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Did the capital structure of firms listed on Oslo Stock Exchange change in the period 2004-2013?

A study of the impact of the financial crisis on the development in firms' capital structure in the Norwegian market

By

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&

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Abstract

After the financial crisis in 2008, the financial landscape has undergone changes. This has affected firms' access to capital. It has become harder to obtain traditional bank loans, because of new regulations and restrictions on banks and financial institutions. At the same time, the Norwegian bond market has experienced a significant growth. This paper examines the development in capital structure and the composition of debt for firms listed on Oslo Stock Exchange. Listed firms had a stable growth in debt for the years 2004-2013. The average debt ratio for OSE-listed firms experienced a jump under the financial crisis. This was due to a large fall in market value of equity. Almost the entire jump in debt ratio can be explained by the fall in share price. There has been a substantial increase in firms' use of bonds after the financial crisis. When one firm is extensively analysed as an example, we find that the use of bonds has increased more than bank loans after the crisis. This indicates that bonds account for an increasing share of total debt.

Preface

This thesis concludes our Master Degree in Economics and Business Administration with specialisation in Applied Finance at the University of Stavanger Business School. The main purpose of this thesis is to give a general overview of the development in capital structure for firms listed on Oslo Stock Exchange. The focus has been on the years 2004-2013, trying to determine if and how the financial crisis in 2008 affected firms' capital structure.

This topic triggered our interest because the financing of firms always will be of relevance, as firms' investments and operations are in need of capital. The financial crisis had large impact on the entire economy and we were eager to explore how the financing of listed firms were affected.

We would like to direct thanks to our supervisor Bernt Arne Ødegaard for contributing with guidance and inputs during the process of writing this thesis. We would also like to thank Odfjell SE, by Gina Jamt Ånonli, for responding and helping us with information and data relevant for our thesis.

Stavanger, June 2015

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Table of Contents

1	Introduction.....	1
2	Theory	5
2.1	Miller and Modigliani theorem.....	5
2.2	The trade-off theory.....	7
2.3	The pecking order theory.....	10
2.4	The market timing theory	12
2.5	Agency cost and ownership structure	13
3	The impact of the financial crisis on capital structure	16
4	The Norwegian market for bank loans and bonds	19
4.1	Market for bank loans during and after the financial crisis.....	19
4.1.1	Macroeconomic perspective.....	19
4.1.2	Development in bank loans to corporations	20
4.2	The Norwegian market for bonds.....	22
4.3	Expectations of capital structure.....	23
5	Empirical strategy.....	25
6	Data	27
6.1	Main dataset.....	27
6.2	Bonds.....	29
6.2.1	Bond market analysis - Oslo Stock Exchange & Nordic ABM	29
6.2.2	Sector-specific analysis	29
6.2.3	Example of the individual firm Odfjell SE	30
7	Results.....	31
7.1	Main dataset.....	31
7.1.1	Development in debt and equity.....	31
7.1.2	Debt ratio.....	33
7.2	Bonds.....	37

7.2.1	Bond market analysis - Oslo Stock Exchange and Nordic ABM	37
7.2.2	Sector-specific analysis	40
7.2.3	Example of the individual firm Odfjell SE	43
7.2.4	Summary and discussion of bond results	44
8	Results related to theory	45
9	Conclusion	46
10	References	48
11	Appendices	52
11.1	Appendix 1 - Exchange rates at year end (31.12).....	52
11.2	Appendix 2 - Sample of OSE listed firms' equity, debt and debt ratio.....	53

List of Figures

Figure 1 - Average debt ratio for OSE-listed firms.....	3
Figure 2 - Firm value, no taxes or bankruptcy costs, Miller & Modigliani (1958), p. 261-297.....	6
Figure 3 - WACC, no taxes or bankruptcy costs, Miller & Modigliani (1958), p. 261-297.....	7
Figure 4 - Cost of debt, Kraus & Litzenberger (1973), p. 911-922	8
Figure 5 - Benefit of debt, Miller & Modigliani (1963), p. 433-443	9
Figure 6 - Marginal cost of debt vs. marginal benefit of debt, Kraus & Litzenberger (1973), p. 911-922	10
Figure 7 - Total market size, bank loans to Norwegian firms, Hetland & Mjøs (2014), p. 71	20
Figure 8 - Change in bank loans to Norwegian firms, Hetland & Mjøs (2014), p. 71	21
Figure 9 - Bank loans to new Norwegian firms, Hetland & Mjøs (2014), p. 72.....	21
Figure 10 - How CFOs perceive the attractiveness and availability of different ways of financing, Deloitte's CFO-undersøkelse (2012), p. 18	23
Figure 11 - How CFOs perceive the attractiveness and availability of bank loans, Deloitte's CFO-undersøkels (2012), p. 20	24
Figure 12 - Average debt, in 1000s	31
Figure 13 - Average market value of equity, in 1000s.....	31
Figure 14 - Average book value of equity, in 1000s.....	32
Figure 15 - Average market value of equity, in 1000s.....	32
Figure 16 - Development in OSEBX, Oslo Stock Exchange (2015)	33
Figure 17 - Average debt ratio for different sectors	34
Figure 18 - Average debt ratio for OSE-listed firms.....	34

Figure 19 - Average debt and average market value of equity for OSE-listed firms	35
Figure 20 - How changes in MVE affect debt ratio for OSE-listed firms	36
Figure 21 - Total number of bonds listed at year end, OSE and Nordic ABM, Oslo Stock Exchange (2015).....	37
Figure 22 - Total number of bonds listed on OSE and Nordic ABM at year end, Oslo Stock Exchange (2015)	38
Figure 23 - Total bond turnover on OSE and Nordic ABM, Oslo Stock Exchange (2015)	38
Figure 24 - Total nominal value of bonds listed on OSE and Nordic ABM, Oslo Stock Exchange (2015).....	39
Figure 25 - Total new bond issues and increases in tap issues on OSE and Nordic ABM, Oslo Stock Exchange (2015).....	39
Figure 26 - Average bonds, all sectors	40
Figure 27 - Average bonds for the sectors energy, industrials and materials combined	41
Figure 28 - Average bonds in the energy-sector	41
Figure 29 - Average bonds in the industrials-sector	42
Figure 30- Average bonds in the materials-sector	42
Figure 31 - Development in bond loans and bank loans for Odfjell SE	43
Figure 32 - Development in bond loans and bank loans for Odfjell SE	43
Figure 33 - Proportion of bonds compared to the sum of bonds and bank loans	44

List of Tables

Table 1 - Ranking of preferred financing, Tirole (2006), p. 238	11
Table 2 - Main dataset, first five rows, monetary numbers in thousands	27
Table 3 - Number of firms with available debt ratios, divided in years and GICS-sectors	28
Table 4 - Debt ratio, descriptive numbers, 2004-2013.....	29
Table 5 - Debt composition for Odfjell SE, in USD mill.....	30
Table 6 - Average debt ratio for different sectors, numbers in %	33

1 Introduction

In order to do business, firms need financing. Their investments and operations need capital. How firms choose the amount of debt and equity, their capital structure, is thus an important decision. It is assumed that firms are able to choose their composition of debt and equity. They will try adapting to the level they find optimal.

Capital structure is a heavily discussed and explored economic phenomenon. Several theories try to explain the problem of an optimal capital structure. There has been extensive research on the subject, which mostly concern the international market. Firms listed in Norway represent a different marketplace than the markets in most of the previous investigations. A specific study of Norway can contribute with additional insight to the discussion on capital structure. If capital structure affects a firm's profitability, liquidity or solidity, and there exists an optimal capital structure, this knowledge would be valuable to managers. It would contribute to more optimal business decisions.

A firm's choice of capital structure and access to capital is affected by the economy as a whole. Because the economy and the financial situation are constantly changing, the capital structure is not constant. There are two main reasons for changes in a firm's capital structure. One reason is internal events in the specific firm. Second, changes in capital structure can be a consequence of external events.

This thesis will differ from previous research on the same subject. We investigate the change in capital structure for listed firms on Oslo Stock Exchange (OSE). The development in year 2004 to 2013 is examined. The financial crisis occurred in the middle of the time period, in 2008. It had a major role in the financial situation. If the financial crisis led to an external shock to institutional structure, this means that some of the change in capital structure is not chosen by managers, but a consequence of external extreme events. The main question is if and how the financial crisis resulted in a change in firms' capital structure.

Despite extensive research concerning capital structure, less focus has been directed towards the Norwegian market. We have chosen to investigate firms on OSE, because the development in capital structure among firms on OSE does not necessary give the same results as studies from other parts of the world. It can be expedient with a study that firms in the Norwegian market can relate to. The objective is that our research can increase the knowledge about the development in listed firms' capital structure. The fact that there was a

worldwide financial crisis in the middle of the time period, gives a new dimension to our analysis. It allows us to relate capital structure to huge upheavals in the economy. This can justify why we are choosing such a well-researched subject. Even though Norway was less affected by the crisis than most countries, the Norwegian economy has been affected.

It has been argued that capital structure is irrelevant for a firm's value (Miller & Modigliani, 1958). Others claim there to be both benefits and costs of taking on debt (Kraus & Litzenberger, 1973). In addition, managers and owners do not always have similar interests. Managers may act in their own interest. This can imply non-rational behaviour for the firm (Jensen & Meckling, 1976). Further contributions explore a preferred ranking of financing, where the ranking is determined by asymmetric information (Myers & Majluf, 1984). It is also argued that a firm's capital structure depends on market timing (Baker & Wurgler, 2002). The ability of the theories to explain the capital structure can change over time, such that their importance have varying significance in different circumstances.

Hetland & Mjøs (2014), studied firms' access to credit before, during and after the financial crisis. They found a continued growth in total bank loans throughout the period 1997-2012. However, small and newly established firms experienced more difficulties in obtaining bank loans after the crisis. According to Oslo Stock Exchange (2014) the Norwegian bond market has experienced a remarkable growth after the financial crisis. De Fiore and Uhlig (2012) highlight the importance of other sources of external financing than bank loans during crises. Deutsche Bank (2013) states a significant increase in corporate bonds after the financial crisis in 2008. Traditional bank loans have become less available due to increased regulations and restrictions. Deutsche Bank also points out increased demand from investors, seeking the higher yields in the bond market. A survey conducted by Deloitte in 2012 shows similar results for Norway. CFOs of Norwegian firms answer that the availability of bond loans has become significantly higher than bank loans. These previous investigations show evidence for changes in firms' capital structure as a result of the financial crisis.

This thesis tries to explain two main questions concerning capital structure. The first is the development in firms' debt ratio, which is the relative use of debt and equity. The second question explores the change in composition of debt. This is basically the relationship between bank loans and bonds.

All listed firms on OSE are analysed. We use financial data for the years 2004-2013 to explore the change in capital structure over time. Both the amount of debt financing and the

composition of the debt are reviewed. Thomson Reuters Datastream is the database used to obtain most of the data. Financial variables were downloaded and organised as panel data. In addition, data concerning the Norwegian bond market has been downloaded directly from Oslo Stock Exchange. Specific firms' bond loans are obtained directly from firms' financial reports.

Our results suggest that the financial crisis resulted in a change in the capital structure for listed firms. As one can see in Figure 1, there has been an observable change in debt ratio during and after the financial crisis. This is the average debt ratio for all firms, which means that the entire economy was affected by the financial crisis. This provides a basis for further research concerning the reason behind the change in capital structure. The observable change is a result of external events, because the crisis appears to have affected the average firm.

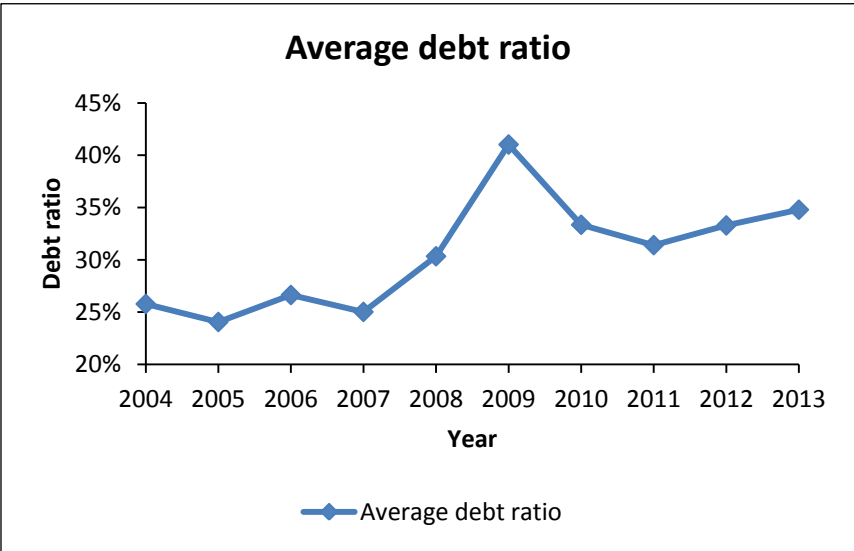


Figure 1 - Average debt ratio for OSE-listed firms

Our results show an increasing development in use of debt throughout the period. When the financial crisis occurred, the market value of equity experienced a large reduction. Debt ratio has a negative correlation with market value of equity. The jump in debt ratio can greatly be explained by the reduced market value of equity. The large jump in debt ratio is thus an automatic mechanism. When studying the composition of debt, we find a development in firms' debt structure. The composition of debt has been subject to a shift from bank loans to more use of bonds.

We have decided to structure the paper as follows. The paper will first address previous theories concerning capital structure. The second part contains previous research on how

firms' capital structures were affected by the financial crisis. The third part reviews the Norwegian market for bank loans and bonds. The fourth part deals with the empirical strategy, how we plan to solve the research question. Fifth, we give a thorough description of the data used in the analysis, before presenting the results in the sixth part. Finally, a summarising conclusion will be presented as well as suggestions to further research.

2 Theory

Capital structure is the way firms finance their assets. It is mainly divided into debt and equity. Debt consists of several types, such as bonds, bank loans, certificates, leasing, convertible debt etc.

To get an understanding of firms' capital structure, one must identify the determinants behind the choice of capital structure and how it is assumed to be affected by different factors. Myers (2001) argues that there is no universal theory to describe the debt-equity choice and no reason to expect one. However, many theories have been introduced.¹ There are different approaches to the problem of capital structure. The theories have different objectives. Some try to solve the problem of an optimal capital structure, while others try to say something about the determinants of firms' sources of financing. The different theories have both advantages and disadvantages. Each theory succeeds in explaining parts of the capital structure issue, while other parts are not clarified.

This part of the thesis will look at some capital structure theories and research. They contribute to increased knowledge about factors assumed to affect the choice of capital structure. In addition, they give a benchmark where we can compare our own results to previous findings. If capital structure has changed as a result of the financial crisis, it is interesting to see if the causes of change can be linked to previous theory and research. The models are simplifications of the real world, but they can still be used to explain mechanisms and decision-making in the economy.

2.1 Miller and Modigliani theorem

Franco Modigliani and Merton Miller formed their famous capital structure theorem in 1958.² Originally, it states that a firm's value is not affected by its capital structure, when holding the firm's investment policy fixed. They claim that a firm's leverage is irrelevant for the total value of the firm. This theorem is also referred to as the Capital Structure Irrelevance Principle.

¹ Myers (2001), p. 81

² Miller & Modigliani (1958), p. 261-297

Their theory on capital structure without taxes and bankruptcy costs that was introduced in 1958 is treated here. A more advanced model accounting for both taxes and bankruptcy costs will be addressed in the trade-off chapter. The capital structure irrelevance principle can be divided into two different propositions. Proposition 1 deals with the firm's total value, while proposition 2 concerns the firm's cost of capital.

When ignoring taxes and bankruptcy costs, a firm's value is assumed to remain unaffected by capital structure. Changes in a firm's capital structure will leave total value unchanged, because the cash flows have not changed. There will not be any additional value to the firm due to changes in the composition of debt and equity. This is illustrated in Figure 2. The size of the pie represents total value of the firm. Even though the firm's financing has changed, total value is unchanged.

