetries. With more dispersed ownership and thereby larger informational asymmetries, it is harder for the shareholders to control for the management's behaviour. This implies that the more concentrated ownership, the smaller is this agency problem. In fact, when the main shareholder controls just above 50 percent, the conflict between the manager and the shareholders falls close to 0, as illustrated in figure 1. However, one should have in mind that if the ownership structure is too dispersed, it could be that shareholders cannot even decide about leverage.

The principal-agent conflict between the manager and the shareholders occurs due to the possibility of the manager to follow a personal agenda instead of maximizing firm value. This can be caused by the fact that managers have restrictions on their gain. As a consequence, managers may want to overinvest and they may also distribute retained earnings for their own personal benefits. From the manager's point of view, the upside risk more than offsets the downside risk when investing in negative NPV projects.[10] A remedy for this incentive problem is to limit the free cash available to the manager. This can be done by increasing the amount of leverage in the capital structure. This remedy commits the manager to pay out cash in the future, and as a result the incentive for the manager to follow a personal agenda is reduced. As a result, the presence of this agency problem, and the problem of overinvestment, results in higher leverage.

Since this agency problem is most severe when the ownership structure is dispersed, one would overall expect that the more dispersed ownership, the higher degree of leverage. The ownership concentration proxy used in this paper is "the sum percent equity held by owners with rank 1". An increase in this variable

[10] Harris and Raviv (1991)

indicates more concentrated ownership. Therefore, we expect to see a negative relationship between ownership and leverage in the empirical tests. The more concentrated ownership, the lower is the leverage expected to be because the relevant agency problem is less likely to occur. This theoretical expectation is investigated in the following hypothesis;

$H4_0$: More concentrated ownership structure does not lead to lower leverage.
$H4_A$: More concentrated ownership structure does lead to lower leverage.

3.3 Growth Opportunities

The influence of growth opportunities on dividend and leverage will be the focus in the two following hypotheses. The relationship between dividend and growth opportunities will be elaborated under hypothesis 5, while the relationship between leverage and growth opportunities is the topic in hypothesis 6.

3.3.1 Hypothesis 5

Firms with high growth opportunities are often characterised as young firms in the early stages of their business cycle. These firms often have many investment opportunities, and have a great need for financing. As a consequence, earnings are retained in the firm to finance positive NPV projects and are not used to pay dividends. When the firm's growth opportunities decreases, the amount of free cash increase and can be paid out as dividends. Consequently, one would in general expect firms with higher growth opportunities to have lower dividend payments.

Still, it is important to acknowledge that this expected relationship may be altered in the presence of agency problems.

From an agency problem point of view, a lack of growth opportunities may enhance the problem of overinvestment, given too much free cash. In the presence of this problem, the amount of cash available for dividend payouts will be limited.

This implies that also firms with lower growth opportunities can pay lower dividends in the presence of this agency problem.

Even though growth opportunities are present, the individual choice of investment can differ because of adverse selection problems due to asymmetric information. An effect of this can be a reduction in the potential earnings, which have a negative effect on the cash available for dividend payouts. The original expectations about the negative relationship are still correct when taking this into consideration.

Overall, we expect that firms in general distribute lower dividend payments in the presence of higher growth opportunities; hence we expect to find a negative relationship.

$H5_0$: There is not a negative relationship between dividend and growth opportunities.
$H5_A$: There is a negative relationship between dividend and growth opportunities.

3.3.2 Hypothesis 6

Firms with high growth opportunities are typically faced with many investment opportunities, and these firms are as mentioned often young and in the early stages of their business cycle. Firms with these characteristics often face financial constraints, which can be a result of both lack of equity and the large amount of good investment opportunities. As a consequence, one would expect that the degree of leverage in the capital structure is larger for these firms. Firms with high growth opportunities can sometimes get too high leverage since they need financing and external equity is too costly. This is also consistent with the pecking order theory. Concerning the theoretical expectations, this indicates that one would expect a positive relationship between growth opportunities and leverage.

For private nonlisted firms, the degree of leverage is to some extent exogenous for the firms, thus the lenders decide the amount of leverage a firm can be granted. When taking this aspect into consideration, the expectations might alter. From a lender's point of view, the important aspect is naturally to lend out money to firms that can repay the loan at a later point in time. From this argument one can expect that older more established firms might be favoured, despite the potential lack of growth opportunities. Nevertheless, one also has to consider that firms, with the characteristics of cash cows, might be less likely to have a need for loans as the previous section suggests. Taking this into account, one would expect that the choice of the lenders is often only between younger firms, and in this case the firms with growth opportunities are more favourable.

The relationship between leverage and growth opportunities can also be regarded from an agency problem point of view as in hypothesis 5. The lack of growth opportunities may enhance the problem of overinvestment. In the case of the agency problem between the manager and the shareholders, as elaborated in more detail in hypothesis 4, the manager might want to overinvest despite lack of growth opportunities. A remedy for this incentive problem is to limit the free cash available to the manager, and this can be done by increasing the amount of leverage in the capital structure. This remedy commits the manager to pay out cash in the future, and thereby reduce the incentive for the manager to follow a personal agenda. Consequently, the presence of this agency problem and the problem of overinvestment result in higher leverage. Since this agency problem is enhanced by a lack in growth opportunities, one would expect firms with higher growth opportunities to have lower leverage, i.e. a negative relationship.

As a conclusion, we expect leverage and growth opportunities to have a negative relationship. This will be the foundation for the following hypothesis;

$H6_0$: There is not a negative relationship between leverage and growth opportunities.
$H6_A$: There is a negative relationship between leverage and growth opportunities.

4. Methodology

This section provides an overview of the methodology and the testable implications for the hypotheses. First, the influence of taxes will be introduced since the tax reform implemented in 2006 is expected to have an effect on the data. Second, the methodology for each topic and its respective hypotheses will be elaborated.

4.1 The Impact of Taxes

Before 2006, dividends from Norwegian companies were in practice tax free for the shareholders. This resulted in an increased incentive for especially small single owned firms to transfer income into dividend. The tax reform in 2006 was implemented due to this type of tax distortion, and resulted in a double taxation of dividends among other things.[11] Since dividends became more expensive there was an incentive to distribute as much as possible, in the period between the announcement and the implementation of the tax reform. Given this, one would expect to see an increase in dividends right after the announcement of the tax reform in 2000 and a decline in dividend payments starting in 2005, since dividends from 2005 were taxed in 2006.

Another effect of the tax reform was that shell companies were established in order to achieve tax relieves. This implies that one should observe a rise in the number of firms after the tax reform.

Since the data in this paper spans from 2000 to 2008, the tax reform will most likely have an impact on the data and must therefore be taken into consideration.

[11] Ministry of Finance, http://www.regjeringen.no/en/dep/fin/

4.2 Dividend and Leverage

In hypothesis 1, the relationship between dividend and leverage is investigated. Since they are both viewed as endogenous variables, there exists an endogeneity problem. To investigate this relationship, the endogeneity problem has to be taken into account. As a result, a system of equations and the two-stage least square method, 2SLS, are applied. 2SLS is considered less efficient than ordinary least squares, OLS, since it usually gives greater standard errors. This inefficiency is strengthened when the variable is a dummy variable, which will be used in some of the regressions. Nevertheless, 2SLS is considered to be the correct method in this context due to the endogeneity problem.

Two-stage least squares, 2SLS, is a method used to account for the endogeneity problem when some of the explanatory variables included in an equation are endogenous. "2SLS is a method of systematically creating instrumental variables to replace the endogenous variables where they appear as explanatory variables in simultaneous equations systems."[12] A good instrumental variable must be highly correlated with the variable it is replacing, and in addition it must be uncorrelated with the error term.

To account for endogeneity the following set of simultaneous equations is applied[13];

The dividend equation;

$$\begin{aligned} \text{Div} &= \alpha_0 + \beta_1 \text{Lev} + \beta_2 \text{CH} + \beta_3 \text{SPO} + \beta_4 \text{OWN} + \beta_5 \text{GO} + \beta_6 \text{Size} \\ &+ \beta_7 \text{EE} + \beta_8 \text{ROA} + \beta_9 \text{ID}_1 + \beta_{10} \text{ID}_2 + \beta_{11} \text{ID}_3 + \beta_{12} \text{ID}_4 + \beta_{13} \text{ID}_5 + \beta_{14} \text{ID}_6 \\ &+ \beta_{15} \text{ID}_7 + \beta_{16} \text{ID}_8 + \beta_{17} \text{ID}_0 + \beta_{18} \text{ID}_9 + \varepsilon \end{aligned} \quad (1)$$

The leverage equation;

$$\begin{aligned} \text{Lev} &= \alpha_0 + \beta_1 \text{Div} + \beta_2 \text{FIX} + \beta_3 \text{LIST} + \beta_4 \text{OWN} + \beta_5 \text{GO} + \beta_6 \text{Size} \\ &+ \beta_7 \text{EE} + \beta_8 \text{ROA} + \beta_9 \text{ID}_1 + \beta_{10} \text{ID}_2 + \beta_{11} \text{ID}_3 + \beta_{12} \text{ID}_4 + \beta_{13} \text{ID}_5 + \beta_{14} \text{ID}_6 \\ &+ \beta_{15} \text{ID}_7 + \beta_{16} \text{ID}_8 + \beta_{17} \text{ID}_0 + \beta_{18} \text{ID}_9 + \varepsilon \end{aligned} \quad (2)$$

[12] Studenmund, 2006

[13] Abbreviations applied in the equations are Div for Dividend, Lev; Leverage, CH; Cash holdings, SPO; Share of personal owners, OWN; Ownership, GO; Growth opportunities Size; Firm size, EE; Retained earnings to equity, ROA; Return on assets, ID_i; Industry dummy i. Additional in the leverage equation are; LIST; Listing status dummy and FIX; Fixed assets.

A definition of the variables used is presented in the data section.

Cash holdings and share of personal owners are variables that are used as instrumental variables for dividend, and therefore represent the exogenous part of dividend. Cash holdings have a more obvious relationship to dividend than to leverage. The higher the cash holdings, the more cash is available for dividend payments. In the presence of personal owners, the dividend policy is constructed for tax reasons. Therefore, there exist a relationship between dividend and the share of personal owners. One would expect that dividends will be higher before the tax reform.

Fixed assets and listing status are both expected to be related to leverage, and not to dividend. Thus, they are used as instrumental variables for leverage, representing the exogenous part. As will be shown later, listing status is included in some OLS regressions when investigating dividend. In these regressions, listing status is nonsignificant for all samples which substantiate the expectations that listing status do not influence dividend. One would expect a positive relation between leverage and fixed assets, and a negative relation between leverage and listing status. The negative influence of listing status is expected since listed firms are able to tap the equity market to a larger extent, while nonlisted firms rely more on debt financing.

In addition to the instrumental variables, a set of control variables, which are expected to influence both dividend and leverage, are included. The control variables are expected to be exogenous, having in mind that in reality no variables are completely exogenous, at least not in the long run.

The simultaneous equations are run on the entire sample two times, both times with a different proxy for dividend; first dividend payout ratio and then a dummy for the dividend paying firms. The regressions are also run with dividend payout ratio as a proxy for dividend in a subsample containing only dividend paying firms. In the remainder of the text, dividend payout ratio will be the proxy for dividend when nothing else is specified.

4.3 Ownership

In hypothesis 2, 3 and 4 the influence of ownership on dividend and leverage will be investigated.

The ownership variable is viewed as exogenous since the ownership structure is decided early on in the firm's life, and are most likely persistent over time, at least with a relatively short time horizon like the 9 years time span in this paper. In the study by Jensen et al (1992), they viewed ownership as endogenous, but the study found no significant results, supporting the exogenous view applied in this paper.

The "Sum percent equity held by owner with rank 1" variable is used as a proxy for ownership concentration and will in the remainder of the text be referred to as the ownership variable.

Hypothesis 4

Concerning hypothesis 4, where the issue is the relationship between leverage and ownership, the results obtained from the 2SLS leverage equation in hypothesis 1 will be applied. The tax reform implemented in 2006 has no obvious impact on leverage. As a result, the influence on leverage does not need to be examined on the basis of the before and after the tax samples, but rather on the basis of the entire sample.

Hypothesis 2 and 3

To test hypothesis 2 and 3, three statistical approaches are applied; the logit model, the OLS method and the 2SLS method.

First, a binomial logit regression is run to test the influence of the explanatory variables on whether or not firms pay dividend at all, using a dummy for dividend paying firms as the dependent variable. This is done since the dividend variable consists of many firms that do not pay dividend at all, and this can influence the results. Logistic regression enables the use of a categorical dependent variable.

Further, since dummy dividend is a dichotomous variable with only two categories; dividend paying firms and non dividend paying firms, a binomial logistic method can be applied.

