The Bondholder-Stockholder Conflict: 
The Relation between Debt Covenants and Bond Spreads

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Abstract

Prior research on covenants show that they are frequently included in corporate debt agreements as means of mitigating bondholder-stockholder conflicts. As covenants should be more frequently included when there is a higher degree of bondholder-stockholder conflict, what is then the relation between covenants and spread? Our results show that on the Norwegian corporate debt market, bonds that include covenants have a higher spread than those that do not. The results of an OLS-regression using some of the most common covenants, Z'-score and bond spread shows that the 43 % of bond spread can be explained by whether the bond includes dividend restrictions, equity restrictions and poison puts, and the Z'-score of the issuer.

Keywords: bondholder-stockholder conflict, covenants, Z'-score, corporate debt, Norwegian bond market

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I. INTRODUCTION

On March 21st 2012, stockholders outstanding debt to bondholders on the Norwegian corporate debt market amounted to over NOK 140 billion. In the issuance of debt, contracts are set with obligations between creditors and the firm. The firm is defined by having an indefinite life and is simply a form of legal fiction that serves as a node for contracting connections between different parties, in this case mainly the stockholders and bondholders (Jensen & Meckling, 1976; Smith & Warner, 1979). The most profitable way for stockholders to handle this debt would be to pay out all liquid assets through dividends, or through creating financial structures that leads to the borrowed wealth being extracted from bondholders (Black, 1976; Jensen & Meckling, 1976). Thus, bondholders and stockholders are in obvious conflict. If bondholders could trust that the stockholders would not extract their wealth, this would not be a problem. Since this is not the case, there must be another explanation for corporate debt agreements being one of the most long-lived financial contracts there is (Jensen & Meckling, 1976; Smith & Warner, 1979).

All bonds come at a price, and the question is what price the bondholder and stockholder can agree upon. Bondholders’ main concerns in the pricing of bonds are the risk of default and the risk of wealth extraction, while stockholders want inexpensive financing. A principal can establish incentives and monitor an agent with the purpose of limiting the number of deviant activities performed by an agent (Smith & Warner, 1979; Jensen & Meckling, 1976). A common way of controlling the amount of conflicts that arise is to include covenants in the debt agreement. Covenants come in many shapes and usually compromise stockholder’s interest and the risk of default. As covenants are regularly used, the benefits and their value regarding mitigating conflicts and reducing agency costs are likely to be non-trivial (Smith & Warner, 1979; Reisel, 2010). Despite being commonly included in debt agreements, the empirical evidence on how covenants are related to debt price is limited (Reisel, 2010). The Norwegian bond market is characterized as well organized, growing and data is easily accessible. Few studies have been made on the Norwegian market; therefore we believe we can provide valuable insights for practitioners and future research.

The purpose of this study is to describe the relation between debt covenants and bond spread on the Norwegian bond market by examining the relation between covenants, financial distress and bond spread.
We hypothesize, (1) that bonds with (without) covenants will have a higher (lower) spread, (2) that bonds issued by companies with a low (high) Z'-score will have a high (low) spread and (3) that an OLS regression can be modulated to explain the value of different covenants and credit risk. Our final sample consists of 184 bonds issued on the Norwegian bond market. The issuers are on average on the verge of financial distress according to Altman's Z'-score. Our results show that covenants significantly explains parts of the bond spread, and that bonds issued by more financially distressed companies have higher bond spread.

To conclude, we partially hypothesis 1, accept hypothesis 2, and partially accept hypothesis 3. We find that bonds with more covenants have a higher spread. Dividend restrictions, poison put options, equity restrictions and Z'-score can explain 43 % of the bond spread.

II. LITERATURE REVIEW AND MOTIVATION
The spread of a bond affects the borrower's cost for borrowing money and the lender's gain for lending the same. To study the effect of corporate bond covenants, the spread must be decomposed since it is affected by several factors. Merton (1974), Leland (1994), and Collin-Dufresne (2001) argue that the spread is composed by both restrictions in the loan agreement, market risk, and the credit risk, which is the risk of default. The loan agreement includes details of the bond and its content regulates the conflict of interests between the bondholder and the stockholder. The following literature review will treat these factors. Firstly, a general introduction of the corporate debt market and the incentives for issuers will be presented. Secondly, we will describe the bondholder-stockholder conflict and the four major types of problems that arise from this conflict. Thirdly, we provide background on covenants in general and on some of the most commonly used and important to consider in particular.

Corporate debt and the bond market
Raising capital by issuing debt is a frequent practice by firms. A debt contract specifies a series of interest and principal payments to be made by a firm to debtholders in return for borrowed funds (Begley & Feltham, 1999). Bonds come in different forms and they all have unique characteristics that affect the price. Besides covenants in the loan agreement there are two factors that affect the price of a bond; credit risk and market risk. Credit risk concerns the risk of the issuer not being able to fulfil its debt obligations. Ceteris paribus, price will vary with differences in probability of default, whereas issuers with higher risk of default will have to
pay a higher price (Merton, 1974). There is a link between accounting information and the cost of debt, as bondholders consider accounting information when pricing a bond (Ball & Brown, 1968; Reisel, 2010). If a firm goes bankrupt or has to default on some of the outstanding debt, debtholders will receive less than the agreed upon amounts from the bond issuer. The bondholders’ expectations of what future amounts they will receive rely in part upon their beliefs about the management’s future operating strategy. These expectations will affect the price of the debt contract (Begley & Feltham, 1999).

Market risk concerns unanticipated fluctuations in the risk-free interest rate, e.g. government bonds. If the riskless rate increases, corporate bond prices decrease as a result of a lower opportunity cost of risk. Floating rate notes are therefore affected by the market risk to a much lesser extent since the coupon is defined as the reference rate plus a spread. The market risk will be priced into the reference rate instead of the spread. The credit risk has to do with company operations and to which degree the issuer can attain its debt obligations (Hull, 2006, pp. 481-503).