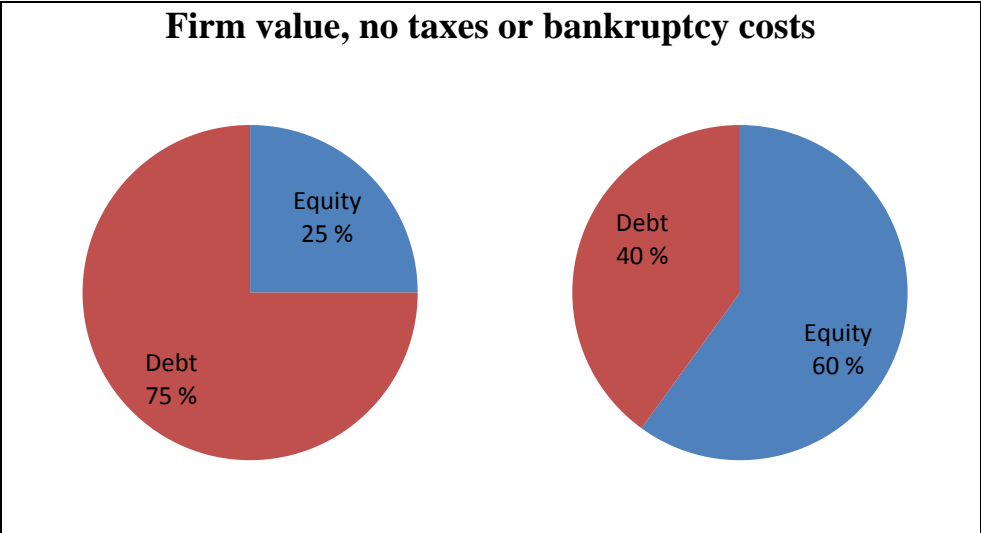


Figure 2 - Firm value, no taxes or bankruptcy costs, Miller & Modigliani (1958), p. 261-297

In order for proposition 1 to be true, the discount rate must remain unchanged. This is shown in proposition 2. Miller and Modigliani states that, in a world without taxes, the WACC (Weighted Average Cost of Capital) will remain constant despite changes in the capital structure.

$$WACC = \frac{E}{D + E} \times K_e + \frac{D}{D + E} \times K_d$$

E = Equity
 D = Debt
 K_e = Cost of Equity
 K_d = Cost of Debt

WACC is unaffected by capital structure. Some of the input variables in the WACC-calculation will change when debt ratio changes, but they will perfectly offset each other.

The second proposition takes into account the effect of risk. Stockholders have larger uncertainty than debt holders. They can only get dividend payments if there is something left after the firm has met its liabilities. Due to the risk of leverage, stockholders will demand an additional return. This risk is assumed proportional with debt ratio. The risk for equity holders will increase if the firm takes on more debt. Cost of equity goes up when debt ratio increases. The increased debt ratio pulls WACC downwards, because it puts a higher weight on the lower cost of debt and a lower weight on the increased cost of equity. The change in capital structure weights is perfectly offset by the increase in cost of equity. The consequence is that WACC remains unchanged. Total firm value is thus independent of capital structure. This is illustrated in Figure 3 for a simple scenario with no taxes or bankruptcy costs.

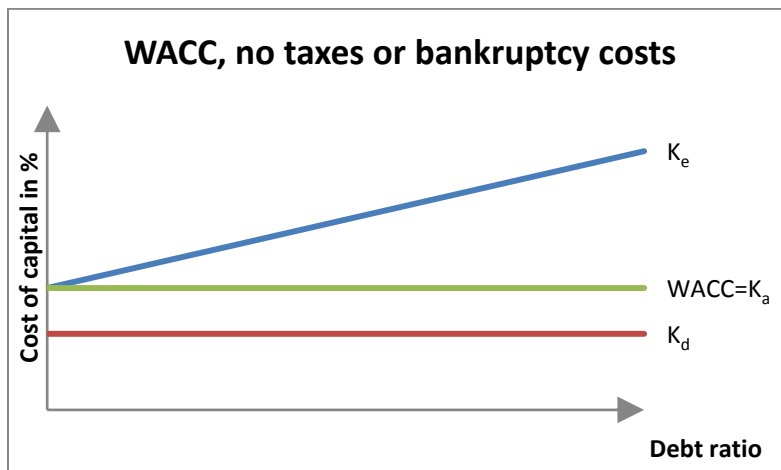


Figure 3 - WACC, no taxes or bankruptcy costs, Miller & Modigliani (1958), p. 261-297

2.2 The trade-off theory

In 1963 Miller and Modigliani modified their theorem to include taxes.³ Bankruptcy costs have also been included to get an offsetting effect. The trade-off theory describes how firms choose their optimal capital structure. The nature of this theory is the trade off between benefits and costs of debt. It was discussed in September 1973 by Alan Kraus and Robert Litzenberger.⁴ In order to apply this theory, one must take assumptions about a nearly perfect market.

Myers based his research on this previous work and announces in The Capital Structure Puzzle (1984): "The firm is viewed as setting a target debt-to-value ratio and gradually

³ Miller & Modigliani (1963), p. 433-443

⁴ Kraus & Litzenberger (1973), p. 911-922

moving towards it."⁵ Further, the text points out the additional adjustment costs necessary to achieve the optimal leverage. The trade-off theory concerns the amount of debt-financing in the firm. Two factors affected by the degree of debt are important. This is the probability of bankruptcy and the tax shield.

Probability of bankruptcy is a cost of debt. A firm incapable of meeting its liabilities will go bankrupt. When a firm has zero debt, it has no liabilities, and thus no probability for bankruptcy. Such a firm is solid and stable. No debt is thus value-increasing, because bankruptcy means end of operation and closure of the firm. As a firm takes on more debt, the probability for bankruptcy will increase. More debt demands more from the firm's liquidity. Figure 4 illustrates the positive relationship between the amount of debt and the probability of bankruptcy.

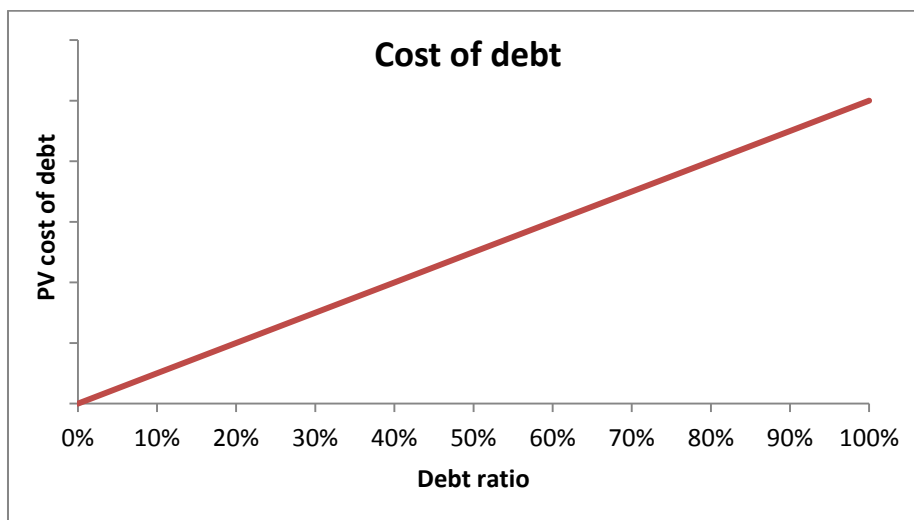


Figure 4 - Cost of debt, Kraus & Litzenberger (1973), p. 911-922

This correlation pulls the optimal debt ratio downwards. When looking at the isolated effect from this particular factor, the optimal debt ratio is zero.

Debt can usually be raised more quickly than equity and accumulated earnings. Therefore, debt contributes to more flexibility when taking on investment opportunities. By exploiting available tax shields, debt can also help increase firms after tax earnings.⁶ A tax shield is a benefit from taking on debt. Firms must pay interest on their interest-bearing liabilities. Such interest on debt is tax deductible. This means reduced taxes because of the debt. Firms seek to minimise taxes, because less taxes means more money left in the company. This will increase

⁵ Myers (1984), p. 576

⁶ Harrison & Widjaja (2013), p. 1

the value of the firm. Zero debt gives no reduced taxes; the tax shield in this case will be zero. As the firm's debt increases, the benefit of debt will also increase. More debt implies more tax deduction and higher firm value. If this is the only decision-relevant factor, the optimal debt ratio is 100%. The firm should take on as much debt as possible in order to reduce taxes with the highest amount. As shown in Figure 5, there is a positive correlation between amount of debt and tax-deductions.

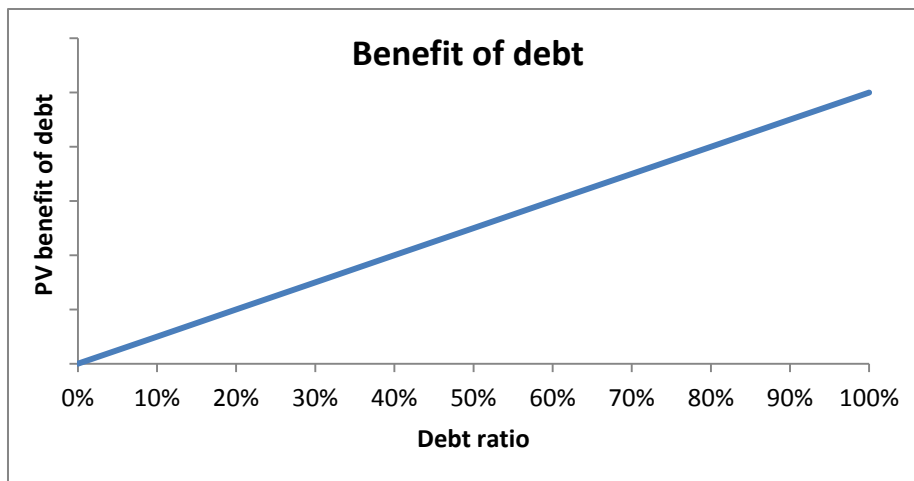


Figure 5 - Benefit of debt, Miller & Modigliani (1963), p. 433-443

As reviewed above, the two factors are pulling in opposite directions. Both benefits and costs of debt increase as the debt ratio increases. The probability of bankruptcy calls for less debt, while the tax shield calls for more. The trade-off theory explains how there are both benefits and costs connected to taking on debt. Kraus and Litzenberger argued that the optimal debt ratio is a trade off between tax benefit of debt and cost of bankruptcy.

Probability of bankruptcy must be multiplied by the cost this would cause. To get the decision relevant number today, present value (PV) of this cost must be calculated. Benefits of the tax shield must also be discounted. PV of the interest tax shield can then be compared to PV of bankruptcy costs.

When debt increases, marginal benefit (MB) of debt will decline.⁷ It's still positive, but the marginal benefit from more debt is reduced. Mathematically, first order derivative is positive, while the second order derivative is negative. Marginal cost (MC) of debt is increasing as debt increases. First order derivative is negative and second order derivative is positive. This is

⁷ Finance, Maps of the World (2013), Trade-off theory

shown in Figure 6. According to this theory, the firm will take on more debt as long as the marginal benefit exceeds the marginal cost.

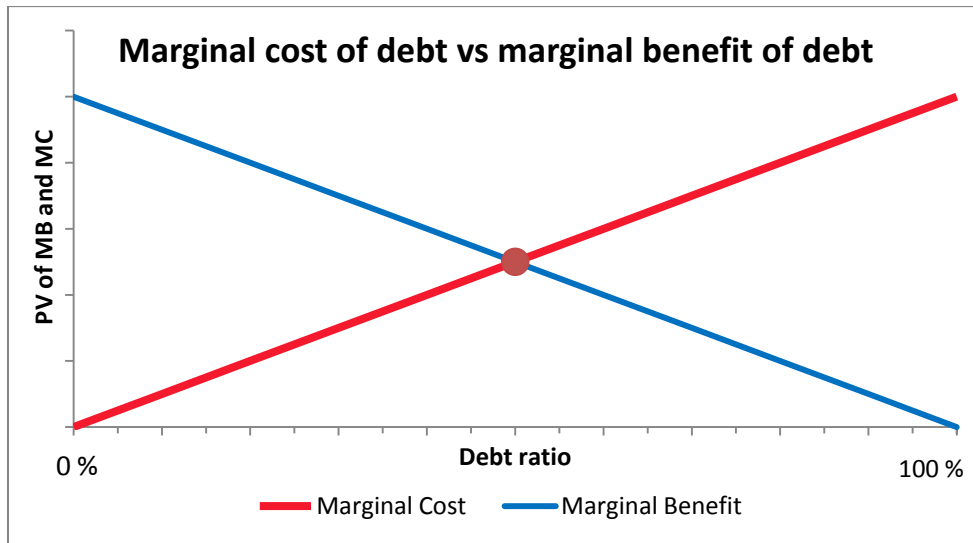


Figure 6 - Marginal cost of debt vs. marginal benefit of debt, Kraus & Litzenberger (1973), p. 911-922

Optimal debt ratio is found in the intersect between MC and MB, marked by the dark red point. If the firm chooses more debt than this, marginal cost exceeds marginal benefit, and total firm value will be reduced. The WACC is also minimised at this optimal debt ratio.

Criticism has been directed towards the trade-off theory. Hackbart, Hennessey and Leland have pointed out some potential errors.⁸ The theory formed by Kraus and Litzenberger doesn't consider different properties of debt. Whether the debt is traded or untraded, the time to maturity and priority of debt is not taken into account. The trade-off theory only assumes one kind of debt, which is a clear weakness. The taxation of companies are also far more complicated and advanced than assumed in the theory.⁹ Haugen and Senbet cite the difficulties in calculating and understanding the bankruptcy costs.¹⁰ This discussion of the trade-off theory confirms its relevance, even though it might be inadequate.

2.3 The pecking order theory

The pecking order theory by Myers (1984) and Myers and Majluf (1984), suggests a ranking of preferred sources of financing. This ranking is based on asymmetric information.