The following equation is applied in the logit regression[14];

$$\ln\left(\frac{P_i}{1-P_i}\right) = P(DumDiv) = \alpha_0 + \beta_1 Lev + \beta_2 OWN + \beta_3 GO + \beta_4 Size + \beta_5 EE + \beta_6 ROA + \beta_7 CH + \beta_8 ID_1 + \beta_9 ID_2 + \beta_{10} ID_3 + \beta_{11} ID_4 + \beta_{12} ID_5 + \beta_{13} ID_6 + \beta_{14} ID_7 + \beta_{15} ID_8 + \beta_{16} ID_0 + \beta_{17} ID_9 + \beta_{18} LD + \varepsilon \quad (3)$$

Second, the OLS method is applied. Including only dividend paying firms, hence only observations that displays 1 in the Dummy dividend variable is kept in the data sample. This is done with the objective to investigate how the explanatory variables influence the degree of dividend payments. In this case, the dividend payout ratio is the dependent variable.

The equation used at this stage is the following[15];

$$\text{Dividend Payout Ratio} = \alpha_0 + \beta_1 Lev + \beta_2 Own + \beta_3 GO + \beta_4 Size + \beta_5 EE + \beta_6 ROA + \beta_7 CH + \beta_8 ID_1 + \beta_9 ID_2 + \beta_{10} ID_3 + \beta_{11} ID_4 + \beta_{12} ID_5 + \beta_{13} ID_6 + \beta_{14} ID_7 + \beta_{15} ID_8 + \beta_{16} ID_0 + \beta_{17} ID_9 + \beta_{18} LD + \varepsilon \quad (4)$$

A potential problem by using the dividend payout ratio as a dependent variable is that some firms pay dividends despite negative earnings. To control for this problem the regressions are run with dividends to total assets as the dependent variable on some of the samples, with the intention to examine the validity of the results.

[14] Abbreviations applied in the equations are; Lev for Leverage, OWN; Ownership, GO; Growth opportunities, EE; Retained earnings to equity, ROA; Return on assets, CH; Cash holdings, ID_i; Industry dummy i. and LD; Listing status dummy.

[15] Abbreviations applied in the equations are; Lev for Leverage, OWN; Ownership, GO; Growth opportunities, EE; Retained earnings to equity, ROA; Return on assets, CH; Cash holdings, IDi; Industry dummy i. and LD; Listing status dummy.

As emphasised earlier, leverage and dividend are both expected to be endogenous variables. Therefore the logit and the OLS results may not be reliable, since the endogeneity of leverage is not accounted for. To account for this, the relationship between dividend and ownership are also investigated with the 2SLS method, which deals with the endogeneity problem. Equation (1) and (2) are applied, and the ownership variable is the main focus. To investigate hypothesis 2 and 3, the dividend equation estimates are used.

As elaborated in chapter 3, ownership affects dividend and leverage mainly through agency problems. As a result the ownership structure and the relevant agency problems need to be considered in order to examine this relationship. Because of this, the basis sample is split to enable an investigation of the two main agency problems, A1 and A2. The basis sample is split in two parts to create a minority ownership and a majority ownership subsample. The split is done on the basis of the ownership variable. Missing observations are deleted on the ownership variable prior to the split due to the fact that they cannot be placed correctly in the split of the sample.

The minority sample contains firms that do not have any controlling shareholder, including all observations that are 50 percent and below, thus have dispersed ownership. Referring to the issues discussed in hypothesis 2, this part will have A1 as the relevant agency problem and the implications of A1 can be tested. This subsample will be used to examine hypothesis 2. The majority sample contains firms that have a dominant shareholder, including all observations that are above 50 percent. The problem of A1 is then removed and A2 can be tested, which will be done in hypothesis 3.

To control for the tax effects from the reform implemented in 2006, the basis sample is split in two subsamples, before and after the tax reform. The “before the tax reform” subsample consists of the years 2000 to 2004, while the “after the tax reform” subsample consists of observations including 2005 up to 2008. The year 2005 is included in the “after the tax reform” subsample because dividend payments in 2005 were taxed in 2006. The same split is also applied on the majority and minority subsamples, creating a majority before tax- and a majority after tax subsample and the same for the minority part. With the objective to go

further into the potential differences caused by the tax reform, regressions on the majority and minority subsamples are also run year by year for some of the regressions.

The logit and OLS regressions are run on all of the above subsamples, while 2SLS is only run on the majority subsample before and after tax together with the minority subsample before and after tax. As mentioned, the regressions using the logit model are run on the above subsamples including all observations. The OLS method is applied on the regressions using the same splits of the sample, but only dividend paying firms are included. Concerning 2SLS, the regressions are run twice on the specified subsamples, first including all firms and then including only dividend paying firms.

Beside the fact that some regressions are run year by year to control for the tax reform, the main regressions are run on the samples containing multiple years. The data in these samples are panel data, time-series cross-sectional data, consisting of multiple firms that have observations over a time period of 9 years. Pooled regressions are used in this paper even though it ignores the panel structure of the data. The reason for this is emphasized below. When working with panel data one would over time expect a stabile relationship on the variables in addition to some firm specific relationship. In the data samples applied these relationship changes over time due to the tax reform and with this justification pooled regressions are used. In addition, the regressions are also run separately before and after the tax reform.

4.4 Growth Opportunities

In hypothesis 5 and 6 the influence of growth opportunities on dividend and leverage will be investigated, hence the growth opportunity variable is the main concern.

The growth opportunities variable is viewed as exogenous from the reasoning that firms will have different growth opportunities based on the state of the economy as a whole. In addition, growth opportunities will be affected by other exogenous

shocks, both global and more local market shocks. Firms will also have different growth opportunities depending on which industry they belong to. The industry aspect should however be captured by the industry dummies included in the regressions.

Normally, the Tobin's Q would be the preferred proxy for growth opportunities. This proxy cannot be used here, since the data contains book values and not market values. In addition, the main part of the firms is nonlisted and this proxy is therefore not feasible. Sales to assets will therefore be applied as a proxy for growth opportunities. The reasoning behind the use of sales to assets as a proxy is the following: If a firm has high sales to assets, this implies a high capacity and a need to expand, and consequently high investment opportunities. This is regarded as an indication of high growth opportunities. In the proceeding, sales to assets will be referred to as the growth opportunity variable.

2SLS will be applied to account for endogeneity. The simultaneous equations used are the same as above, and therefore the 2SLS results obtained under the previous hypotheses will be applied. The relationship between dividend and growth opportunities, which is investigated in hypothesis 5, uses the 2SLS subsamples results from the ownership section with the basis samples results. To investigate hypothesis 6, the relationship between leverage and growth opportunities, only the 2SLS regression results on the main samples are used. There is no need to look at the before and after the tax reform subsamples, since the tax reform from 2006 has no obvious impact on leverage. This has already been checked in order to control the robustness of the results

5. Data

Data on Norwegian firms from the CCGR database will be used in this paper. This database is created by the Centre for Corporate Governance Research at BI, and contains limited liability firms registered in Norway in the time period 1994 to 2008. The main part of the CCGR database is built on data by CreditInform (Berzins, Bøhren, & Rydland, 2008). The data is reliable since Norwegian limited liability firms must be audited by law. This is a large dataset consisting of not only listed but also nonlisted firms that creates a unique opportunity to investigate nonlisted firms, which is quite rare in the existing literature.

To obtain a comprehensive data sample, some filters have been applied on the dataset. The sample includes observations in the time period 2000 to 2008, independent firms and firms with 2 or more employees with a maximum of 500 employees. A filter is also applied on the dividend payout ratio and the leverage variable, with a maximum of 200 percent and 100 percent respectively.

In addition to the filters applied, observations that are significantly different are viewed as outliers and are deleted before ending up with the data basis for this paper. The elimination of outliers has been done on the basis of the distribution of the variables to avoid the elimination of good data.

Further, a cleaning of the data has been performed with the intention to create a reasonable sample. Negative observations on dividend, liabilities to financial institutions and current liabilities, trade debtors, trade creditors, stocks and tax payable, are eliminated since these are unrealistic observations. For the same reason, negative and zero observations on revenue and total assets are eliminated. In addition, ownership percentages above 100 percent are removed.

The filtering and cleaning process results in a basis sample that will be used in the proceeding of this paper. This sample consists of 322 528 observations. 322 443 observations are nonlisted, while 85 observations are listed. This is why the main focus in this paper evolves around private nonlisted firms. 124 543 observations have a minority ownership structure, while 197 985 have a majority ownership structure. In the basis sample 234 364 (72.7 percent) observations do not pay

dividend, while 88 164 (27.3 percent) observations pay dividend. The number of firms are approximately 35 800 firms. The distribution of firms per year is displayed in table 5-1 below.

Table 5-1 The distribution of firms per year.

Year	Number of firms
2000	37 476
2001	29 750
2002	26 267
2003	36 200
2004	32 690
2005	40 224
2006	42 220
2007	38 733
2008	38 968

Due to the tax reform in 2006, there was a tendency to see the establishment of shell companies. These companies do not do business per se and are mainly set up for the sake of avoiding taxes. Hence, there existed incentives for the shareholders to transfer their shares to shell companies to avoid double taxation. This resulted in a large increase in the total number of firms in Norway after the tax reform. However, due to the applied independency filter, the increase is not that clear in this sample. One would also expect that there can be a change in the ownership structure, but this difference is insignificant in this sample, with 38.5 percent minority ownership before tax and 38.7 percent minority ownership after the tax reform.

5.1 Variables

The variables obtained from the CCGR database are displayed in appendix 5-A1. In this section, an overview of the variables used is presented. Due to large differences in firm sizes, ratios are used to create variables that are comparable across firms. In appendix 5-A2, the formulas are summarized and presented with CCGR item numbers.

5.1.1 Main variables

Dividends

A dividend payout ratio is used to create a basis of comparison across firms; the variable is calculated by taking dividend to operating results.

A potential problem by using the dividend payout ratio as a proxy for dividend is that some firms distribute dividends despite negative earnings. To control for this possible problem dividend to total assets is calculated as a proxy for dividend payout. This variable is used to check the validity of the dividend payout ratio in some of the regressions.

A dummy dividend variable is also constructed. This categorical variable is coded such that it displays 0 when the dividend variable is 0 and 1 for every value of positive dividends. The dummy dividend variable shows whether or not the firms pay dividend.

Leverage

As a proxy for leverage the following formula is used; short and long term debt as a share of total assets. The total assets variable is constructed by adding fixed- and current assets.

$$\text{Leverage} = \frac{\text{Current liabilities} + \text{Liabilities to financial institutions}}{\text{Total assets}}$$

Ownership

The variable “Sum percent equity held by owner with rank 1” is used as a proxy for ownership concentration. This variable is divided by 100 to obtain a ratio that is comparable with the other ratios. As the variable increases, the ownership concentration increases.

Growth Opportunities

As explained in the methodology chapter, sales to assets will be applied as a proxy for growth opportunities.

$$\text{Growth Opportunites} = \frac{\text{Sales}}{\text{Total Assets}}$$

5.1.2 Control Variables

To avoid bias from missing variables, some control variables are included in the regressions. A description of the control variables is provided below.

Firm Profitability

Return on Assets, ROA, is used as a proxy for firm profitability and firm performance.

$$\text{ROA} = \frac{\text{Operating Results}}{\text{Total Assets}}$$

Firm Age

When a firm matures, it will most likely function as a cash cow at some point in time. Cash cows are identified as firms producing a lot of cash and high margins, but with lack of investment opportunities. Firms with such characteristics are expected to have the highest dividend payments. Therefore, retained earnings to equity are used as a proxy for firm age. High retained earnings to equity indicates high firm age.

Firm Size

The logarithm of total sales is used as a proxy for firm size.

Cash Holdings

The cash holdings variable consists of the variables “bank deposits, cash in hand etc.” and “other current assets”. This is normalized through dividing by total assets. The story behind this variable is that a firm that possess much cash, regardless of other factors like size, age etc, may want to pay out more dividend than a firm with less cash.

Listing Status

The listing status is given by the variable new list indicator, and is coded 1 for listed firms and 0 for nonlisted firms. This is included so the effect of listing status can be controlled.

Industry Dummies

Firms are divided into industries according to the NAIC industry classifications codes; these are specified in appendix 5-A3. These codes are further arranged into 9 industry sectors which are used in the creation of industry dummies. These classifications are adopted from Berzins and Bøhren (2008). The industry sectors are shown in table 5-2 together with the distribution of the observations. The group coding will be the name of the respective industry dummy. An industry dummy 0 is created to capture all observations that do not have any assigned industry. Industry dummy 9 represents all observations that are in multiple industries. The industry dummy results will not be presented in the result tables, only a confirmation that they are included.

Table 5-2 The industry classification

Sector	Industry Sector	Observations	Percentages
1	Agriculture, forestry, fishing, mining	6316	1.96
2	Manufacturing, chemical products	33 654	10.43
3	Energy	753	0.02
4	Construction	48 099	14.91
5	Service	113 810	35.30
6	Financial	861	0.03
7	Trade	87 665	27.18
8	Transport	15 789	4.89
9	Multisector	14 722	4.57
0	Missing	859	0.03

Fixed Assets

This variable is created to be used in the 2SLS equations. Fixed assets influence leverage, but it does not have any clear influence on dividend, as elaborated under the methodology chapter. Hence, this variable is included as an instrumental variable for leverage. The variable is normalized by dividing by total assets.

