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# The effect of the 2006 tax reform on the companies' capital structure

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# Abstract

This paper investigates the interrelationship between leverage and ownership concentration in the case of Norwegian non-listed firms while considering the effects of the 2006 Norwegian tax reform. This paper finds that the tax reform had a negative impact on leverage and a positive impact on ownership concentration. In addition, there is a bidirectional positive relationship between leverage and ownership concentration and the effect of leverage on ownership concentration is bigger than the effect of ownership concentration on leverage. The positive sign of this relationship can be explained through the role that the firm control may play in deciding the financing policy: firms may prefer to issue debt instead of equity if issuing equity means sharing or losing control. Leverage is positively related with tangibility and firm size and negatively related with profitability. Ownership concentration is positively related with profitability and tangibility and negatively related with firm size.

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# 1. Introduction

This paper aims to analyze the interrelationship between leverage and ownership concentration while taking into account the effects of the 2006 Norwegian tax reform. This study considers a sample of Norwegian non-listed firms which was extracted from the CCGR database at BI Norwegian Business School.

Following the view of Jensen, Solberg and Zorn (1992), this paper considers that leverage and ownership concentration are "related both directly and indirectly through their relationship with the characteristics of firms". Thus, leverage and ownership concentration are assumed to be endogenous variables while tangibility, profitability, firm size, growth opportunities and industry sector are assumed to be exogenous variables. Although their findings concluded that the leverage, dividend and insider ownership policies are interdependent, this paper focuses only on the leverage and ownership policies because the dividend policy has been thoroughly studied before.

Since the tax reform was announced in advance and some transitionary rules were implemented even from 2004, the reactions of the firms were observed starting with 2005: leverage decreased while ownership concentration increased.

The decrease in leverage can be explained by the fact that since the cost of dividends increased, shareholders decided to retain earnings rather than distribute them as dividends. This led to an increase in equity and consequently a decrease in leverage.

The increase in ownership concentration can be explained by the fact that the tax reform abolished the split model (delingsmodell) which involved an additional tax for the firms with active shareholders owning more than 2/3 of the firm.

This paper is structured as follows: chapter 2 presents a review of the capital structure literature, chapter 3 describes the 1992 and 2006 Norwegian tax reforms,

chapter 4 presents information about the samples and the variables used, as well as descriptive statistics, chapter 5 presents the research methodology and its results while chapter 6 presents the conclusion of this paper.

# 2. Literature review

The modern theory of capital structure started with the famous article of Modigliani and Miller (1958). Assuming perfect capital markets, Modigliani and Miller (1958) demonstrated that in the absence of bankruptcy costs and tax subsidies on interest payments, the market value of the firm is independent of its capital structure. They later (1963) showed that the existence of tax subsidies on interest payments would increase the total value of the firm by an amount equal with the market value of debt times the corporate tax rate. Since the firm value increases with the amount of debt, the firm should theoretically use as much debt finance as possible. However, in the real world, firms do not use 100% debt finance because of the cost of financial distress. Therefore, the leverage lowers tax payments and increases the cost of equity as a result of the cost of financial distress.

Following the categories of determinants of capital structure identified by Harris and Raviv (1991), this chapter will be divided in three parts: agency theory (models based on agency costs), pecking order theory (models using asymmetric information) and trade-off theory.

## 2.1 Agency theory

The agency theory of capital structure states that the "capital structure is determined by agency costs, meaning costs due to conflicts of interest" (Harris and Raviv 1991). It was first suggested by Jensen and Meckling (1976) building on earlier work of Fama and Miller (1972).

Jensen and Meckling analyzed the agency costs generated by two types of conflicts of interest: conflicts between the shareholders and managers and conflicts between shareholders and debtholders. They believe that the existence of agency costs provides stronger reasons for arguing that "the probability distribution of future cash flows is not independent of the capital structure".

Conflicts between shareholders and managers arise because managers "do not capture the entire gain from their profit enhancement activities, but they do bear the entire cost of these activities" (Harris and Raviv 1991). The agency costs generated by this type of conflict are defined as the sum of: the monitoring expenditures by the principal (shareholders), the bonding expenditures by the agent (managers) and the residual loss.

Let's consider a company that is 100% owned by the manager. If some potentially profitable investment opportunities appear and he does not have enough wealth in order to exploit them, he must obtain outside financing. This means that he will reduce his ownership in the company while also incurring agency costs generated by the conflict between him and the new shareholders. The lower his ownership fraction, the lower is his incentive to devote significant effort to profit enhancement activities, but the larger are the agency costs he incurs. Because the agency costs are borne entirely by the original owner (manager), he has the incentive to minimize them. However, if the investments requiring outside financing are sufficiently profitable, his welfare will continue to increase despite the agency costs he incurs (Jensen and Meckling 1976).

Therefore, the agency conflict between the owner-manager and the outside shareholders derives from "the manager's tendency to appropriate perquisites out of the company's resources for his own consumption" (Jensen and Meckling 1976). The appropriation of perquisites can be limited if the manager holds a high equity stake in the company because his objective is aligned with those of the shareholders. This type of conflict can also be mitigated by debt financing because "increasing debt reduces the amount of free cash available to managers to

consume perquisites while increases the manager's share of the equity" (Harris and Raviv 1991).

Conflicts between shareholders and debtholders arise because "the debt contract gives shareholders an incentive to invest in very risky projects even if they have negative NPV" so that debtholders bear most of the consequences in case the investment fails while shareholders capture most of the gains in case the investment succeeds. However, the shareholders bear the cost of this incentive if the debtholders correctly anticipate their future behavior. This is an agency cost of debt financing called the "asset substitution effect" (Harris and Raviv 1991).

The tax subsidy on interest payments provides an incentive to use debt to the point where the marginal wealth benefits of the tax subsidy are just equal to the marginal wealth effects of the agency costs associated with debt (Jensen and Meckling 1976).
However, debt doesn't completely dominate the firms' capital structures because of the agency costs associated with the existence of debt claims on the firms. The agency costs of debt consist of: the incentive effects associated with highly leveraged companies (asset substitution effect), the monitoring and bonding costs by the bondholders and the owner-manager, the bankruptcy and reorganization costs (Jensen and Meckling 1976).

Therefore, Jensen and Meckling state that the optimal capital structure can be obtained by trading off the agency costs of debt against the benefits of debt. This view is also shared by Stulz (1990) who also analyzes the conflicts between shareholders and managers.

In a world with asymmetric information and where managers value investment more than shareholders do, the extent to which managers are able to pursue their own self-interest leads to the creation of two agency costs: the overinvestment cost (managers invest too much so that the firm invests even in negative NPV projects) and the underinvestment cost (managers invest too little so that the firm

does not take advantage of all the positive NPV investment opportunities) (Stulz 1990).

Stulz's analysis shows that the firm's debt-equity ratio depends on the probability distribution of cash flow and on the firm's investment opportunities.
If a firm has negative expected FCF and poor investment opportunities, the shareholders may want the firm to issue debt so that the management is forced to pay out the firm's debt obligations and therefore reduce the amount of FCF available for investments. This reduces the overinvestment cost, but increases the underinvestment cost.
If a firm has positive expected FCF and good investment opportunities, the shareholders may want the firm to raise more funds by issuing equity in order to take advantage of all the positive NPV investment opportunities. This reduces the underinvestment cost, but increases the overinvestment cost.
Therefore, by influencing the amount of resources under management's control, financing policy can reduce one of these agency costs, but not both (Stulz 1990).

Fluck (1999) also analyzes the distribution of equity ownership between entrenched insiders (management) and dispersed outsiders when the management has the ability to manipulate cash flows and when the agency costs for the shareholders are big. When the ownership is dispersed, control challenges may succeed after repeated attempts and then the real cost of capital influences the shareholders' willingness to discipline management.

If the real cost of capital is low (shareholders are long-term oriented), the shareholders are willing to control management no matter the amount of the agency costs nor the time spent so that management tends to reduce its equity stake in the company by selling shares to dispersed outsiders. Because the probability of success does not affect the threat of control, the concentration of outside equity does not lead to improved managerial performance (Fluck 1999).

If the real cost of capital is high (shareholders are short-term oriented), the shareholders are less willing to control management if it is costly in the short run

so that management tends to increase its equity stake in the company. In this case, the probability of success increases the threat of control so that the concentration of outside equity leads to improved managerial performance and increased dividends (Fluck 1999). In addition, Fluck's analysis also shows that management is more likely to purchase shares in companies with dispersed outside ownership than in companies with concentrated outside ownership.

## 2.2 Pecking order theory

First proposed by Donaldson (1961) and later modified by Myers and Majluf (1984), the pecking order theory states that "capital structure will be driven by firms' desire to finance new investments, first internally, then with low-risk debt, and finally with equity only as a last resort". (Harris and Raviv 1991)

In a world without taxes, transaction costs or other capital market imperfections, Myers and Majluf developed an equilibrium model of the issue-invest decision which has the following assumptions:

- Asymmetric information which means that management knows more about the firm's value than potential investors.
- Management's objective is to act in the interest of passive, old stockholders (meaning to maximize the true or intrinsic value of the existing shares).

While from the first assumption it can be inferred that the potential investors (outsiders) need to analyze the managers' signals in order to figure out the firm value, from the second assumption it can be inferred that managers tend to issue equity when it is overvalued which implies that new issues will be interpreted as bad news and lead to the price decline of the existing shares. In addition, "the price drop will be larger, the larger is the informational asymmetry and the larger is the equity issue". On the other hand, "financing through internal funds or riskless debt will not convey information and will not result in any stock price reaction" (Harris and Raviv 1991). Therefore, external funds are more expensive

than internal funds. In conclusion, this model explains the companies' tendency to rely on internal sources of funds and to prefer debt to equity if external financing is required (Myers and Majluf 1984).

The authors use the concept of "financial slack" which means "cash, liquid assets or unused borrowing power" instead of internal sources of funds. They emphasize that "ample financial slack allows the company to avoid external financing and to disentangle investment decisions from conflicts of interest between old stockholders and new investors". Financial slack has value because a company with insufficient financial slack may not undertake all valuable investment opportunities as it may be unwillingly to issue stock to finance them (Myers and Majluf 1984).

In addition, the pecking order theory supports the negative relation between profitability and leverage. Considering the suggested financing sequence, a profitable company may have sufficient internal sources of funds to rely on so that it does not need to choose debt financing which is the next in line financing source. As a consequence, profitable companies may end up by having low leverage. On the other hand, less profitable companies may be forced to choose debt financing in case they do not have sufficient internal sources of funds.

## 2.3 Trade-off theory

Modigliani and Miller have shown that in complete and perfect capital markets the firm's market value is independent of its capital structure. Kraus and Litzenberger (1973) analyzed the effect of leverage on the firm's market value by introducing the following market imperfections: taxation of corporate profits and the existence of bankruptcy penalties into a single-period valuation model in a complete capital market. According to the authors, the optimization of the firm's capital structure involves "a tradeoff between the benefits of tax deductibility of interest rate costs and the bankruptcy penalties".