⁸ Hackbart, Hennessey & Leland (2007), p. 1-3

⁹ Murray & Vidham (2005), p. 8-12

¹⁰ Haugen & Senbet (1978), p. 383-393

Asymmetric information indicates that managers have more knowledge about a firm's financial situation than outside investors. The cost of financing rises with increasing asymmetric information. The firm aims to issue the type of financing that require the lowest information costs and is least affected by asymmetric information. The main financing sources are internal means (internal equity and retained earnings), debt, hybrid securities and new equity.¹¹ A firm's choice of financing is perceived as a signal of the firm's financial position and further interpreted by investors.¹²

Ranking of preferred financing
1. Internal means
2. Debt
3. Hybrid securities
4. Equity issue

Table 1 - Ranking of preferred financing, Tirole (2006), p. 238

Gordon Donaldson (1961) was one of the first to suggest the thoughts behind the pecking order theory. He found that managers prefer to use internal means for financing.¹³ He also stated that debt capacity is limited and that debt increases bankruptcy risk.¹⁴ Myers and Majluf (1984) and Myers (1984) further build on these ideas and suggest that firms use a financing hierarchy. Issuing equity is the least preferred type of financing, due to asymmetric information.¹⁵ Debt is preferred to equity issue because it contains lower information costs. However, debt increases bankruptcy costs. At some point, it will not be optimal to issue more debt.¹⁶ Myers and Majluf also emphasise that bond issue is preferred to issuing equity.¹⁷ The most preferred type of financing is internal means because it is assumed to contain no asymmetric information. When a firm prefers internal to external financing and if it uses external financing, prefers debt to equity, the firm is acting according to the pecking order theory.¹⁸ Adverse selection and agency theory is the two most common ways to derive models for the pecking order. A financing hierarchy can also arise considering tax on its own.¹⁹

¹¹ Tirole (2006), p. 237-238

¹² Myers & Majluf (1984), p. 187

¹³ Donaldson (1961), p. 67

¹⁴ Lindblom, Sandahl & Sjögren (2010), p. 2

¹⁵ Myers & Majluf (1984), p. 187

¹⁶ Tirole (2006), p. 238

¹⁷ Myers & Majluf (1984), p. 209

¹⁸ Myers (1984), p. 576

¹⁹ Frank & Goyal (2005), p. 20

Researchers have found the pecking order theory to be a decent approximation in some occasions. Findings state that the main source of financing in mature firms is retained earnings, while external financing is essentially debt. Seasoned equity is not common. The idea behind the pecking order theory also corresponds to the fact that equity issue leads to a negative stock price reaction while debt does not.²⁰ The pecking order has failed to hold where it is sufficient and expected to hold. Asymmetric information is a common problem in small firms. However, Helwege and Liang (1996) found that the pecking order does not hold for small firms. Frank and Goyal (2003) found similar results. To some extent, large firms followed the pecking order, while small companies did not. They found that the support of the pecking order increases with the size of the firm.²¹ More criticisms can be read in the book, "The Theory of Corporate Finance" (Tirole, 2006).²²

2.4 The market timing theory

The market timing theory explores how firms choose to structure their use of equity and debt. This theory suggests that a firm time its equity issue based on stock market conditions.²³ A firm's choice of equity and debt depends on what type of financing is most valuable in the financing market at the moment. Corporations try to identify mispricing in debt or equity components in an attempt to time financing decisions.²⁴

Baker and Wurgler (2002) introduced the market timing theory. They claim market timing to be an important determinant of a firm's capital structure choice.²⁵ The theory is viewed as a distinction to the pecking order hypothesis and the trade-off theory. When market values of equity are high relative to book and past market values, the market timing theory claims that firms are more likely to issue equity. Conversely, when market values are low relative to book and past market values, firms are more likely to repurchase equity or issue debt.²⁶ Baker and Wurgler state that market timing has a persistent effect on capital structure. The choice of capital structure will thus be highly related to historical market values.²⁷ Their findings can be

²⁰ Tirole (2006), p. 238

²¹ Frank & Goyal (2003), p. 237

²² Tirole (2006), p. 238

²³ Baker & Martin (2011), p. 21

²⁴ Finance, Maps of World (2013), The market timing hypothesis

²⁵ Baker & Wurgler (2002), p. 1

²⁶ Harrison & Widjaja (2013), p. 26-27

²⁷ Baker & Wurgler (2002), p. 1

summarised in the following sentence: “The results suggest the theory that capital structure is the cumulative outcome of past attempts to time the equity market.”²⁸

According to empirical studies, market timing has an influential position in firms' financing.²⁹ Baker and Wurgler found the timing effects on leverage to be persistent and extend beyond ten years. Alti (2006) found that the effect of market timing on leverage disappeared after two years.³⁰ The market timing theory has received some criticism. It does not explain why there exists mispricing in the assets and it assumes firms are better at detecting mispricing than the market.³¹

2.5 Agency cost and ownership structure

The incentives of the managers' investment and operating choices are influenced by financing decisions. The effects of financing decisions can be explained by agency costs.³² An agency relationship exists when there is a contract where principals (investors) engage an agent (manager) to perform some form of service. The relationship gives the agent authority to make decisions on the behalf of the principal. Both agency costs and ownership structure affect a firm's capital structure. The relationship between the amount of ownership claims held by the management (insiders) and the amount held by the investors (outsiders) affect how aligned their interests are. This has impact for management decisions. Increased outside financing implies higher agency costs for the manager.³³

Theories mentioned earlier assume that the interests of both shareholders and managers are the same, such that the financing decisions are equivalent to the interests of the shareholders. Jensen and Meckling (1976) state that this is unrealistic and not true in reality. As long as managers and investors both utility-maximise, the agent will not always act in the best interest of the principal. The agent has his/her own interests, wanting to maximise both economic and non-economic benefits. The principals can discourage deviation from their interest and create proper incentives for the agent by using monitoring and control, pay bonding cost and design compensation packages. These represent a cost and will reduce the principals' revenue. As a

²⁸ Baker & Wurgler (2002), p. 1

²⁹ Baker & Martin (2011), p. 21

³⁰ Alti (2006), p. 1681-1682

³¹ Finance, Maps of World (2013), The market timing hypothesis

³² Myers (2003), p. 2

³³ Jensen & Meckling (1976), p. 305, 308, 349-350

result, agents' divergence from principals' interests will never be entirely eliminated.³⁴ Myers (2003) states that it is naive to believe in the trade-off and the pecking order theories if one consider the theory of agency cost to be true.³⁵

The importance of a reasonable capital structure can be clarified by the three following agency costs:

The asset substitution effect

When managers' act in investors' interests, managers in firms with high debt ratios have incentive to take on investments with a low chance of success, but in the case of success would yield high profit.³⁶ If the investment has a positive outcome, the equity holders get to keep the profit. If the investment has a negative outcome, the debt holders will lose.³⁷

The underinvestment problem / debt overhang problem

Firms that have issued risky debt will tend to under-invest in projects, even projects with positive NPV that could increase the value of the firm. This is because profit received from successful projects will first go to the debt holders and not the shareholders.³⁸

The free cash flow theory

Jensen (1986)³⁹ free cash flow hypothesis states that when firms have free cash flow, they tend to waste them by over-investing. He argues that the free cash flow should be paid out as dividends or debt expenses.⁴⁰ Debt has a positive effect of enforcing financial discipline on management behaviour.⁴¹

The three types of agency costs illustrate that too high debt ratio and risky debt can lead to the asset substitution effect and the underinvestment problem. However, not enough debt may lead to the negative effect of the free cash flow problem. It is important with a suitable amount of debt when constructing a firm's capital structure. There should not be too much nor too little debt and the debt should not be too risky.

³⁴ Jensen & Meckling (1976), p. 308

³⁵ Myers (2003), p. 31-32

³⁶ Spiegel (1999), p. 18

³⁷ Jensen & Meckling (1976), p. 334

³⁸ Spiegel (1999), p. 25

³⁹ Jensen (1986), p. 323-325

⁴⁰ Spiegel (1999), p. 40

⁴¹ Chaturvedi (2009), p. 200

The agency theory gives insight to incentives of the management, risk, information systems and outcome uncertainty.⁴² One criticism argues that the agency theory has had a bad impact on society. Sumantra Ghoshal claims that by putting too much weight on the assumptions of agency theory, the actions of some managers have led to dysfunctional companies, and in some cases been the source of corporate scandals. Other claim that the agency theory has an incorrect focus, that it only focuses on one direction of the agency relationship and that some of the assumptions underlying the agency theory are wrong.⁴³

⁴² Eisenhardt (1989), p. 57

⁴³ Huse (2007), p. 50-51

3 The impact of the financial crisis on capital structure

The financial crisis affected firms' capital structure, both through exogenous events and internal managerial decisions. Several investigations highlight an increased use of bond loans. Some will be discussed to understand the development in firms' capital structure. The following researches are conducted in the US-market and EU-market. Even though they do not study the Norwegian market, they can still provide insight of how firms' capital structure was affected by the financial crisis.

Harrison & Widjaja (2013) studied whether the financial crisis in 2008 had an impact on the capital structure of firms. They compared determinants of capital structure before and after the financial crisis. Firms in the S&P 500 were used as the subject of study. Leverage served as a proxy for capital structure. The capital structure determinants they studied were tangibility, firm size, profitability, liquidity and market to book ratio. They found firms' choice of capital structure to have been affected by the financial crisis. Some of their findings were that the coefficients on tangibility and market to book ratio had a stronger influence on capital structure choices during the financial crisis than prior to 2008. The capital structure choice was less influenced by the profitability coefficient than before the crisis. In addition, the coefficient on firms' size had a negative sign. This was the opposite of the period before the crisis. Compared to previous discussed theories, the pecking order theory had more explanatory power during the financial crisis than the market timing theory.⁴⁴

Studies concerning change in capital structure have also been conducted in the European monetary area. De Fiore and Uhlig (2012) presented a model used to explain the development in the structure of corporate debt during the financial crisis. The model tries to explain the observed change from bank financing to bond financing despite the increased cost related to bonds compared to bank loans. The opportunity to substitute among sources of external financing is of high importance when it comes to protecting firms from the negative effects a financial crisis can have on investments and outputs.⁴⁵

European banks had large difficulties to obtain financing during the financial crisis. Higher perception of counterparty risk in the interbank market came as a result of concerns due to exposure from the sub-prime crisis in the US, and led to liquidity dry-up. Banks started to hoard liquidity and limited their lending to each other. The non-financial corporations in the

⁴⁴ Harrison & Widjaja (2013), p. abstract

⁴⁵ De Fiore & Uhlig (2012), p. 1

euro area were usually highly dependent on bank loans. The corporations were soon affected by the funding difficulties of banks, facing gradually more tightened lending standards. As a result, non-financial firms began to shift their debt structure from bank loans to other debt securities such as bonds. Simultaneously, the cost of bonds increased and became higher than the cost of bank loans. An aggregate drop in investments and outputs were also observed by studying the turmoil in financial markets.⁴⁶

To explain the development in debt composition during the financial crisis, De Fiore and Uhlig suggested a dynamic stochastic general equilibrium model. The model allowed them to evaluate economic consequences of the financial choices firms make. Their model resulted in the same response to shocks as detected during the financial crisis. The shock increased banking costs and reduced the efficiency of banks in financial intermediation. That is, corporate debt moved from bank financing to bond financing, the cost of debt increased and investments and outputs were reduced. The model points out that the response of real activity during the crisis was highly determined by corporate debt composition. The negative effects a shock has on investments and outputs are amplified when firms have no access to the bond market. Instruments of external finance can reduce the adverse consequences on economic activity in periods of financial distress. De Fiore and Uhlig therefore suggest that policy measures aimed at achieving easier substitutability of bank loans might be equally important as banks central role for ensuring financing stability when facing crises.⁴⁷

Deutsche Bank Research (2013) conducted an extensive study within the subject corporate bond issuance in Europe.⁴⁸ A focus for the research was to explore if there has been a change in the composition of capital structure after the financial crisis. It states a significant increase in corporate bond issuance after 2008. Firms rely less on traditional bank loans, as they get more of their capital from the bond market. Traditional bank loans have become less available due to increased regulations and requirements for banks. Another reason for the change in the bond market is the increased demand from investors willing to participate in this market. There has been a shift where investors rather invest in corporate bonds than sovereign bonds. This is because of the higher yields in the corporate bond market.

Later in 2013, Deutsche Bank published another study on the same subject. The focus in this case was on the issuers' point of view. They emphasised three main reasons for the growth in

⁴⁶ De Fiore & Uhlig (2012), p. 2

⁴⁷ De Fiore & Uhlig (2012), p. 24-25

⁴⁸ Deutsche Bank Research (01.2013), p. 1 & 13

the bond market.⁴⁹ This was expansionary monetary policy, strong investor demand and tighter lending standards at some banks due to higher funding costs.

The leader in the Economist has introduced a suggestion to reduce the probability of future financial crises.⁵⁰ It argues that the tax benefit of debt should be removed, because it increases the likelihood for crises. The tax benefit of debt has created a financial system that encourages crises. Firms' decisions can be a result of a policy where the main objective is to maximise tax reliefs. The underlying needs in the business might be neglected because of this. Reduced taxes make it lucrative for firms to take on debt. Because of tax subsidies, firms are encouraged to take on more debt. Their debt level will thus be higher than without this tax deduction. A higher debt level increases the probability of bankruptcy. This means that tax subsidies enhances both the probability for crises and firms exposure to crises. By removing this tax benefit of debt, governments would increase their income substantially and be more solid when facing crises. If this policy is implemented, firms have incentives to reduce their amount of debt. Debt will not be as profitable as before, because the tax-benefit of debt is removed. Regardless of this, debt will still be an easy and fast way of achieving capital for the firms' investments.

⁴⁹ Deutsche Bank Research (05.2013), p. 2

⁵⁰ The Economist, (16.05.15), p. 9

4 The Norwegian market for bank loans and bonds

4.1 Market for bank loans during and after the financial crisis

Bank loans are one of the most important financing sources for corporations. This implies that conditions and restrictions in the banking market have impact on firms' access to capital. One of the main policy objectives after the financial crisis was to make banks more solid. As a result, the banking sector has been subject to a significant change in regulations the previous years. This entails consequences for firms' access to traditional bank loans. Basel Committee on Banking Supervision (BCBS) provided recommendations on banking laws and regulations both before and after the crisis.⁵¹ These recommendations concern capital adequacy requirements. The objective is to make banks better prepared to deal with unexpected losses. The capital requirements are a way of conducting risk control. Banks need more capital to give riskier loans compared to more secure loans.⁵² This means that newly established and small firms can experience more difficulties in getting financed, because of higher risk. Even though Norway was less affected by the crisis than most other countries, the Norwegian banking sector has been subject to more strict regulations than before the financial crisis.

4.1.1 Macroeconomic perspective

As all other participants in the economy, banks are influenced by business cycles. When the economy is doing well, banks are more willing to lend money because they are more confident that the money will be repaid. When the economy experiences a recession, banks want to limit their lending. Even though new loans from banks are reduced, the borrowers must keep repaying debt that has already been issued. When loans are repaid faster than banks issue new loans, money disappear from the economy. This may cause the economy to slow down and prices to decrease. The danger is that the economy can end up in a debt-deflation spiral, where prices and wages decrease while the value of debt stays the same. In such case, the debt will become relatively more expensive.⁵³ The Bank of England explained this process by saying: “Just as taking out a new loan creates money, the repayment of bank loans destroys

⁵¹ Steffensen (2013)

⁵² Borchgrevink (2012)

⁵³ Positive Money (2015)

money... Banks making loans and consumers repaying them are the most significant ways in which bank deposits are created and destroyed in the modern economy."⁵⁴

4.1.2 Development in bank loans to corporations

The empirical research program "Krise, omstilling og vekst"⁵⁵ (Crisis, restructuring and growth) explores the Norwegian bank market. The research studies the impact of reduced access to credit for corporations during and after the financial crisis.

Hetland and Mjøs found the results shown in Figure 7. The amount of bank loans to Norwegian firms has been characterised by high growth in the period 1997-2012. There is a short decline in 2009, but further growth in the following years.⁵⁶

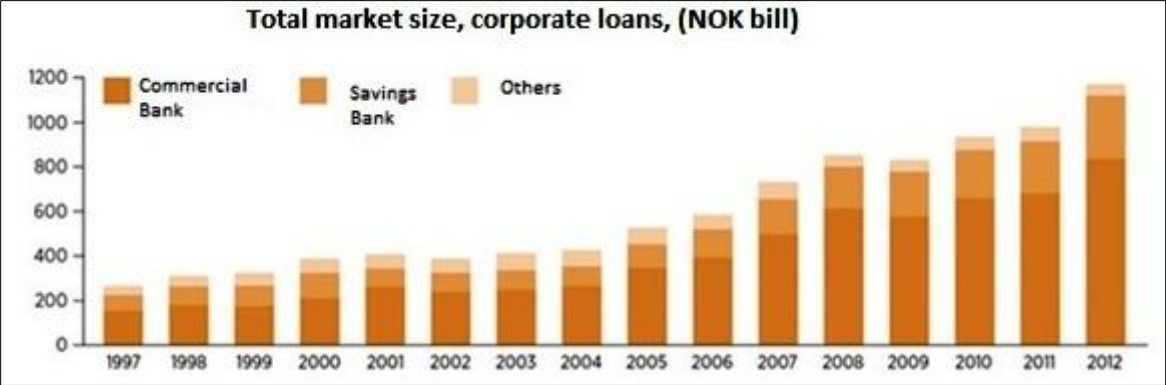


Figure 7 - Total market size, bank loans to Norwegian firms, Hetland & Mjøs (2014), p. 71

Figure 8 displays a decomposition of annual changes in bank loans to Norwegian corporations. The black line illustrates the overall change in bank loans to Norwegian firms. Banks increased their amount of lending substantially in the years prior of the financial crisis. The annual change had the highest negative value in 2009. The level of annual change in credit in 2010-2012 was lower than the years 2007-2008. This can indicate that banks have been more careful when giving loans to firms after the financial crisis.⁵⁷

⁵⁴ McLeay, Radia & Thomas (2014), Money Creation in the Modern Economy, Bank of England p. 3-4

⁵⁵ Hetland & Mjøs (2014)

⁵⁶ Hetland & Mjøs (2014), p. 71-72

⁵⁷ Hetland & Mjøs (2014), p. 72

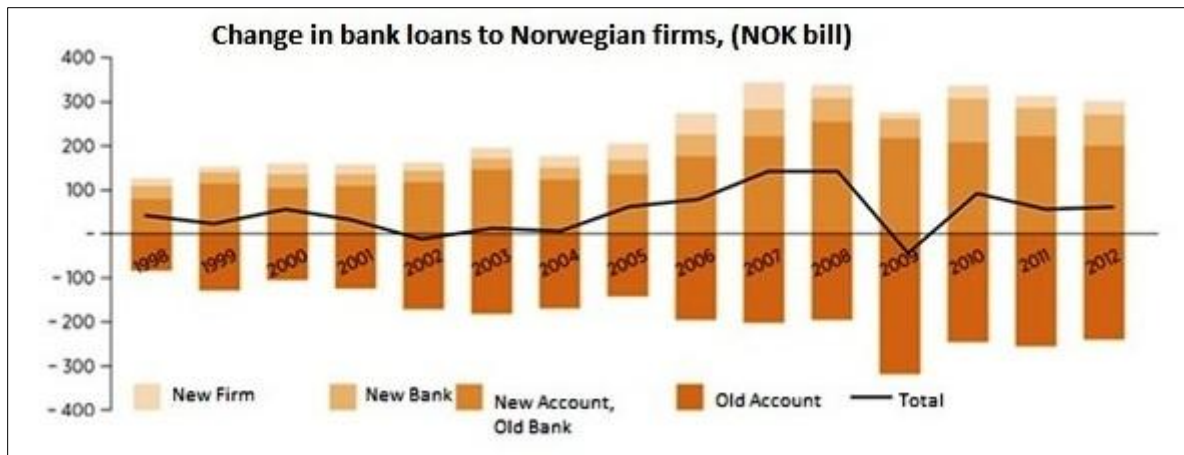


Figure 8 - Change in bank loans to Norwegian firms, Hetland & Mjøs (2014), p. 71

In addition, the research finds that bank loans to newly established firms have declined since 2007. Figure 9 illustrates the amount of bank loans to new customers. This is either firms with no previous history with the specific bank or newly established firms.