Share of Personal Owners

This variable is also created to be used in the 2SLS equations. This variable is expected to influence dividend, but has no clear influence on leverage.[16] Hence, this variable is included as an instrumental variable for dividend. The variable is constructed by taking the variable "Aggregated fraction held by personal owners" and divide by 100 to obtain a ratio that is comparable with the other ratios.

[16] The tax reform implemented in 2006 resulted in a double taxation of dividends, which gave an increased incentive to switch from equity to debt income. In order to deal with this, the tax authorities adjusted the tax on interests so it was in line with tax on dividend income. From an owner's point of view the tax on interests increased, which thereby lead to a reduced gap between debt and equity.

5.2. Descriptive Statistics

In this section some of the most relevant descriptive statistics are presented. Table 5-3 includes an overview of the minimum, median, maximum, mean and the standard deviation for the main variables. Table 5-4 presents a correlation matrix between the four variables that are the main focus in the hypotheses. In table 5-5, the average for the main variables in the two subsamples, majority and minority, are presented. Finally, table 5-6 displays the average year by year for the dividend payout ratio, the proportion of dividend payers and leverage.

Table 5-3 Descriptive statistics for the main variables in the basis sample
n = 322 528, dividend payout ratio has 1087 missing observations and has therefore only 321 441 observations.

	Min	Median	Max	Mean	Std.Dev.
Dividend Payout Ratio	0.00	0.00	2.00	0.23	0.44
Leverage	0.00	0.74	2.00	0.74	0.31
Growth Opportunities	0.00	2.31	585.00	2.74	2.74
Ownership	0.00	0.65	1.00	0.69	0.27
ROA	-416.00	0.07	98.00	0.05	0.83
Firm Size	6.91	15.36	22.69	15.41	1.37
Cash Holdings	-2.58	0.20	9.89	0.26	0.23

Table 5-4 Pearson's Correlation Matrix
This table presents the correlation between the most important variables

	Dividend Payout Ratio	Leverage	Growth Opportunities	Ownership
Dividend Payout Ratio	1.000			
Leverage	0.019***	1.000		
Growth Opportunities	-0,003*	0.197***	1.000	
Ownership	-0.016***	0.011***	0.046***	1.000

Table 5-5 Averages for the main variables in the two subsamples

Mean	Minority sample	Majority sample
Dividend Payout Ratio	0.24	0.23
Leverage	0.74	0.74
Growth Opportunities	2.67	2.79
Ownership	0.40	0.87
ROA	0.05	0.06
Firm Size	15.40	15.42
Cash Holdings	0.27	0.26

Table 5-6 Averages for some variables year by year

	Average Payout Ratio	Proportion of Dividend payers	Average Leverage
2000	0.24	0.36	0.73
2001	0.33	0.39	0.75
2002	0.41	0.43	0.77
2003	0.40	0.42	0.78
2004	0.51	0.51	0.80
2005	0.06	0.08	0.73
2006	0.15	0.21	0.72
2007	0.05	0.07	0.69
2008	0.09	0.13	0.69

Table 5-5 indicates that the average of the main variables is quite similar in the minority and majority subsamples. The firms in this data basis have a dividend payout ratio, with an average around 20 percent, while the average degree of debt is quite large with 74 percent. This is consistent with the expectations that firms are quite debt dependent, since most of the firms included in this data basis are nonlisted. The ownership average is also quite interesting. In the minority sample, the average ownership is 40 percent, which indicates that for firms with dispersed ownership the share of the largest shareholder is rather high. The same is the case for the majority sample, the controlling shareholder in firms with concentrated ownership have a high share. These are all characteristics of private nonlisted firms, where the ownership concentration is expected to be quite high.

In table 5-6, the influence of the tax reform is quite evident. The average payout ratio and the average proportion of dividend payers are substantially greater before the tax reform than after. The large drop in dividend payments and dividend paying firms is observed between 2004 and 2005. The average number of dividend payers decreased from 51 percent to only 8 percent, while the average dividend payout ratio decreased from 51 percent to 6 percent. This is consistent with the tax reform since dividends paid in 2005 were taxed in 2006, thus after the new tax rules. The average leverage is quite consistent over time, which indicates that the tax reform has no impact on leverage. This confirms that when dealing with leverage, the tax effects do not need to be taken into account, as stated in the methodology section.

6. Empirical Results

In this chapter the empirical results are presented. General attributes will be elaborated in section 6.1, and the empirical results are presented and interpreted in section 6.2.

6.1 General Attributes

The Pearson's correlation coefficients between the independent variables are low and significant in every sample, indicating absence of the multicollinearity problem. The tolerance and VIF values reported also indicate absence of the multicollinearity problem. The exception from this is industry dummy 5, industry dummy 7 in one sample, which are omitted from the model due to a tolerance value below the tolerance band.

Concerning the residuals, the Normal Probability Plot displays no deviations from normality in all samples, indicating that the residuals are normally distributed.

The presence of outliers is investigated using the Scatterplot and the Case Diagnostics. In all samples, some values are detected as possible outliers, but due to the large sample these represent such a small fraction that it seems superfluous to treat them.

The R-square values reported in the model summaries are presented in the results tables. The R-square values vary across the samples, but are overall acceptable.

6.2 Overview of the Empirical Results

The empirical results are presented and interpreted in this section. The subsections are divided between the main topics of this paper and for each subsection the relevant hypotheses will be examined. This investigation is done, both within and across the different regression models as elaborated under the methodology section. The relevant results from the 2SLS regressions are presented in table 6-1 to 6-3 below, while the rest are to be found in the appendix;

Table 6-1 2SLS regressions

Table 6-1 displays the coefficients obtained from the 2SLS regression model. The first two columns display the regressions obtained from the entire sample, where the first column has dividend payout ratio as dependent, while the second has dummy dividend as dependent. The third column is the regression estimates obtained from the entire sample containing only dividend paying firms and with dividend payout ratio as dependent. D1 stands for only dividend paying firms. This is elaborated more in chapter 4. The variables used are defined in chapter 5. Only unstandardized coefficients are presented in the table. T-values are presented in parentheses. ***, **, * indicate significance at the 1 %, 5 % and 10 % level respectively.

	Entire sample with Div payout ratio	Entire sample with Dummy dividend	Entire sample D1 Div. payout ratio
Dividend Equation			
Alpha	-0.765*** (-39.849)	-0.924*** (-48.564)	0.869*** (21.024)
Leverage	0.036* (1.663)	0.007 (0.310)	-0.025 (-0.398)
Cash holdings	0.372*** (45.125)	0.370*** (45.297)	0.108*** (11.255)
Share of personal owners	0.143*** (46.258)	0.160*** (51.955)	0.064*** (10.644)
Ownership	-0.005** (-1.960)	-0.019*** (-6.866)	0.040*** (7.010)
Growth opportunities	-0.009*** (-15.156)	-0.011*** (-19.455)	0.008*** (5.330)
Firm size	0.050*** (81.843)	0.064*** (105.927)	-0.008*** (-5.565)
Retained earnings to equity	0.000 (-0.011)	0.000 (1.433)	-0.115*** (-28.886)
ROA	0.137*** (50.735)	0.150*** (55.702)	0.329*** (13.435)
Industry dummies	Yes	Yes	Yes
Leverage Equation			
Alpha	0.563*** (60.066)	0.472*** (52.614)	1.273*** (22.905)
Dividend	-0.703*** (-75.407)	-0.648*** (-78.287)	-0.673*** (-14.000)
Fixed to total assets	-0.089*** (-24.746)	-0.080*** (-24.025)	-0.090*** (-12.911)
Listing status	-0.574*** (-12.059)	-0.606*** (-13.617)	-0.379 (-1.389)
Ownership	-0.015*** (-5.280)	-0.024*** (-8.925)	0.039*** (7.455)
Growth opportunities	0.018*** (58.031)	0.016*** (56.358)	0.025*** (28.932)
Firm size	0.021*** (31.943)	0.028*** (42.456)	-0.003** (-2.438)
Retained earnings to equity	0.000*** (5.896)	0.000*** (7.204)	-0.119*** (-20.017)
ROA	0.004* (1.733)	0.006*** (2.568)	0.482*** (23.144)
Industry dummies	Yes	Yes	Yes
R-square - Div eq. (in %)	*8.1*	*10.0*	*4.6*
R-square - Lev eq. (in %)	*4.8*	*5.3*	*3.1*

Table 6-2 2SLS regressions – MINORITY SAMPLES – The dividend equation
Table 6-2 displays the coefficients obtained from the dividend equation when running the 2SLS regression model. The regression is run on 4 minority samples. The first two columns show the results when using the minority before tax- and the minority after tax samples respectively, here all firms are included. The second two columns use the same samples, but only dividend paying firms are included. D1 stands for only dividend paying firms. For the last regressions run on the D1 sample, listing status is omitted since it is constant for this sample. The variables used are defined in chapter 5. Only unstandardized coefficients are presented in the table. T-values are presented in parentheses.
***, **, * indicate significance at the 1 %, 5 % and 10 % level respectively.

	Entire sample		Entire sample D1	
	Minority before tax reform	Minority after tax reform	Minority before tax reform	Minority after tax reform
Dividend Equation				
Constant	-1.900** (-48.812)	-0.769*** (-22.535)	0.351*** (6.120)	0.979*** (8.873)
Leverage	0.398*** (8.389)	0.522*** (12.439)	0.016 (0.156)	0.625*** (4.289)
Cash holdings	0.810*** (51.562)	0.350*** (22.420)	0.145*** (8.757)	0.171*** (7.568)
Share of personal owners	0.293*** (25.067)	-0.094*** (-17.301)	0.205*** (9.844)	-0.065*** (-4.666)
Ownership	0.185*** (9.211)	0.017 (1.451)	0.239*** (8.349)	0.059 (1.514)
Growth opportunities	-0.029*** (-27.943)	-0.026*** (-14.753)	-0.006** (-2.156)	0.016*** (2.746)
Firm size	0.098*** (63.358)	0.034*** (33.456)	0.021*** (6.959)	-0.049*** (-12.261)
Retained earnings to equity	0.000 (-0.365)	0.000** (-2.261)	-0.316*** (-20.927)	-0.021*** (-7.273)
ROA	0.174*** (33.852)	0.223*** (23.863)	0.338*** (7.109)	0.122** (2.046)
Industry dummies	Yes	Yes	Yes	Yes
R-square (in percent)	*18.6*	*6.6*	*8.9*	*10.4*

Table 6-3 2SLS regressions – MAJORITY SAMPLES – The dividend equation
Table 6-3 displays the coefficients obtained from the dividend equation when running the 2SLS regression model. The regression is run on 4 majority samples. The first two column shows the results when using the majority before tax- and the majority after tax samples respectively, here all firms are included. The second two columns use the same samples, but only dividend paying firms are included. D1 stands for only dividend paying firms. For the two regressions run on the D1 sample, listing status is omitted since it is constant for these samples. The variables used are defined in chapter 5. Only unstandardized coefficients are presented in the table. T-values are presented in parentheses.
***, **, * indicate significance at the 1 %, 5 % and 10 % level respectively.

	Entire sample		Entire sample D1	
	Majority before tax reform	Majority after tax reform	Majority before tax reform	Majority after tax reform
Dividend Equation				
Constant	-1.047*** (-31.698)	-0.311*** (-10.819)	0.558*** (9.954)	0.770*** (6.901)
Leverage	-0.090** (-2.314)	0.101*** (3.310)	-0.176* (-1.677)	0.228 (1.468)
Cash holdings	0.651*** (48.053)	0.196*** (15.455)	0.133*** (9.264)	0.138*** (5.535)
Share of personal owners	0.330*** (47.731)	-0.067*** (-26.186)	0.080*** (6.512)	-0.107*** (-8.815)
Ownership	-0.024*** (-2.871)	-0.007 (-1.473)	0.064*** (5.060)	0.035* (1.650)
Growth opportunities	-0.005*** (-5.836)	-0.001 (-1.397)	0.001 (0.468)	0.005 (1.110)
Firm size	0.071*** (58.202)	0.022*** (28.043)	0.020*** (7.688)	-0.003 (-0.846)
Retained earnings to equity	0.000 (-0.345)	0.000 (0.778)	-0.180*** (-17.854)	-0.344*** (-13.028)
ROA	0.194*** (43.555)	0.089*** (21.281)	0.489*** (12.165)	0.303*** (5.652)
Industry dummies	Yes	Yes	Yes	Yes
R-square (in percent)	*17.1*	*5.7*	*5.1*	*12.7*

6.2.1 Dividend and Leverage

6.2.1.1 Hypothesis 1

The results for hypothesis 1 are presented in table 6-1 to 6-3 above. The method used is as described in the methodology section 2SLS, which accounts for endogeneity.