**Agency costs in the bondholder-stockholder conflict**

*Agency costs*

Agency costs arise in the relationship between bondholders and managers, as well as between stockholders and managers (Jensen & Meckling, 1976). Bondholders and stockholders have conflicting interests regarding investment, financing, and dividend policies. To resolve this conflict, bondholders and stockholders apply constraints and restrictions to management’s decision-making authority (Smith & Warner, 1979). Such constraints and restrictions lead to agency costs. Agency costs can be divided into three categories. Firstly, there are monitoring costs, which result from the bondholder or stockholder ensuring that the manager meets certain imposed obligations. Secondly, bonding costs arise from the manager having to expend resources to fulfil obligations towards the principal. Thirdly, the residual loss is the reduced profitability that comes from constraints on management decision-making. Agency costs are as real as any other costs and should not be neglected by rational bondholders, managers or stockholders (Jensen & Meckling, 1976). In well-functioning capital markets lenders and investors foresee these costs (Myers, 1977). The level of agency costs in a firm is dependent on the contracting creators when originating contracts, as well as how much the principal trusts the agent (Jensen & Meckling, 1976). Firms with a high financial leverage
have a greater probability for financial distress, and therefore face higher agency costs. By disclosing accounting information, bond issuers can reduce these costs (Malitz, 1986; Reisel, 2010).

*Bondholder–stockholder conflict*

The bondholder-stockholder conflict is an issue that the capital markets are aware of according to the efficient-market hypothesis. Rational stockholders and bondholders recognize the incentives of stockholders and understand that after bonds have been issued, any opportunity to increase the wealth of the stockholders will be taken. Therefore, when pricing the bond issue, bondholders estimate the behavior of the stockholders given the investment, financing, and dividend policies available to the stockholders. The price that bondholders pay for the issue will be lower because of the possibility of subsequent wealth transfers to stockholders. Vice versa, the market value of the firm will increase at the time of the issue of the bonds since there is an increased possibility of transfers from which shareholders will gain (Smith & Warner, 1979). In a levered firm, stockholders have increased incentives for undertaking actions that will transfer wealth from bondholders to stockholders. These conflicts are considered by the debtholders and are incorporated into the debtholders’ demand for financial assets (Nash et al., 2003; Nikolaev, 2010). The costs that arise from the probability of conflicts on investment and financing policies between bondholders and stockholders are one of the most important to consider (Billett et al., 2007).

*Management constraints*

It is possible for bondholders to, through the inclusion of covenants, limit managerial behaviours that would result in a reduced value of the bonds. Therefore, imposed constraints on management’s decisions regarding future debt issues, dividends and working capital are not uncommon. Such constraints should not be viewed as a guarantee for a firm value-maximizing strategy though. To provide a complete protection for bondholders from incentive effects, provisions would have to be incredibly detailed and cover a majority of an enterprise’s operating aspects including limitations on risks associated with projects undertaken. The costs involved in creating such provisions and enforcing them, and the reduced profitability of the firm are likely to be significant. Bondholders need to accept that management is a continuous decision making process, and the control that can be applied is therefore limited, unless having the bondholders themselves performing the management function (Jensen & Meckling, 1976; Smith & Warner, 1979).
Agency costs are as real as any other costs and should not be neglected by rational bondholders, managers or stockholders. The level of agency costs in a firm is dependent upon the cleverness of the contracting creators when originating contracts, as well as how much the principal trusts the agent (Jensen & Meckling, 1976). Smith & Warner (1979) suggest that there are four major types of bondholder-stockholder conflicts that need to be considered; dividend payment, claim dilution, asset substitution and underinvestment.

The bondholder-stockholder conflicts

Dividend payment
Instead of investing, and thereby potentially maximizing the value of the firm, firms tend to pay out dividends (Smith & Warner, 1979). Regarding how dividend payments affect bond pricing, Black (1976) has made an extreme but illustrative example: “There is no easier way for a company to escape the burden of a debt than to pay out all of its assets in the form of a dividend, and leave the creditors holding an empty shell” (Black, 1976, p. 10). Even though this is an extreme example, all increases in dividend that is not matched by a likewise increase in external financing will be negative for the creditors. This is because the assets that have been paid out to stockholders no longer are assets available for payback to creditors. The opposite is also true, and lays out an obvious reason for why firms pay dividends. Stockholders prefer to have a part of a firm’s assets paid out as dividends, rather than the same assets being invested in projects from which the cash flow might only go to the hands of creditors (Black, 1976). Shareholders are residual claimants, and management acting in shareholders interest has incentives for distributing the firm’s assets to stockholders before debt holders raise their claims since dividend payments and share repurchases are the primary means of making premature equity distributions (Begley & Feltham, 1999). Shareholders have incentives to maintain dividend payments during financial distress. Therefore, dividend restrictions help reduce wealth expropriation that is not firm value maximizing (Black, 1976; Malitz, 1986). Restrictive covenants should more likely be included when the issuer is in financial distress (Nash et al., 2003).

Underinvestment problem – shareholders not maximizing the firm value
Underinvestment is essentially when stockholders fail to accept projects or investments with a positive net present value (Malitz, 1986). There are negative effects for the firm and for the debt holders if management finances wealth distributions to shareholders by choosing to not
invest in positive net present value projects (Begley & Feltham, 1999). One motive for shareholders to reject net present value investments is that the proceeds from those might accrue to the bondholders rather than the stockholders. Assuming rational bondholders, this aspect is considered in the pricing of the debt so that the shareholders bear the full costs of the firms’ value loss (Smith & Warner, 1979; Malitz, 1986).

Financial distress affects the risk of underinvestment problem. Underinvestment is more likely to occur in periods of financial distress since a larger part of the value extracted from investments accrues to bondholders when default appears likely (Bodie & Taggart, 1978). Underinvestment is also more likely to occur during financial distress since shareholders also have incentives for maintaining dividend payments, and thus dividend restrictions help reduce underinvestment (Malitz, 1986).