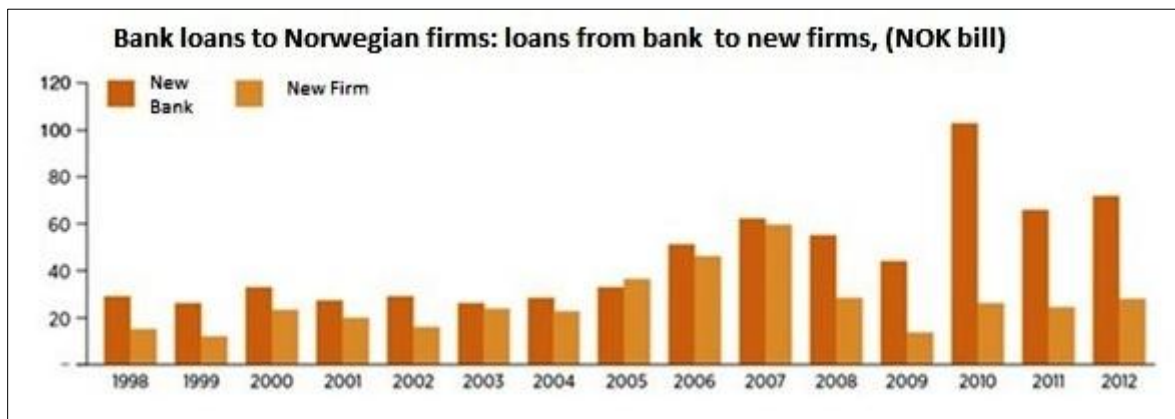


Figure 9 - Bank loans to new Norwegian firms, Hetland & Mjøs (2014), p. 72

Loans to established firms have stayed relatively high after the financial crisis. However, there has been a clear reduction in the amount of new loans to newly established firms, particularly for the years 2008 and 2009. The level in the following years is also strikingly lower than before the crisis. A reduction in bank loans because of the crisis is not unexpected since newly established firms are generally more risky than established firms. The financial crisis may have led to reduced bank lending to new companies due to its uncertainty. This effect is not as clear for established firms, which banks already are familiar with. Banks have the opportunity to use established firms' financial data when evaluating whether to lend

money, as opposed to start-ups.⁵⁸ This can indicate that newly established companies to a higher degree must seek other sources of financing, such as bond loans.

After the crisis, interest margins relative to NIBOR (Norwegian InterBank Offered Rate) have increased and vary more between firms.⁵⁹ Bank loans are thus more expensive. This can also be a reason for firms to seek alternative financing.

4.2 The Norwegian market for bonds

Bonds and certificates are an alternative to bank loans for firms in need of capital. A bond is a financial instrument that assures financing to a firm. When issued, the bond imposes the issuer (the borrower) to repay a loan amount plus interest to an investor (the lender).⁶⁰ Bonds have duration above one year. Certificates have duration below one year. Both instruments are registered in VPS (Verdipapirsentralen) and can be traded in the second-hand market.

Norwegian bonds are mainly listed on Oslo Stock Exchange or Nordic ABM. Bonds issued with credit rating BB+ or lower are called high yield bonds. Companies with such bonds must pay a higher interest rate than other more reliable companies due to lower credit rating.⁶¹

Bonds have proven to be an appropriate funding source and a good alternative to traditional bank financing for many companies. It contributes to increased opportunities of finance and diversifies the loan structure. Raising capital through bonds on Oslo Stock Exchange has had a record growth after the financial crisis. Bonds were previously seen as a financing option for large companies. Over the years it has become a recognised way of financing also for medium and small companies. The high yield market in Norway has grown in line with the capital-intensive industries.⁶² Bonds and bank loans account for approximately equal parts of the loan market in the US. The distribution in Europe has been 80 percent bank loans and 20 percent bonds. Loans from banks became more uncertain after the financial crisis. In addition, more companies wanted to be a part of the capital market, and began to issue more bonds.

⁵⁸ Hetland & Mjøs (2014), p. 72-73

⁵⁹ Hetland & Mjøs (2014), p. 70

⁶⁰ Hvalbye (2011), p. 2

⁶¹ Finstad (2014)

⁶² Oslo Stock Exchange (2014)

According to a report from Nordea Markets, 62 percent of the total loan amount issued in Norway in 2013 was high yield bonds.⁶³

The Norwegian government bond fund was established in 2009. The purpose of the fund was to increase the flexibility of the Norwegian bond market, by making more capital available. The fund invested in bonds issued by Norwegian firms. The government established this fund to aid firms with financing during and after the crisis. The fund was liquidated on June 30, 2014, as the bond market had become more stable.⁶⁴

4.3 Expectations of capital structure

Deloitte conducted a survey in 2012 among CFOs (Chief Financial Officers) in the largest firms in Norway.⁶⁵ The survey consists of many different aspects of the strategic and financial opportunities in the future. The most relevant results are related to the view on capital structure.

35% of the CFOs reported it likely that their firm would issue bond loans the next twelve months. As shown in Figure 10, both bond loans and traditional bank loans are perceived as more attractive ways of financing than equity financing. The perceived availability of bond loans exceeds bank loans significantly. When considering both availability and attractiveness, bond loan is the preferred choice.

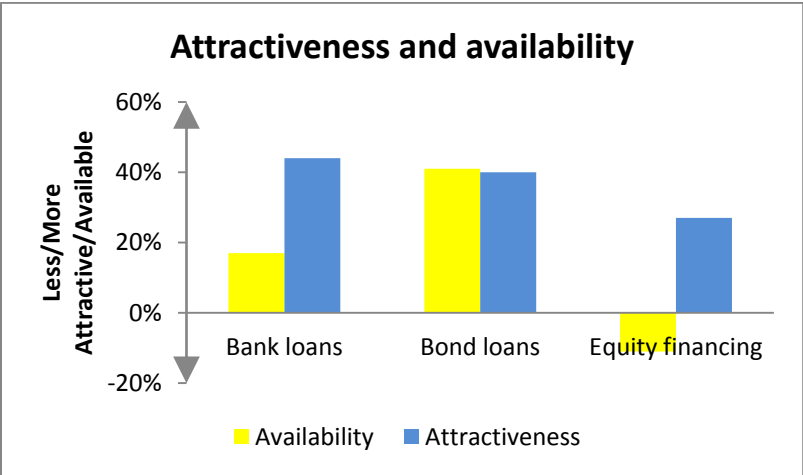


Figure 10 - How CFOs perceive the attractiveness and availability of different ways of financing, Deloitte's CFO-undersøkelse (2012), p. 18

⁶³ Finstad (2014)

⁶⁴ Folketrygdfondet (2014)

⁶⁵ Deloitte, CFO-undersøkelse (2012), p. 15-20, 24, 29-33

A proposed explanation to the increased use of bonds can be found in Figure 11. The availability of bank loans has decreased significantly. Banks wanted to reduce their loans to corporations because of increased borrowing costs. When bank loans become less attractive and available, this calls for alternative financing.

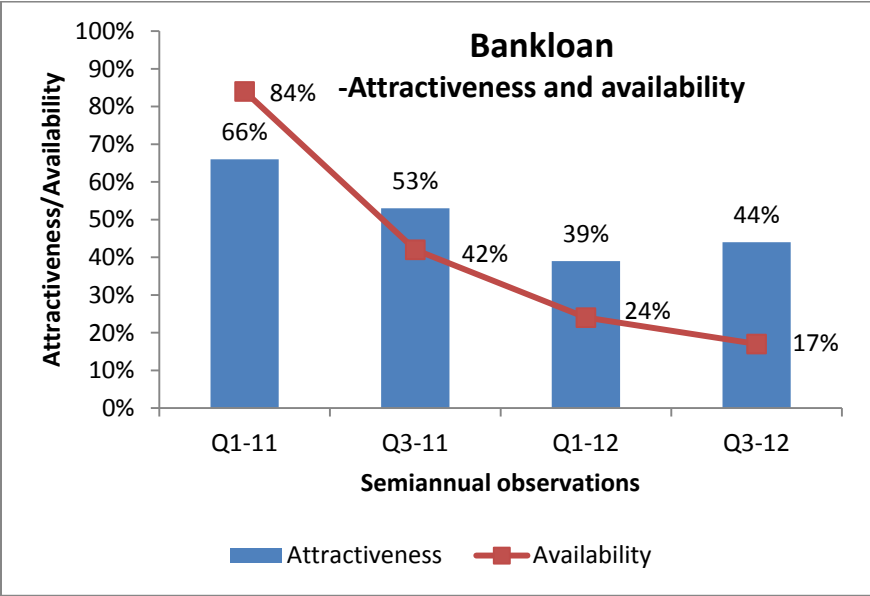


Figure 11 - How CFOs perceive the attractiveness and availability of bank loans, Deloitte CFO-undersøkels (2012), p. 20

Rune Bjerke, CEO of DNB said that 2012 was the first year the majority of financing came from the bond market and argued that the development would continue as more Norwegian firms take advantage of this market.⁶⁶ This CFO-study gives reason to assume that there has been a change in the corporate bond market in Norway.

⁶⁶ Bjerke (2012)

5 Empirical strategy

Firms strive to choose the optimal proportion of debt and equity. When a firm's capital structure is changed, there is either an internal or external reason for the change. External events are our main input variable when studying capital structure in the Norwegian market. The subject for our research is whether external factors changed the majority of the firms' capital structure in the same direction. We suspect that there has been an external shock after the financial crisis in 2008. Earlier discussed research states that banks have been less able and willing to lend money to corporations. Research suggests an increase in bond loans. This implies that there has been an alteration in the way firms structure their financing. Research indicates an overall change in debt, not only in debt value, but also in the composition of debt. The purpose of our thesis is to study if the same development is present for firms listed on Oslo Stock Exchange. If our study confirms that there has been a change in firms' capital structure, the next step is trying to identify the causes behind this change.

We ask the following question: “Did the capital structure of firms listed on Oslo Stock Exchange change in the period 2004-2013?” Two approaches to this question will be applied. The first is the development in debt ratio and how it is affected by market value of equity and debt. The second concerns change in the composition of debt and how the use of bank loans and bonds have developed. Changes will be tried identified and explained.

To answer these questions we use data from companies listed on OSE in the ten year period. To explore whether there has been a change in capital structure we use annual data of debt and equity for each firm. Debt ratio is a suitable comparison measure when looking at firms' capital structure. It illustrates the size of debt compared to the overall size of debt and equity. The debt ratio is calculated by dividing total debt on the sum of total debt and market value of equity. We examine the development in average debt ratio for the ten year period. We also explore the development in average debt ratio for each sector. The development in median and standard deviation of yearly debt ratio observations are presented. Changes in debt ratio will be tried explained by looking at the development in equity and debt.

Debt is a main part of the capital structure for most firms. To get an understanding of the development in capital structure, we also look at the development in different sources of debt. Discussion earlier states that there has been a change in debt from traditional bank loans to more use of bond loans. In order to understand and explain the capital structure of listed

firms, it is necessary to include the financing through bonds. The development in the Norwegian bond market will be examined. For practical purposes bonds will be used as a common denomination for the combination of bonds and certificates throughout this paper.

One study looks at the development in the bond market on OSE and Nordic ABM. A second study is more sector specific, looking at firms' development in amount of bond loans. Third, one firm is extensively investigated in order to evaluate the change in debt structure further. The main purpose is to examine if the size of bond loans relative to bank debt has changed. Odfjell SE has been chosen as the example-firm for this purpose. This is a Norwegian shipping company focusing on transportation and storage of liquid chemicals. It is listed on OSE under the industrials sector. Odfjells debt structure will be decomposed and the amounts of bonds and bank loans compared to each other. The purpose is to study the development in the significance of bond loans.

6 Data

6.1 Main dataset

Thomson Reuters Datastream is the main source of data. This database offers a wide range of global financial data and gives information on companies and markets in time series.

Statistical agencies in each country along with organisations such as IMF and OECD are the sources of economic data in the database.⁶⁷

Data from firms listed on OSE has been downloaded 31.01.2015. The data concerns the years 2004-2013. Firms listed during this period of time are included in the analysis. Total number of firms are 471. Annual observations for each firm is organised as panel data. The downloaded data had some missing numbers. The numbers were not available or they did not exist. This posed a problem, because it was difficult to know if the firm was off-listed or just lacked number for that particular year.

Table 2 shows the layout of how the panel data is structured. The purpose of this table is to illustrate what the dataset looks like; only a sample of the financial variables has been included here. For a larger sample, see appendix 2. Each row in the dataset is characterised by year, sector and name of the firm.

Year	Sector	Name	MV Equity	Debt	Total Capital	Debt ratio
2004	Consumer Discretionary	Expert	1 366 160	105 437	1 471 597	7.16 %
2004	Consumer Discretionary	Gresvig	682 180	204 605	886 785	23.07 %
2004	Consumer Discretionary	Gyldendal	670 320	292 815	963 135	30.40 %
2004	Consumer Discretionary	Hjellegjerde	158 740	90 100	248 840	36.21 %

Table 2 - Main dataset, first five rows, monetary numbers in thousands

The firms are separated into ten sectors using GICS. GICS is an international system for classifying listed firms. It stands for Global Industry Classification System. This is the same system as Oslo Stock Exchange uses. The idea behind this separation is to look for development in capital structure between sectors. The left column in Table 3 displays nine of the GICS sectors. The Financials sector is excluded from the table and further analysis because it behaves differently than the other sectors. Firms in the Financials sector provide financial services to corporations. A bank can lend money to a firm in need of capital.

⁶⁷ BI Handelshøyskolen (2015)

Financial firms are thus on the opposite side of the table compared to firms in the other sectors. For this reason, it will be incorrect to include the Financials sector in this study.