The leverage equation is run on the entire sample with all firms in addition to the entire sample with only dividend paying firms. These results are presented in table 6-1. The results for these equations indicate a robust negative relationship between dividend and leverage. All of the dividend coefficients are significant at the one percent level and they are approximately of the same magnitude with quite strong coefficients. This indicates that if a firm pays dividend for some exogenous reason, the firm will have a low degree of leverage. Thus, higher dividends result in lower leverage. This indicates that dividend and leverage are substitutes.

This result is consistent with the fact that firms should signal a restricted payout policy in order to obtain debt financing, i.e. the lower the dividend payouts; the more likely it is for the firm to get a loan approval. All of the statements above support the findings and the original theoretical expectations about a negative relationship between dividend and leverage. This implies that dividend and leverage are substitutes when taking the leverage equations into consideration.

For the dividend equations, the results are more complex. When investigating the regressions run on the main samples, the only regression with a significant coefficient for leverage is in the basis sample with dividend payout ratio as the dependent variable. The regressions run on the two remaining samples indicate that leverage has an insignificant effect on dividend payout. Due to the lack of robustness, the regressions based on the majority and minority subsamples will be investigated for the dividend equations.

For the dividend equation in the regressions based on the subsamples, leverage has a significantly negative influence on dividend in the majority before tax samples, while the remaining regressions for both majority after tax and the minority equations display a positive relationship between leverage and dividend.

Regarding the majority before tax observations, leverage affects dividend negatively. However, the coefficient for leverage is positive for the regressions run on the majority after tax sample, but this result is only significant for the regression run on the sample with all firms. The switch in signs can be caused by several reasons.

One possible explanation is that the double taxation of dividends led firms to increase their payout ratios before the tax reform followed by a decrease in the payout policy after the tax reform. Because of the increase in costs for dividend paying firms after the tax reform, these firms had an incentive to pay as much as possible before the tax reform. These firms most likely reached the payout boundary induced by the lenders, and thereby struggled to distribute as much as they wanted in dividends, i.e. caused a negative relationship between dividend and leverage. The positive relation found after the tax reform can be explained by the increased costs, which resulted in a reduced incentive for firms to pay dividends. Consequently, the firms did not struggle to pay dividends after the tax reform, hence did not reach the boundary, which can be an explanation for the positive relationship.

Since the regression coefficients provided by the majority samples in the dividend equation display both negative and positive signs for the leverage variable, it is difficult to state whether dividend and leverage are substitutes or complements. However, if the negative results simply are caused by a tax effect, this indicates that dividend and leverage can be complements.

The remaining regressions for both the majority after tax and the minority equations display a positive relation between leverage and dividend in the dividend equation, indicating that leverage has a positive effect on dividend. The higher the amount of leverage in the capital structure, the higher the dividend payout, indicating that leverage and dividend function as complements.

Potential remedies for reducing the agency problem between the manager and the shareholders are to increase the degree of leverage or to increase the dividend payments. These remedies commit the manager to pay out cash in the future, which in turn reduces the incentive for the manager to follow a personal agenda. If both of these remedies are used together, as indicated in this result, they can be regarded as complements in reducing the free cash problem.

As an overall conclusion, all of the sections above find a relationship between dividend and leverage; hence the null hypothesis which states that there is no relationship can be rejected. The question is then whether dividend and leverage function as substitutes or complements.

In the leverage equations, the exogenous part of dividend affects leverage negatively, which indicates that they are substitutes. In the dividend equation, the results indicate that the relationship between dividend and leverage is positive, which indicates that they are complements. As a result, the overall finding for the dividend and leverage equations implies that high leverage results in high dividend, while high dividend leads to low leverage. As a consequence, it is difficult to conclude whether dividend and leverage are substitutes or complements.

A tentative explanation can be drawn from the agency problem between the shareholders and the debtholders. The positive relation found in the dividend equations can in this context be explained by the following: In firms which already have high leverage, the shareholders have an incentive to run away with the cash and distribute is as dividends, i.e. high leverage leads to high dividends. Further, the negative relationship found in the leverage equation can be explained in the same context. In short, for firms that have high dividends to start with, it is more difficult to get a loan approval, i.e. high dividends leads to low leverage.

As a final conclusion, the results indicate that there is a relationship between dividend and leverage. It is difficult to conclude whether they are substitutes or complements. Nevertheless, the relationship can be explained by the agency problem between shareholders and debtholders.

6.2.2 Ownership

In this section the influence of ownership on dividend and leverage is investigated. Hypothesis 2 and 3 focuses on the relationship between ownership and dividend. Hypothesis 2 deals with the agency problem between the manager and the shareholders. Hypothesis 3 deals with the agency problem between majority and minority shareholders. Hypothesis 4 investigates the relationship between ownership and leverage.

As elaborated in chapter 4, a logit, an OLS and a 2SLS model are run to investigate hypothesis 2 and 3. The main 2SLS results are presented in table 6-1 to 6-3 and a summary of the OLS and logit results are found in the table 6-4. More detailed tables concerning the logit and OLS regressions are found in the appendix with regressions done year by year. Hypothesis 4 is investigated on the basis of the 2SLS regressions run on the entire samples, which is presented in table 6-1 above.

Table 6-4 Overview of the most important coefficients in the Logit and the OLS regression models

Table 6-4 displays a summary of the most important coefficient estimates obtained from the OLS and the logit regressions. The entire tables are to be found in the appendix. The samples used under OLS contains only dividend paying firms, denoted D1, while the samples used under the logit regressions contains all firms. The dependent variable is dividend payout ratio under OLS, and Dummy dividend under the logit model. The variables used are defined in chapter 5. The methodology is elaborated in chapter 4. Only unstandardized coefficients are presented in the table. T-values are presented in parentheses.
***, **, * indicate significance at the 1 %, 5 % and 10 % level respectively.

	Leverage	Ownership	Growth Opportunities
OLS Regression – Samples include only dividend paying firms			
Entire sample D1	0.652***	0.027***	-0.005***
	(83.735)	(5.094)	(-5.903)
Before tax reform D1	0.532***	0.037***	-0.010***
	(58.620)	(5.908)	(-10.212)
After tax reform D1	0.847***	0.056***	-0.002
	(58.939)	(5.980)	(-1.536)
Majority sample D1	0.614***	0.014	-0.008***
	(59.830)	(1.354)	(-7.752)
Majority before tax reform D1	0.520***	0.040***	-0.009***
	(43.833)	(3.412)	(-7.777)
Majority after tax reform D1	0.770***	0.078***	-0.013***
	(39.692)	(3.991)	(-7.080)
Minority sample D1	0.677***	0.169***	-0.003*
	(56.221)	(7.666)	(-1.948)
Minority before tax reform D1	0.533***	0.233***	-0.015***
	(37.774)	(9.109)	(-8.355)
Minority after tax reform D1	0.809***	0.041	0.008***
	(37.446)	(1.088)	(2.671)
Logit Regression - Samples include all firms			
Entire sample	0.589***	-0.132***	-0.118***
Before tax reform	0.052**	-0.067***	-0.131***
After tax reform	1.061***	-0.092***	-0.114***
Majority sample	0.746***	-0.562***	-0.065***
Majority before tax reform	0.066**	-0.305***	-0.083***
Majority after tax reform	1.008***	-0.083	-0.080***
Minority sample	0.738***	1.020***	-0.191***
Minority before tax reform	-0.027	2.367***	-0.260***
Minority after tax reform	1.153***	0.463***	-0.212***

6.2.2.1 Hypothesis 2

In hypothesis 2 the influence of ownership on dividend is investigated in the case of dispersed ownership. The agency problem between the manager and the shareholders, A1, is of interest in this case as explained in chapter 3. Consequently, when investigating this hypothesis only the regressions run on the minority sample is of interest. The minority sample contains firms that do not have any controlling shareholders, including all observations that are 50 percent and below, thus have dispersed ownership.

As explained in section 3.2.1, one would expect that firms with more dispersed ownership have lower dividend payouts in the outcome scenario. This represents the alternative hypothesis. More dispersed ownership leads to higher dividend payouts under the substitution scenario. This represents the null hypothesis that more dispersed ownership in the firm does not lead to lower dividends.

The main results from the OLS regression equations are presented in table 6-4. These results suggest a positive relationship between ownership and dividend. As the ownership variable increases, the ownership concentration increases. Therefore, this indicates that the higher concentrated ownership, the higher dividend payments. This supports the theoretical expectations of the outcome scenario.

As elaborated under section 3.2.1, the outcome scenario implies that the manager runs away with the cash to follow a personal agenda. This agency problem arises due to the conflict of interest between the manager and the shareholders given information asymmetries. Consequently, there exists an incentive for the manager to reduce effort in managing the firm and to transfer the firm's resources to increase personal benefits. The presence of this agency problem will limit the cash available for dividend payments. Therefore, when considering this agency problem, one would expect lower dividends for more dispersed ownership. This is what the results indicate when using the OLS method.

The coefficients from the OLS regression however are not all significant. The results are nonsignificant in the regression run on the minority sample after tax. This indicates that the relationship can be strengthened for tax reasons. Nevertheless, the main findings support the outcome scenario.

The logit regression also supports these findings, displaying significantly positive ownership coefficients for the regressions run on all main minority samples. This is evidence for the outcome scenario, which indicates that the more concentrated ownership the more likely the firm is to have dividend payments.

As elaborated in chapter 4, the 2SLS method is applied on the regression in some of the main samples to account for the endogeneity problem. The relevant results from the dividend equations are presented in table 6-2. All regressions run on the minority samples have positive ownership coefficients, however only the coefficients obtained on the "before the tax reform" samples are significant. This is the case both when all firms are included and when only dividend paying firms are included. These are the same results as found in the OLS regressions, which indicate that the relationship between ownership and dividend can be strengthened for tax reasons.

Overall, the results display significant positive coefficients that support the outcome scenario. The more concentrated ownership structure, the higher is the dividend payments due to the lower influence of the agency problem. This leads to the conclusion that the null hypothesis can be rejected, thus more dispersed ownership in the firm lead to lower dividends.

6.2.2.2 Hypothesis 3

In hypothesis 3, the influence of ownership on dividend is investigated in the case of concentrated ownership. The agency problem between the majority and the minority shareholders, A2, is of interest in this case as explained in chapter 3. Consequently, when investigating this hypothesis only the regressions run on the majority sample is of interest. The majority sample contains firms that have a

dominant shareholder, including all observations above 50 percent. As elaborated in chapter 3, the problem of A1 is removed and the effects of A2 can be tested.

To recapitulate the arguments found in chapter 3, one would overall expect that firms with more concentrated ownership have higher dividend payouts in the outcome scenario, since the problem of A2 is reduced as the majority share increases. This represents the alternative hypothesis. In the substitution scenario the expectations are that more concentrated ownership will have lower dividend payouts, which represents the null hypothesis.

The results obtained from the OLS and logit regressions are presented in table 6-4 above. The ownership coefficients obtained from the different majority samples when applying the OLS method are significantly positive. The coefficient estimates from the logit regression, are in contrast significantly negative, except the ownership coefficient from the "majority after tax" sample which is nonsignificant. These conflicting results can be explained by the fact that the samples used in OLS includes only dividend paying firms, while the samples used in the logit approach includes all firms.

The 2SLS method is also applied in some of the main samples to account for the endogeneity problem. The relevant results from the dividend equations, which are of interest in this case, are presented in table 6-3. Since the 2SLS results account for the endogeneity problem, these results will be the basis of the arguments in the proceeding.

The 2SLS regressions, run on the majority samples including all firms, estimate negative ownership coefficients. This supports the findings under the logit regression. As under the logit regressions, the ownership coefficient from the "majority after tax" sample is nonsignificant. Even though the coefficients are of relatively low magnitude, suggesting a rather weak influence on dividend, the negative relationship between ownership and dividend supports the substitution scenario.

In the substitution scenario, the reputational aspect is taken into consideration. This creates an incentive for the majority shareholder to act in the firm's best interest. A consequence of this can be that the majority shareholder wants to pay high dividends to attract external equity investors, in addition to keeping the minority shareholders in the firm. This is why the substitution scenario indicates that the presence of A2, leads to higher dividend payouts. This agency problem is highest when the shareholder controls just above 50 percent and then it decreases as the share of the controlling shareholder increases. This is illustrated in figure 1. When looking at the majority sample, the substitution scenario indicates that when the ownership variable increases, the dividend payouts will decrease. This is what these results indicate.

The negative coefficients, obtained in the samples containing all firms, can be caused by tax effects as explained in the results from hypothesis 1. This indicates that the negative signs cannot be interpreted as evidence for the substitution scenario. This is especially true in firms where there is a personal owner. Nevertheless, the 2SLS regressions have controlled for personal owners and the results display that this variable has consistently shifting signs before and after the tax reform for all subsamples. This indicates that the share of personal owner's variable captures much of the tax effect, and function as a proxy for this. As a result, this effect is most likely removed under the ownership variable, which suggests that the negative signs are not explained by this. This means that there is an agency problem that causes the negative sign, which in turn confirms the evidence of the substitution scenario.