# 3. Norwegian tax reforms

## 3.1 Tax bases

The Norwegian income tax system operates with two income tax bases: ordinary income and personal income.

Ordinary income (alminnelig inntekt) is a net income tax base and it is calculated for all taxpayers, both companies and individuals. It includes all taxable income from work, business and capital. Tax allowances and reliefs are deductible in the computation of ordinary income. The most important of these are interest payments on debts and a basic tax allowance on wage and pension income. The latter does not, however, apply to wage income from self-employment. In addition to the basic tax allowance, travel expenses to and from work exceeding NOK 12800, trade union fees, gifts to voluntary organizations, documented expenses for child care etc. are deductible. (Ministry of Finance, The personal tax code)

Personal income (personinntekt) is a gross income tax base which consists of the total amount of gross wage and pension income. Social security contributions and surtax are levied on personal income. Wage income is a broad term that is defined as the sum of wages, income from self-employment that is related to labor input and fringe benefits such as company cars, free phone, free stock options etc. In general, all kinds of fringe benefits are regarded as personal income. (Ministry of Finance, The personal tax code)

## 3.2 1992 Tax Reform

In 1992 Norway implemented a broad tax reform whose main goal was to reduce tax-induced distortions to a minimum by lowering the tax rates and broadening the tax base. The reform also involved a significant step towards a more neutral tax system with respect to the type of economic activity and the organizational and financial structure of such activity. (Ministry of Finance)

The dual income tax introduced in 1992 was characterized by a low and flat tax rate on capital income and a progressive tax rate on personal income. The basic idea was to imply a neutral taxation on capital income and to ensure the redistribution of income through the progressive taxation of personal income and net wealth. The capital income earned by personal tax payers (as well as the one earned by corporate tax payers) was subject to a flat tax rate of 28 per cent. The difference in marginal tax rates on capital and labor income (including employers' social security contributions) started out at 28.1 percentage points in 1992, increasing to 36.7 percentage points in 2004.

The split model was to function as a bridge between these two parts of the tax system, by dividing the income from active owners and self employed into capital and labor income respectively. This split model implied that a part of the income earned by companies owned two-thirds or more by active shareholders, was taxed as personal income (which was subject to progressive tax rates), irrespective of whether this income was distributed as a dividend or not. However, since the 1992 reform, the split model has been changed several times with the result that it no longer functioned in a satisfactory manner.

To avoid double taxation, shareholders receiving dividends from Norwegian limited companies, were entitled to full credit for tax imposed on the dividends (the imputation method). Consequently dividends from Norwegian companies were in practice tax free on the hands of the shareholder, ensuring the same total taxation of 28 percent upon income earned in a limited company as on other capital income. On receiving dividend from a foreign limited company, a personal

shareholder was not entitled to a full imputation credit, only a tax credit in respect of foreign withholding tax.

The 1992 tax reform also introduced a system of annual adjustment of the cost base of the shares in Norwegian companies with the amount of retained taxed profit in the company, to avoid economic double taxation of retained earnings, called the RISK-system.

## 3.3 2006 Tax Reform

The Norwegian Parliament passed a major tax reform in 2006 which replaced the last major Norwegian tax reform from 1992. The main objective of the 2006 tax reform was to achieve a more efficient and fair tax system by solving the income shifting problem created by the large gap between labor and capital income taxation without violating the economic principles of the dual income tax. The maximum rate differential between capital income and labor income was 33.5 percentage points in 2005 and this led the owners of small companies to paying their salaries as dividends by reclassifying labor income as capital income. (Ministry of Finance 2005)

The challenge of the 2006 reform was to eliminate the gap in the marginal tax rates and abolish the split model without violating the tax neutrality of financing decisions, and without increasing the corporate income tax. The only realistic way to reduce the gap in the marginal tax rates was to combine a reduction in the marginal tax rates on labor with an introduction of a partial double taxation of dividends paid to individual shareholders (by eliminating the former imputation system). To maintain neutrality, the dividend tax was equipped with an allowance for the cost of capital (as well as ordinary loss deductions), the so called shareholder model. The same principle was introduced in the taxation of sole proprietors and partnerships. (Ministry of Finance 2011)

The main element of the 2006 tax reform was to replace the split model and the imputation system with the shareholder model.
Norwegian Individual Shareholders are taxable for capital gains on the realization of shares and have a corresponding right to deduct losses. Capital gains are taxed as ordinary income with a flat tax rate of 28%. Also, the dividends exceeding a risk-free return on the investment are taxed as ordinary income with a flat tax rate of 28%. Before the dividends distribution, the company has paid the ordinary 28% corporate tax on the operating profits, so the total maximum marginal tax rate is therefore 48.16 % (28% + (72 x 28%)) for distributed dividends. As a consequence, the gap between labor and capital income has been reduced as the income derived from labor and pensions is taxed progressively as personal income up to maximum 47.8% on salary. (Albert 2008)

Thus, the dividends that are not exceeding a risk-free return on the investment are subject only to the 28% corporate tax on the operating profits. If the dividends for one year are less than the calculated risk-free return on investment, the surplus tax free amount can be carried forward in order to be offset against dividends distributed in a later year or against any capital gain from the alienation of the same share. This risk-free return allowance was intended to prevent tax on dividends from raising the costs of funding Norwegian equity and it was regarded as particularly important for start-ups and small companies that cannot fund new investment with retained profits, or which have limited access to credit markets or international capital markets. (Report No. 11 to the Storting)

Norwegian Corporate Shareholders are not subject to tax on dividends and on capital gains derived from realization of shares in companies which are resident within the EEA, while losses suffered from such realization are not tax deductible. This method can be also applicable to investments in foreign countries outside the EEA only if the corporate shareholder holds at least 10% of the shares and voting rights for at least 2 years. (Albert 2008) As a consequence, the tax system has built in an important incentive when it comes to the type of business entity to choose. Therefore, an increased number of limited companies have been

established by private investors for the purpose of buying and selling shares without taxation through their private limited company.

In addition, the general tax treatment of interest income is that the lender is taxable for the received interests with a flat tax rate of 28 %, and the paid interests are deductible in ordinary income with the same amount for the borrower. But if an individual shareholder lends money to a limited company an additional tax is levied, more specifically another 28% on 72% of the received interest will be charged for tax purposes. The reason for this deduction of 28% is symmetry considerations towards tax on retained earnings. This means that interests received from a limited company are taxed with a total of 48.16% for amounts exceeding a risk-free return and the same as for distributed earnings. (Albert 2008) This additional tax charge comes as an addition to the ordinary taxation of the interest and thus 172% of the relevant part of the interest is taxed. (KPMG Tax Facts 2006) Appendix 1 presents a comparison between the two major tax reforms.

# 4. Data

## 4.1 Data sources and samples

The CCGR database was constructed by Pål Rydland from data delivered by CreditInform which specializes in credit ratings and buys data from the state agency (Brønnøysundregistrene). This database is extremely reliable because every limited liability company registered in Norway is legally obliged to publish the identity of its CEO, directors, owners and the fraction of equity held by every owner as well as to submit an annual report to the state agency each year.
The annual report consists of a profit and loss statement, a balance sheet, accompanying footnotes, a cash flow statement, the board of directors' report and the auditor's report.

The CCGR database covers the period 1994-2009 for accounting information and general firm information, whereas data on governance, founding year, auditor remarks, and credit ratings is available only for the period 2000-2009. It has about 240 items per firm per year across the accounting, governance and misc. categories and about 126 additional items reserved for consolidating accounting data.

When the sample data was extracted from the CCGR database, there have been applied some filters which select independent private firms with limited liability that have a positive number of employees and whose largest owner is not the state or international. The aim of the independency filter was to exclude the companies that were established with the purpose of avoiding taxes. Thus, the initial sample had a total number of 960159 observations across the time period 2000-2009. It represents a panel data since multiple firms are observed at multiple time periods.

In order to create a highly accurate sample, more filters were further applied. Firstly, 550211 observations remained in the sample after the firms that have negative or zero accounting statement items (for example: revenue, assets, dividends, liabilities, equity) were excluded. Secondly, after applying a filter which selects the firms that have the sum % of equity held by owner with rank 1 below and equal to 100% or the Herfindahl index below and equal to 1, the final data sample had a total number of 550093 observations across the time period 2000-2009. This final data sample will be further called Sample 1.

In order to conduct the desired tests, two new samples were created: Sample 2 and Sample 3. Although this may involve survival bias, Sample 2 includes only the firms which are present along the whole sample period meaning from 2000 to 2009 and Sample 3 includes only the firms which are present from 2000 to 2005. Thus, Sample 2 has a total of 136060 observations meaning 13606 firms observed during 10 years and Sample 3 has a total of 143394 observations meaning 23899 firms observed during 6 years. Sample 2 will be used for some additional tests performed in chapter 4 and for the first and third econometrical model, while sample 3 will be used for the second econometrical model.

## 4.2 Definitions of variables

The variables obtained from the CCGR database are presented in Appendix 2. Further on follows a description of the variables defined in this paper together with a motivation for the measures used for each variable.

**Leverage**

Leverage is measured by using the most common definition in previous research according to Frank and Goyal (2009):

*Leverage= Total Debt/ Total Assets*

Where:

Total Debt = current liabilities (item_109) + bonds + liabilities to financial institutions (long) + other long term liabilities (item_93_94_98)

Total Assets = Total Debt + Total equity (item_87)

Two traditional determinants of capital structure are: assets tangibility and firm size.

**Tangibility**

According to Harris and Raviv (1991), the available studies generally agree that leverage is positively related to fixed assets. Frank and Goyal (2009) also indicate that the tradeoff theory suggests that "a firm with more assets can pledge them in support of debt" while the pecking order theory "can predict both a negative and positive relation to leverage depending on the type of economic forces for which the collateral is viewed as a proxy".

Assets tangibility is a proxy for collateral value so that the greater the collateral value of a firm's assets, the more value the debtholder can recover in case of default (Jensen and Meckling 1976).

*Tangibility = Fixed assets (item_51) / Total assets*

**Firm size**

Firm size can be measured either as logarithm of sales or logarithm of assets. According to Frank and Goyal (2009), leverage is positively related to firm size as measured by log of sales. In addition, they state that "empirically log of sales is a better measure of firm size than is log of assets".

According to Demsetz and Lehn (1985), ownership concentration is negatively related to firm size as "larger firms realize a lower overall cost with a more diffuse ownership structure than do small firms".

Thus *Firm size = ln (sales).* Sales are represented by item_9.

**Profitability**

According to the pecking order theory, leverage is negatively related to profitability because a profitable company has enough internal funds so that it does not need to rely on debt. However, under the tradeoff theory discussed by Fama and French (2002), leverage is positively related to profitability.

According to Demsetz and Villalonga (2001), there is a negative relationship between ownership concentration and profitability. Ownership concentration may decrease as outside investors start to be interested in companies that have good results of operations.

*Profitability = Results of operations (item_19) / Total assets*

**Growth opportunities**

Usually high growth opportunities are specific to firms found at the beginning of their life-cycle. Since ownership concentration is high for these type of firms, it is predicted a positive relation between growth opportunities and ownership concentration. Because the sample includes only non-listed firms, growth opportunities are measured by Revenue/ Total assets.