GICS-Sectors	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Total
Energy	27	30	43	47	52	50	51	52	55	52	459
Consumer Staples	7	8	9	11	16	17	15	16	16	12	127
Utilities	1	1	1	1	1	1	1	1	1	1	10
Health Care	5	5	6	8	8	9	8	10	9	9	77
Industrials	25	28	30	37	36	35	33	35	34	30	323
IT	29	28	29	29	28	25	23	23	22	20	256
Consumer Discretionary	14	14	12	13	11	11	10	12	12	12	121
Materials	7	6	6	6	8	7	5	6	6	7	64
Telecommunication	1	1	1	2	2	2	2	2	2	2	17
Total	116	121	137	154	162	157	148	157	157	145	1454

Table 3 - Number of firms with available debt ratios, divided in years and GICS-sectors

Table 3 does also show number of firms with available debt ratio in each sector for every year. The sectors Telecommunication and Utilities have been excluded when comparing sectors, because they only consist of one or two observations each year.

Debt ratio is the main focus of the first question in this study. The debt ratio is calculated by dividing total debt on the sum of market value of equity and total debt.

Total debt = long term debt + short term debt

Market value of equity = number of shares outstanding * share price

Debt ratio = total debt/(total debt + market value of equity)

Total debt consists of both long term and short term debt. It represents only interest bearing debt. The optimal is to use market value of debt, but this is hard to obtain. As is common, book value of debt is used. Market value of equity is the share price multiplied with the number of shares outstanding. There are 1454 observations where all information necessary to calculate the debt ratio is present. Even though this is a large amount, it is far less than the total 4710 rows. This is due to lack of available numbers from Thomson Reuters Datastream. Table 4 summarises the yearly debt ratio observations.

Debt ratio	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Average	26 %	24 %	26 %	25 %	30 %	40 %	33 %	31 %	33 %	35 %
Standard deviation	24 %	23 %	23 %	22 %	24 %	31 %	28 %	26 %	30 %	29 %
Median	19 %	17 %	23 %	21 %	26 %	37 %	30 %	25 %	27 %	26 %
# of observations	116	121	137	154	162	157	148	157	157	145

Table 4 - Debt ratio, descriptive numbers, 2004-2013

In order to explain the development in debt ratio, we use average data on debt, market value of equity, book value of equity and OSEBX.

6.2 Bonds

6.2.1 Bond market analysis - Oslo Stock Exchange & Nordic ABM

The bond markets we focus on are Oslo Stock Exchange and Nordic ABM. Relevant data from both these markets are downloaded directly from Oslo Stock Exchange.⁶⁸ We use data for the years 2005-2014. The total sum of bonds from both markets are applied. The relevant part of this market is bonds issued by corporations. The purpose is to look for development in the bond market over the last ten years. Data on four different aspects of the bond market are downloaded, structured and explored. This is turnover value, number of issues, nominal value and new issues.

Firms issuing bonds on OSE or Nordic ABM are not necessary listed on OSE. This means that the research on the bond market is not perfectly representative for firms listed on OSE. However, it is still a good indication on the development in the Norwegian bond market, and firms' availability to issue bonds and raise capital.

6.2.2 Sector-specific analysis

A second approach is applied to explore firms' use of bonds. We look at the amount of bonds for some of the firms listed on OSE in the period 2004-2013. If available, a random selection of ten firms per sector is chosen. Information on bonds are obtained directly from the firms' financial reports. The balance sheet and the notes of the parent company have been used when necessary. This proved to be difficult, because limited information was available. We had to

⁶⁸ Oslo Stock Exchange (2015)

find firms where the size of bonds was specified in the balance sheet or in the notes. This was not always the case. Some firms' financial statements were in USD. They were converted to NOK at the end of each year (31.12).^{69,70,71}

Certificates were not always included in bonds. Certificates were often included in short term debt and not stated separately. This implies that the bond value might be underestimated. This is not crucial though, because the main focus is the change over time, not the exact numbers. Most importantly, each separate firm is treated the same way.

The sample consists of limited amounts of firms. Annual averages of bonds have been applied in order to get comparable values. Due to limited information it was hard to do a realistic analysis for all sectors. Because of this, the sectors energy, industrials and materials have been selected for the sector-specific analysis.

6.2.3 Example of the individual firm Odfjell SE

The third approach examines an individual firm. The firm chosen as an example is Odfjell SE. It is reviewed in order to illustrate how a single firm was affected by the financial crisis and how the capital structure was subject to change. This means that the firm's development and composition of debt will be examined. The purpose is to compare the use of bonds to traditional bank loans. This makes it possible to see if an increasing part of a firm's debt financing consists of bonds. Table 5 shows the key numbers obtained. Data is received from Odfjell SE, by our contact Gina Jamt Ånonli. All numbers in the table are in US dollars.

Composition of debt for Odfjell SE, (USD mill)											
Year	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Bank debt	536	576	581	466	494	507	517	440	315	401	355
Bond debt	0	49	109	125	98	116	93	88	274	294	319
Sum	536	625	690	591	592	623	610	528	589	695	674
Bond proportion	0 %	8 %	16 %	21 %	16 %	19 %	15 %	17 %	47 %	42 %	47 %

Table 5 - Debt composition for Odfjell SE, in USD mill

⁶⁹ Attachment 1

⁷⁰ Oanda (2015)

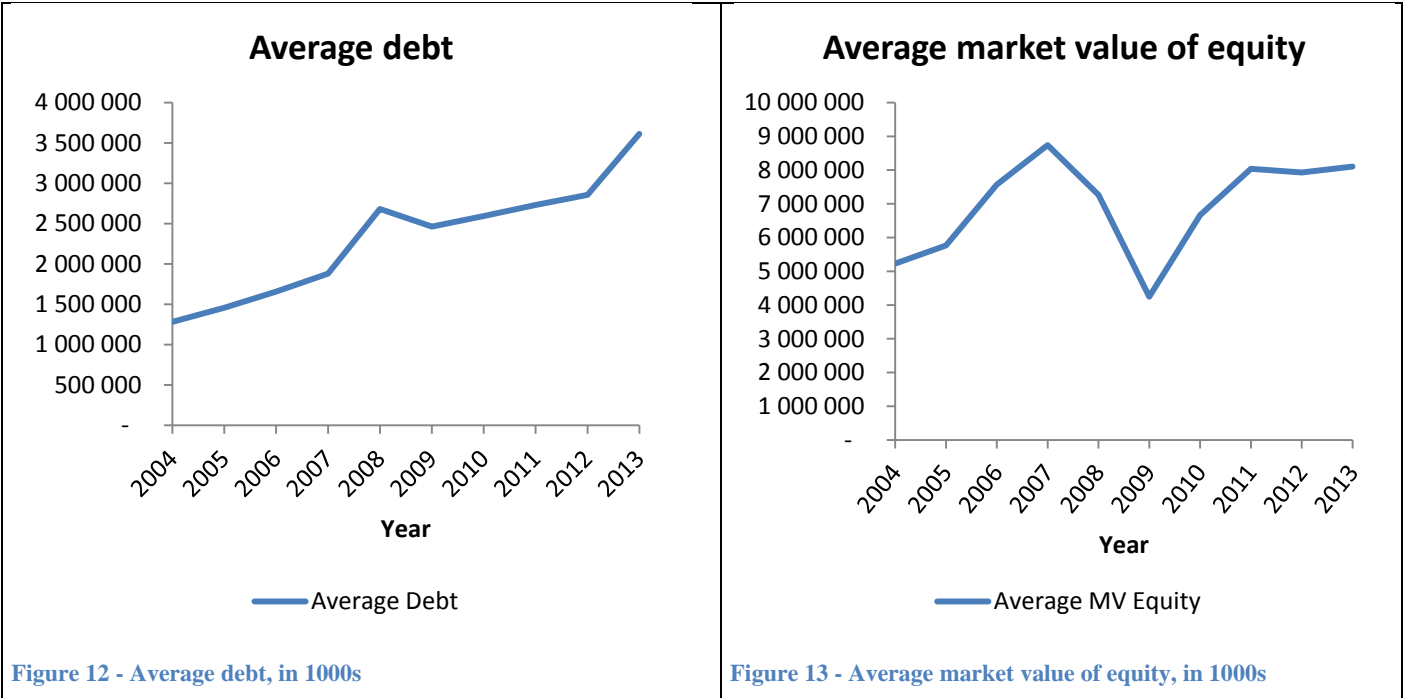
⁷¹ Norges Bank (2015)

7 Results

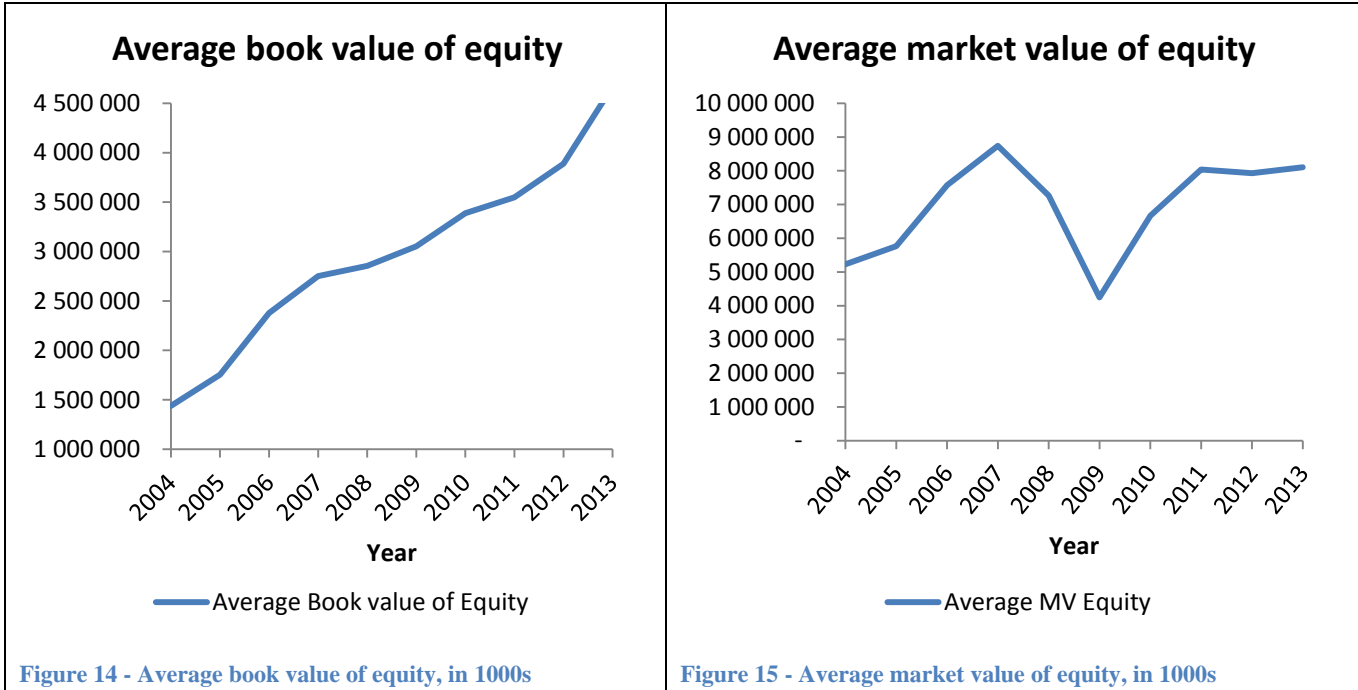
7.1 Main dataset

7.1.1 Development in debt and equity

Market value of equity and debt are the two input variables in the calculation of debt ratio. Before debt ratio is further explored, knowledge about the development of equity and debt must be present. Average debt each year and average market value of equity has been calculated from the data downloaded from Datastream. The development is illustrated in Figure 12 and Figure 13.



Except for a small drop in 2009, average debt increased during the entire period. This illustrates that there has not been a significant change in use of debt neither because of or despite of the financial crisis. Market value of equity has varied far more, especially during the financial crisis where it experienced a large reduction. There has been a significant change in market value of equity under the financial crisis.



Firms have limited control of the market value of their equity. Book value of equity is compared to market value of equity in Figure 14 and Figure 15. Book value of equity experienced a stable growth throughout the crisis, as opposed to market value of equity. This drop in market value of equity is not a deliberate choice by firms, but a consequence of an exogenous factor. The financial crisis implied uncertainty, higher probability of bankruptcy and lowered the future expectations in the market. This resulted in a large decline in market value of equity.

When the financial crisis struck, OSE fell dramatically, as shown in the Oslo Stock Exchange Benchmark Index in Figure 16. OSEBX contains a representative sample of firms listed on OSE. This index experienced a large drop in value under the financial crisis.

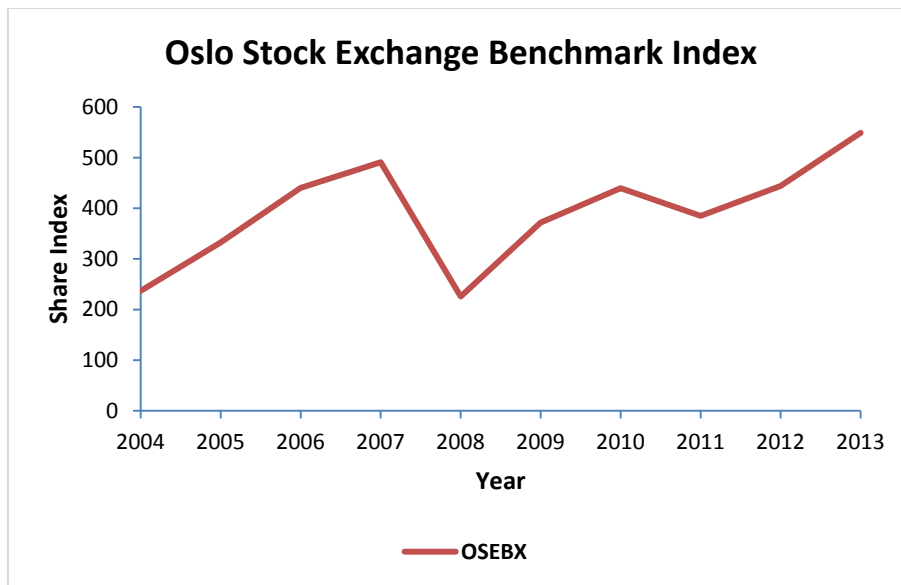


Figure 16 - Development in OSEBX, Oslo Stock Exchange (2015)

7.1.2 Debt ratio

The average debt ratios are summarised in Table 6. There are two dimensions, year and sector. The table shows average debt ratios in percentage for all firms in each sector every year. It illustrates the trend in debt ratio over time for each specific sector and overall.

Sector	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Average debt ratio
Energy	36.5	27.0	29.0	29.6	33.8	49.8	37.0	34.1	31.4	37.0	34.8
Consumer Staples	42.2	41.0	31.8	29.9	37.5	49.6	33.6	33.1	44.2	35.9	38.2
Utilities	30.6	29.1	23.2	32.2	32.3	32.3	31.2	33.3	36.4	37.4	31.8
Health Care	2.7	4.1	2.9	6.8	11.3	8.0	4.0	10.3	5.2	8.7	6.9
Industrials	31.0	32.9	31.4	28.3	31.3	43.4	41.9	42.9	47.5	44.8	37.7
IT	6.9	6.4	13.6	11.7	18.1	18.7	19.6	14.6	16.3	16.9	13.9
Consumer Discretionary	31.5	27.6	32.8	38.2	42.8	54.1	37.3	29.8	35.5	41.2	36.7
Materials	35.8	38.2	45.2	22.3	33.5	41.1	39.4	35.4	40.8	41.5	37.3
Telecommunication	21.9	28.0	23.7	16.4	11.8	14.9	8.8	9.0	12.3	34.1	16.9
Average debt ratio	25.8	24.0	26.6	25.0	30.3	41.0	33.3	31.4	33.3	34.8	30.9

Table 6 - Average debt ratio for different sectors, numbers in %

The bottom row shows the general trend over time, not divided in sectors. The table above is visualised through Figure 17. The important part is the development in debt ratio. Health Care and IT have the lowest debt ratios, far below the other sectors. We observe debt ratios to be peaking during the financial crisis for most of the sectors.