The 2SLS regressions run on the majority samples, including only dividend paying firms, estimate significantly positive ownership coefficients. This supports the findings in the OLS regression. The majority after tax sample however is only significant at the 10 percent level and the coefficients are of relatively low magnitude. The positive relationship between ownership and dividend supports the outcome scenario described in section 3.2.2.

In short, the outcome scenario relates to the free cash problem, when the controlling shareholder has an incentive and an opportunity to take the firm's cash in order to maximize personal gain. This problem results in limited cash available

for dividend payments, hence the outcome scenario expects that in the presence of A2, the dividend payments will be lower. The A2 problem decreases as the share of the controlling shareholder increases. The outcome scenario indicates, when looking at the majority sample, that when the ownership variable increases, the dividend payouts increase. This is in correspondence with the results interpreted in this section.

The significance level is weaker after the tax reform. This indicates that the relationship can be strengthened for tax reasons.

Overall, there is mixed evidence in the results, due to both positive and negative ownership coefficients, which supports both the outcome and the substitution scenario. There is slightly stronger evidence for the outcome scenario since the dividend paying firms are more important in the context of this relationship. However, a clear conclusion cannot be drawn and the null hypothesis cannot be rejected.

6.2.2.3 Hypothesis 4

In hypothesis 4 the influence of ownership on leverage is investigated. In this relationship, the conflict between the manager and the shareholders, A1, is the relevant agency problem. In the absence of this agency problem there is not expected to be any connection between ownership and leverage. As a consequence, and the fact that leverage is not affected by the tax reform[17], it is not necessary to look at the majority and minority subsamples in this hypothesis. The hypothesis will be examined on the basis of the 2SLS regressions run on the entire samples, which is presented in table 6-1 above. Further, from a leverage point of view the results of interest are those obtained from running the regressions on the main sample containing all firms.

The ownership coefficients estimated from the 2SLS regressions run on the main sample are both significantly negative. The coefficients are significant at the one percent level and the magnitude of the coefficients is low, which indicates that

[17] This is confirmed by the findings in the descriptive statistics section, when the average leverage is presented year by year.

ownership has a relatively small influence on leverage. Nevertheless, this indicates a negative relationship, i.e. the higher ownership concentration, the lower the leverage. This finding supports the alternative hypothesis. In short, the problem with free cash is caused by managers who may want to overinvest for personal benefits. A potential remedy for the shareholder is to limit the free cash by increasing the amount of leverage in the capital structure. Consequently, the presence of this agency problem and the problem of overinvestment can result in higher leverage. This agency problem will be most severe when the ownership structure is dispersed. The expectation is that the more concentrated ownership, the lower degree of leverage, which is what the results prove.

Based on the main findings, the null hypothesis that more concentrated ownership structure does not lead to lower leverage can be rejected. The conclusion of this hypothesis will therefore be that more concentrated ownership structure does lead to lower leverage.

6.2.3 Growth Opportunities

In this section the influence of growth opportunities on dividend and leverage is investigated. The relationship between dividend and growth opportunities will be elaborated under hypothesis 5, while the relationship between leverage and growth opportunities is the topic in hypothesis 6.

In hypothesis 5, the 2SLS dividend equations obtained by running the regressions on the basis samples is used, including all firms and only dividend paying firms. These results are presented in table 6-1. In addition, the results obtained from the dividend equation run on the majority and minority subsamples regressions presented in table 6-2 and 6-3 are used. Further, from a leverage point of view the results of interest are the ones obtained from running the regressions on the basis sample, and these are used in the investigation of hypothesis 6.

6.2.3.1 Hypothesis 5

In this hypothesis the influence of growth opportunities on dividend is the focus. The regressions, run on the entire sample which includes all firms, display a positive and significant relationship between dividend and growth opportunities. The regressions, run on the sample with only dividend paying firms, indicate that growth opportunities have an insignificant effect on dividend. Based on this, the regressions run on the majority and minority subsamples are used to have a more thorough investigation of the relationship.

All the significant results in the regressions based on the subsample with all firms display a negative effect of growth opportunities on dividend. These coefficients are rather weak, but they are all significant at the one percent level. A negative coefficient on the growth opportunity variable implies that the more growth opportunities a firm have, the lower is the payout ratio. This result is consistent with the original theoretical expectation. A reason for the negative effect on the payout policy is that firms need to invest in positive NPV projects. If dividends are paid, this will limit their ability to finance the projects. One would assume that the growth opportunities decline as the firms get older and more established in the market, but as long as there are growth opportunities, firms should invest and retain dividends to be able to finance the investments.

In the regressions run on the subsamples based on only the dividend paying firms, the significant results are in the minority sample. These coefficients display that growth opportunities have both a negative effect but also a positive effect on the payout policy. The negative coefficients support the theoretical expectation elaborated above, while the positive sign contradicts the general theoretical expectations. A positive sign indicate that if growth opportunities are present, the amount of dividends increase. One explanation is that dividends can be used to signal information about the firm to the market. Nevertheless, one would in general expect that high dividend payments simply are a result of limited growth opportunities and that firms in general distribute lower dividends when they have higher growth opportunities.

Overall, there is mixed evidence in the results, but there is slightly stronger evidence for a negative relationship. The significant negative coefficients presented under this hypothesis support the theoretical expectation that higher growth opportunities lead to lower dividend payments. However, due to the conflicting results, a conclusion cannot be drawn. Hence, the null hypothesis cannot be rejected.

6.2.3.2 Hypothesis 6

The focus in hypothesis 6 is the influence of growth opportunities on leverage. The regressions represented in table 6-1, run on the main sample including all firms, are used to investigate this relationship since these results are those of interest from a leverage point of view.

All the regression results display positive and significant growth opportunity coefficients, which suggest a positive relationship between growth opportunities and leverage. All the coefficients are significant at the one percent level and are approximately of the same magnitude, with a relatively weak influence on leverage. The positive relationship indicates that the more growth opportunities a firm have, the higher is the leverage. This is reasonable since the higher the growth opportunities; the greater is the need for financing. Especially since the firms included in this paper are mostly private nonlisted firms that rely on debt financing, one would expect an increase in leverage as the growth opportunities increase. Consequently, the results are consistent with the pecking order theory.

When taking the agency problem between the manager and the shareholders into account, the expectations change. As elaborated under section 3.3.2, low growth opportunities can lead to an overinvestment problem. The presence of this agency conflict can result in higher leverage, as a remedy taken by the shareholders with the intention to limit the free cash. This theory therefore suggests that a firm with high growth opportunities, where overinvestment is less likely, is expected to have a lower degree of leverage.

The results obtained do not support this agency problem point of view. However, this can be expected since firms included are mainly private nonlisted firms where the agency problems most likely are reduced. The agency problem can be of less importance due to the fact that there are often fewer owners, family relations and the relationship between the shareholders and the manager is often closer. In addition, in some firms the shareholders and the manager can even be the same person.

Taking into consideration that this paper investigates mainly private nonlisted firms, where debt is the most important source of financing, one would generally expect that higher growth opportunities lead to a higher degree of leverage. This is simply because there is a large need for financing that most likely cannot be covered only through equity financing.

Overall, the null hypothesis cannot be rejected on the basis of these results, since the results indicate that there is a positive relation between leverage and growth opportunities. The results cannot be explained by the agency problem between the manager and the shareholders. Instead, the results can be evidence of the pecking order theory.

6.2.4 Effects of the Control Variables

Even though the control variables applied in the regression models are not the main subject in this paper, it is interesting to see how they behave in the model. The interpretation is based on the results from the 2SLS regressions.

As mentioned under section 6.2.2.2, the share of personal owner's variable flips signs around the tax reform. This indicates that the variable captures much of the tax effect, and works as a proxy for this.

The cash holdings variable, included as an instrumental variable on dividend, display positive significant coefficients. The magnitude of this coefficient is also relatively high, indicating a high impact on dividend. This result is reasonable since more cash enables higher dividend payments.

The listing status dummy variable is included as an instrumental variable on leverage. In the main sample including all firms, the coefficient has negative significant results of rather high magnitude. This implies that listed firms have less leverage than nonlisted firms. This can be explained by the fact that listed firms have access to more equity in the financial market; hence the need for debt financing is reduced.

The fixed assets variable has significant negative signs, which is the opposite of what is expected theoretically.

The retained earnings to equity variable do not really work. As explained earlier, this variable is included in both equations as a proxy for firm age, and thereby cash cows. The expected relationship is that as firms mature, they will most likely function as cash cows at some point in time. Then the dividend payments will increase and the leverage will decrease. The results do not support this. In the leverage equation, the results are statistically significant, but not economically.

The return on assets, ROA, variable is used as a proxy for firm profitability. The results display positive significant ROA coefficients for both the dividend equation and the leverage equation. The relation with dividend is reasonable since more profitable firms are expected to pay more dividends. The positive relationship with leverage is more complicated. More profitable firms have most likely more earnings and cash available for reinvestment, and thereby the need for leverage is reduced. The results obtained contradict this. It can be explained by the fact that more profitable firms are most likely firms with high growth opportunities that have a larger need for financing, hence more likely to have more leverage as explained under hypothesis 6. Another possible reason is that profitable firms can take on more leverage to create a higher tax shield.

The results concerning the firm size variable suggest that larger firms pay more dividends, which are quite intuitive theoretically. The results for the leverage equation are unexpected, suggesting that larger firms have a higher degree of leverage.

7. Conclusion

The main focus in this paper is the relationship between debt capacity and payout policy. In addition, the influence of ownership and growth opportunities on leverage and dividend is examined.

One of the main findings in this paper is the existence of a relationship between dividend and leverage. The findings indicate that high leverage results in high dividend, while high dividend leads to low leverage. As a consequence, it is difficult to conclude whether dividend and leverage function as substitutes or complements. However, the relationship can be explained in terms of the agency problem between shareholders and debtholders.

The results found when the influence of ownership is investigated indicate that ownership has a significant effect on both dividend and leverage. For firms with dispersed ownership, the results support the outcome scenario; the more dispersed ownership structure, the lower is the dividend payments.

The results are mixed for firms with concentrated ownership structures. Due to both positive and negative ownership coefficients, a clear conclusion cannot be drawn.

The findings concerning the relationship between ownership and leverage indicate that more concentrated ownership structures lead to lower leverage, since the agency problem between the manager and the shareholders decrease.

Regarding the influence of growth opportunities on dividend, conflicting results are found and a conclusion cannot be drawn. When investigating the influence of growth opportunities on leverage, a positive relationship is found. This does not support the original expectation; however the results can be evidence of the pecking order theory.

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Appendix

Table 5-A1 Variables obtained by the CCGR database

Item	Description
9	Revenue
15	Depreciation of fixed assets and intangible assets
16	Write-down of fixed assets and intangible assets
19	Results of operation
35	Operating results
51	Tangible fixed assets
63	Fixed assets
64	Stocks (Inventory)
65	Trade debtors
76+77	Bank deposits, cash in hand etc. and Other current assets
78	Current assets
86	Retained earnings
87	Equity
94+101	Liabilities to financial institutions
102	Trade creditors
103	Tax payable
105	Dividends
109	Current liabilities
113	Number of employees
11103	Industry codes at level 2
13405	Number of employees
13421	Foundation year
13501	First rating date
13601	Share owned by CEO
14011	Sum % equity held by owner with rank 1
14019	Aggregated fraction held by personal owners
14507	Is independent
-	New list indicator

Table 5-A2. Definition of variables

Variable	Definition
Total Assets	[63 Fixed assets] + [78 Current assets]
Dividend Payout Ratio	[105 Dividends] / [35 Operating Results]
Dividend to Total Assets	[105 Dividends] / [Total assets]
Leverage	([109 Current liabilities] + [94+101 Liabilities to financial institutions]) /[Total assets]
Ownership	[14011 Sum % equity held by owner with rank 1] / 100
Sales to Assets	[9 Revenue] / [Total assets]
ROA	[35 Operating results] / [Total assets]
Retained Earnings to Equity	[86 Retained earnings] / [87 Equity]
Firm Size	Ln[9 Revenue]
Cash Holdings	[76+77 Bank deposits, cash in hand etc. and Other current assets] / [Total assets]
Fixed Assets to Total Assets	[63 Fixed assets] / [Total assets]
Share of Personal Owners	[14019 Aggregated fraction held by personal owners] / 100
Dummy Dividend	{1 if firm is paying dividend, 0 if not}
Listing Status	{1 if the firm is listed, 0 if nonlisted} (Based on new list indicator)
Industry Dummy 1	{1 if firms is in Agriculture, forestry, fishing, mining industry, 0 if not}
Industry Dummy 2	{1 if firm is in Manufacturing, chemical products industry, 0 if not}
Industry Dummy 3	{1 if firm is in Energy industry, 0 if not}
Industry Dummy 4	{1 if firm is in Construction industry, 0 if not}
Industry Dummy 5	{1 if firm is in Service industry, 0 if not}
Industry Dummy 6	{1 if firm is in Financial industry, 0 if not}
Industry Dummy 7	{1 if firm is in Trade industry, 0 if not}
Industry Dummy 8	{1 if firm is in Transport industry, 0 if not}
Industry Dummy 9	{1 if firm is in multiple industries, 0 if not}
Industry Dummy 0	{1 if firm is not in any industry, 0 if it is}

Table 5-A3 Industry classification according to the NAIC industry codes and the division of these into 9 industry sectors.
The industry dummies used are based on the nine industry sectors classified here. The classifications are adopted from Berzins and Bøhren (2008). Industry dummy 9 represents all observations that are in multiple industries. In addition an industry dummy 0 is created to capture all observations that do not have any assigned industry.