*Growth opportunities = Revenue (item_9) / Total assets*

**Time**

*Time* is a dummy variable which records the effect of the 2006 Norwegian tax reform. It takes 1 if the firm observation is done after the tax reform and 0 otherwise. The observations belonging to the period 2005-2009 are considered after the tax reform.

**Industry**

According to Frank and Goyal (2009), industry effects should be considered when analyzing leverage since firms in a high leverage industry have higher leverage. This is also supported by the tradeoff theory which suggests that firms in the same industry face many common factors.

Since the considered period is from 2000 to 2009 and the NAIC industry codes changed in 2007, the new codes were transformed according to the old classification in order to have the same industry code classification across the sample. Then, the NAIC industry codes were used to classify the companies into industries according to the classification presented in Appendix 3. In order to avoid the dummy variable trap, 9 industry dummies will be used in order to classify the companies into 9 industry sectors while keeping 0 as the reference group for the companies that were not assigned any industry (Berzins, Bøhren and Rydland 2008). An industry dummy 9 records all the observations that have more than one industry assigned. The table below shows the distribution of firms across the industry sectors.

| Industry dummies | Sector name | Nb. of firms | Percentages |
|---|---|---|---|
| Reference group | Missing | 30730 | 5.6 |
| IND1 | Agriculture, forestry, fishing, mining | 10416 | 1.9 |
| IND 2 | Manufacturing, chemical products | 44985 | 8.2 |
| IND 3 | Energy | 2261 | .4 |
| IND 4 | Construction | 54127 | 9.8 |
| IND 5 | Service | 240716 | 43.8 |
| IND 6 | Financial | 5408 | 1.0 |
| IND 7 | Trade | 94821 | 17.2 |
| IND 8 | Transport | 46001 | 8.4 |
| IND 9 | Multisector | 20628 | 3.7 |
| Total | | 550093 | 100 |

**Ownership concentration**

Jensen and Meckling (1976) consider that the shareholders of a firm which has a concentrated ownership structure may prefer less debt if debt brings more monitoring. Therefore ownership concentration is expected to be negatively related with leverage so that the higher is the ownership concentration, the lower is the leverage.

The ownership concentration is measured by using variables based on ultimate (all-layers) ownership instead of direct (first-layer) ownership. La Porta, Lopez-de-Silanes and Shleifer (1999) were the first to introduce the concept of ultimate ownership which is the sum of direct and indirect equity holdings in a company held by the ultimate owner. The variable used to measure the ownership concentration is the sum % of equity held by the owner with rank 1.

*OwnershipConc = Sum % of equity held by owner with rank 1 / 100*

Firm control can play an important role in establishing the effect of ownership concentration on leverage. According to Céspedes, González and Molina (2010),

firms may prefer to issue debt instead of equity if issuing equity means sharing or losing control.

Consider a first example in which a firm has a 60% majority shareholder and a 40% minority shareholder and the second example in which a firm has a 60% majority shareholder and 5 minority shareholders each holding 8% of the firm. If the firm from the first example decides to issue equity, then the majority shareholder may lose the control of the firm and therefore he may prefer to issue debt. However, the majority shareholder from the second example does not lose the control of the firm if the firm decides to issue equity.
Therefore, the firm's incentive to issue debt instead of equity when the majority shareholder can lose the firm control in favor of minority shareholders can explain a positive relationship between ownership concentration and leverage.

**Herfindahl index**

According to Demsetz and Lehn (1985), the Herfindahl index of the firm's ownership structure is calculated as the sum of the squares of the equity fractions held by each shareholder in the firm. It reflects both the average size of the equity fractions and the inequality of equity fractions between shareholders. High levels of the Herfindahl index indicate high ownership concentration. Since leverage is negatively related to ownership concentration, it can be concluded that the higher is the Herfindahl index, the lower is the leverage. The Herfindahl index is used as an instrumental variable for the 2SLS approach.

## 4.3 Descriptive statistics

Firstly, there are presented the most important descriptive statistics (mean, median, standard deviation, minimum, maximum) for the main dependent variables: Leverage and Ownership concentration as well as for the Herfindahl index variable (Table 1).

**Table 1: Descriptive statistics for the main dependent variables and Herfindahl (Sample 1)**

| | Leverage | OwnershipConc | Herfindahl index |
|---|---|---|---|
| N | 550093 | 550093 | 550093 |
| Mean | .685882 | .697419 | .654692 |
| Median | .752427 | .660000 | .545000 |
| Std. Deviation | .2371081 | .2754877 | .3016452 |
| Minimum | .0000 | .0000 | .0000 |
| Maximum | 1.0000 | 1.0000 | 1.0000 |

The average leverage in the sample is quite high (68.58%). The average ownership concentration proxied by the fraction of equity held by owner with rank 1 (OwnershipConc) is also high 69.74%. Both averages are expected to be high because these are the typical features of non-listed firms. The Herfindahl index takes into account all the equity fractions held by all the shareholders in the firm so that its average (65.46%) is smaller than the OwnershipConc average.

Secondly, the Pearson's Correlation matrix shows that leverage and ownership concentration (OwnershipConc) are negatively correlated (Table 2). This finding is consistent with the theory suggested by Jensen and Meckling (1976).

**Table 2: Pearson's Correlation matrix (Sample 1)**

| | | Leverage | OwnershipConc |
|---|---|---|---|
| Leverage | Pearson Correlation<br>Sig. (1-tailed) | 1 | -.037**<br>.000 |
| OwnershipConc | Pearson Correlation<br>Sig. (1-tailed) | -.037**<br>.000 | 1 |

**Significant at 0.01% level.

In order to take account of the 2006 Norwegian tax reform, I divided Sample 1 in two samples: before the tax reform (2000-2004) and after the tax reform (2005-2009). Year 2005 belongs to the after the tax reform sample because the effects of the reform were noticed since 2005. Thus it has been created the dummy variable Time which takes the value 0 if the observation's year belongs to 2000-2004 and the value 1 if the observation's year belongs to 2005-2009. Table 3 shows the descriptive statistics for the before and after the tax reform samples including also the independent sample t tests for the means. Nonparametric independent samples median tests were also conducted.

**Table 3: Descriptive statistics for the before and after the tax reform sample**

| | Leverage | | OwnershipConc | | Herfindahl | |
|---|---|---|---|---|---|---|
| | Before | After | Before | After | Before | After |
| N | 267419 | 282674 | 267419 | 282674 | 267419 | 282674 |
| Mean | .728524 | .645541 | .677727 | .716047 | .630634 | .677453 |
| Median | .802682 | .697702 | .645500 | .700000 | .520000 | .557800 |
| Std.Deviation | .219668 | .245782 | .269957 | .279345 | .295225 | .305858 |
| Minimum | .0000 | .0000 | .0000 | .0000 | .0000 | .0000 |
| Maximum | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| T test (for mean) | 132.177** | | -51.738** | | -57.768** | |

**Significant at 0.01% level.

It can be noticed that the average leverage decreased from 72.85% in the before the tax reform sample to 64.55% in the after the tax reform sample. An unequal variances t test revealed that the firms' mean leverage before the tax reform was significantly different from the firms' mean leverage after the tax reform. Thus, it can be inferred that the tax reform influenced leverage.

In addition, the average ownership concentration (OwnershipConc) increased from 67.77% in the before the tax reform sample to 71.60% in the after the tax reform sample. An unequal variances t test revealed that the average ownership concentration before the tax reform was significantly different from the average ownership concentration after the tax reform. Thus, it can be inferred that the tax reform influenced ownership concentration. The same conclusion is reached even

if the Herfindahl index is used as a proxy for ownership concentration because the difference between the means is still statistically significant.

Nonparametric independent samples median tests were performed for all the three variables: Leverage, OwnershipConc and Herfindahl. The tests showed that the medians before and after the tax reform for all the above mentioned variables are significantly different.

Moreover, there have been computed the correlations between Leverage and OwnershipConc variables before and after the tax reform (Table 4). It can be noticed that the correlation between leverage and ownership concentration changes signs: from positive before the tax reform to negative after the tax reform. Nevertheless, if the whole Sample 1 is considered, the correlation is negative.

**Table 4: Pearson's Correlation matrix before and after the tax reform**

| | Leverage | | OwnershipConc | |
|---|---|---|---|---|
| | Before | After | Before | After |
| Leverage | 1 | 1 | 0.024 | -0.065 |
| OwnershipConc | 0.024 | -0.065 | 1 | 1 |

*All the correlations are significant at the 0.01 level.

However, the results of the previous independent samples tests (for the mean and median) may have not been so accurate because the tests assumed that the observations belong to different firms while in reality Sample 1 includes also observations that belong to the same firm but at different points in time. Thus, Sample 2 was used for conducting paired-samples t tests for the means as well as nonparametric related samples median tests (Table 5).

From the paired-samples t tests for the means it can be concluded that there was a significant decrease in the average leverage from the before the reform period (mean=73.16%) to the after the reform period (mean=62.86%). The eta squared statistic (0.2713) indicates a large effect size.

There was also a significant increase in the average ownership concentration from the before the reform period (mean=66.73%) to the after the reform period (mean=69.79%). The eta squared statistic (0.0468) indicates a moderate-small effect size.

**Table 5: Paired samples statistics and test for the means (Sample 2)**

| | Mean | Mean difference | T test | Sig. (2-tailed) | Eta squared |
|---|---|---|---|---|---|
| LeverageBeforeReform – LeverageAfterReform | .731686<br>.628616 | .1030699 | 71.172 | .000** | 0.2713 |
| OwnershipConcBefore Reform – OwnershipConcAfter Reform | .667398<br>.697916 | -.0305175 | -25.865 | .000** | 0.0468 |

**Significant at the 0.01 level.

In addition, the nonparametric related samples tests (Wilcoxon Signed Rank Test) showed that the medians before and after the tax reform for both leverage and ownership concentration are significantly different.

Table 6 shows the average values of leverage and ownership concentration for the whole period 2000-2009 (Sample 1).

**Table 6: The mean leverage and ownership concentration grouped by year (Sample 1)**

| Year | Nb. of observations | Mean Leverage | Mean OwnershipConc | Mean Herfindahl |
|---|---|---|---|---|
| 2000 | 52022 | .687755 | .684355 | .636608 |
| 2001 | 52124 | .706320 | .675971 | .628194 |
| 2002 | 52545 | .734681 | .672740 | .625272 |
| 2003 | 54603 | .739915 | .676380 | .629623 |
| 2004 | 56125 | .770089 | .679196 | .633365 |
| **2005** | **56997** | **.691776** | **.700047** | **.657925** |
| 2006 | 54505 | .663501 | .722786 | .681372 |
| 2007 | 57617 | .643395 | .714196 | .676117 |
| 2008 | 56440 | .623704 | .720110 | .684026 |
| 2009 | 57115 | .606008 | .723437 | .688052 |

According to Alstadsæter and Fjærli (2009), the tax reform caused the leverage levels of small and closely held firms to increase during the years prior to the reform (2001-2004) and then to decrease during the years after the reform (2005-2009). The same result is also noticed from Sample 1: the average leverage had an increasing trend until 2004, but then it suffered a sudden decrease in 2005 which continued until 2009. Thus, average leverage decreased from 77% in 2004 to 69.17% in 2005 and then to 60.60% in 2009.