The underinvestment problem is further investigated by Myers (1977), who argues that a major part of a firm’s value lies not only in the value of its assets, but also in the net present value of growth opportunities and of future investments. There is a conflict between the book value, i.e. the assets already in place, and the stock market value of a firm, i.e. the present value of further growth opportunities. The amount of debt that is issued by a firm should be set to an amount that maximizes its market value. This does not have a direct relationship to the probability of default or the amount lenders are willing to lend. The value of debt will instead be inversely related to the ratio of discretionary expenditures to total asset value. Discretionary expenditures include all variable costs that if undertaken will lead to the end-of-period value of the firm being increased. Assets-in-place should be financed by debt to a larger extent than growth opportunities since they are sunk costs. Financing growth opportunities with equity leads to the shareholder capturing the full value of these opportunities. When it comes to investments in assets-in-place, the factors that should be associated with heavy debt financing is capital-intensity and high operating leverage, as well as profitability which ideally should be measured in terms of expected future value of the firm’s assets (Myers, 1977). Corporations of different type and size, and with shifting growth opportunities therefore will have different capital structures (Myers, 1977; Barclay & Smith, 1995).
**Asset substitution problem**

Stockholders can extract wealth from debtholders through engaging in investments that have a higher risk than before the issue of the bond. An illustrative example is a shift from investments in tangible, general-purpose assets to intangible firm-specific assets such as research and development (Nash et al., 2003; Malitz, 1986). Equity in a firm can be considered as a European-type call option that allows the holder of the option to buy the firm from the bondholders, at an exercise price that matches the face value of outstanding debt. As variance of a firm’s cash flows increases, the value of the call option increases. By engaging in risky projects that increases the variance of the firm value, stockholders extract value from bondholders. Bondholders do not gain extra benefits from high variance projects but bear the costs of increased risk of default while stockholders risk is limited to equity and can capture extra gains. Including limits on the holding of financial assets, and limitations on debt in the debt agreement can mitigate the asset substitution problem (Nash et al., 2003; Malitz, 1986). For firms that possess extensive growth opportunities or face financial distress the reduced flexibility of such limitations can incur losses that are greater than the benefits (Nash et al., 2003).

**Claim dilution problem**

Claim dilution concerns the seniority of bondholder’s claims, i.e. the priority of their claims compared to other claimant’s. Senior claims are prioritized over subordinated claims, and thus the risk of subsequent debt being given a more senior claim affects the price of corporate debt (Smith & Warner, 1979). Debt holders face the risk of their claims becoming subordinate debt in relation to other debt. If the pricing of a bond includes the assumption that no further debt will be issued, the bondholders wealth will be reduced by the issue of equally or higher prioritized debt. When additional debt is given a higher priority in the claim “pecking order”, existing claims are demoted and their value reduced (Nash et al., 2003; Brauer, 1983). Anticipation of such behavior increases the nominal interest rate in those specific contracts, but is not necessarily costly for the firm. Bondholders can use several covenants to protect themselves from this type of wealth expropriation. For example, debt restrictions and negative pledge clauses ensure that other creditors will not be able to receive more senior claims (Begley & Feltham, 1999; Nikolaev 2010). An aspect that needs to be considered is that by leaving the firm an option to issue senior debt, which could have a lower interest rate, the firm could achieve a less costly financing all in all (Begley & Feltham, 1999).
The four major problems of dividend payments, underinvestment, asset substitution, and claim dilution need to be considered and handled when originating debt contracts. Unless controlled, these problems can lead to strategies not maximizing firm value being followed and wealth being extracted from bondholders. Since responsible managers should handle agency costs, the bondholder-stockholder conflict needs to be considered when originating debt contracts. Bond issuers and bondholders have means to do so by including restrictions regarding dividends policies, financial situation, debt ratios, and further issuance of debt, equity, and seniority of bonds.

Covenants and the value of the firm
Debt contracts generally contain some sort of restrictions on firm operations, and these restrictions are called covenants. We will first provide a background on covenants in general and their effect on the value of the firm and after that present the specific covenants that are examined in this study.

"A bond covenant is a provision, such as a limitation on the payment of dividends, which restricts the firm from engaging in specified actions after the bonds are sold." (Smith & Warner, 1979)

Covenants can be divided into several categories. Accounting-related covenants regard the firms accounting numbers while other restrictive covenants regard the firm's activities. Managers must meet covenant restrictions before taking certain actions (Nikolaev, 2010). Violation of covenants is costly for borrowers, and managers have incentives for making financial reporting decisions that reduce the likelihood of an accounting-related covenant being violated. Covenants can therefore also be used as an option to step in and take action when circumstances warrant (Dichev & Skinner, 2002; Reisel, 2010). Covenant inclusion can result in both costs and gains for equity holders. Costs arise when covenants either prevent management from taking decisions that leads to maximizing of the firm's value, or encourage management to take decisions that do not maximize the value of the firm. Gains result from covenants when they either hinder opportunistic behavior that decreases the value of the firm, or give incentives for taking actions that lead to the firm’s value being maximized (Begley & Feltham, 1999; Dichev & Skinner, 2002). Covenants can be costly even in companies that are financially healthy if they restrict managers' abilities to follow a firm value-maximizing strategy (Nikolaev, 2010).
Costly contracting hypothesis

The two major hypotheses on the bondholder-stockholder conflict are the irrelevance hypothesis and the costly contracting hypothesis. When debt contracts are agreed upon but fills no function because of external market pressure or if the debt structure can be changed without implying costs the covenants are according to the irrelevance hypothesis, complex and meaningless. Such a contract doesn’t change the value of the firm (Smith & Warner, 1979). The costly contracting hypothesis state that by including covenants in the debt contracts the shareholders are ensuring necessary actions to maintain firm value and future claims by bondholders (Malitz, 1986; Barclay & Smith, 1995, Billett et al., 2007; Reisel, 2010). If the firm itself bears the monitoring costs and the indirect costs of reduced future managerial distraction, then the covenants lead to a trade-off between monitoring, bonding and enforcement against the benefits of increased firm value. Therefore, each firm has its own unique set of contracts that maximizes its value (Jensen & Meckling, 1976; Smith & Warner, 1979; Malitz, 1986). The firm’s size and leverage also are important characteristics regarding whether and what covenants will be used (Reisel, 2010).