NAICS code	NAICS label	Industry Sector code	Industry Sector label
1	Agriculture and hunting	1	Agriculture, forestry, fishing, mining
2	Forestry and logging	1	Agriculture, forestry, fishing, mining
5	Fishing, fish farming, incl. services	1	Agriculture, forestry, fishing, mining
10	Coal mining and peat extraction	1	Agriculture, forestry, fishing, mining
12	Mining of uranium and thorium ores	1	Agriculture, forestry, fishing, mining
13	Mining of metal ores	1	Agriculture, forestry, fishing, mining
14	Other mining and quarrying	1	Agriculture, forestry, fishing, mining
27	Basic metals	2	Manufacturing, chemical products
28	Fabricated metal products	2	Manufacturing, chemical products
29	Machinery and equipment n.e.c	2	Manufacturing, chemical products
30	Office machinery and computers	2	Manufacturing, chemical products
31	Electrical machinery and apparatus	2	Manufacturing, chemical products
32	Radio, TV sets, communication equip	2	Manufacturing, chemical products
26	Other non-metallic mineral products	2	Manufacturing, chemical products
34	Motor vehicles, trailers, semi-tr.	2	Manufacturing, chemical products
21	Pulp, paper and paper products	2	Manufacturing, chemical products
26	Other non-metallic mineral products	2	Manufacturing, chemical products
34	Motor vehicles, trailers, semi-tr.	2	Manufacturing, chemical products
21	Pulp, paper and paper products	2	Manufacturing, chemical products
33	Instruments, watches and clocks	2	Manufacturing, chemical products
25	Rubber and plastic products	2	Manufacturing, chemical products
24	Chemicals and chemical products	2	Manufacturing, chemical products
35	Other transport equipment	2	Manufacturing, chemical products
22	Publishing, printing, reproduction	2	Manufacturing, chemical products
36	Furniture, manufacturing n.e.c.	2	Manufacturing, chemical products
20	Wood and wood products	2	Manufacturing, chemical products
19	Footwear and leather products	2	Manufacturing, chemical products
18	Wearing apparel., fur	2	Manufacturing, chemical products
17	Textile products	2	Manufacturing, chemical products
16	Tobacco products p	2	Manufacturing, chemical products
15	Food products and beverages	2	Manufacturing, chemical products
23	Refined petroleum products	2	Manufacturing, chemical products
40	Electricity, gas and steam supply	3	Energy
11	Oil and gas extraction, incl. serv.	3	Energy
45	Construction	4	Construction
91	Membership organizations n.e.c.	5	Service
74	Other business activities	5	Service
73	Research and development	5	Service
72	Computers and related activities	5	Service

71	Renting of machinery and equipment	5	Service
37	Recycling	5	Service
80	Education	5	Service
99	Extra-territorial org. and bodies	5	Service
85	Health and social work	5	Service
75	Public administration and defense	5	Service
90	Sewage, refuse disposal activities	5	Service
70	Real estate activities	5	Service
92	Cultural and sporting activities	5	Service
55	Hotels and restaurants	5	Service
93	Other service activities	5	Service
95	Domestic services	5	Service
50	Motor vehicle services	5	Service
41	Water supply	5	Service
64	Post and telecommunications	5	Service
66	Insurance and pension funding	6	Financial
65	Financial intermediation, less ins.	6	Financial
67	Auxiliary financial intermediation	6	Financial
52	Retail trade, repair personal goods	7	Trade
51	Wholesale trade, commission trade	7	Trade
63	Supporting transport activities	8	Transport
62	Air transport	8	Transport
61	Water transport	8	Transport
60	Land transport, pipeline transport	8	Transport
		9	Multisector
		0	Missing

Table 6-A1 OLS regression - Dividend payout ratio as dependent
Table 6-A1 presents the coefficients obtained from the OLS regression model. The dependent variable is dividend payout ratio. The variables used are defined under section 5. The regression are run on the basis sample with only dividend paying firms together with this basis sample split into before and after the tax reform in 2006. This is elaborated more under section 4. Only unstandardized coefficients are presented in the table. T-values are presented in parentheses.
***, **, * indicate significance at the 1 %, 5 % and 10 % level respectively.

	Entire sample	Sample before tax reform	Sample after tax reform
Alpha	0.594*** (28.122)	0.390*** (15.686)	0.375*** (9.555)
Explanatory variables			
Leverage	0.652*** (83.735)	0.532*** (58.620)	0.847*** (58.939)
Ownership	0.027*** (5.094)	0.037*** (5.908)	0.056*** (5.980)
Growth Opportunities	-0.005*** (-5.903)	-0.010*** (-10.212)	-0.002 (-1.536)
Control Variables			
Firm size	-0.016*** (-12.428)	0.006*** (4.150)	-0.021*** (-9.069)
Retained earnings to equity	-0.083*** (-30.522)	-0.157*** (-35.005)	-0.037*** (-12.218)
ROA	0.101*** (7.796)	0.206*** (13.503)	0.079*** (3.466)
Cash holdings	0.178*** (26.175)	0.195*** (24.607)	0.197*** (16.179)
Dummy listing status	-0.257 (-0.865)	-0.387 (-1.283)	Constant -
Industry Dummies	Yes	Yes	Yes
R^2 (in percent)	*11.5*	*10.3*	*19.7*

Table 6-A2 OLS regression - Dividend payout ratio as dependent
Table 6-A2 presents the coefficients obtained from the OLS regression model. The dependent variable is dividend payout ratio. The variables used are defined under section 5. The regression is run on the majority and minority samples containing only dividend paying firms. In addition the regression are also run on these samples when split into before and after the tax reform from 2006, this is elaborated more under section 4. Only unstandardized coefficients are presented in the table. T-values are presented in parentheses.
***, **, * indicate significance at the 1 %, 5 % and 10 % level respectively.

	Majority samples			*Minority Samples*		
	Entire	Before tax reform	After tax reform	Entire	Before tax reform	After tax reform
Alpha	0.486*** (17.550)	0.337*** (10.317)	0.190*** (3.678)	0.687*** (18.828)	0.328*** (7.743)	0.755*** (11.116)
Explanatory Var.						
Leverage	0.614*** (59.830)	0.520*** (43.833)	0.770*** (39.692)	0.677*** (56.221)	0.533*** (37.774)	0.809*** (37.446)
Ownership	0.014 (1.354)	0.040*** (3.412)	0.078*** (3.991)	0.169*** (7.666)	0.233*** (9.109)	0.041 (1.088)
Growth Opportunities	-0.008*** (-7.752)	-0.009*** (-7.777)	-0.013*** (-7.080)	-0.003* (-1.948)	-0.015*** (-8.355)	0.008*** (2.671)
Control Var.						
Firm size	-0.004*** (-2.649)	0.008*** (4.154)	0.003 (1.036)	-0.027*** (-12.959)	0.011*** (4.121)	-0.045*** (-11.610)
Ret. Earn to Equity	-0.141*** (-28.637)	-0.123*** (-23.077)	-0.283*** (-22.357)	-0.057*** (-17.814)	-0.251*** (-30.105)	-0.022*** (-7.366)
ROA	0.159*** (9.379)	0.256*** (12.899)	0.163*** (5.344)	0.025 (1.255)	0.136*** (5.703)	0.060* (1.783)
Cash Holdings	0.174*** (19.419)	0.196*** (19.053)	0.192*** (11.372)	0.180*** (17.228)	0.195*** (15.674)	0.188*** (11.041)
Dummy Listing status	Constant -	Constant -	Constant -	-0.208 (-0.725)	-0.389 (-1.344)	Constant -
Industry Dummies	Yes	Yes	Yes	Yes	Yes	Yes
R^2 (in percent)	*11.2*	*9.4*	*21.4*	*12.9*	*12.9*	*22.2*

Table 6-A3 OLS regression - Dividend to Total Assets as dependent
Table 6-A3 presents the coefficients obtained from the OLS regression model. The dependent variable is dividend to total assets. The variables used are defined under section 5. The regression are run on the basis sample with only dividend paying firms together with this basis sample split into before and after the tax reform in 2006. This is elaborated more under section 4. Only unstandardized coefficients are presented in the table. T-values are presented in parentheses.
***, **, * indicate significance at the 1 %, 5 % and 10 % level respectively.

	Entire sample	Majority sample	Minority sample
Alpha	-0.005	0.008*	-0.015**
	(-1.473)	(1.664)	(-2.309)
Explanatory variables			
Leverage	0.157***	0.150***	0.161***
	(116.513)	(84.715)	(77.444)
Ownership	-0.002*	-0.014***	0.002
	(-1.691)	(-7.759)	(0.630)
Growth Opportunities	-0.003***	-0.003***	-0.004***
	(-23.728)	(-20.577)	(-14.151)
Control Variables			
Firm size	-0.004***	-0.003***	-0.005***
	(-19.401)	(-11.900)	(-12.798)
Retained earnings to equity	-0.012***	-0.024***	-0.007***
	(-25.488)	(-27.665)	(-12.102)
ROA	0.648***	0.627***	0.682***
	(288.444)	(214.276)	(195.235)
Cash holdings	0.063***	0.066***	0.058***
	(53.557)	(42.512)	(32.135)
Dummy listing status	-0.028	Constant	-0.025
	(-0.537)	-	(-0.514)
Industry Dummies	Yes	Yes	Yes
R^2 (in percent)	*63.5*	*61.4*	*67*

Table 6–A4 Logit Regression – Dummy dividend as dependent
Table 6-A4 presents the β coefficients obtained from the logit regression model run on the basis sample containing all firms. In addition the regression is also run on this sample when split into before and after the tax reform. This is elaborated more under section 4. The dependent variable is Dummy dividend. The variables used are defined in section 5.
***, **, * indicate significance at the 1 %, 5 % and 10 % level respectively.

	Entire sample	Sample before tax reform	Sample after tax reform
Alpha	-7.992***	-7.822***	-11.481***
Explanatory variables			
Leverage	0.589***	0.052**	1.061***
Ownership	-0.132***	-0.067***	-0.092***
Growth Opportunities	-0.118***	-0.131***	-0.114***
Control Variables			
Firm size	0.367***	0.405***	0.510***
Retained earnings to equity	0.001	0.001	0.001
ROA	5.602***	7.850***	4.136***
Cash holdings	1.671***	2.099***	1.657***
Dummy listing status	-3.379***	-3.217***	-19.926
Industry Dummies	Yes	Yes	Yes
Pseudo R^2 (in percent)	*20.3*	*40.1*	*19.4*

Table 6-A5 Logit Regression – Dummy dividend as dependent
Table 6-A5 presents the β coefficients obtained from the logit regression model run on the majority and minority samples. In addition the regression is also run on these samples when split into before and after the tax reform. This is elaborated more under section 4. The dependent variable is Dummy dividend. The variables used are defined in section 5.
***, **, * indicate significance at the 1 %, 5 % and 10 % level respectively.

	Majority Samples			Minority Samples		
	Entire	Before tax reform	After tax reform	Entire	Before tax reform	After tax reform
Alpha	-6.188***	-6.398***	-10.701***	-9.440***	-12.087***	-13.258***
Explanatory Var.						
Leverage	0.746***	0.066**	1.008***	0.738***	-0.027	1.153***
Ownership	-0.562***	-0.305***	-0.083	1.020***	2.367***	0.463***
Growth Opp.	-0.065***	-0.083***	-0.080***	-0.191***	-0.260***	-0.212***
Control Var.						
Firm size	0.260***	0.312***	0.456***	0.441***	0.645***	0.623***
Ret. Earn/Equity	0.000	0.001	0.001	0.000	0.002	0.001
ROA	4.834***	7.773***	3.893***	5.040***	7.888***	4.509***
Cash holdings	1.285***	2.012***	1.646***	1.434***	2.453***	1.667***
Dummy list. status	-20.514	-20.766	-20.312	-3.466***	-3.843***	-20.326
Industry Dummies	Yes	Yes	Yes	Yes	Yes	Yes
Pseudo R^2 (in percent)	*21.1*	*38.3*	*17.2*	*26*	*45.2*	*23.3*

Table 6–A6 2SLS regressions – Majority and Minority samples for the leverage equation

Table 6-A6 presents the coefficients obtained from the leverage equation obtained from the 2SLS regression model. The regression is run on 4 minority and 4 majority samples. The first 4 columns use the basis sample containing all firms, while the 4 last columns are run on the basis sample that only includes dividend paying firms. The specified samples used are displayed in the next row. This is elaborated more under section 4. The variables used are defined under section 5. Only unstandardized coefficients are presented in the table. T-values are presented in parentheses.