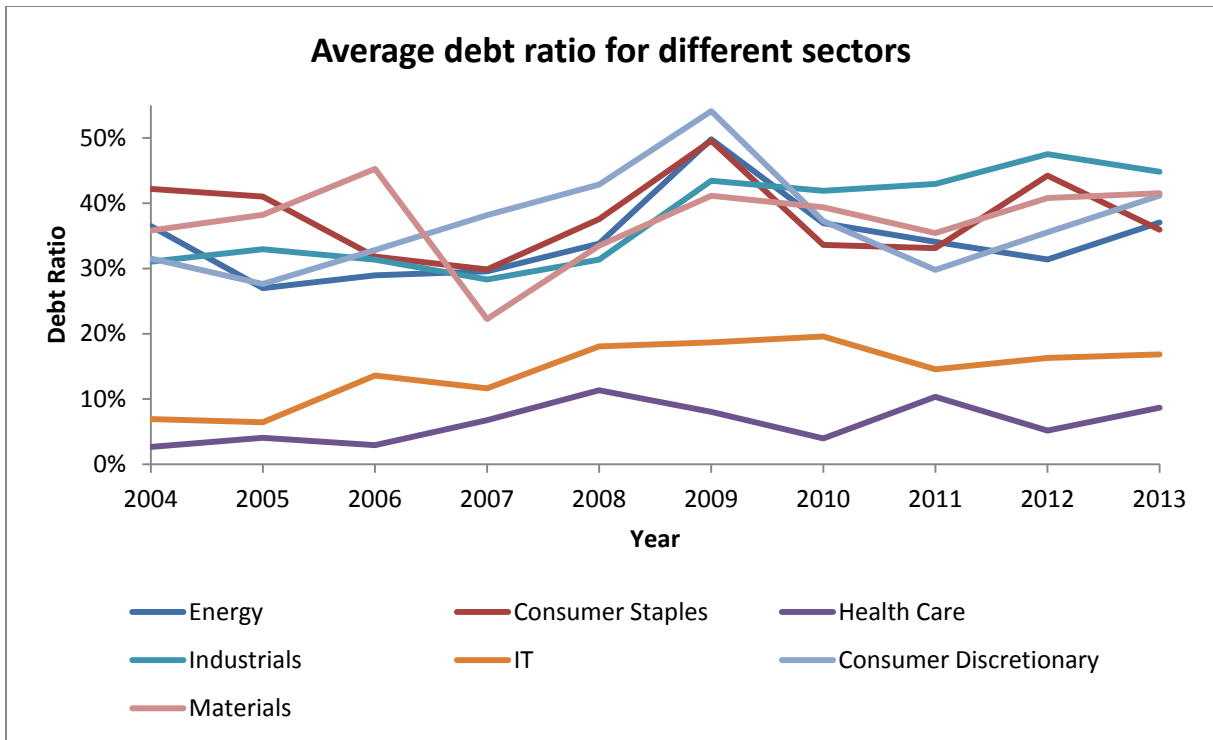


Figure 17 - Average debt ratio for different sectors

Figure 18 displays the trend in average debt ratio, all sectors included. The debt ratio varies between 24% and 41%. There was a seventeen percentage points increase from 2005 to 2009. This is a significant growth, with a peak in 2009. There has been a decreasing tendency in debt ratio after 2009, but it remained relatively stable on a higher level than before the crisis. Prior to the crisis, in 2004-2007, debt ratio was between 24% and 27%. After the crisis, from 2010, it was at a higher level, ranging from 31% to 35%. The higher debt ratio level can be explained by the continuously increasing amount of total debt. Average debt ratio changed as a result of the financial crisis.

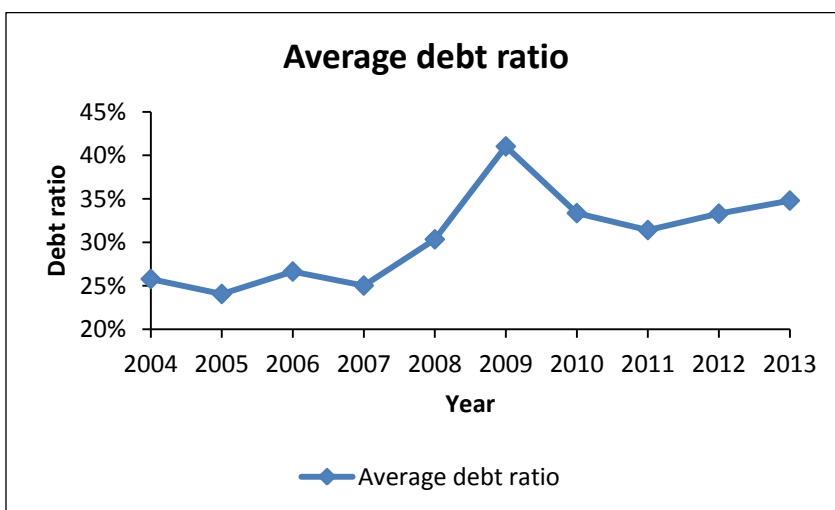


Figure 18 - Average debt ratio for OSE-listed firms

According to Figure 18, it seems like firms have increased their amount of debt drastically during the financial crisis. As previously mentioned and according to Figure 19, this is not the case. Average debt has increased the entire period, except for a small decrease in 2009. The average market value of equity was halved from 2007 to 2009, before it started to grow after 2009. The change in market value of equity is by far exceeding the change in debt.

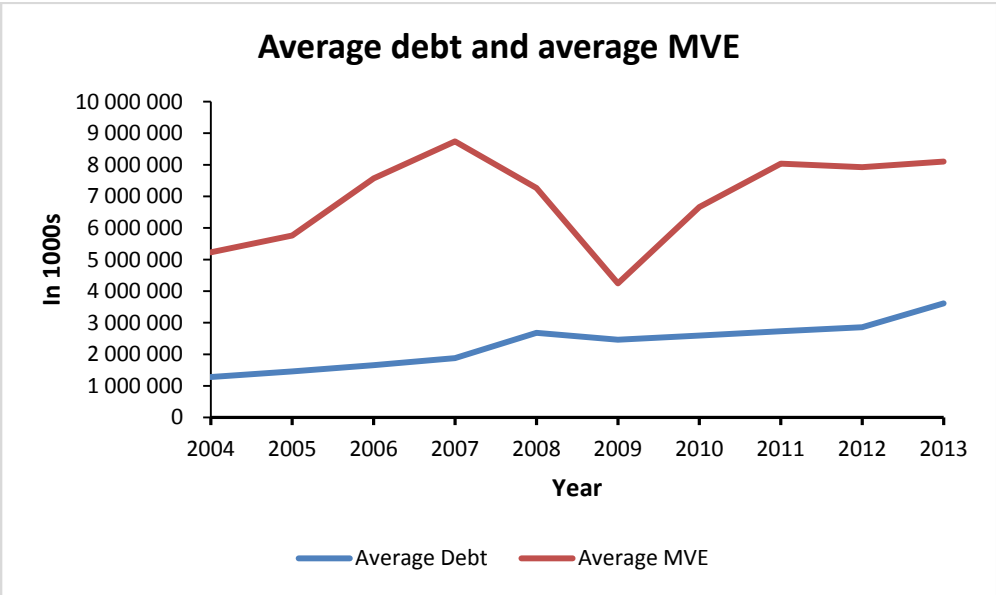


Figure 19 - Average debt and average market value of equity for OSE-listed firms

Because market value of equity fell more than debt increased, the rise in debt ratio under the crisis can to a great extent be explained by the drop in market value of equity. The rapid growth in debt ratio is due to the major value drop in equity.

Debt ratio is calculated like this: $Debt\ ratio = D / (D + E)$. There is a negative relationship between equity and debt ratio. If market value of equity falls, this will automatically lead to a rise in debt ratio. Figure 20 looks at the actual change in market value of equity and how this change will affect the debt ratio, all else equal. The starting point is the previous year's debt ratio. A new debt ratio from the current year is calculated by looking at the real change in market value of equity from the last year. The new calculated debt ratio is compared to the observed debt ratio previous year. This change in debt ratio is shown as the red line in the figure. When ignoring change in debt, the figure shows how the change in market value of equity will change debt ratio.

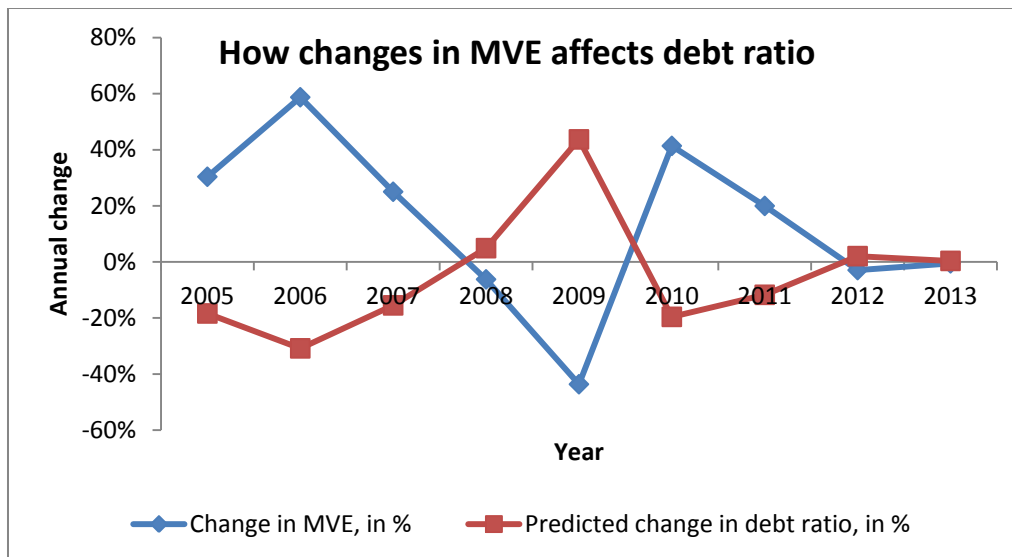


Figure 20 - How changes in MVE affect debt ratio for OSE-listed firms

Market value of equity fell by 43.65% in 2009. Given the previous year's debt ratio and ignoring the development in debt, this would mean an increase in debt ratio of 43.70%. The debt ratio in 2009 should thus be 43.59%. The observed debt ratio in 2009 was 41%. When comparing the calculated value to the observed average for 2009, we find the theoretical value of 43.7% to be higher than the observed value of 41%. Because debt actually fell some this year, this means that the entire growth in debt ratio in 2009 was because of the drop in market value of equity.

The rise and fall in debt ratio during the financial crisis was not the result of large changes in the amount of debt used, but the consequence of a large external event where the market value of equity dropped. This happened because stock prices fell as a consequence of the financial crisis.

Figure 19 illustrates that the amount of debt used had a stable growth for the entire period. As previous research argue, it has been harder to obtain traditional bank loans after the crisis. Because the development in average debt did not fall significantly in the period after the crisis, the composition of debt must be explored. The main focus will further be on bonds, because previously discussed research indicates that this market has been subject to large changes the latter years.

7.2 Bonds

7.2.1 Bond market analysis - Oslo Stock Exchange and Nordic ABM

Different aspects of the Norwegian market for bonds have been investigated and the change over time explored. Several diagrams give insight to the development in this market.

Total number of issues listed

Figure 21 shows that total number of issues listed at the end of the year is clearly increasing from 2008. On average, total issues grew by more than 28 issues each year. From 2005 to 2014 total number of issues more than doubled. The largest growth is observed after the financial crisis and the growth has been highest after 2011.

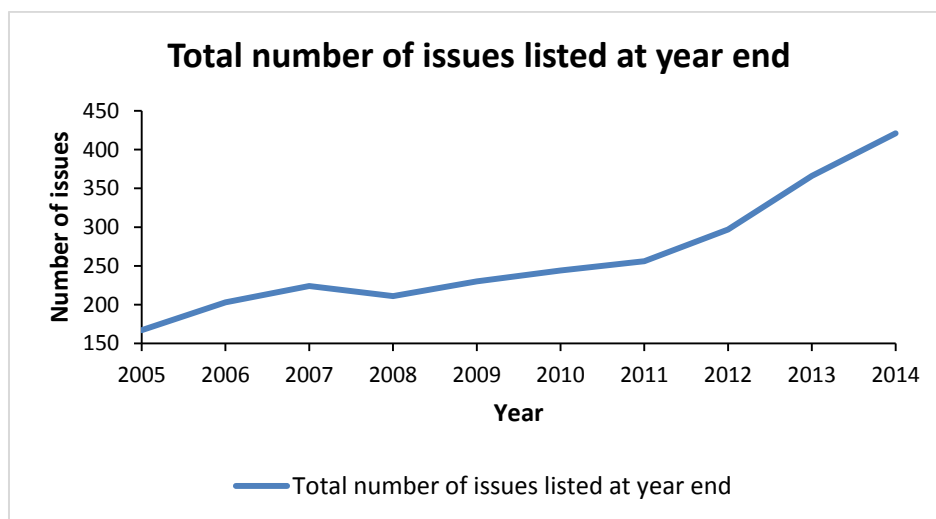


Figure 21 - Total number of bonds listed at year end, OSE and Nordic ABM, Oslo Stock Exchange (2015)

The same information can be seen in Figure 22. It also highlights the increased impact from Nordic ABM after its creation in 2005. Issues at OSE has a relatively stable growth, but the columns in red displays that Nordic ABM accounts for an increasing part of the bond market. Firms have increased their use of the Norwegian bond market.

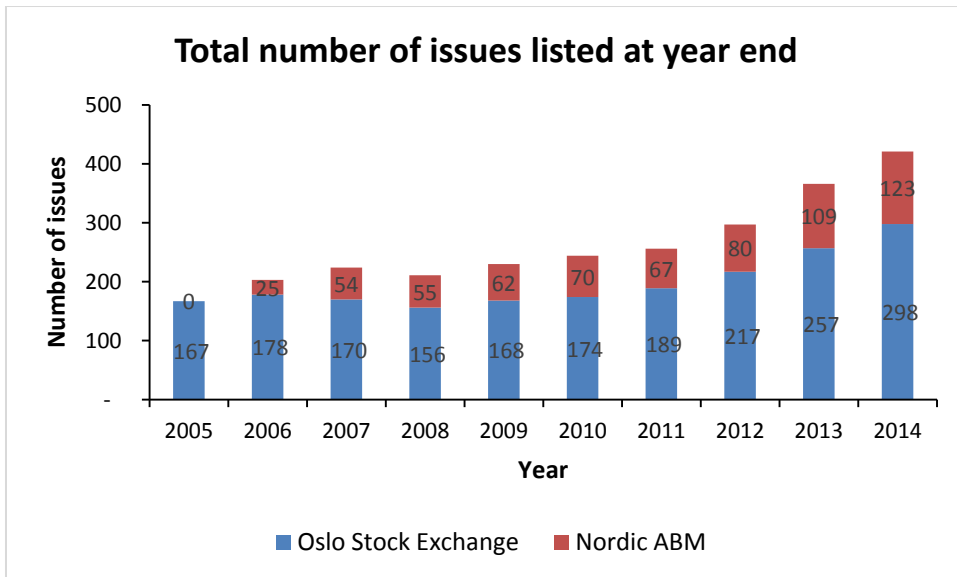


Figure 22 - Total number of bonds listed on OSE and Nordic ABM at year end, Oslo Stock Exchange (2015)

Total turnover value in the Norwegian bond market

Turnover value is the total turnover excluding repo in the Norwegian bond market. It is expressed in NOK million and shown in Figure 23. Total turnover value more than tripled from 2010 to 2014. The increased activity indicates the larger impact of bonds in the financing of firms after the financial crisis.