The costly contracting hypothesis assumes that even though financial markets and the bondholder-stockholder conflict to some extent control and affect a firm’s operations, capital structure and investment policy, the stockholders will still intend to maximize the value of their equity instead of the value of the firm. The primary value added by covenants is the reduction of potential conflicts arising between bondholders and stockholders (Billett et al., 2007; Reisel, 2010).

As seen in Table 1, covenant inclusion is a common practice. These earlier findings provide some background into which covenants are most regularly used, and have contributed to our motivation regarding what covenants to study.
# Table 1
## Earlier findings of covenant occurrence

<table>
<thead>
<tr>
<th>Authors</th>
<th>Timeperiod</th>
<th>n</th>
<th>Data Source</th>
<th>Area of research</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Roberts &amp; Viscione (1984)</td>
<td>Jan 1972 - June 1981</td>
<td>86</td>
<td>Moody’s Manuals, Moody’s Bond Record</td>
<td>Differences in bond spread between companies with similar credit rating and different</td>
<td>In 79 out of 114 months, bond spreads were lower in senior/secured bonds at 95% significance</td>
</tr>
<tr>
<td>Pratt &amp; Livingston (1993)</td>
<td>April 1988 - March 1990</td>
<td>108</td>
<td>-</td>
<td>Impact of Poison Put-options in corporate debt agreements</td>
<td>In their sample, 44% have dividend restrictive covenants and 37% have borrowing covenants</td>
</tr>
<tr>
<td>Barclay &amp; Smith (1995)</td>
<td>1974-1992</td>
<td>39949</td>
<td>Compustat, CRSP, NYSE, AMEX, Nasdaq</td>
<td>The maturity structure of corporate debt</td>
<td>Firms that have few growth options, are large, or are regulated have more long-term debt in their capital structure</td>
</tr>
<tr>
<td>Guedes &amp; Opler (1996)</td>
<td>1982-1993</td>
<td>7369</td>
<td>Compustat</td>
<td>The determinants of the maturity of corporate debt issues</td>
<td>Size and bond ratings are important indicators to whether the firm will want to issue more long-term debt</td>
</tr>
<tr>
<td>Begley &amp; Freedman (1998)</td>
<td>Jan 1909 - Dec 1993</td>
<td>285</td>
<td>-</td>
<td>What events do poison put covenants attempt to control</td>
<td>In their sample, 25% have dividend restrictions and 23% have borrowing covenants.</td>
</tr>
<tr>
<td>Begley &amp; Feltham (1999)</td>
<td>Jan 1975 - Dec 1979</td>
<td>91</td>
<td>Senior debt issues drawn from the population of non-convertible debentures issued by industrial firms, Forbes, and Compustat</td>
<td>Management incentives and covenant correlation</td>
<td>In their sample, 48% have dividend restrictions, 44% have borrowing covenants, Pearson correlation between the two of 0.383.</td>
</tr>
<tr>
<td>Billet et al. (2007)</td>
<td>1960 - 2003</td>
<td>15504</td>
<td>Fixed Income Securities Database (FISD)</td>
<td>Occurrence and distribution of covenants in corporate debt</td>
<td>99.5% of the bonds are senior, 56% are callable and 29% include a poison put option</td>
</tr>
<tr>
<td>Nikolaev (2010)</td>
<td>1980 - 2006</td>
<td>5420</td>
<td>Mergent Fixed Investment Securities Database (FISD), Compustat, and CRSP.</td>
<td>Frequency of Covenant Occurrence (Mean of covenants per bond)</td>
<td>Total mean: 7.42, Dividend restrictive: 0.74, Investment related: 2.73, Financing-related: 1.27, Accounting-related covenants: 0.80.</td>
</tr>
<tr>
<td>Reisel (2010)</td>
<td>1989-2006</td>
<td>4267</td>
<td>Mergent Fixed Investment Securities Database (FISD), Compustat</td>
<td>Price impact of covenants</td>
<td>Restrictions on investment activities or financing activities reduce the cost of debt by about 50-70 basis</td>
</tr>
</tbody>
</table>

¹ As originally cited by Begley & Feltham (1999)
Specific covenants

Seniority covenant
Bonds have different priorities to issuer’s assets in case of default. Rational bondholders consider their priority pricing their bonds, and senior debt receives a higher price than subordinate debt. Debt is more likely to be senior in financially distressed firms, since seniority is one way of handling the risk of losses in the case of default for bondholders (Merton, 1974, Brauer 1983; Roberts & Viscione, 1984; Altman, 2006 pp.233-235).

Dividend restrictions
Dividend restrictions covenants restrict the amount available for dividend payments. Stockholders prefer to have a part of a firm’s assets paid out as dividends, rather than the same assets being invested in projects from which the cash flow might only go to the hands of creditors. Dividend constraints are an effective means for reducing the underinvestment-problem (Black, 1976). A typical dividend constraint establishes a dividend inventory, which accumulates over time. All of a firm’s funds that are available for dividend payments are usually included in these restrictions, which can range between just a few per cent to all of the funds available for dividend payments (Malitz, 1986). Furthermore, issuers that are highly leveraged are more likely to include dividend restrictions in debt contracts (Reisel, 2010).