***, **, * indicate significance at the 1 %, 5 % and 10 % level respectively.

	Basis sample				Basis sample D1			
Leverage Equation	Majority before tax	Majority after tax	Minority before tax	Minority after tax	Majority before tax	Majority after tax	Minority before tax	Minority after tax
Constant	0.746*** (60.578)	0.048 (1.587)	0.314*** (16.820)	-0.271*** (-5.432)	0.818*** (20.467)	0.248*** (8.232)	0.445*** (16.369)	0.924*** (6.430)
Dividend	-0.221*** (-35.644)	-2.096*** (-37.883)	-0.324*** (-35.855)	-2.489*** (-26.592)	-0.480*** (-10.605)	0.151*** (4.690)	-0.070** (-2.555)	-0.382*** (-3.738)
Fixed to total assets	-0.079*** (-17.281)	-0.113*** (-10.959)	-0.154*** (-24.208)	-0.258*** (-14.622)	-0.072*** (-9.219)	-0.054*** (-5.958)	-0.076*** (-12.462)	-0.156*** (-6.833)
Listing status	-0.535*** (-3.344)	-0.542 (-1.644)	-0.555*** (-8.233)	-0.705*** (-6.891)	Constant -	Constant -	-0.198 (-1.500)	Constant -
Ownership	0.003 (0.612)	0.009 (0.752)	0.379*** (28.882)	0.233*** (8.054)	0.068*** (7.821)	-0.025*** (-2.780)	0.183*** (12.682)	0.128*** (4.119)
Growth opportunities	0.015*** (40.744)	0.028*** (30.233)	0.008*** (16.636)	0.016*** (8.546)	0.014*** (17.541)	0.017*** (20.185)	0.017*** (20.488)	0.041*** (10.305)
Firm size	0.005*** (6.922)	0.051*** (24.498)	0.030*** (23.695)	0.077*** (20.896)	0.018*** (12.427)	0.023*** (16.065)	0.018*** (15.151)	-0.007 (-1.353)
Retained earnings to equity	0.000*** (4.071)	0.000 (1.546)	0.001*** (4.640)	0.000** (2.185)	-0.156*** (-18.750)	-0.098*** (-6.941)	-0.142*** (-15.099)	-0.011*** (-3.384)
ROA	-0.002 (-0.479)	0.025*** (3.241)	-0.025*** (-8.019)	0.063*** (3.966)	0.490*** (18.816)	0.139*** (7.400)	0.335*** (21.988)	0.365*** (8.556)
Industry dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R square (in percent)	*4.9*	*3.6*	*6.1*	*3.3*	*4.9*	*20.5*	*15.2*	*6.9*

Table 6–A7 OLS regression - Dividend payout ratio as dependent - MINORITY PART YEAR BY YEAR

Table 6–A7 presents the coefficients obtained from the OLS regression models. The dependent variable is dividend payout ratio. The variables used are defined under section 5. The regressions displayed in this table are run on the minority sample year by year with only dividend paying firms. This is elaborated more under section 4. Only unstandardized coefficients are presented in the table. T-values are presented in parentheses. ***, **, * indicate significance at the 1 %, 5 % and 10 % level respectively.

	Minority 2000	Minority 2001	Minority 2002	Minority 2003	Minority 2004	Minority 2005	Minority 2006	Minority 2007	Minority 2008
Alpha	0.589*** (6.943)	0.292*** (2.729)	0.300*** (2.772)	0.361*** (4.112)	0.667*** (7.787)	0.477*** (3.010)	0.904*** (8.573)	0.937*** (4.932)	0.460*** (3.578)
Explanatory variables									
Leverage	0.547*** (20.129)	0.595*** (16.604)	0.548*** (14.417)	0.425*** (14.717)	0.278*** (9.421)	0.580*** (10.963)	0.922*** (26.572)	0.812*** (14.426)	0.677*** (16.185)
Ownership	0.236*** (4.544)	0.291*** (4.467)	0.343*** (5.088)	0.289*** (5.723)	0.055 (1.093)	0.246*** (2.612)	0.001 (0.016)	-0.130 (-1.369)	0.145** (2.083)
Growth Opportunities	-0.002 (-0.434)	-0.014*** (-3.264)	-0.020*** (-4.347)	-0.011*** (-3.069)	-0.008** (-2.267)	0.000 (-0.116)	0.006 (1.374)	-0.003 (-0.405)	0.011* (1.773)
Control Variables									
Firm size	-0.022*** (-4.427)	0.000 (-0.004)	0.009 (1.374)	0.013** (2.499)	0.010* (1.883)	-0.025*** (-2.826)	-0.057*** (-9.440)	-0.038*** (-3.305)	-0.015* (-1.938)
Retained earnings to equity	-0.116*** (-7.307)	-0.141*** (-5.118)	-0.201*** (-7.981)	-0.211*** (-12.021)	-0.203*** (-11.954)	-0.014*** (-4.402)	-0.032*** (-5.007)	-0.225*** (-5.581)	-0.285*** (-8.943)
ROA	0.058 (1.175)	0.319*** (5.282)	0.388*** (5.870)	0.019 (0.405)	0.026 (0.576)	0.084 (1.069)	0.072 (1.378)	-0.122 (-1.361)	0.202*** (3.099)
Cash holdings	0.233*** (8.940)	0.239*** (7.724)	0.163*** (5.094)	0.170*** (6.885)	0.120*** (4.917)	0.213*** (4.612)	0.161*** (6.791)	0.220*** (4.567)	0.194*** (5.311)
Dummy listing status	Constant	-0.337 (-0.786)	Constant	Constant	-0.502 (-1.265)	Constant	Constant	Constant	Constant
Industry Dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R^2 (in percent)	*11.6*	*10.4*	*9.6*	*4*	*3.7*	*17.5*	*23.3*	*29.7*	*20*

Table 6–A8 OLS regressions - Dividend payout ratio as dependent - MAJORITY PART YEAR BY YEAR

Table 6–A8 presents the coefficients obtained from the OLS regression models. The dependent variable is dividend payout ratio. The variables used are defined under section 5. Dummy listing status was constant in every sample, implying that there are only nonlisted firms in these samples**.** The regressions displayed in this table are run on the majority sample year by year with only dividend paying firms. This is elaborated more under section 4. Only unstandardized coefficients are presented in the table. T-values are presented in parentheses.

***, **, * indicate significance at the 1 %, 5 % and 10 % level respectively.

	Majority 2000	Majority 2001	Majority 2002	Majority 2003	Majority 2004	Majority 2005	Majority 2006	Majority 2007	Majority 2008
Alpha	0.444*** (6.901)	0.395*** (4.968)	0.247*** (2.879)	0.691*** (10.273)	0.396*** (5.900)	-0.332*** (-2.741)	0.373*** (4.791)	0.347** (2.403)	0.203* (1.876)
Independent variables									
Leverage	0.547*** (23.964)	0.448*** (15.410)	0.482*** (14.961)	0.357*** (14.419)	0.269*** (10.602)	0.593*** (13.432)	0.816*** (27.951)	0.942*** (17.778)	0.770*** (17.826)
Ownership	0.063*** (2.681)	0.055* (1.930)	0.048 (1.541)	0.038 (1.596)	0.014 (0.616)	0.173*** (3.751)	0.078*** (2.750)	0.043 (0.875)	0.050 (1.159)
Growth Opportunities	-0.005** (-2.347)	-0.012*** (-4.197)	-0.004 (-1.206)	-0.006*** (-2.833)	-0.008*** (-3.232)	-0.023*** (-5.916)	-0.011*** (-4.094)	-0.018*** (-3.473)	-0.008* (-1.899)
Control Variables									
Firm size	-0.013*** (-3.189)	0.010* (1.943)	0.014*** (2.668)	-0.005 (-1.224)	0.026*** (6.266)	0.037*** (5.555)	-0.008 (-1.637)	-0.008 -0.872)	0.001 (0.183)
Retained earnings to equity	-0.085*** (-6.256)	-0.205*** (-9.705)	-0.125*** (-8.091)	-0.019** (-2.548)	-0.156*** (-10.753)	-0.244*** (-10.310)	-0.350*** (-18.138)	-0.299*** (-7.833)	-0.220*** (-7.107)
ROA	0.232*** (5.978)	0.418*** (8.004)	0.543*** (10.139)	0.094** (2.294)	0.082** (2.231)	0.339*** (4.744)	0.138*** (3.021)	-0.068 (-0.837)	0.218*** (3.412)
Cash holdings	0.191*** (9.059)	0.222*** (8.735)	0.192*** (7.063)	0.156*** (7.566)	0.157*** (7.869)	0.138*** (3.427)	0.203*** (8.103)	0.236*** (5.357)	0.162*** (4.601)
Industry Dummies	yes	Yes	yes	yes	yes	yes	yes	yes	yes
R^2 (in percent)	*14.7*	*12.5*	*12*	*9.2*	*4.6*	*20.2*	*23.4*	*27.3*	*25.2*

Table 6–A9 Logit Regression – Dummy dividend as dependent

Table 6–A9 presents the β coefficients obtained from the logit regression model run on the minority samples that are split year by year. This is elaborated more under section 4. The dependent variable is Dummy Dividend. The variables used are defined under section 5. ***, **, * indicate significance at the 1 %, 5 % and 10 % level respectively.

	Minority 2000	Minority 2001	Minority 2002	Minority 2003	Minority 2004	Minority 2005	Minority 2006	Minority 2007	Minority 2008
Alpha	-11.526***	-11.839***	-11.599***	-13.063***	-11.957***	-16.837***	-15.957***	-10.910***	-12.026***
Explanatory variables									
Leverage	-0.244***	-0.419***	-0.237**	0.068	-0.024	2.013***	1.613***	0.535***	0.664***
Ownership	1.741***	2.167***	2.203***	2.696***	3.175***	0.324	0.450**	0.592*	0.194
Growth Opportunities	-0.305***	-0.220***	-0.258***	-0.250***	-0.259***	-0.251***	-0.245***	-0.155***	-0.212***
Control Variables									
Firm size	0.637***	0.640***	0.625***	0.678***	0.625***	0.776***	0.784***	0.453***	0.552***
Retained earnings to equity	0.004	0.006	0.002	-0.001	0.003	0.001	0.000	0.005	0.000
ROA	5.808***	4.776***	8.115***	11.057***	10.869***	4.433***	6.074***	3.730***	4.796***
Cash holdings	2.300***	2.766***	2.491***	2.394***	2.249***	1.868***	2.161***	1.262***	1.660***
Dummy listing status	-23.017	-1.828	-21.554	-21.130	-4.077***	-20.937	-20.856	-18.867	-20.534
Industry Dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Pseudo R^2 (in percent)	*36.7*	*36.4*	*46.7*	*53.7*	*54.3*	*22*	*35.7*	*14.7*	*25.3*

Table 6–A10 Logit Regression – Dummy dividend as dependent

Table 6–A10 presents the β coefficients obtained from the logit regression model run on the majority samples that are split year by year. This is elaborated more under section 4. The dependent variable is Dummy Dividend. The variables used are defined under section 5. ***, **, * indicate significance at the 1 %, 5 % and 10 % level respectively.

	Majority 2000	Majority 2001	Majority 2002	Majority 2003	Majority 2004	Majority 2005	Majority 2006	Majority 2007	Majority 2008
Alpha	-6.222***	-7.361***	-6.679***	-6.220***	-5.443***	-14.970***	-11.694***	-8.996***	-9.438***
Explanatory variables									
Leverage	-0.387***	-0.383***	-0.046	0.122*	0.447***	1.520***	1.422***	0.602***	0.384***
Ownership	-0.164**	-0.273***	-0.472***	-0.323***	-0.462***	0.684***	-0.243**	-0.420***	-0.044
Growth Opportunities	-0.051***	-0.103***	-0.092***	-0.069***	-0.095***	-0.145***	-0.107***	-0.009	-0.020**
Control Variables									
Firm size	0.297***	0.383***	0.327***	0.289***	0.263***	0.646***	0.526***	0.290***	0.371***
Retained earnings to equity	0.008**	0.013**	0.000	0.000	0.000	0.000	0.000	0.001	0.004
ROA	5.198***	7.827***	7.451***	10.510***	8.582***	2.929***	5.648***	3.317***	4.288***
Cash holdings	1.749***	1.940***	1.998***	1.992***	2.288***	1.917***	1.773***	1.625***	1.486***
Dummy listing status	-21.131	-20.931	constant	constant	constant	-20.916	-21.020	constant	-17.814
Industry Dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Pseudo R^2 (in percent)	*26.7*	*38.8*	*38.7*	*47.4*	*42.5*	*17.4*	*26.9*	*11.1*	*18.9*

Student ID:

Preliminary Thesis Report

"Debt Capacity and Payout Policy"

Supervisor:

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1. Introduction

Debt capacity and payout policy have often been presented as two separate topics, but little has been done on the relation between the two of them. The relationship between capital structure and dividend policy is interesting because the topic connects many important theories of corporate finance and allows us to test several hypotheses.