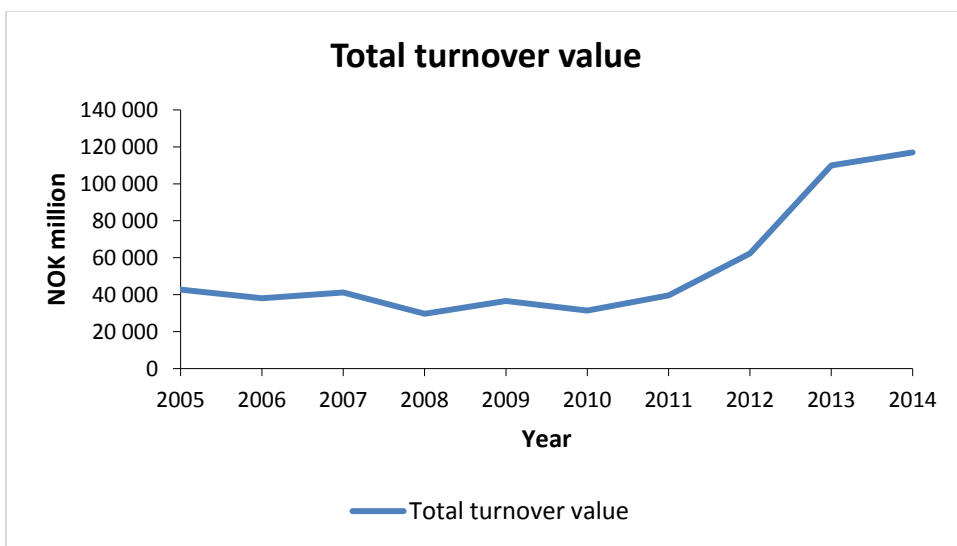


Figure 23 - Total bond turnover on OSE and Nordic ABM, Oslo Stock Exchange (2015)

Total nominal value

Nominal value is the stated value of the issue. It can differ from the market value, which is the price of the bond at the moment. The total nominal value is expressed in NOK million. It has grown fast and steadily for the last decade, see Figure 24. The value has more than tripled

from 2005 to 2014. The largest increase occurred in the years after the financial crisis. The market for bonds grew significantly these years.

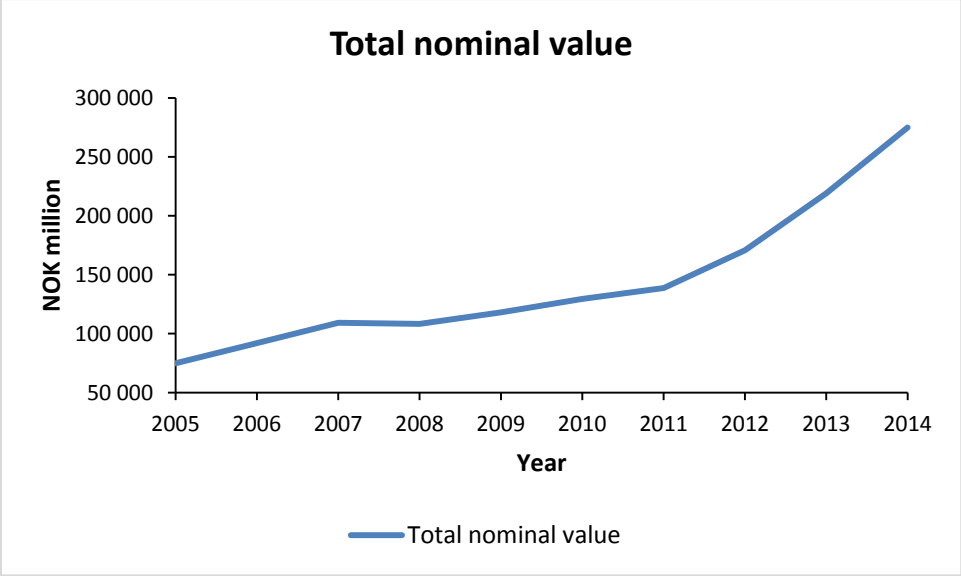


Figure 24 - Total nominal value of bonds listed on OSE and Nordic ABM, Oslo Stock Exchange (2015)

New issues and increases in tap issues

The sum of total new issues and increases in tap issues experienced a small peak in 2010. Despite a small decline in 2011, the growth has been large after the financial crisis.

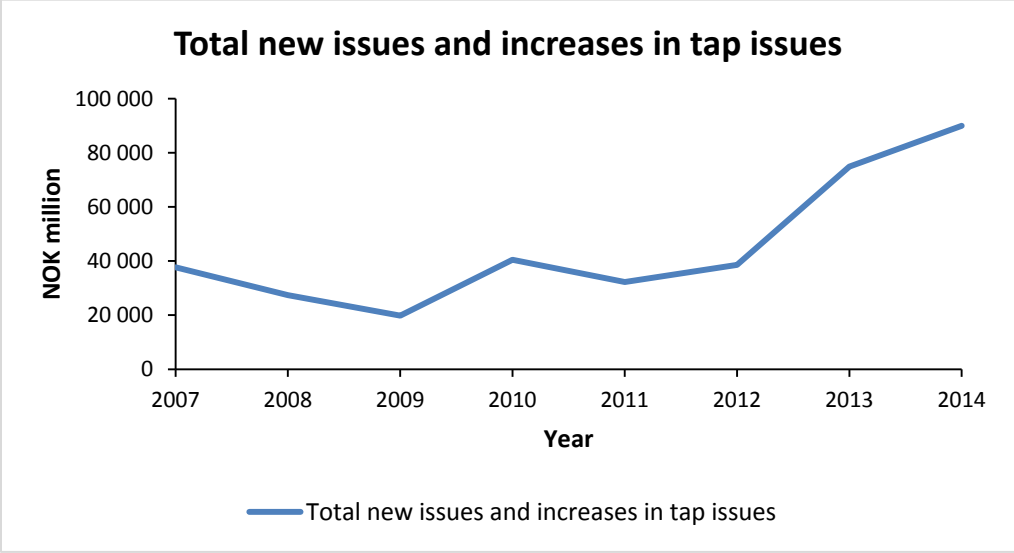


Figure 25 - Total new bond issues and increases in tap issues on OSE and Nordic ABM, Oslo Stock Exchange (2015)

The development in all these four aspects of the Norwegian bond market illustrates the same trend. Financing through bonds became significantly more used after the financial crisis struck Oslo Stock Exchange. It can be argued that there has been a shift in financing. Firms

get more of their capital by issuing bonds. The observed use of bonds is the real development in the bond market. It gives limited knowledge about how managers really wanted to finance their firms. The bond market development does not need to be the same as managers' desired use of bonds.

7.2.2 Sector-specific analysis

In addition to the general analysis of the market for bonds on OSE and ABM, a sector-specific analysis of listed firms has been applied. It examines how firms' outstanding bonds have changed the last ten years. The purpose is to look for changes in firms' capital structure and get further confirmation of the increased use of bonds.

When considering all sectors, there is an upward sloping trend in average amount of bonds. This is clearly expressed by the trend line in Figure 26. Average bonds increased during and after the financial crisis.

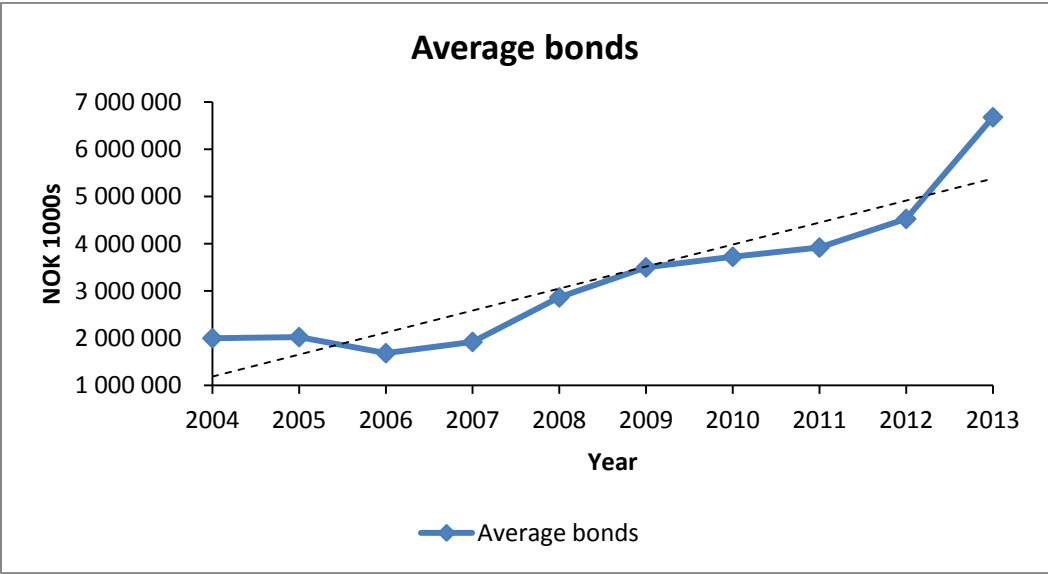


Figure 26 - Average bonds, all sectors

The sectors energy, industrials and materials are studied further. Figure 27 shows an increasing trend when looking at the sectors energy, industrials and materials combined. The majority of the growth happened after the financial crisis occurred. Average bond loans went from around 7 billion in 2008 to more than 20 billion five years later in 2013.

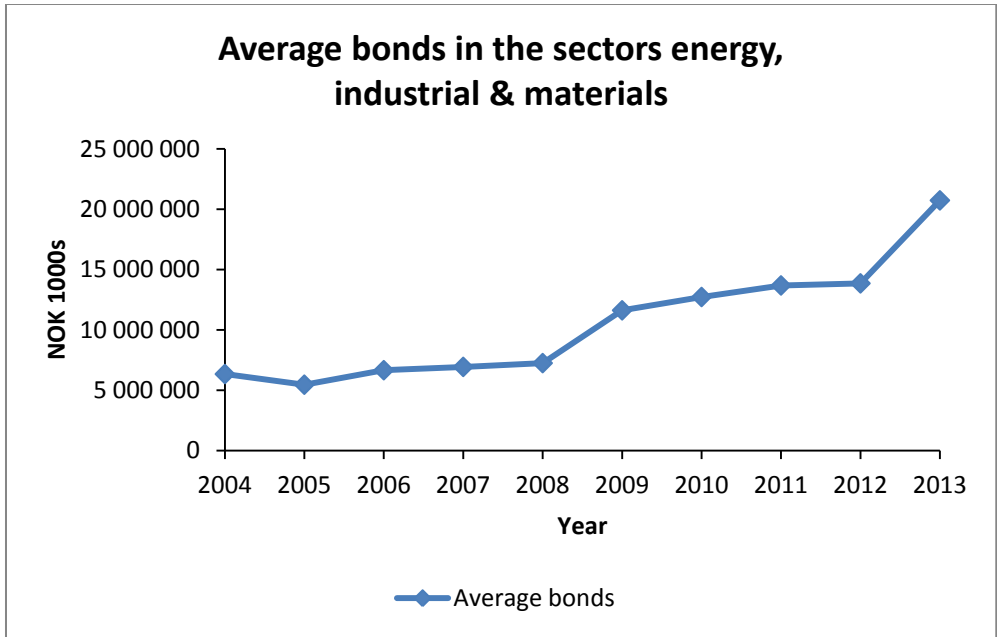


Figure 27 - Average bonds for the sectors energy, industrials and materials combined

Total bond loans have been split up in their respective sectors in Figure 28, Figure 29 and Figure 30. The main reason for this is to get a proper view of the development over time in each sector.