Equity restrictions
Bondholders consider accounting measures relevant when pricing a bond (Ball & Brown, 1968; Reisel, 2010). For creditors, there are usually incentives to control the leverage of a firm and include equity restrictions since high leverage affects a manager’s behavior. High leverage gives the manager strong incentives to engage in activities that promise high payoffs if successful, despite a low probability of succeeding. Equity restrictions also help mitigate problems associated with financial distress. Firms can generally postpone bankruptcy for a limited time, and managers may use this as an opportunity to gamble with the remaining wealth of the firm (Nash et al., 2003).

Combined use of equity & debt
Limitations on debt reduce the firm’s ability to use debt financing for investments in intangible assets and other projects that are riskier and might not have a tangible value in case of default. Limitations on debt have little effect on underinvestment problems, for which dividend payout restrictions are more efficient. Firms that would benefit from the use of
either covenant will also benefit from the use of the other. Since none of the covenants reduces both problems, each single covenant could be associated with larger losses than gains. The largest gains should come from a combined use of such covenants (Smith & Warner, 1979; Malitz, 1986).

Secured bonds
By issuing secured bonds, the issuer has a means for mitigating agency costs, that for some firms might have been larger would they have had to include restrictive covenants in the debt agreements. A secured bond includes a guarantee from a third party, collateral, escrow accounts or similar. The issuer can reduce claim dilution and underinvestment problems by issuing secured debt. Firms that face financial distress are more likely to consider issuing secured debt because of the reduced agency costs that comes from the specific asset claims from bondholders, whilst avoiding costs of lost flexibility that would be the effect of restrictive covenants. Secured bonds should include fewer or less restrictive covenants, and should ceteris paribus have a lower price than unsecured debt (Roberts & Viscione, 1984; Barclay & Smith, 1995; Nash et al., 2003).

Pledge/Negative pledge
Pledge/negative pledge is a frequently used covenant (Reisel, 2010). Bondholders take the risk of subsequently issued debt receiving a higher priority into consideration when pricing a bond. Pledge/negative pledge is an efficient mean for reducing the risk of losing priority in the pecking order. The inclusion of pledges should therefore reduce the spread, ceteris paribus (Smith & Warner, 1979; Begley & Feltham, 1999; Reisel, 2010). A pledge/negative pledge clause can also help mitigate asset substitution problems, since is provides obstacles for managers wanting to undertake riskier projects (Nash et al., 2003).

Call options
Call options are an additional help when it comes to mitigating agency costs of debt. In an efficient market, the difference in price between a callable bond and a noncallable bond should reflect the value of the call option to the shareholder (Bodie & Taggart, 1978). This might not be the whole truth, and call options in corporate bonds are therefore probably affected by additional factors (Myers, 1971; Bodie & Taggart, 1978). The flexibility call options give managers helps the firm more than it costs investors, but both stakeholders might gain from it. Shareholders can be made better off and acquire additional benefits with
call options being included in the bond agreement than they would be when using noncallable debt, whilst leaving the bondholders indifferent between the two (Bodie & Taggart, 1978). Callable debt can help mitigate the underinvestment problem. By calling the debt, the firm can then gain the full benefits from the positive net present value investment. Shareholders can also rid themselves from dividend restrictions by calling debt that includes dividend restrictions (Barclay & Smith, 1995; Nash et al., 2003).

Poison put options
It is more likely that the debt agreement will include a poison put option if it the issuer is financially distressed. A poison put option gives the bondholder the option to force the issuer to pre-maturely fulfil debt obligations in case of a certain event or action happening. The poison put option is a means through which bondholders can protect themselves from significant increases in leverage and risky investments, thereby helping mitigate asset substitution problems. Poison put options are used much more frequently in high-risk bonds than in investment grade bonds (Nash et al., 2003; Chava et al., 2010; Reisel, 2010).

Maturity
Shortening the maturity of outstanding debt lessens the underinvestment problem as well as the asset substitution problem. A longer maturity of bonds means a longer period of time during which profitable investments can arise and subsequently be rejected by managers acting in shareholders interest. As equity can be seen as a European call option for the firm, the price of this option decreases with shorter maturity of debt, since it is not as sensitive to the variance of the underlying asset’s returns. Firms with larger growth opportunities should issue debt with shorter maturity to preserve the firm’s flexibility (Barclay & Smith, 1995; Nash et al., 2003). Large firms should issue either very short term or very long term debt (Guedes & Opler, 1996). Because of the liquidity risk that comes from short-term debt, only the firms of the highest and lowest strength position should use short-term debt (Barclay & Smith, 1995; Guedes & Opler, 1996; Billett, et al., 2007).

Accounting-related covenants
There is a link between accounting information and the cost of debt, and therefore other accounting-related covenants than dividend and equity restrictions are considered (Ball & Brown, 1968; Reisel, 2010). These include minimum requirements on net worth, ratios of coverage of interest from cash flows or EBIT, level of earnings and indebtedness ratios.
Covenants of this type are often very specific and lead to further disclosure of accounting information. Accounting-related covenants can help recognizing losses in timely fashion and hinder opportunistic behavior of managers (Nikolaev, 2010).

Earlier findings

*Altman’s Z-score*

The Z-score is a method for measuring credit risk, i.e. the probability of default. Altman’s first tests managed to categorize companies correctly prior to bankruptcy with 95 % accuracy (Altman, 1968). Several tests have been made since then with test accuracies between 82 - 94 % as can be seen in Table 2. Despite the popularity, the Z-score has been subject of criticism. Grice and Ingram (2001) argues that the bankruptcy prediction accuracy has declined since the invention and that the coefficients seems to be unstable over time which they show in their study of the generalizability of the Z-score. They received 58 % accuracy in their test.