We will in this paper investigate the relationship between debt capacity and payout policy in the case of private non-listed Norwegian firms, which represents a new angle of research. Most importantly on the following issue; “The ways in which private firms try to attract potential lenders by using their payout policy and whether the degree of “debt dependence” of various private firms influence their payout policy”.

A potential contribution of studying this topic will be a greater understanding of the dynamics of payout policies in relation to capital structure, in terms of private non-listed Norwegian firms. In addition, the results of our study may indicate the potential importance of ownership structure.

The outline of the rest of the paper is as follows: first we go through a literature review of different theories made around debt capacity and payout policy. There exist a large amount of different theories concerning these topics, but only the most relevant theories will be elaborated. The most relevant theories are; signalling theory, pecking order theory and agency problems. Further the hypotheses and methodology will be presented followed by an explanation of the data.

2. Literature review

The modern corporate finance literature is based on the theorem of Modigliani and Miller (1958). According to Modigliani and Miller, (1958) leverage and payout policy should be irrelevant for the firm value. There exists a large amount of literature on this topic which implies the opposite. "MM has not been seen to be a very good description of the reality, thus much of the research agenda in corporate finance over the last forty years has been concerned with trying to find "what's missing in MM""[18]. Nevertheless the Modigliani and Miller theorem is the foundation of later work on payout policy and capital structure.

There exist several theories around payout policy and capital structure. The most relevant theories are presented below; signalling theory, pecking order theory and agency problems.

2.1 Signalling theory

Amongst signalling models the most known are developed by Bhattacharya (1979), Miller and Rock (1985) and John and Williams (1985). Signalling theory in general implies that signalling to equity investors through dividends give an indication of the firm's value, with the assumption of asymmetric information. In signalling models the firms are fully equity financed and the models predict that typically a high dividend or a rise in dividend signals good future prospects for the firm. The idea of these models is to explain the purpose of paying a larger part of their earnings as dividends which actually is more costly. An element to have in mind is if a high dividend policy actually is a reflection of a high firm value. A high payout in dividend may also for instance be a result of limited growth opportunities and the firm might just function as a cash cow. According to Allen and Michaely (2002) the dividend contains two separate elements of information; an increase in dividend might imply that the firms risk has decreased, but on the other hand profits might decline.

[18] Hart (2001,1080)

So why are dividend payouts such a desirable characteristic? An explanation is that news about reduced risk is more important than the reduction in profitability. A risk averse investor is more concerned about the potential downside risk involved in the investment, than a possible decrease in payout.

Bhattacharya (1979) developed a signalling model and explained why firms in spite of the tax disadvantage still choose to pay dividends. "The major signalling costs that lead dividends to function as signals arise because dividends are taxed at the ordinary income tax rate, whereas capital gains are taxed at a lower rate".[19] As Allen and Michaely (2002) explain the Miller and Rock theory: "The basic story, that firms shave investment to make dividends higher and signal high earnings, is entirely plausible".

In the case of private non-listed firms, the theory might seem less relevant because these firms do not issue equity that often. On the other hand, the few times ownership does change in these firms it is a large change, and high dividend might be used as signalling right before that change.

Signalling also relates to other studies that investigate signalling with proportion of debt in the capital structure, which implies information asymmetries.

Regarding signalling theory it is important to investigate if the firms use signalling at all, when analyzing the data, ownership changes in the firms must be taken into account to investigate possible changes in the payout policy. If they use signalling, how does it depend on which kind of capital structure they want? Do they want to signal attractive dividends to new equity holders or do they want to signal more restrictive payout policy to attract lenders.

[19] Bhattacharya, Sudipto (1979, 259)

2.2 Pecking Order Theory

Myers and Majluf (1984) developed a model that could explain a tendency in corporate financing behaviour to rely on internal sources of funds and to prefer debt to equity when external financing is necessary. The pecking order theory relates to the capital structure of the firm and the order of financing, with the assumption of asymmetric information between the firm and external investors. Own funds will be used first, followed by debt and at last equity. As Mjøs (2008) writes in his article, the pecking order theory has in recent years been further developed. For instance Halov and Heider (2004) developed the theory to also concern risk. "They find that firms prefer to issue equity when risk matters relatively more and debt otherwise"[20]

A rival to the pecking order theory is the static trade-off theory which was introduced by Kraus and Litzenberger (1973). This theory uses the impact of taxes on the capital structure as a starting point. They argue that the capital structure is determined on the basis of balancing the benefits and the costs of debt. The benefits of tax savings by having debt need to be balanced with the higher probability of bankruptcy cost that comes from having high debt. This indicates that the optimal debt-equity ratio should be higher when the tax advantages of debt increases.

This pecking order theory is even more credible for private non-listed firms since there is a greater asymmetric information problem present. For private firms, debt is the most important source of external capital. Since this is expensive, it may lead to lower dividends. In addition debt holders also want to prevent excessive dividend payouts.

[20] Mjøs, Aksel (2008, 5)

2.3 Agency Problems

Another part of capital structure studies concerns the agency problems that arise due to conflict of interest. Jensen and Meckling (1976) initiated this research. Milton and Raviv (1991) give an overview of this research and explain how Jensen and Meckling derive two types of agency conflicts. "Jensen and Meckling argue that an optimal capital structure can be obtained by trading of the agency cost of debt against the benefit of debt."[21]

The first type outlined by Jensen and Meckling is the conflict between equity/shareholders and managers. This principal - agent conflict occurs due to the possibility of the manager to follow a personal agenda instead of maximizing firm value and increase equityholders wealth, by this creating firm inefficiency. "No investor is willing to hold outside equity when management has the ability to divert cash flows as private benefits and when managerial manipulation of cash flow is costly to verify". [22]According to Stulz (1990) managers may choose to invest even though there does not exist any positive net present value projects. The firm can solve this problem by an increase in leverage or by paying high dividends, which in terms will reduce free cash flow. An aspect of this is outlined in Jensen's free cash flow hypothesis which indicates that firms will prefer higher debt and thereby lower their free cash flow. This limits the cash available for the manager and thereby limits the possibility for investing in non-profitable investment projects and perks. In contrast, Meyers (1977) states the hypothesis that too much debt might lead to underinvestment in positive net present value projects.

The second type of conflict outlined is between the debtholders and equityholders. This conflict arises because of their attitude towards risk. Equityholders want to invest in very risky projects were the profit is potentially large. This is because they will capture the gain earned above the face value of the debt (the firms liabilities must be paid first) and will therefore benefit from large profits.

[21] Milton and Raviv (1991, 301)
[22] Fluck, Zsuzsanna (1998,404)

In the case when investments fail, the debtholders bear the consequences. For the equityholders the upside risk more than offsets the downside risk. Another kind of issue between the different parties arise from equityholders reputational considerations trying to attract potential lenders, either by avoiding default investments or by having a good history of repaying debt.

The agency problem between managers and equityholders is less relevant for non-listed firms because they usually have quite concentrated ownership and shareholders take an active managing role. More relevant is the agency problem between debt holders and equityholders. While debtholders do not want high dividend payouts, equityholders want this. Covenants often exist in debt contracts to limit the dividend payouts.

3. Hypotheses and methodology

In terms of methodology, the main issue is endogeneity. The methods that accounts for this are 2SLS, and panel data methods which we will also most likely use.

In the following, 8 hypotheses will be presented. We will give a background for each hypothesis and follow this by the testable implications and finally the hypothesis is stated.

Hypothesis 1

Debt, mainly bank debt, is the most important source of external financing for private firms, thus private firms are debt dependent. Lenders want to avoid too high dividend payouts to secure their position. Therefore, firms with a high debt/equity ratio are most likely to have lower dividend payouts.

The testable implication is if we can observe high or above average leverage, then we can see if this results in lower payouts.

H1: Do companies with a high debt to equity ratio pay smaller dividends than firms with a lower debt to equity ratio?

Hypothesis 2

In signalling models the firms have only equity in their capital structure. These models imply that high dividends are a sign of good firm performance. Our data also consist of leveraged firms and thereby the signalling effect becomes more complex.

As a proxy for firm performance, we use return on assets (ROA) and return on equity (ROE). When leverage increases, ROE should go up. If leverage is added to the capital structure, this can be good news for two reasons. The first reason is that it can be good news for all parties, implying that the firm performance generally is better; in this case we will observe an increase in both ROE and ROA. The other reason is that it is simply a transfer of funds to shareholders through dividends, only in benefit to them. In this case ROE will go up and ROA will go down. We can on the basis of this construct the hypothesis below. In addition it could be interesting to investigate if shareholders benefit over debtholders?

H2: Do changes in payout policy predict changes in firm performance?

This hypothesis might represent a contradictory reasoning compared to the first hypothesis. If the firms are debt dependent, they have less possibilities and incentives to make lenders worse off than shareholders.

Hypothesis 3

Based on traditional signalling papers when there are large information asymmetries, firms should use dividend as a signal to the uninformed shareholders. In the case of private firms, there are often close ownership, like for instance families. The use of signalling becomes less relevant here.
In this case, all the shareholders have access to all necessary information and funds.

When the ownership change and/or there is an issue of new equity, there will be a potential higher information asymmetry problem indicating a more relevant use of signalling. Especially dealing with nonlisted firms the information asymmetry might be large because the firms are usually not well known companies.

The following hypothesis can be derived from this;

H3: Have dividend payouts been abnormally high prior to change in ownership structure and the issuing of new equity?

Hypotheses 4 and 5

The existing literature suggests that firms with high earnings should pay out higher dividends to avoid agency problems. Agency problems are often divided between two groups. The first group, hereby called A1, is the conflict between managers and shareholders. The other group, hereby called A2, concerns the conflict between the majority and minority of shareholders. The agency problems of the two groups evolve in relation to the ownership concentration. A1 has the largest degree of agency problems with the most dispersed ownership. When the main shareholder controls around 50 %, A1 falls close to 0. Concerning A2 the agency problems is relatively small up to 50 %, its peaks at 50 % + 1. After this it decreases and tends towards 0 at 100 % ownership concentration. If we have agency problems, does it imply low or high dividends? We have the two following scenarios. First, the *outcome scenario* leads to low dividend for both A1 and A2. The second is the *substitution scenario*. For A1 as a manager you care about your career and reputation, this implies paying high dividend. The same is the case for A2; the majority of the shareholders will have high dividends to create a good reputation for possible future equity investors.

To test for this in our data, we can split the sample in two. The first sample contains firms that do not have any controlling shareholder, thus have dispersed ownership. This part will have A1 as the relevant agency problem and we have now data to test the implications of A1. For this sample it will be easier to get debt financing given the dispersion of ownership. The second sample contains the firm that has a dominant shareholder.

We have then removed the problem of A1 and can therefore test for A2. A1 is not relevant here, because managers can be controlled or easily fired. For this sample it is important to control for leverage, given that banks might be worried about the controlling shareholder, hence be worried about the payout policy.

We have the following hypotheses. The first hypothesis implies a test of A1 using the first sample and the second hypothesis is a test of A2 using the second sample;

H4: Does more dispersed ownership in the firm lead to lower dividends?

H5: Does having a dominant shareholder lead to lower dividend? How does this interact with leverage?

Hypotheses 6, 7 and 8

Concerning growth opportunities, existing literature has looked at dividend and growth opportunities and debt and growth opportunities as separate matters. If growth opportunities are high, one should observe low leverage and low dividends. Low growth opportunities, implies high leverage and high dividends. We would in addition also like to investigate the link between them. It will be interesting to see if we find dividends and leverage to be supplements or complements.

To investigate these matters we need a proxy for growth opportunities. Normally the preferred proxy would be Tobin's Q, but we are dealing with book values and not market values and are therefore prevented from using this. This also applies to investment costs specified by R&D as a proxy. We therefore use lagged sales to assets as a proxy for growth opportunities. It is important to adjust this to the specific industry.

From this topic we have derived the following three hypotheses;

H6: Is there a relationship between dividend and growth opportunities?

H7: Is there a relationship between leverage and growth opportunities?

H8: Are dividend and leverage supplements or complements?

4. Data

In the study of this topic we will use data on non-listed private Norwegian firms from the CCGR database. The data spans from 1994 to 2007. By using this database we have access to a big dataset consisting of not only listed but also non-listed firms, which is quite rare. We can in addition proxy for ownership. We have in this database data on family ownership. The data are reliable since Norwegian firms must be audited by law.

We will use the following proxies.

- Dividend payout proxies;
    - Dividend to earnings
    - Dividend to cash flow
- Leverage proxy;
    - Short and long term debt as a share of total assets
- Firm performance proxies;
    - Return on assets (ROA)
    - Return on equity (ROE)
- Ownership proxies;
    - Share of largest owner
    - Share of largest family
    - Share of the CEO
- Growth opportunity proxy;
    - Sales to assets

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