Considering the ownership concentration variable proxied by OwnershipConc, it can be noticed that the average ownership concentration had a decreasing trend until 2002 which was followed by a very small increase until 2004 and then a big increase in 2005. Thus, average ownership concentration increased from 67.91% in 2004 to 70% in 2005. Then it basically continued to increase with the exception of 2007 so that it reached 72.34% in 2009.

Considering the ownership concentration variable proxied by the Herfindahl index, it can be noticed that it followed the same trend as the one proxied by OwnershipConc. Thus, average ownership concentration increased from 63.33% in 2004 to 65.79% in 2005 and then to 68.80% in 2009.

# 5. Methodology approach and results

This paper aims to analyze the interrelationship between leverage and ownership concentration which are considered to be related both directly and indirectly through their relationship with the characteristics of each firm. Thus, this paper follows the view of Demsetz and Lehn (1985) who supported the hypothesis of endogenous ownership structure as well as the view of Jensen, Solberg and Zorn (1992) who considered that the decisions regarding leverage and insider ownership are interdependent.

The descriptive statistics and the additional tests performed in the previous chapter showed that the 2006 Norwegian tax reform had a significant effect on the leverage and ownership concentration variables. However, there are also many other factors (firm characteristics) that may have influenced the changes in leverage and ownership concentration.

In order to further examine the relationship between leverage and ownership concentration, three econometrical models will be defined. Each econometrical model consists of a simultaneous equations system with two structural equations. This approach "allows for the interdependence of firm decisions, while controlling for the effects that the other firm characteristics may have on these decisions" (Jensen, Solberg and Zorn 1992). Since the application of OLS to these simultaneous equations systems will lead to biased coefficient estimates, the two stage least squares (2SLS) approach will be used.

According to Brooks (2008, 277), the 2SLS method is done in two stages:
"Stage 1: Estimate the reduced form equations (endogenous variables are written in terms of exogenous variables) by using OLS and obtain the fitted values for the endogenous variables.
Stage 2: Estimate the structural equations using OLS, but replace any RHS endogenous variables with their stage 1 fitted values."

Thus, the goal of the 2SLS method is to provide better estimates of the regression coefficients when the explanatory endogenous variable is correlated with the error term. Since R-squared has no statistical meaning in the context of 2SLS (http://www.stata.com/support/faqs/statistics/two-stage-least-squares/), the model fit output will not be analyzed.

## 5.1 First econometrical model

The first econometrical model takes a long-term perspective and assesses the impact of the average firm characteristics before the reform on the average leverage and average ownership concentration after the reform. This model uses cross-sectional variables where each of the 13606 cross sections corresponds to a firm from Sample 2. The results for this econometrical model are shown in Table 7 and Table 8. (Appendix 4)

$$\overline{Leverage_{2005-2009}} = \alpha + \beta_1 * \overline{Tangibility_{2000-2004}} + \beta_2 * \overline{Profitability_{2000-2004}} + \beta_3 * \overline{Firm\ size_{2000-2004}} + \beta_4 * IND1 + \beta_5 * IND2 + \beta_6 * IND3 + \beta_7 * IND4 + \beta_8 * IND5 + \beta_9 * IND6 + \beta_{10} * IND7 + \beta_{11} * IND8 + \beta_{12} * IND9 + \beta_{13} * \overline{Ownership\ concentration_{2005-2009}}$$

$$\overline{Ownership\ concentration_{2005-2009}} = \alpha + \beta_1 * \overline{Growth\ opportunities_{2000-2004}} + \beta_2 * \overline{Profitability_{2000-2004}} + \beta_3 * \overline{Firm\ size_{2000-2004}} + \beta_4 * IND1 + \beta_5 * IND2 + \beta_6 * IND3 + \beta_7 * IND4 + \beta_8 * IND5 + \beta_9 * IND6 + \beta_{10} * IND7 + \beta_{11} * IND8 + \beta_{12} * IND9 + \beta_{13} * \overline{Leverage_{2005-2009}}$$

**Table 7 – Results for the first econometrical model (2SLS approach) – Equation 1**

| Equation 1 (Average leverage after the reform) | Unstandardized Coefficients | | Beta | T | Sig. |
|---|---|---|---|---|---|
| | B. | Std. Error | | | |
| (Constant) | -.056 | .051 | | -1.110 | .267 |
| TangibilityBR | .102 | .009 | .103 | 11.842 | .000 |
| FirmSizeBR | .044 | .001 | .301 | 34.955 | .000 |
| ProfitabilityBR | -.168 | .011 | -.129 | -15.509 | .000 |
| OwnershipConcAfter Reform | .021 | .006 | .029 | 3.396 | .001 |
| Industry dummies | Yes | | | | |

From the above table, it is noticed that all the four explanatory variables (average tangibility before the reform, average firm size before the reform, average profitability before the reform and average ownership concentration after the reform) are significant.

The estimated unstandardized coefficients B show the predicted change in the dependant variable when the explanatory variable is increased by one unit conditional on all the other variables in the model remaining constant.

Provided that the firms have constant values for all the other variables in the model, the average profitability before the reform has the biggest impact (-0.168) on the average leverage after the reform while the average ownership concentration after the reform has the smallest impact (0.021) on the average leverage after the reform.

The negative relationship between the average leverage and average profitability supports the predictions of the pecking order theory. On the other hand, the positive relationship between average leverage and average ownership concentration contradicts the predictions of Jensen and Meckling (1976) agency theory of capital structure. However, this positive relationship can be explained by the role that the firm control may play in deciding the financing policy: firms may prefer to issue debt instead of equity if issuing equity means sharing or losing control.

The positive relationship between average leverage and average tangibility supports the trade-off theory. It also supports the pecking order theory if it is assumed that "a firm with more assets has a greater worry about the adverse selection on those assets" (Frank and Goyal 2009). In addition, the positive relationship between average leverage and average firm size also supports the predictions of Frank and Goyal (2009).

The standardization of the beta coefficients enables the comparison of effects across explanatory variables. The explanatory variable which has the biggest beta makes the strongest unique contribution to explaining the dependent variable, when the variance explained by all other variables in the model is controlled for. Therefore, the set of beta-coefficients suggests that the average firm size before the reform has the strongest effect on the average leverage after the reform, after adjusting for the effects of other explanatory variables.

**Table 8 – Results for the first econometrical model (2SLS approach) – Equation 2**

| Equation 2 (Average ownership concentration after the reform) | Unstandardized Coefficients | | Beta | T | Sig. |
|---|---|---|---|---|---|
| | B. | Std. Error | | | |
| (Constant) | 1.298 | .158 | | 8.233 | .000 |
| FirmSizeBR | -.166 | .010 | -.809 | -16.317 | .000 |
| ProfitabilityBR | .641 | .054 | .354 | 11.908 | .000 |
| LeverageAfterReform | 2.790 | .227 | 1.998 | 12.293 | .000 |
| GrowthOppBR | .000 | .003 | .001 | .058 | .954 |
| Industry dummies | Yes | | | | |

From the above table, it is noticed that three explanatory variables (average firm size before the reform, average profitability before the reform, average leverage after the reform) are significant. Contrary to the expectations, the average grow opportunities before the reform are not significant.

Provided that the firms have constant values for all the other variables in the model, the average leverage after the reform has the biggest impact (2.79) on the average ownership concentration after the reform while the average firm size

before the reform has the smallest impact on the average ownership concentration after the reform.

The relationship between average leverage and average ownership concentration is again positive. The negative relationship between average ownership concentration after the reform and average firm size before the reform is in accordance with the predictions of Demsetz and Lehn (1985).
The positive relationship between the average ownership concentration after the reform and the average profitability before the reform contradicts the findings of Demsetz and Villalonga (2001). An explanation for this positive relationship can be that private owners are so attached to their family businesses that they do not want to lose the control of their companies by selling shares or maybe that the investors do not want to invest in these private firms even if they are profitable.

The set of beta-coefficients suggests that the average leverage after the reform has the strongest effect on the average ownership concentration after the reform, after adjusting for the effects of other explanatory variables.

Since the average leverage after the reform has the strongest effect on the average ownership concentration after the reform while the average ownership concentration after the reform has the weakest effect on the average leverage after the reform, it can be concluded that the average leverage impacts more the average ownership concentration than the other way around.

## 5.2 Second econometrical model

The second econometrical model assesses the impact of the average firm characteristics before the reform on the change in leverage and on the change in ownership concentration between 2004 and 2005. It takes a short-term perspective since 2005 is the first year in which the reform effects started to be noticed. This model uses cross-sectional variables where each of the 23899 cross sections

corresponds to a firm from Sample 3. The results for this econometrical model are shown in Table 9 and Table 10. (Appendix 5)

$$\Delta\ Leverage_{2003-2004} = \alpha + \beta_1 * \overline{Tangibility_{2000-2004}} + \beta_2 * \overline{Profitability_{2000-2004}} + \beta_3 * \overline{Firm\ size_{2000-2004}} + \beta_4 * IND1 + \beta_5 * IND2 + \beta_6 * IND3 + \beta_7 * IND4 + \beta_8 * IND5 + \beta_9 * IND6 + \beta_{10} * IND7 + \beta_{11} * IND8 + \beta_{12} * IND9 + \beta_{13} * \Delta Ownership\ concentration_{2003-2004}$$

$$\Delta Ownership\ concentration_{2003-2004} = \alpha + \beta_1 * \overline{Growth\ opportunities_{2000-2004}} + \beta_2 * \overline{Profitability_{2000-2004}} + \beta_3 * \overline{Firm\ size_{2000-2004}} + \beta_4 * IND1 + \beta_5 * IND2 + \beta_6 * IND3 + \beta_7 * IND4 + \beta_8 * IND5 + \beta_9 * IND6 + \beta_{10} * IND7 + \beta_{11} * IND8 + \beta_{12} * IND9 + \beta_{13} * \Delta\ Leverage_{2003-2004}$$

**Table 9 – Results for the second econometrical model (2SLS approach) – Equation 1**

| Equation 1 (Change in leverage) | Unstandardized Coefficients | | Beta | T | Sig. |
|---|---|---|---|---|---|
| | B. | Std. Error | | | |
| (Constant) | -.007 | .028 | | -.248 | .804 |
| TangibilityBR | .031 | .005 | .037 | 5.815 | .000 |
| FirmSizeBR | .004 | .001 | .038 | 6.104 | .000 |
| ProfitabilityBR | -.432 | .007 | -.398 | -65.604 | .000 |
| ChangeInOwnershipConc | .017 | .008 | .013 | 2.084 | .037 |
| Industry dummies | Yes | | | | |

From the above table, it is noticed that all the four explanatory variables (average tangibility before the reform, average firm size before the reform, average profitability before the reform and change in ownership concentration) are significant.