<table>
<thead>
<tr>
<th>Author</th>
<th>Timeperiod</th>
<th>N</th>
<th>Accuracy (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Altman (1968)</td>
<td>1946-1965</td>
<td>66</td>
<td>95¹</td>
</tr>
<tr>
<td>Altman (2000)</td>
<td>1997-1999</td>
<td>120</td>
<td>94 (84)</td>
</tr>
</tbody>
</table>

¹ One year prior to bankruptcy
² Two years prior to bankruptcy

*Default Return rates*

<table>
<thead>
<tr>
<th>Author</th>
<th>Time</th>
<th>Sample source</th>
<th>Sample</th>
<th>Arithmetic average default</th>
</tr>
</thead>
<tbody>
<tr>
<td>Altman</td>
<td>1971-2004</td>
<td>Authors compilation</td>
<td>Defaulted bonds</td>
<td>3.232 %</td>
</tr>
<tr>
<td></td>
<td>1978-2004</td>
<td></td>
<td>Defaulted bonds</td>
<td>3.567 %</td>
</tr>
<tr>
<td></td>
<td>1985-2004</td>
<td></td>
<td>Defaulted bonds</td>
<td>4.401 %</td>
</tr>
<tr>
<td>Hull</td>
<td>1982-2003</td>
<td>Moody’s</td>
<td>Senior secured defaulted bonds</td>
<td>51.6 %</td>
</tr>
<tr>
<td></td>
<td>1982-2004</td>
<td></td>
<td>Senior unsecured defaulted bonds</td>
<td>36.1 %</td>
</tr>
<tr>
<td></td>
<td>1982-2005</td>
<td></td>
<td>Senior subordinated defaulted bonds</td>
<td>32.5 %</td>
</tr>
</tbody>
</table>

In Table 3, default return rates that have been compiled by Altman (2006, pp. 6-7) and Hull (2006, pp. 6-7) are presented. Altman shows that the return rate of bonds at default is very
low, which means that bondholders seldom regain much of the outstanding debt in the case of default (Altman, 2006, pp. 6-7). Hull (2006, pp. 481-503) presents somewhat more positive numbers, but still shows that bondholders are at a major loss if the issuing company were to default. To summarize, bondholders have met considerable losses in the cases of bonds defaulting.

III. DEVELOPMENT OF HYPOTHESES

Development of H1
The bondholder-stockholder conflict is costly and considered by rational bondholder and stockholders when pricing a bond. When there is a higher degree of conflict, spread should be higher. To mitigate the problems that arise from the conflict, such bonds should also include more covenants. The inclusion of covenants that empower stockholders should also lead to a higher spread.

Bondholders consider their rank in the “pecking order” in the case of default when pricing a bond and prefer a higher rank (Merton, 1974; Brauer, 1983; Roberts & Viscione, 1984; Altman, 2006, p34). Bondholders consider the risk of their claims becoming subordinated to subsequently issued debt when pricing a bond (Smith & Warner, 1979; Brauer, 1983; Begley & Feltham, 1999; Nash et al., 2003; Nikolaev, 2010). Securing of a bond is an efficient mean for mitigating agency costs and can reduce claim dilution problems and underinvestment problems (Barclay & Smith, 1995; Nash et al., 2003). Dividend restrictions ensure that assets are not transferred to stockholders with bondholders at a loss (Black 1976; Malitz, 1986; Reisel, 2010). Dividend restrictions are efficient means for reducing underinvestment problems and asset substitution problems (Smith & Warner, 1979; Malitz, 1986; Begley & Feltham, 1999, Nash et al, 2003; Reisel, 2010). Through poison put options bondholders can rid themselves from certain pre-agreed upon negative effects (Nash et al., 2003; Reisel, 2010). Equity restriction covenants are efficient means for reducing underinvestment problems and asset substitution problems (Smith & Warner, 1979; Nash et al., 2003). Bondholders can use additional accounting-related covenants to protect themselves from wealth expropriation (Nikolaev, 2010). Call options mitigate agency costs of debt and have a larger value for stockholders than bondholders. Call options should be associated with a higher spread and
occur more frequently together with dividend restrictions (Myers, 1970; Bodie & Taggart, 1978; Barclay & Smith, 1995; Nash et al., 2003).

Rational bondholders and stockholders will consider covenants when pricing a bond, therefore:

**H1** Bonds with (without) covenants will have a higher (lower) spread.

**Development of H2**

The credit risk affects bond prices. A higher risk for default results in a higher bond price (Merton, 1974). There is a link between accounting information and the cost of debt (Reisel, 2010). A lower $Z'$-score implies a higher credit risk (Altman, 2006, p. 233–235). Ceteris paribus, increased financial distress and credit risk will lead to a higher price

**H2** Bonds with a lower (higher) $Z'$-score will have a higher (lower) spread.

**Development of H3**

Rational investors consider several factors when pricing a bond and an OLS-regression can be modulated to describe how each of the above factors explains bond spread. The ordinary least squares method have been used by Merton (1974), Collin-Dufresne et al. (2001), Nash et al., (2003), Nikolaev, (2010) and Reisel (2010) among others.

**H3** Rational investors consider all factors affecting a bond contract.

**IV. SELECTION OF SAMPLE AND DATA**

First we present the selection of the sample, secondly we present company and market related information, and thirdly we present the covenant data from the sample.

One of the main reasons for focusing on the Norwegian market was the Stamdata database provided by Norwegian Trustee (Norsk Tillitsman). As they have a neutral status we believe the data provided by them credible. The database provided bond characteristics such as maturity date, industry, rates and other key data, which makes filtration possible. The database did not include covenant specific information, but provided us with electronic versions of the loan agreements, from which we could extract all necessary information about covenants.
Selection of the sample

The extraction of data from Stamdata resulted in over 16,163 observations. The data was collected at March 21st 2012 and no bonds issued after that date is considered. Due to the focus of our study we had to limit the selection sample by using various filters on the data and for this purpose the indexations provided by Stamdata were used (see Table 4 for sample breakdown). Financial data was not available for all companies and therefore we use two different final samples; Final sample (covenants) with 271 observations, which is used for testing H1, and Final sample (Z’-score) with 184 observations, which is used for testing H2 and H3.