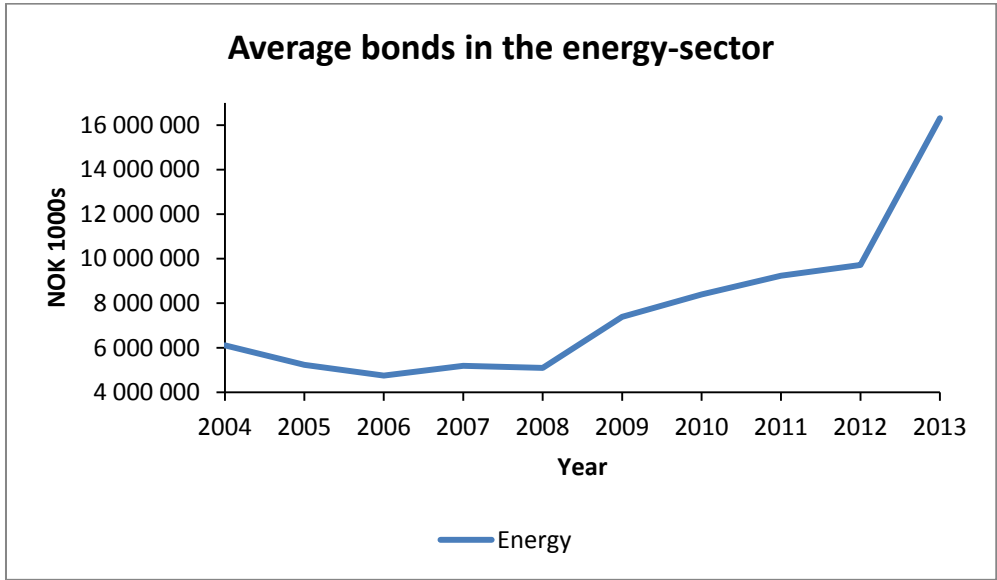


Figure 28 - Average bonds in the energy-sector

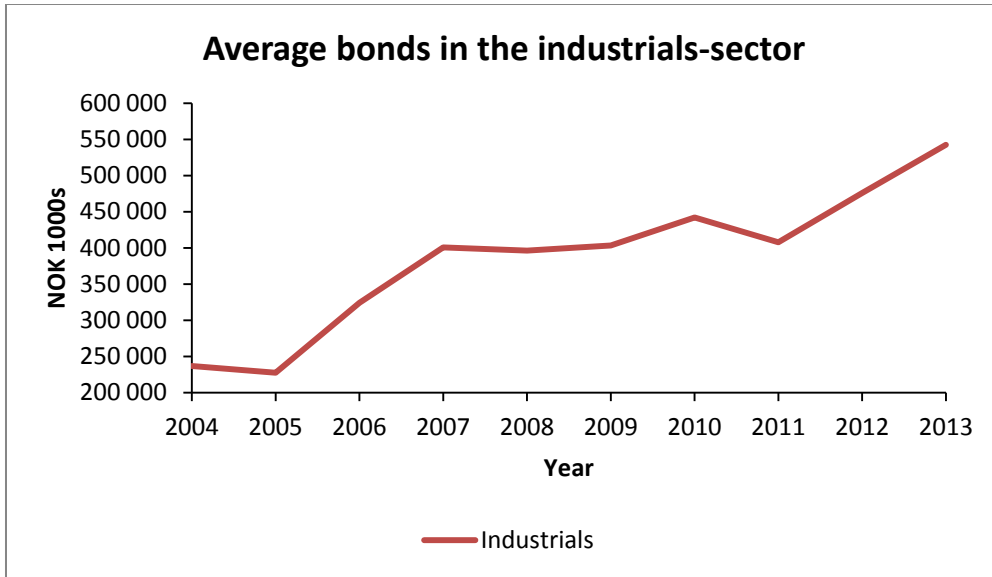


Figure 29 - Average bonds in the industrials-sector

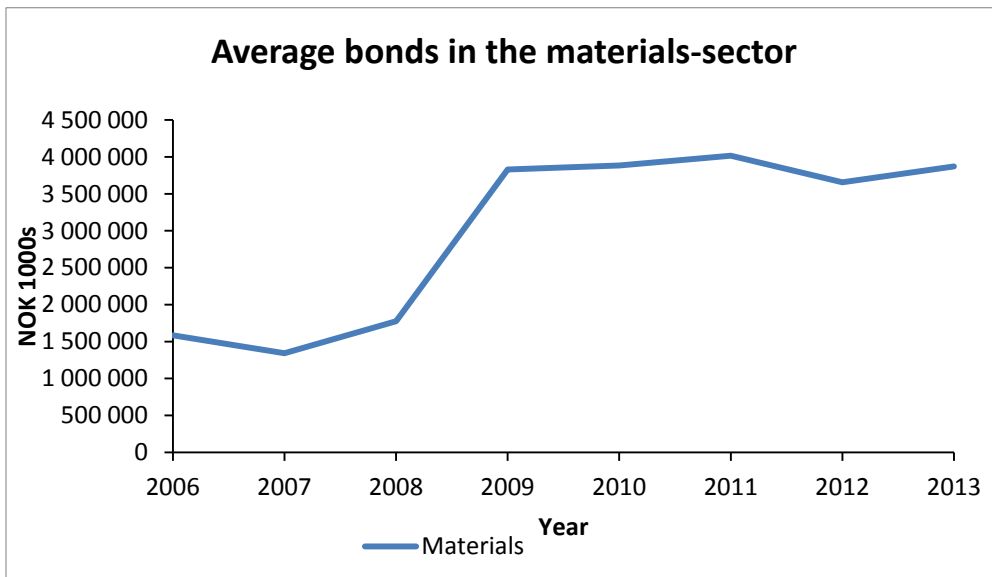


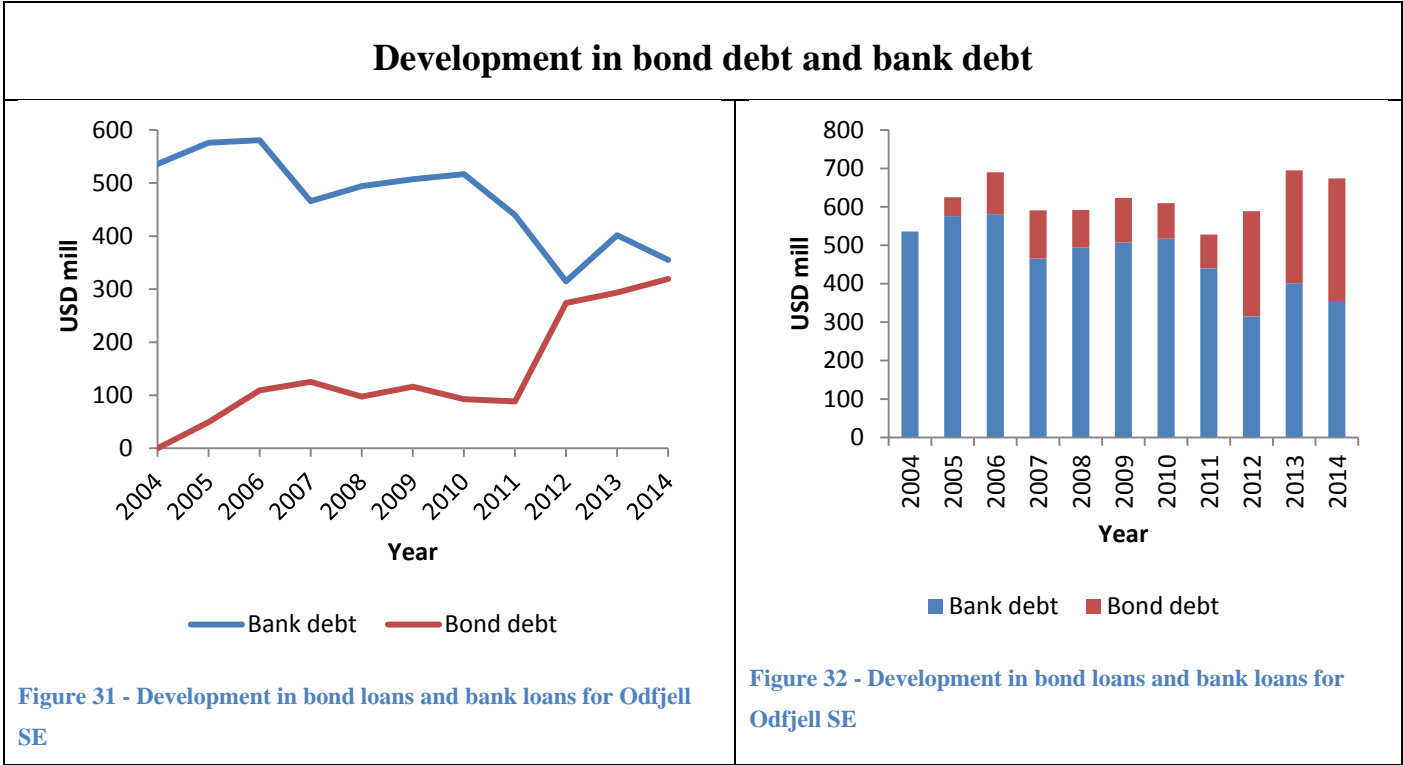
Figure 30- Average bonds in the materials-sector

The sector-specific diagrams show that bond loans have increased during this ten years period. The analysis confirms the increased use of bonds for firms listed on OSE. Both the sectors materials and energy indicate a major change after the financial crisis in 2008. This is not the case for the industrials sector; it remained stable under the crisis, but has experienced growth in the latest years. This argues that sectors behave different, but the general trend is still clear. The development observed in Figure 26 emphasises the increase in bond loans for listed firms after the financial crisis.

7.2.3 Example of the individual firm Odfjell SE

The firm Odfjell SE has been subject to a firm-specific analysis concerning debt composition. The use of bonds and bank loans has been analysed.

As shown in Figure 31 and Figure 32, the amount of bond debt was zero in 2004. It increased the following years, with a small peak in 2007, before decreasing until 2011. Bonds experienced a large growth in 2012 and remained high in both 2013 and 2014. Bank loans decreased with approximately 39% from 2007 to 2014. The reduction in bank debt was largest in the years 2011 and 2012. The amount of bank loans has been reduced after the financial crisis. At the same time the firm's bonds have increased significantly, from around \$90 million in 2011 to more than \$319 million in 2014.



To get an understanding of the development in debt composition, bond loans have been calculated as a percentage of the sum of bond loans and bank loans. In the 11-year period, the proportion of bond loans has grown. It increased from zero in 2004 to 16% in 2008. The proportion of bonds increased further after the crisis, and reached 47.3% in 2014. This is illustrated in Figure 33. The highest growth took place after the financial crisis.

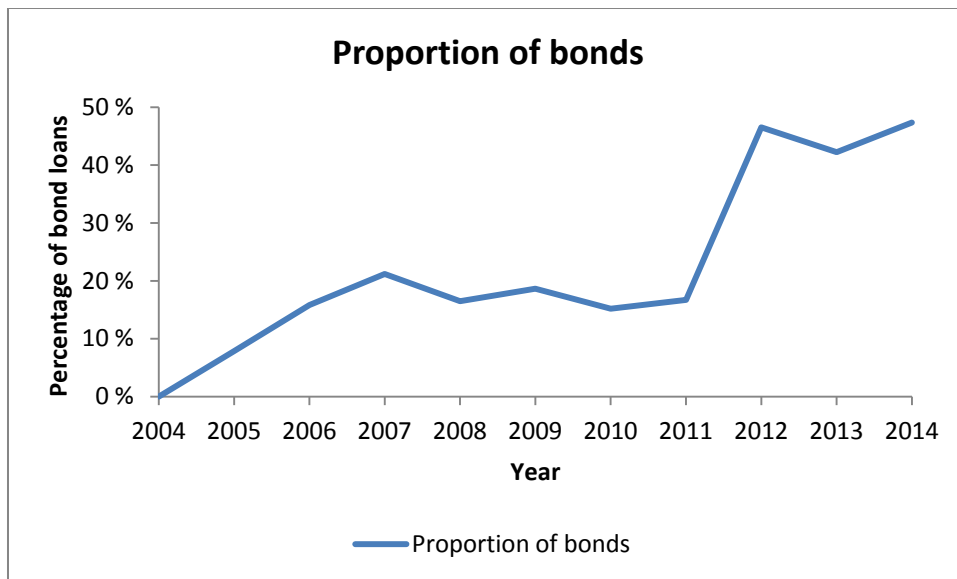


Figure 33 - Proportion of bonds compared to the sum of bonds and bank loans

This study shows that bond loans increased more than bank loans in the years after the financial crisis for Odfjell SE. This gives improved confidence that firms get an increased proportion of financing through bond loans.

7.2.4 Summary and discussion of bond results

The first analysis of the entire bond market at Oslo Stock Exchange and Nordic ABM indicates that the Norwegian market for bonds has increased significantly after 2008. The sector-specific analysis gives the same result, despite some differences between sectors. The firms' capital structure consists of more bond loans than before the crisis. The use of bonds has increased. The third approach, where one firm has been reviewed, is also in line with the previous two analyses. It also confirms that the amount of bond loans has increased more than traditional bank loans. Ergo, there is evidence of change in the composition of debt after the financial crisis.

One must still keep in mind; the bond values in these three analyses are the observed use of bonds. This is not necessarily the same as what the firms' wanted. We have limited knowledge of the firms' preferred debt composition, only what actually happened.

8 Results related to theory

Our analysis has revealed a change in composition of debt. Because the trade-off theory only assumes one kind of debt, it has limited relevance explaining the change in debt structure observed in the last years.

The trade-off theory assumes that marginal cost of debt is increasing and marginal benefit of debt is decreasing as debt ratio becomes larger. This should indicate an interior solution to the optimal debt ratio problem. Table 6 illustrates average debt ratios, both between years and sectors. The debt ratios ranged between 3% and 50%, but most were from 20% to 40%. Our findings do indeed indicate an interior solution. Firms choose to take on some debt, but cannot or will not use only debt financing.

The pecking order theory indicates that bonds are preferred to equity. This is consistent with our results, where increased use of bonds has been proved. The reason for this can also be linked to the theory of agency costs. When bonds are issued rather than equity, there are fewer stockholder interests to consider for managers and current stockholders.

The fact that the majority of debt ratios of listed firms ranged from 20% to 40% can also be linked to the theory of agency costs. One can imagine that firms acknowledge the danger of too high or too low debt ratios. Too much debt can result in either the asset substitution effect or the underinvestment problem. The free cash flow problem can be a consequence of too low debt ratios.

According to the market timing theory, firms' choice of financing depends on market values of equity and debt. There was a major drop in market value of equity during the financial crisis. The market to book ratio was relatively low, making it more likely for firms to issue debt or repurchase outstanding shares. This theory might explain why listed firms' average debt experienced a peak in 2008. The combination of firms demanding debt and new regulations making it harder for firms to get bank loans, can be one explanation for the increased use of bond loans.

9 Conclusion

In this paper, we ask the question: "Did the capital structure of firms listed on Oslo Stock Exchange change in the period 2004-2013?" This is a study of the impact of the financial crisis on the development in firms' capital structure and composition of debt in the Norwegian market. Our results imply that there has been a capital structure response to the financial crisis.

Average debt ratio for all listed firms increased significantly during the financial crisis. Even though sectors behaved differently, the majority of the sectors experienced a peak in debt ratio under the crisis. The natural assumption is that firms have taken on more debt in this period. This seems unreasonable because of the banking sectors newly imposed restrictions and increased reluctance towards lending. This reduced firms' access to bank loans. When looking at the development in firms' total debt, we find that listed firms had a stable growth in debt for the years 2004-2013. This means that average debt did not experience large changes under the crisis and can thus not explain the jump in debt ratio. Market value of equity had a large decline during the financial crisis. The increase in debt ratio was due to this large fall in market value of equity. It was an automatic mechanism, not a deliberate choice by firms. Debt ratio fell when the share price rose back to previous levels, but stabilised on a higher level than before the crisis. The continuously increasing amount of total debt can explain the higher level of debt ratio.

The Norwegian market for bonds has experienced a significant growth in the last ten years. The growth has been largest after the financial crisis. The bond market analysis of OSE and Nordic ABM proves this. This substantial increase in bonds after the financial crisis is confirmed in the sector-specific analysis. When one firm is extensively analysed, we find the use of bond loans to have increased more than bank loans after the crisis. These findings indicate that bonds account for an increasing share of total debt. We can conclude that there has been a change in listed firms' capital structure because of the financial crisis; the use of bonds has increased

Recommendations of further research

The financing of firms will always be relevant and of high importance for the economy. We only consider some of the many ways of debt financing, which simplifies our analysis and

results. A more thorough study of the composition of firms' capital structure would be appropriate and further contribute to this subject. We focused mainly on bank loans and bonds, but there are other ways of debt liabilities, such as leasing and convertible debt. We only used one firm in the analysis where bank loans and bond loans were compared. Our confidence in these results would have been enhanced if several firms were examined the same way and these showed a similar development. When analysing the development in bonds and bank loans, we do not consider different yield, maturity and debt rating. Our suggestion for future research is that the development in composition of debt for each and every firm is examined to reveal the trend in financing. This would demand far more time and resources than we had available.

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11 Appendices

11.1 Appendix 1 - Exchange rates at year end (31.12)

Year	USD/NOK
2004	6.047
2005	6.77971
2006	6.22835
2007	5.40375
2008	7.03196
2009	5.80653
2010	5.89666
2011	5.99378
2012	5.58249
2013	6.11845

11.2 Appendix 2 - Sample of OSE listed firms' equity, debt and debt ratio

Year	Sector	Name	MV Equity	Total Debt	Total Capital	Debt Ratio
2013	Energy	DOF	2 831 810	24 235 000	27 066 810	89,54 %
2013	IT	Dolphin Group	2 478 830	1 075 285	3 554 115	30,25 %
2013	Consumer Staples	Domstein	65 410	264 100	329 510	80,15 %
2013	Energy	Eidesvik Offshore	1 079 370	3 107 996	4 187 366	74,22 %
2013	Industrials	Eitzen Chemical	85 730	5 619 259	5 704 989	98,50 %
2013	Consumer Discretionary	Ekornes	3 645 850	0	3 645 850	0,00 %
2013	Energy	Electromagnetic Geoservices	1 859 530	344 393	2 203 923	15,63 %
2013	IT	Eltek	1 843 550	747 100	2 590 650	28,84 %
2013	Energy	Emas Offshore	366 150	305 144	671 294	45,46 %
2013	Industrials	EMS Seven Seas	109 710	309 557	419 267	73,83 %
2013	Consumer Discretionary	Eqology	53 060	16 835	69 895	24,09 %
2013	IT	Evry	2 248 320	3 523 700	5 772 020	61,05 %
2013	Industrials	Fairstar Heavy Transport	891 730	NA	NA	
2013	IT	Fara ASA	110 470	NA	NA	
2013	Energy	Farstad Shipping	5 148 000	9 742 149	14 890 149	65,43 %
2013	Energy	Flex Long	327 290	0	327 290	0,00 %
2013	Energy	Fred Olsen Energy	17 007 010	4 826 600	21 833 610	22,11 %
2013	Energy	Fred Olsen Production	985 150	NA	NA	
2013	Energy	Frontline	961 550	1 248 426	2 209 976	56,49 %
2013	IT	Funcom	106 400	13 964	120 364	11,60 %
2013	Energy	Ganger Rolf	4 434 860	1 503 900	5 938 760	25,32 %
2013	Industrials	GC Rieber Shipping	1 993 480	1 578 539	3 572 019	44,19 %
2013	Industrials	Golden Ocean Group	2 522 560	521 805	3 044 365	17,14 %
2013	Industrials	Goodtech	559 500	195 558	755 058	25,90 %
2013	Consumer Staples	Grieg Seafood	1 568 850	1 603 106	3 171 956	50,54 %
2013	Consumer Discretionary	Gyldendal	501 030	145 000	646 030	22,44 %
2013	Energy	Hafslund 'A'	5 759 840	11 764 000	17 523 840	67,13 %
2013	Consumer Staples	Havfisk	503 640	1 223 000	1 726 640	70,83 %
2013	Energy	Havila Shipping	814 850	5 933 486	6 748 336	87,93 %
2013	Industrials	Havyard Group	NA	276 094	NA	
2013	Energy	Hexagon Composites	766 450	448 505	1 214 955	36,92 %
2013	Consumer Discretionary	Hoegh Long Holdings	3 546 690	3 532 390	7 079 080	49,90 %
2013	Health Care	Hofseth Biocare	185 780	63 535	249 315	25,48 %
2013	Consumer Discretionary	Hurtigruten	1 260 780	2 993 726	4 254 506	70,37 %
2013	IT	Idex	495 610	0	495 610	0,00 %
2013	Industrials	IM Skaugen	414 600	1 031 808	1 446 408	71,34 %
2013	Industrials	Infratek	1 277 260	7 200	1 284 460	0,56 %
2013	Energy	Interoil Exploration and Prod	148 070	397 112	545 182	72,84 %
2013	Materials	Intex Resources	341 040	0	341 040	0,00 %
2013	IT	Itera	157 800	15 827	173 627	9,12 %
2013	Industrials	Jason Shipping	5 270	NA	NA	
2013	Industrials	Jinhui Shipping and Transport	777 420	3 822 098	4 599 518	83,10 %
2013	IT	Kitron	385 700	316 868	702 568	45,10 %