Provided that the firms have constant values for all the other variables in the model, the average profitability before the reform has the biggest impact (-0.432)

on the change in leverage. The average firm size before the reform has the smallest impact (0.004) on the change in leverage.

The negative relationship between the change in leverage and average profitability before the reform supports the pecking order theory. The relationship between the change in leverage and the average firm size before the reform is positive as well as the relationship between the change in leverage and the average tangibility before the reform. The relationship between the change in leverage and the change in ownership concentration is positive meaning that a change in the ownership concentration triggers a change in leverage also.

The set of beta-coefficients suggests that the average profitability before the reform has the strongest effect on the change in leverage, after adjusting for the effects of other explanatory variables.

**Table 10 – Results for the second econometrical model (2SLS approach) – Equation 2**

| Equation 2 (Change in ownership concentration) | Unstandardized Coefficients | | Beta | T | Sig. |
|---|---|---|---|---|---|
| | B. | Std. Error | | | |
| (Constant) | -.079 | .133 | | -.594 | .552 |
| FirmSizeBR | -.010 | .004 | -.116 | -2.470 | .014 |
| ProfitabilityBR | 2.022 | .265 | 2.570 | 7.645 | .000 |
| ChangeInLeverage | 4.571 | .603 | 6.304 | 7.584 | .000 |
| GrowthOppBR | -.015 | .003 | -.247 | -4.930 | .000 |
| Industry dummies | Yes | | | | |

From the above table, it is noticed that four explanatory variables (average firm size before the reform, average profitability before the reform, change in leverage, average grow opportunities before the reform) are significant.

Provided that the firms have constant values for all the other variables in the model, the change in leverage has the biggest impact (4.571) on the change in ownership concentration. The average firm size before the reform has the smallest impact on the change in ownership concentration.

The relationship between the change in leverage and the change in ownership concentration is positive. The relationship between the change in ownership concentration and the average firm size before the reform is negative. There is a positive relationship between the change in ownership concentration and the average profitability before the reform.

There is a negative relationship between the change in ownership concentration and average growth opportunities before the reform. This finding contradicts the initial prediction that there is a positive relationship between them. According to Iancu and Radulescu (2011), this negative relationship can be explained by the fact that growth opportunities may be associated with better performance, which may increase the investors' interest in the company, thus making it possible for the ownership concentration to decrease as the existing shareholders sell part of their shares to the investors

.

The set of beta-coefficients suggests that the change in leverage after the reform has the strongest effect on the change in ownership concentration after the reform, after adjusting for the effects of other explanatory variables.

Since the change in leverage after the reform has the strongest effect on the change in ownership concentration after the reform while the change in ownership concentration after the reform has the weakest effect on the change in leverage after the reform, it can be concluded that the change in leverage impacts more the change in ownership concentration than the other way around.

As a conclusion of the first two econometrical models, the effect is stronger from leverage to ownership concentration than from ownership concentration to leverage no matter if it is considered the change or the average in the respective variables. In addition, the sign of the relationship between leverage and ownership concentration stays constant. Also the signs of the relationships between tangibility, firm size, profitability and leverage stay constant as well as the signs between firm size, profitability and ownership concentration. The negative sign

between grow opportunities and ownership concentration is significant only in the second econometrical model.

## 5.3 Third econometrical model

The third econometrical model looks at the effect of the tax reform (using the Time dummy variable) and the firm characteristics on the levels of leverage and ownership concentration. This model uses the balanced panel data from Sample 2 which has 13606 cross sections for 10 years. The results for this econometrical model are shown in Table 11 and Table 12. (Appendix 6)

Leverage = $\alpha + \beta_1$* Tangibility + $\beta_2$* Profitability + $\beta_3$ * Firm size + $\beta_4$*IND1 + $\beta_5$*IND2 + $\beta_6$*IND3 + $\beta_7$*IND4+ $\beta_8$*IND5 + $\beta_9$*IND6+ $\beta_{10}$*IND7 + $\beta_{11}$*IND8 + $\beta_{12}$*IND9+ $\beta_{13}$ * Ownership concentration + $\beta_{14}$ * Time

Ownership concentration= $\alpha + \beta_1$* Profitability + $\beta_2$ * Firm size + $\beta_3$ *Growth opportunities + $\beta_4$*IND1 + $\beta_5$*IND2 + $\beta_6$*IND3 + $\beta_7$*IND4+ $\beta_8$*IND5 + $\beta_9$*IND6+ $\beta_{10}$*IND7 + $\beta_{11}$*IND8 + $\beta_{12}$*IND9 + $\beta_{13}$*Leverage + $\beta_{14}$ * Time

**Table 11: Results for the third econometrical model (2SLS approach) – Leverage as dependent variable (Sample 2)**

| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|---|---|---|---|---|
| C | -0.045096 | 0.007519 | -5.997244 | 0.0000 |
| TANGIBIL | 0.126429 | 0.002755 | 45.88291 | 0.0000 |
| PROFITAB | -0.006539 | 0.002853 | -2.291866 | 0.0219 |
| FIRMSIZE | 0.045364 | 0.000411 | 110.4464 | 0.0000 |
| OWNERCO | 0.050480 | 0.002044 | 24.69475 | 0.0000 |
| TIME | -0.110905 | 0.001117 | -99.25343 | 0.0000 |
| INDUSTRY DUMMIES | Yes | | | |

From the above table, it is noticed that all the five explanatory variables of the endogenous variable leverage are significant. In comparison with the previous two econometrical models, there are maintained the positive relationships between tangibility and leverage, firm size and leverage as well as ownership concentration and leverage.

Provided that the firms have constant values for all the other variables in the model, tangibility has the biggest impact (0.126) on leverage. Ownership concentration had the third biggest impact (0.05) on leverage.

The significance of the dummy variable Time proves that the tax reform did have a negative impact on leverage, more specifically the second biggest impact (-0.11) after tangibility. Thus, leverage decreased following the tax reform and this can also be seen from Table 6.

Contrary to the findings from the above two econometrical model where average profitability had the biggest impact on the change in leverage and the average leverage after the reform, this model shows that profitability has the smallest impact on leverage. However, all three econometrical models show that there is a negative relationship between profitability and leverage.

**Table 12: Results for the third econometrical model (2SLS approach) –Ownership concentration as dependent variable (Sample 2)**

| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|---|---|---|---|---|
| C | 1.095441 | 0.032997 | 33.19802 | 0.0000 |
| GROWOPP | 0.008132 | 0.001362 | 5.970229 | 0.0000 |
| PROFITAB | 0.153546 | 0.012960 | 11.84767 | 0.0000 |
| FIRMSIZE | -0.232809 | 0.004149 | -56.11718 | 0.0000 |
| LEVERAGE | 4.365767 | 0.084829 | 51.46574 | 0.0000 |
| TIME | 0.540515 | 0.010843 | 49.84754 | 0.0000 |
| INDUSTRY DUMMIES | Yes | | | |

From the above table, it is noticed that all the five explanatory variables of the endogenous variable ownership concentration are significant. In comparison with the previous two econometrical models, there are maintained the positive relationships between profitability and ownership concentration, tangibility and ownership concentration, leverage and ownership concentration as well as the negative relationship between firm size and ownership concentration. The only relationship whose sign does not remain unchanged is the one between growth opportunities and ownership concentration. This third econometrical model

supports the initial prediction that there is a positive relationship between growth opportunities and ownership concentration.

Provided that the firms have constant values for all the other variables in the model, leverage has the biggest impact (4.365) on ownership concentration.
The significance of the dummy variable Time proves that the tax reform did have an impact on ownership concentration, more specifically the second biggest impact (0.54) after leverage. Thus, ownership concentration increased following the tax reform and this can also be seen from Table 6.

In accordance with the findings of the previous two econometrical models, the third econometrical model shows that the effect is stronger from leverage to ownership concentration than from ownership concentration to leverage.

# 6. Conclusions

All the three econometrical models showed that there is a bidirectional positive relationship between leverage and ownership concentration and that leverage's effect on ownership concentration is bigger than the ownership concentration's effect on leverage. This positive relationship contradicts the prediction of the agency theory of capital structure but it can be explained by the role that the firm control may play in deciding the financing policy: firms may prefer to issue debt instead of equity if issuing equity means sharing or losing control.

The third econometrical model proved that the tax reform had a negative impact on leverage and a positive impact on ownership concentration. The size of the impact is ranked as the second highest for both equations. In addition, the tests conducted for the mean and median showed that there is a significant difference between the leverage before and after the tax reform as well as between the ownership concentration before and after the tax reform.

All the three models proved that the relationships between profitability and ownership concentration, tangibility and ownership concentration are positive

while the relationship between firm size and ownership concentration is negative. In addition, the relationships between tangibility and leverage, firm size and leverage are positive while the relationship between profitability and leverage is negative. All the signs of these relationships are in accordance with the ones predicted by the theory with the exception of the relationship between profitability and ownership concentration.

The only relationship that changes signs between the models is the one between growth opportunities and ownership concentration. This third econometrical model supports the initial prediction that there is a positive relationship between growth opportunities and ownership concentration while the second econometrical model shows a negative relationship.

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# Appendix

Appendix 1: Previous rules (1992 Tax reform) vs. New rules (2006 Tax reform)

| Previous rules | New rules |
|---|---|
| Share income earned by Norwegian personal shareholders | |
| **Share dividends from Norwegian companies**:<br>In principle taxable, but full imputation means that in practice dividends are not taxed in the hands of the shareholder.<br><br>**Share dividends from foreign company**:<br>Fully taxable, deduction in Norwegian tax for tax at source on dividends paid to the state in which the company is resident.<br><br>**Active shareholders** are additionally taxed according to the **split income model**, with progressive tax (National Insurance contributions and surtax) on an estimated share of the company's profit attributable to labour, irrespective of whether the profit was distributed as dividend or not.<br><br>Capital gains on shares are always taxable income, and losses on shares are deductible.<br><br>When gain or loss on shares is calculated, income that was taxed in the company during the shareholder's ownership period is credited to the shareholder through the RISK rules<br>(opening value adjustment). This adjustment ensures that the portion of the gains that is due to retained profits is not taxed. RISK is only applied to shares in Norwegian companies. | **The shareholder model:** Share dividends in excess of the allowance for a computed risk-free return are taxable. The imputation rules are abolished.<br><br>The shareholder model applies only to dividends from companies resident in Norway or another EEA country.<br><br>Dividends from companies resident in non□EEA countries will be taxable as before, i.e. fully taxable, but with deduction in Norwegian tax for taxation at source.<br><br>The split income model is abolished for active shareholders. The new rules do not distinguish between active and passive shareholders.<br><br>*Entry into force:* 1 January 2006.<br>A transitional rule for 2005 introduced the same right to imputation for dividends from companies in<br>EEA countries as for dividends from Norwegian limited companies.<br><br>Capital gain on shares is always taxable, and loss on shares is always deductible.<br><br>The RISK rules are abolished. Unused risk□free return allowance reduces capital gains, but cannot be used to increase a loss. |