Securities such as convertibles and certificate of deposits were excluded since the study only concern bonds. Market rates fluctuate, investors therefore demand higher rates on corporate bonds if market rates are explicitly high or will be high implicitly. Therefore, fixed rate issues were excluded since it would be impossible to compare bonds that have been issued different years without deeper analysis and explanation of fixed rate bond pricing. Because of time constraints and that pricing of credit derivatives fall outside the focus of this study, we chose to only include floating rate notes. 50 % of the floating rate notes had NIBOR 3 month (Norwegian Interbank Offered Rate) as reference rate. In order to increase precision,
comparability, and to avoid currency risks, all issues having EURIBOR, STIBOR or LIBOR were excluded.

Some of the industries have characteristics that disqualify them from the sample. Bank and finance companies are subjects of governance from the Norwegian FSA (Finanstilsynet), which monitors capital adequacy and liquidity as a result of the adoption of the Basel accords (Finanstilsynet, 2011). Such bonds are under strict governance and do not include comparable covenants. Furthermore, all companies related to the Kingdom of Norway such as municipal-owned, state-owned or municipalities were excluded because the Kingdom of Norway technically guarantees them. Covered bonds were excluded since they are backed by cash flows from mortgages or public sector loans, and mainly issued by mortgage companies or the public sector. To maintain the homogeneity and to avoid interpretable errors associated with old agreements, all issues prior to year 2000 were excluded.

While indexing the loan agreements, we found that some of the bonds lacked attached agreements or were wrongly labelled, resulting in a loss of 38 observations. Our Final sample (covenants) contained 271 observations. Due to financial information being unavailable for several companies 87 observations were excluded which led our Final sample (Z’-score) to contain 184 observations.
The issuers and issues

Our Final Sample (Z’-Score) included 184 observations of 84 different companies. The mean revenue for the companies observed was NOK 625 million. The issuers were sorted into several sectors using given labels from Stamdata. Aggregate outstanding bond volume was NOK 461 million (see Appendix B).

Chart 1
Issues per industry

As seen in Chart 1, Shipping, Oil & Gas, Property, and Industry accounts for a majority of the issues. This is not surprising since Norway has a tradition of shipping and oil prospecting as a result of its geographic position and geologic conditions.

Chart 2
Number of issues 2000 - 2012

Chart 2 shows that there has been an increase in issues over the past twelve. Note that the amount for 2012 only include issues up until March 21st, indicating that the bond market is experiencing an increase in the number of issues.
Bond characteristics and covenants

Table 5

<table>
<thead>
<tr>
<th>Industry</th>
<th>Total</th>
<th>Secured</th>
<th>Unsecured</th>
<th>Call option</th>
<th>Poison put</th>
<th>Dividend restriction</th>
<th>Equity restriction</th>
<th>Pledge</th>
<th>Acc. Rel. Cov.</th>
<th>~Days to maturity¹</th>
<th>~Spread¹</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fishery</td>
<td>9</td>
<td>1</td>
<td>8</td>
<td>6</td>
<td>8</td>
<td>6</td>
<td>7</td>
<td>3</td>
<td>1</td>
<td>981</td>
<td>5,03</td>
</tr>
<tr>
<td>Food &amp; Beverages</td>
<td>7</td>
<td>7</td>
<td>7</td>
<td>7</td>
<td>7</td>
<td>7</td>
<td>7</td>
<td>7</td>
<td>7</td>
<td>1748</td>
<td>0,79</td>
</tr>
<tr>
<td>Industry</td>
<td>31</td>
<td>4</td>
<td>27</td>
<td>10</td>
<td>10</td>
<td>12</td>
<td>17</td>
<td>13</td>
<td>7</td>
<td>1637</td>
<td>3,59</td>
</tr>
<tr>
<td>Media</td>
<td>4</td>
<td>4</td>
<td>2</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>1440</td>
<td>1,55</td>
</tr>
<tr>
<td>Oil &amp; Gas</td>
<td>52</td>
<td>15</td>
<td>37</td>
<td>26</td>
<td>30</td>
<td>28</td>
<td>40</td>
<td>22</td>
<td>16</td>
<td>1394</td>
<td>4,51</td>
</tr>
<tr>
<td>Property</td>
<td>36</td>
<td>13</td>
<td>23</td>
<td>5</td>
<td>7</td>
<td>4</td>
<td>13</td>
<td>15</td>
<td>12</td>
<td>1304</td>
<td>1,65</td>
</tr>
<tr>
<td>Pulp &amp; Paper</td>
<td>3</td>
<td>3</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>1676</td>
<td>5,77</td>
</tr>
<tr>
<td>Service</td>
<td>22</td>
<td>7</td>
<td>15</td>
<td>11</td>
<td>15</td>
<td>14</td>
<td>14</td>
<td>7</td>
<td>6</td>
<td>1210</td>
<td>4,73</td>
</tr>
<tr>
<td>Shipping</td>
<td>78</td>
<td>22</td>
<td>56</td>
<td>17</td>
<td>29</td>
<td>21</td>
<td>43</td>
<td>21</td>
<td>20</td>
<td>1554</td>
<td>3,94</td>
</tr>
<tr>
<td>Telecom/IT</td>
<td>7</td>
<td>7</td>
<td>1</td>
<td>4</td>
<td>5</td>
<td>4</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>969</td>
<td>3,40</td>
</tr>
<tr>
<td>Transportation</td>
<td>7</td>
<td>4</td>
<td>3</td>
<td>6</td>
<td>2</td>
<td>6</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>1594</td>
<td>4,14</td>
</tr>
<tr>
<td>Wholesale &amp; Retail</td>
<td>15</td>
<td>4</td>
<td>11</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>4</td>
<td>15</td>
<td>2</td>
<td>1564</td>
<td>2,77</td>
</tr>
<tr>
<td>Total</td>
<td>271</td>
<td>70</td>
<td>201</td>
<td>80</td>
<td>115</td>
<td>97</td>
<td>148</td>
<td>113</td>
<td>68</td>
<td>1444</td>
<td>3,64</td>
</tr>
</tbody>
</table>

% with covenant       | 26%   | 74%     | 30%       | 42%         | 36%        | 55%                   | 42%               | 25%    | 25%            |

¹ Arithmetic mean

All bonds in the sample are senior, and this covenant has thus been excluded from Table 5. Table 5 shows that, out of 271 issues, the majority is unsecured and that equity restriction is the most commonly included covenant. Overall, the inclusion of covenants does not seem to be an uncommon practice.