| Previous rules | New rules |
|---|---|
| Share income accrued by Norwegian limited companies | |
| Dividends, capital gains and losses are treated as described above for personal shareholders. | **The exemption method**: Share dividend and capital gains on shares are exempt from tax. Conversely, losses on shares are not deductible.<br><br>The exemption method does not apply to:<br>- shares in companies in low-tax non-EEA countries<br>- portfolio shares (i.e. in cases of a less than 10 per cent holding) in companies in non-EEA countries<br><br>For these shares, dividends and capital gain on shares are still taxable and losses on shares are deductible.<br><br>*Entry into force:* 1 January 2004 for dividends and 26 March 2004 for capital gains and losses on shares. |

| Previous rules | New rules |
|---|---|
| Share dividends from Norwegian limited companies to foreign shareholders | |
| Obligation to pay tax at source to Norway on dividends. The tax rate is 25 per cent at the outset, but has been reduced in a number of tax agreements into which Norway has entered with other states. | If the foreign shareholder is a limited company resident in an EEA country, the exemption method applies.<br><br>*Entry into force:* 1 January 2004.<br><br>Personal shareholders resident in another EEA country are taxed according to the shareholder model in the same way as Norwegian personal shareholders. For shareholders outside the EEA (both personal and corporate) the tax at source rules apply as previously.<br><br>*Entry into force:* 1 January 2004.<br>Under a transitional rule, these shareholders were exempt from tax at source in 2005. |

| Previous rules | New rules |
|---|---|
| General partnerships, limited partnerships and other partnerships | |
| The company's profits are taxed on an accrual basis as ordinary income in the hands of partners.<br><br>Active partners are additionally taxed according to the split income model, with progressive tax (National Insurance contributions and surtax) on an estimated share of the company's profit attributable to labor, regardless of whether the profit was distributed to partners or not. | The company's profits are taxed on an accrual basis as ordinary income in the hands of partners.<br><br>**The partnership model:** When corporate profits are distributed to personal partners, the part that exceeds a computed risk□free return on the investment is additionally taxed as ordinary income.<br><br>The split income model is abolished for active partners.<br><br>*Entry into force:* 1 January 2006 |

| Previous rules | New rules |
|---|---|
| Self□employed (sole proprietorships) | |
| The profits are taxed on an accrual basis as ordinary income in the hands of the owner.<br><br>Active owners are additionally taxed according to the split income model with a progressive tax (National Insurance contributions and surtax) on a computed share of the company's profits attributable to labor. | The profits are taxed on an accrual basis as ordinary income in the hands of the owner.<br><br>**The self employed model**: The owner is additionally subject to a progressive tax (National Insurance contributions and surtax) on accrued profits after deduction of a computed risk□free return on the capital.<br><br>*Entry into force:* 1 January 2006 |

Source: Ministry of Finance, Report No. 11 to the Storting: "Evaluation of the 2006 Tax Reform"

Appendix 2: Variables table

| | Item number | Item name |
|---|---|---|
| 1 | 9 | Revenue |
| 2 | 19 | Results of operations |
| 3 | 51 | Tangible fixed assets |
| 4 | 78 | Current assets |
| 5 | 87 | Equity |
| 6 | 93 +94+ 98 | Bonds + Liabilities to financial institutions (long term) + Other long-term liabilities |
| 7 | 101 | Liabilities to financial institutions (short term) |
| 8 | 102 | Trade creditors |
| 9 | 105 | Dividends |
| 10 | 109 | Current liabilities |
| 11 | 124 | NOR Kontantstrøm (CF) |
| 12 | 11103 | Industry codes at level two |
| 13 | 13420 | Company age |
| 14 | 13501 | First rating date |
| 15 | 219 | Aggregated fraction held by personal owners |
| 16 | 231 | Largest owner is institutional |
| 17 | 13601 | Share owned by CEO |
| 18 | 14011 | Sum % Equity held by owner with rank 1 |
| 19 | 14025 | Herfindahl |
| 20 | 30 | Other interest expenses |

Appendix 3: Firms' classification into 9 industry sectors using the NAIC codes

| NAICS code | NAICS label | Industry sector code | Industry sector |
|---|---|---|---|
| 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 |
| 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 | 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 |

# Appendix 4: Full results for the first econometrical model

**Model Description**

| | | Type of Variable |
|---|---|---|
| Equation 1 | LeverageAfterReform | Dependent |
| | TangibilityBR | predictor & instrumental |
| | FirmSizeBR | predictor & instrumental |
| | ProfitabilityBR | predictor & instrumental |
| | IND1 | predictor & instrumental |
| | IND2 | predictor & instrumental |
| | IND3 | predictor & instrumental |
| | IND4 | predictor & instrumental |
| | IND5 | predictor & instrumental |
| | IND6 | predictor & instrumental |
| | IND7 | predictor & instrumental |
| | IND8 | predictor & instrumental |
| | IND9 | predictor & instrumental |
| | OwnershipConcAfterReform | Predictor |
| | GrowthOppBR | Instrumental |
| | HerfindahlAR | Instrumental |
| Equation 2 | OwnershipConcAfterReform | Dependent |
| | LeverageAfterReform | Predictor |
| | GrowthOppBR | predictor & instrumental |
| | FirmSizeBR | predictor & instrumental |
| | ProfitabilityBR | predictor & instrumental |
| | IND1 | predictor & instrumental |
| | IND2 | predictor & instrumental |
| | IND3 | predictor & instrumental |
| | IND4 | predictor & instrumental |
| | IND5 | predictor & instrumental |
| | IND6 | predictor & instrumental |
| | IND7 | predictor & instrumental |
| | IND8 | predictor & instrumental |
| | IND9 | predictor & instrumental |
| | TangibilityBR | Instrumental |
| | HerfindahlAR | Instrumental |

MOD_1

**Model Summary**

| | | |
|---|---|---|
| Equation 1 | Multiple R | .341 |
| | R Square | .116 |
| | Adjusted R Square | .115 |
| | Std. Error of the Estimate | .176 |
| Equation 2 | Multiple R | .156 |
| | R Square | .024 |
| | Adjusted R Square | .023 |
| | Std. Error of the Estimate | .553 |

**ANOVA**

| | | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|---|
| Equation 1 | Regression | 55.570 | 13 | 4.275 | 137.332 | .000 |
| | Residual | 423.067 | 13592 | .031 | | |
| | Total | 478.637 | 13605 | | | |
| Equation 2 | Regression | 103.746 | 13 | 7.980 | 26.074 | .000 |
| | Residual | 4160.152 | 13592 | .306 | | |
| | Total | 4263.899 | 13605 | | | |

**Coefficients**

| | | Unstandardized Coefficients | | Beta | t | Sig. |
|---|---|---|---|---|---|---|
| | | B | Std. Error | | | |
| Equation 1 | (Constant) | -.056 | .051 | | -1.110 | .267 |
| | TangibilityBR | .102 | .009 | .103 | 11.842 | .000 |
| | FirmSizeBR | .044 | .001 | .301 | 34.955 | .000 |
| | ProfitabilityBR | -.168 | .011 | -.129 | -15.509 | .000 |
| | IND1 | -.031 | .049 | -.021 | -.640 | .522 |
| | IND2 | -.016 | .047 | -.028 | -.346 | .730 |
| | IND3 | .003 | .061 | .001 | .045 | .964 |
| | IND4 | .033 | .047 | .065 | .691 | .489 |
| | IND5 | .019 | .047 | .047 | .394 | .694 |
| | IND6 | .010 | .066 | .002 | .146 | .884 |
| | IND7 | .017 | .047 | .040 | .366 | .715 |
| | IND8 | .021 | .048 | .025 | .449 | .654 |
| | IND9 | -.009 | .048 | -.010 | -.198 | .843 |
| | OwnershipConcAfterReform | .021 | .006 | .029 | 3.396 | .001 |
| Equation 2 | (Constant) | 1.298 | .158 | | 8.233 | .000 |
| | FirmSizeBR | -.166 | .010 | -.809 | -16.317 | .000 |
| | ProfitabilityBR | .641 | .054 | .354 | 11.908 | .000 |
| | IND1 | .082 | .153 | .040 | .538 | .591 |
| | IND2 | .075 | .149 | .090 | .501 | .616 |
| | IND3 | -.163 | .191 | -.024 | -.851 | .395 |
| | IND4 | -.014 | .149 | -.020 | -.092 | .926 |
| | IND5 | .000 | .148 | .000 | .001 | .999 |
| | IND6 | .157 | .206 | .020 | .765 | .444 |
| | IND7 | .089 | .148 | .148 | .598 | .550 |
| | IND8 | -.025 | .150 | -.020 | -.164 | .870 |
| | IND9 | .098 | .150 | .073 | .655 | .513 |
| | LeverageAfterReform | 2.790 | .227 | 1.998 | 12.293 | .000 |
| | GrowthOppBR | .000 | .003 | .001 | .058 | .954 |

# Appendix 5: Full results for the second econometrical model

**Model Description**

| | | Type of Variable |
|---|---|---|
| Equation 1 | ChangeInLeverage | Dependent |
| | TangibilityBR | predictor & instrumental |
| | FirmSizeBR | predictor & instrumental |
| | ProfitabilityBR | predictor & instrumental |
| | IND1 | predictor & instrumental |
| | IND2 | predictor & instrumental |
| | IND3 | predictor & instrumental |
| | IND4 | predictor & instrumental |
| | IND5 | predictor & instrumental |
| | IND6 | predictor & instrumental |
| | IND7 | predictor & instrumental |
| | IND8 | predictor & instrumental |
| | IND9 | predictor & instrumental |
| | ChangeInOwnershipConc | Predictor |
| | GrowthOppBR | Instrumental |
| | ChangeInHerfindahl | Instrumental |
| Equation 2 | ChangeInOwnershipConc | Dependent |
| | ChangeInLeverage | Predictor |
| | GrowthOppBR | predictor & instrumental |
| | FirmSizeBR | predictor & instrumental |
| | ProfitabilityBR | predictor & instrumental |
| | IND1 | predictor & instrumental |
| | IND2 | predictor & instrumental |
| | IND3 | predictor & instrumental |
| | IND4 | predictor & instrumental |
| | IND5 | predictor & instrumental |
| | IND6 | predictor & instrumental |
| | IND7 | predictor & instrumental |
| | IND8 | predictor & instrumental |
| | IND9 | predictor & instrumental |
| | TangibilityBR | Instrumental |
| | ChangeInHerfindahl | Instrumental |

MOD_4

**Model Summary**

| | | |
|---|---|---|
| Equation 1 | Multiple R | .413 |
| | R Square | .170 |
| | Adjusted R Square | .170 |
| | Std. Error of the Estimate | .147 |
| Equation 2 | Multiple R | .050 |
| | R Square | .003 |
| | Adjusted R Square | .002 |
| | Std. Error of the Estimate | .681 |

**ANOVA**

| | | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|---|
| Equation 1 | Regression | 106.100 | 13 | 8.162 | 376.801 | .000 |
| | Residual | 517.350 | 23885 | .022 | | |
| | Total | 623.450 | 23898 | | | |
| Equation 2 | Regression | 27.938 | 13 | 2.149 | 4.629 | .000 |
| | Residual | 11089.257 | 23885 | .464 | | |
| | Total | 11117.195 | 23898 | | | |

**Coefficients**

| | | Unstandardized Coefficients | | Beta | t | Sig. |
|---|---|---|---|---|---|---|
| | | B | Std. Error | | | |
| Equation 1 | (Constant) | -.007 | .028 | | -.248 | .804 |
| | TangibilityBR | .031 | .005 | .037 | 5.815 | .000 |
| | FirmSizeBR | .004 | .001 | .038 | 6.104 | .000 |
| | ProfitabilityBR | -.432 | .007 | -.398 | -65.604 | .000 |
| | IND1 | -.092 | .028 | -.075 | -3.314 | .001 |
| | IND2 | -.093 | .027 | -.180 | -3.428 | .001 |
| | IND3 | -.083 | .036 | -.021 | -2.313 | .021 |
| | IND4 | -.089 | .027 | -.198 | -3.278 | .001 |
| | IND5 | -.101 | .027 | -.298 | -3.743 | .000 |
| | IND6 | -.163 | .037 | -.037 | -4.362 | .000 |
| | IND7 | -.084 | .027 | -.232 | -3.125 | .002 |
| | IND8 | -.084 | .027 | -.111 | -3.094 | .002 |
| | IND9 | -.089 | .027 | -.111 | -3.264 | .001 |
| | ChangeInOwnershipConc | .017 | .008 | .013 | 2.084 | .037 |
| Equation 2 | (Constant) | -.079 | .133 | | -.594 | .552 |
| | FirmSizeBR | -.010 | .004 | -.116 | -2.470 | .014 |
| | ProfitabilityBR | 2.022 | .265 | 2.570 | 7.645 | .000 |
| | IND1 | .359 | .138 | .400 | 2.595 | .009 |
| | IND2 | .385 | .136 | 1.032 | 2.827 | .005 |
| | IND3 | .343 | .171 | .118 | 1.999 | .046 |
| | IND4 | .378 | .135 | 1.169 | 2.793 | .005 |
| | IND5 | .438 | .138 | 1.786 | 3.165 | .002 |
| | IND6 | .732 | .200 | .229 | 3.669 | .000 |
| | IND7 | .375 | .135 | 1.422 | 2.773 | .006 |
| | IND8 | .338 | .135 | .612 | 2.514 | .012 |
| | IND9 | .380 | .137 | .652 | 2.781 | .005 |
| | ChangeInLeverage | 4.571 | .603 | 6.304 | 7.584 | .000 |
| | GrowthOppBR | -.015 | .003 | -.247 | -4.930 | .000 |

# Appendix 6: Full results for the third econometrical model

Dependent Variable: LEVERAGE
Method: Panel Two-Stage Least Squares
Date: 01/08/12 Time: 12:12
Sample: 2000 2009
Periods included: 10
Cross-sections included: 13606
Total panel (balanced) observations: 136060
Instrument specification: C TANGIBIL PROFITAB FIRMSIZE IND1 IND2 IND3 IND4 IND5 IND6 IND7 IND8 IND9 TIME HERFINDA GROWOPP
Constant added to instrument list

| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|---|---|---|---|---|
| C | -0.045096 | 0.007519 | -5.997244 | 0.0000 |
| TANGIBIL | 0.126429 | 0.002755 | 45.88291 | 0.0000 |
| PROFITAB | -0.006539 | 0.002853 | -2.291866 | 0.0219 |
| FIRMSIZE | 0.045364 | 0.000411 | 110.4464 | 0.0000 |
| IND1 | -0.003536 | 0.005568 | -0.635051 | 0.5254 |
| IND2 | 0.010399 | 0.003930 | 2.646451 | 0.0081 |
| IND3 | 0.015327 | 0.011011 | 1.391913 | 0.1640 |
| IND4 | 0.066313 | 0.003854 | 17.20813 | 0.0000 |
| IND5 | 0.045537 | 0.003710 | 12.27275 | 0.0000 |
| IND6 | 0.071230 | 0.014464 | 4.924511 | 0.0000 |
| IND7 | 0.048055 | 0.003766 | 12.76165 | 0.0000 |
| IND8 | 0.037144 | 0.004002 | 9.281571 | 0.0000 |
| IND9 | 0.049256 | 0.004745 | 10.38007 | 0.0000 |
| OWNERCO | 0.050480 | 0.002044 | 24.69475 | 0.0000 |
| TIME | -0.110905 | 0.001117 | -99.25343 | 0.0000 |

| | | | |
|---|---|---|---|
| R-squared | 0.155105 | Mean dependent var | 0.680151 |
| Adjusted R-squared | 0.155018 | S.D. dependent var | 0.212621 |
| S.E. of regression | 0.195447 | Sum squared resid | 5196.855 |
| F-statistic | 1808.759 | Durbin-Watson stat | 0.466949 |
| Prob(F-statistic) | 0.000000 | Second-Stage SSR | 5185.661 |
| Instrument rank | 16 | | |

Dependent Variable: OWNERCO
Method: Panel Two-Stage Least Squares
Date: 01/08/12 Time: 19:21
Sample: 2000 2009
Periods included: 10
Cross-sections included: 13606
Total panel (balanced) observations: 136060
Instrument specification: C TANGIBIL PROFITAB FIRMSIZE IND1 IND2 IND3 IND4 IND5 IND6 IND7 IND8 IND9 TIME HERFINDA GROWOPP
Constant added to instrument list

| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|---|---|---|---|---|
| C | 1.095441 | 0.032997 | 33.19802 | 0.0000 |
| GROWOPP | 0.008132 | 0.001362 | 5.970229 | 0.0000 |
| PROFITAB | 0.153546 | 0.012960 | 11.84767 | 0.0000 |
| FIRMSIZE | -0.232809 | 0.004149 | -56.11718 | 0.0000 |
| IND1 | -0.088492 | 0.025241 | -3.505888 | 0.0005 |
| IND2 | -0.093401 | 0.017843 | -5.234452 | 0.0000 |
| IND3 | -0.220375 | 0.049977 | -4.409519 | 0.0000 |
| IND4 | -0.291317 | 0.018370 | -15.85810 | 0.0000 |
| IND5 | -0.228468 | 0.017257 | -13.23940 | 0.0000 |
| IND6 | -0.251265 | 0.065863 | -3.814942 | 0.0001 |
| IND7 | -0.143042 | 0.017362 | -8.238999 | 0.0000 |
| IND8 | -0.164963 | 0.018474 | -8.929357 | 0.0000 |
| IND9 | -0.247228 | 0.021974 | -11.25098 | 0.0000 |
| LEVERAGE | 4.365767 | 0.084829 | 51.46574 | 0.0000 |
| TIME | 0.540515 | 0.010843 | 49.84754 | 0.0000 |

| | | | |
|---|---|---|---|
| R-squared | -9.733007 | Mean dependent var | 0.682657 |
| Adjusted R-squared | -9.734112 | S.D. dependent var | 0.270735 |
| S.E. of regression | 0.887008 | Sum squared resid | 107037.9 |
| F-statistic | 3403.228 | Durbin-Watson stat | 0.436979 |
| Prob(F-statistic) | 0.000000 | Second-Stage SSR | 7386.057 |
| Instrument rank | 16 | | |

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**BI Norwegian Business School**

**Preliminary Thesis Report**

# The effect of the 2006 tax reform on the companies' capital structure

Submitted on: 16.01.2012

Supervisor name: Bogdan Leon Stăcescu

Study programme: Master in Business and Economics, Major in Finance

# Table of contents

# 1. Introduction to the research topic

## 1.1. Tax bases

The Norwegian income tax system operates with two income tax bases: ordinary income and personal income.

Ordinary income (alminnelig inntekt) is a net income tax base and it is calculated for all taxpayers, both companies and individuals. It includes all taxable income from work, business and capital. Tax allowances and reliefs are deductible in the computation of ordinary income. The most important of these are interest payments on debts and a basic tax allowance on wage and pension income. The latter does not, however, apply to wage income from self-employment. In addition to the basic tax allowance, travel expenses to and from work exceeding NOK 12800, trade union fees, gifts to voluntary organizations, documented expenses for child care etc. are deductible. (Ministry of Finance)

Personal income (personinntekt) is a gross income tax base which consists of the total amount of gross wage and pension income. Social security contributions and surtax are levied on personal income. Wage income is a broad term that is defined as the sum of wages, income from self-employment that is related to labor input and fringe benefits such as company cars, free phone, free stock options etc. In general, all kinds of fringe benefits are regarded as personal income. (Ministry of Finance)

## 1.2. 1992 Tax Reform

In 1992 Norway implemented a broad tax reform whose main goal was to reduce tax-induced distortions to a minimum by lowering the tax rates and broadening the tax base. The reform also involved a significant step towards a more neutral tax system with respect to the type of economic activity and the organizational and financial structure of such activity. (Ministry of Finance)

The dual income tax introduced in 1992 was characterized by a low and flat tax rate on capital income and a progressive tax rate on personal income. The basic idea was to imply a neutral taxation on capital income and to ensure the redistribution of income through the progressive taxation of personal income and net wealth.

The capital income earned by personal tax payers (as well as the one earned by corporate tax payers) was subject to a flat tax rate of 28 per cent. The difference in marginal tax rates on capital and labor income (including employers' social security contributions) started out at 28,1 percentage points in 1992, increasing to 36,7 percentage points in 2004.

The split model was to function as a bridge between these two parts of the tax system, by dividing the income from active owners and self employed into capital and labor income respectively. This split model implied that a part of the income earned by companies owned two-thirds or more by active shareholders, was taxed as personal income (which was subject to progressive tax rates), irrespective of whether this income was distributed as a dividend or not.

However, since the 1992 reform, the split model has been changed several times with the result that it no longer functioned in a satisfactory manner.

To avoid double taxation, shareholders receiving dividends from Norwegian limited companies, were entitled to full credit for tax imposed on the dividends (the imputation method). Consequently dividends from Norwegian companies were in practice tax free on the hands of the shareholder, ensuring the same total taxation of 28 percent upon income earned in a limited company as on other capital income. On receiving dividend from a foreign limited company, a personal shareholder was not entitled to a full imputation credit, only a tax credit in respect of foreign withholding tax.

The 1992 tax reform also introduced a system of annual adjustment of the cost base of the shares with the amount of retained taxed profit in the company, to avoid economic double taxation of retained earnings, called the RISK-system. The adjustment only applied to shares in Norwegian companies.

## 1.3. 2006 Tax Reform

The Norwegian Parliament passed a major tax reform in 2006 which replaced the last major Norwegian tax reform from 1992. The main objective of the 2006 tax reform was to achieve a more efficient and fair tax system by solving the income shifting problem created by the large gap between labor and capital income taxation without violating the economic principles of the dual income tax. The maximum rate differential between capital income and labor income was 33.5 percentage points in 2005 and this led the owners of small companies to paying their salaries as dividends by reclassifying labor income as capital income. (Ministry of Finance 2005)

The challenge of the 2006 reform was to eliminate the gap in the marginal tax rates and abolish the split model without violating tax neutrality of financing decisions, and without increasing the corporate income tax. The only realistic way to reduce the gap in the marginal tax rates was to combine a reduction in the marginal tax rates on labor with an introduction of a partial double taxation of dividends paid to individual shareholders. (by eliminating the former imputation system). To maintain neutrality, the dividend tax was equipped with an allowance for the cost of capital (as well as ordinary loss deductions), the so called shareholder model. The same principle was introduced in the taxation of sole proprietors and partnerships. (Ministry of Finance 2011)

The main element of the 2006 tax reform was to replace the split model and the imputation system with the shareholder model.
Norwegian Individual Shareholders are taxable for capital gains on the realization of shares and have a corresponding right to deduct losses. Capital gains are taxed as ordinary income with a flat tax rate of 28%.
Also, the dividends exceeding a risk-free return on the investment are taxed as ordinary income with a flat tax rate of 28%. Before the dividends distribution, the company has paid the ordinary 28% corporate tax on the operating profits, so the total maximum marginal tax rate is therefore 48.16 % (28% + (72 x 28%)) for distributed dividends. Thus, the dividends that are not exceeding a risk-free return on the investment are subject only to the 28% corporate tax on the operating

profits. If the dividends for one year are less than the calculated risk-free return on investment, the surplus tax free amount can be carried forward in order to be offset against dividends distributed in a later year or against any capital gain from the alienation of the same share. This risk-free return allowance was intended to prevent tax on dividends from raising the costs of funding Norwegian equity and it was regarded as particularly important for start-ups and small companies that cannot fund new investment with retained profits, or which have limited access to credit markets or international capital markets. (Report No. 11 to the Storting)

As a consequence, the gap between labor and capital income has been reduced as the income derived from labor and pensions is taxed progressively as personal income up to maximum 47.8% on salary. (Albert 2008) The highest marginal tax on labor income (including employer's social security contribution) was thereby reduced from 64.7 per cent in 2004 to 54.3 per cent in 2006,

Norwegian Corporate Shareholders are not subject to tax on dividends and on capital gains derived from realization of shares in companies which are resident within the EEA, while losses suffered from such realization are not tax deductible. This method can be applicable to investments in foreign countries outside the EEA only if the corporate shareholder holds at least 10% of the shares and voting rights for at least 2 years. (Albert 2008)

In addition, the general tax treatment of interest income is that the lender is taxable for the received interests with a flat tax rate of 28 %, and the paid interests are deductible in ordinary income with the same amount for the borrower. But if an individual shareholder lends money to a limited company an additional tax is levied, more specifically another 28% on 72 % of the received interest will be charged for tax purposes. The reason for this deduction of 28% is symmetry considerations towards tax on retained earnings. This means that interests received from a limited company are taxed with a total of 48.16 % for amounts exceeding a risk-free return and the same as for distributed earnings. (Albert 2008) This additional tax charge comes as an addition to the ordinary taxation of the interest and thus 172 % of the relevant part of the interest is taxed. (KPMG Tax Facts 2006)

2. Previous rules (1992 Tax reform) vs. New rules (2006 Tax reform)

| Previous rules | New rules |
|---|---|
| Share income earned by Norwegian personal shareholders | |
| **Share dividends from Norwegian companies**:<br>In principle taxable, but full imputation means that in practice dividends are not taxed in the hands of the shareholder.<br><br>**Share dividends from foreign company**:<br>Fully taxable, deduction in Norwegian tax for tax at source on dividends paid to the state in which the company is resident.<br><br>**Active shareholders** are additionally taxed according to the **split income model**, with progressive tax (National Insurance contributions and surtax) on an estimated share of the company's profit attributable to labour, irrespective of whether the profit was distributed as dividend or not.<br><br>Capital gains on shares are always taxable income, and losses on shares are deductible.<br><br>When gain or loss on shares is calculated, income that was taxed in the company during the shareholder's | **The shareholder model:** Share dividends in excess of the allowance for a computed risk-free return are taxable. The imputation rules are abolished.<br><br>The shareholder model applies only to dividends from companies resident in Norway or another EEA country.<br><br>Dividends from companies resident in non-EEA countries will be taxable as before, i.e. fully taxable, but with deduction in Norwegian tax for taxation at source.<br><br>The split income model is abolished for active shareholders. The new rules do not distinguish between active and passive shareholders.<br><br>*Entry into force:* 1 January 2006.<br>A transitional rule for 2005 introduced the same right to imputation for dividends from companies in EEA countries as for dividends from Norwegian limited companies.<br><br>Capital gain on shares is always taxable, and loss on shares is always |

| | |
|---|---|
| ownership period is credited to the shareholder through the RISK rules (opening value adjustment). This adjustment ensures that the portion of the gains that is due to retained profits is not taxed. RISK is only applied to shares in Norwegian companies. | deductible.<br><br>The RISK rules are abolished. Unused risk-free return allowance reduces capital gains, but cannot be used to increase a loss. |

| Previous rules | New rules |
|---|---|
| Share income accrued by Norwegian limited companies | |
| Dividends, capital gains and losses are treated as described above for personal shareholders. | **The exemption method**: Share dividend and capital gains on shares are exempt from tax. Conversely, losses on shares are not deductible.<br><br>The exemption method does not apply to:<br>- shares in companies in low-tax non-EEA countries<br>- portfolio shares (i.e. in cases of a less than 10 per cent holding) in companies in non-EEA countries<br><br>For these shares, dividends and capital gain on shares are still taxable and losses on shares are deductible.<br><br>*Entry into force:* 1 January 2004 for dividends and 26 March 2004 for capital gains and losses on shares. |

| Previous rules | New rules |
|---|---|
| Share dividends from Norwegian limited companies to foreign shareholders | |
| Obligation to pay tax at source to Norway on dividends. The tax rate is 25 per cent at the outset, but has been reduced in a number of tax agreements into which Norway has entered with other states. | If the foreign shareholder is a limited company resident in an EEA country, the exemption method applies.<br><br>*Entry into force:* 1 January 2004.<br><br>Personal shareholders resident in another EEA country are taxed according to the shareholder model in the same way as Norwegian personal shareholders. For shareholders outside the EEA (both personal and corporate) the tax at source rules apply as previously.<br><br>*Entry into force:* 1 January 2004. Under a transitional rule, these shareholders were exempt from tax at source in 2005. |

| Previous rules | New rules |
|---|---|
| General partnerships, limited partnerships and other partnerships | |
| The company's profits are taxed on an accrual basis as ordinary income in the hands of partners.<br><br>Active partners are additionally taxed according to the split income model, with progressive tax (National Insurance contributions and surtax) on an estimated share of the company's profit attributable to labor, regardless of whether the profit was distributed to partners or not. | The company's profits are taxed on an accrual basis as ordinary income in the hands of partners.<br><br>**The partnership model:** When corporate profits are distributed to personal partners, the part that exceeds a computed risk-free return on the investment is additionally taxed as ordinary income.<br><br>The split income model is abolished for active partners.<br><br>*Entry into force:* 1 January 2006 |

| Previous rules | New rules |
|---|---|
| Self□employed (sole proprietorships) | |
| The profits are taxed on an accrual basis as ordinary income in the hands of the owner.<br><br>Active owners are additionally taxed according to the split income model with a progressive tax (National Insurance contributions and surtax) on a computed share of the company's profits attributable to labor. | The profits are taxed on an accrual basis as ordinary income in the hands of the owner.<br><br>**The self employed model**: The owner is additionally subject to a progressive tax (National Insurance contributions and surtax) on accrued profits after deduction of a computed risk-free return on the capital.<br><br>*Entry into force:* 1 January 2006 |

Source: Ministry of Finance, Report No. 11 to the Storting

# 3. Literature review

Alstadsæter & Fjærli (2009) performed a study in which they analyzed the dividend policy of 75433 Norwegian non-listed corporations. Their most important finding revealed that the timing of dividend payments was very sensitive to changes in the taxation of shareholders and that corporations with concentrated ownership had the strongest responses. More specifically, "aggregate proposed dividends increased by 82% the last year before the introduction of the shareholder income tax and dropped by 41% after the reform". Moreover, they discovered that extraordinarily high dividend payouts compared to after tax profits took place.

Another interesting finding was that "the intertemporal income shifting through the timing of dividends drains the corporations for internal equity and increases their debt-equity ratios". They also pointed out that there is a clear tendency for debt-asset ratios to increase in the years prior to the reform in small corporations and in closely held corporations, indicating that internal equity to a large extent was replaced by debt. After the reform, it was noticed a sharp drop in dividend payments and thus the debt-asset ratio declined.

In addition, there exists the possibility that the tax motivated excessive dividend payments could temporarily confine investments if leakage of working capital through dividend distributions is not replaced by new funds. Nevertheless, if foregone internal funds are replaced by debt or equity, it is less likely that intertemporal income shifting have important real effects. In a study performed by Mjøs (2008) in which he analyzed the capital structure of Norwegian companies, it was found that univariate data actually indicate reduced use of debt in years with dividend taxation.

One of the findings of the Myers & Majluf (1984) model is "the tendency to rely on internal sources of funds, and to prefer debt to equity if external financing is required" when the company's managers have superior information. They also relate "profitability to debt policy through a modified <<pecking order>> hypothesis, which suggests that more profitable firms will decrease their demand

for debt, since more internal funds will be available to finance investment." (Jensen et al. 1992)

Since limited companies are not taxable for neither received earnings or for capital gains, the tax system has built in an important incentive when it comes to the type of business entity to choose. Therefore, an increased number of limited companies have been established by private investors for the purpose of buying and selling shares without taxation through their private limited company. Furthermore, there are tax advantages with debt financing compared to retained earnings financing because a company will have the possibility to deduct 28 % of all interests paid to external lenders.

According to Jensen et al. (1992), "high insider ownership firms choose lower levels of both debt and dividends". Moreover, the firms with "high dividend payouts find debt financing less attractive than equity financing".

## 4. Research questions and objectives of the thesis

The objective of this thesis is to uncover the main effects of the 2006 Norwegian tax reform on the companies' capital structure.
This thesis intends to further investigate the following research questions:

- ✓ Had debt become more attractive as a source of finance after the introduction of the double taxation of dividend income? What's the role of retentions as a preferred source of finance?
- ✓ Does the sharp increase in equity ratios after the reform just reflect the timing reflects and turbulence related to the transition or does it also involve a permanent change in the funding and payout policy?
- ✓ Is there a correlation between excess dividend payments and asset growth?
- ✓ What's the real purpose of reallocation of dividends from individuals to holding companies? Are corporations used as a tax evasion instrument?
- ✓ The importance of financial slack.
- ✓ What's the reform's effect on the company's cost of debt?
- ✓ What's the effect of the insider ownership on the debt and dividend policy?

## 5. Research design and method

Different statistical methods will be used on the sample data obtained from the Center for Corporate Governance Research. The research questions will be approached by firstly analyzing the previous findings and relevant theory and secondly by formulating and testing the hypothesis.

The sample data will consist of independent Norwegian non-listed firms with major financial statements data (revenue, results of operations, current liabilities, current assets and others) and other non-financial data such as the Herfindahl index and ownership structure.

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