All bonds in our study are treated as senior debt, and are prioritized before subordinated claims such as shareholders’. In our study, typical collateral is either a ship or an oil platform, and a typical guarantee is a parent company. As can be seen in Table 5 almost 74% of the issues are unsecured. The pledge clauses are divided into pledge and negative pledge. The essential difference is that pledge implies that collateral is in financial control of the bondholder whereas in a negative pledge the asset is kept in financial control of the issuer, but cannot be used as collateral in other debt agreements. Approximately 42% of the issues include negative pledge or pledge according to Stamdata’s indexation. In our study, there are two types of options; call options, and poison put options. All options are separately regulated in the bond agreement regarding redemption dates and rates that should be applied if the option is exercised. An event that triggers the application of a poison put option is usually the sale of a specified asset or a change of control over the company. Pre-mature realization is often connected to a fixed price premium or price premium schedule. 30% of the issues have a call option and 41% have a poison put option. Generally 2004 marks the starting point for the use of option clauses in our sample and its use seem to increase. The dividend restriction comes in two main categories, either as a percentage of the company’s profit or prohibition of
dividends overall. The sample contains 97 (36 %) issues with dividend restrictions. Our results show that the equity restrictive covenants are formulated in different ways. Either they regulate the minimum ratio compared to, for example, debt and total assets or in absolute terms as the total amount of equity that a company must have, creating a dynamic ratio. As shown in Table 5, a majority (55 %) of the bonds in the study includes this covenant. 25% of the issues contain accounting-related covenants. It is important to remember that this general variable is made out of several specific measures. These most commonly regulate ratios of EBIT to debt and gearing ratio. The sample contains issues with days to maturity that ranges from 14 to 5400 days. One reason for the broad days to maturity-range is that outstanding bonds, in some cases, have been redeemed (option has been exercised). The average bond is issued with 1444 days to maturity (4 years). The spread varies from 0 % to 12 % with a mean value of 3,64 % and a standard deviation of 2,68 % (see Appendix A).

The Z’-score of the observations in the Final Sample (Z’-score) varies from -1,3 to 8,2 with a mean of 1,4 based on the 184 observations with financial information. 9 observations are in the safe zone, 82 Observations are within the ignorance zone and 93 are below the ignorance zone, in other words distressed.

V. METHOD

To the best of our knowledge, there is no public database that presents specific information on bond covenants in Norwegian bonds in a structured way available. In order to describe the use of covenants and eventually analyse the relation between firm specific values and bond characteristics, we had to construct a database. First, the method for extracting and evaluating bond specific information will be presented. Secondly, the method for extracting and evaluating company specific information will be presented. Thirdly, the statistical models used are described.

Bond specific information

The Stamdata database did not include covenant specific information, but provided us with electronic versions of the loan agreements, including all necessary information about covenants. We were able to complete our database with covenant information by reading through the agreements. See Appendix B for some of the most common examples and how the variables are coded.
The variables in our dataset were coded as either dummies or as a scale. The variables treated as dummies were seniority, secured, call option, poison put option, dividend restriction, equity restriction, pledge, and accounting-related covenants. Treating the dividend restrictions, equity restrictions and accounting-related covenants as dummies might lead to noisy results since they are often set as a ratio, an absolute number or a scale, and are therefore not binary in their nature. The variables treated as scales were the Z’-score, days to maturity and spread.

When coding the covenants, several manual errors could have been made because of the human factor. To reduce the risk of misinterpretation, two people read the bond agreements simultaneously. The largest risk for errors is in the bonds that were printed in Norwegian, due to interpretation problems.

**Company specific information**

Financial distress was measured through Altman’s Z-score that was invented in 1968 and has been revised several times since then. The Z-score is a commonly used practice when testing for financial distress (Nash et al., 2003; Billett et al., 2007; Nikolaev, 2010). We used Thomson Reuters DataStream to gather financial information. In this study, the X₄-term was substituted with book values using the private company version of the Z-score, the Z’-score. The original formula uses ‘market value of equity’ instead of ‘book value of equity’, but problems with retrieving accurate market values forced us to use book values despite them being arguably less accurate when applied to listed companies (Altman, 2000, p. 13). Furthermore, retained earnings were not accessible in our version of Thomson Reuters DataStream and therefore total shareholder equity less common stock were used as a proxy for retained earnings, giving a slight overestimation of approximately 10% in that particular item. Since there are other balance sheet items than common stock included in total shareholders equity, the proxy could be regarded as noisy. In addition, the X₃-term where retained earnings is included is given the highest weight in the Z’-score. Despite that, it has an overall average impact on the total sample of 13 %, reducing the severity of potential errors.

Altman’s Z-score compares financial ratios to predict bankruptcy. The variables derive from the income statement and the balance sheet and together they are used to measure company distress. The five parameters used are taking liquidity, profitability, productivity, solvency and sales generating ability into consideration.
The Z’-score formula for private companies is expressed as follows:

\[ Z' = 0,717 \times X_1 + 0,847 \times X_2 + 3,107 \times X_3 + 0,420 \times X_4 + 0,998 \times X_5 \]

The five ratios used are:

\[ X_1 = \frac{\text{working capital}}{\text{total assets}} \]
\[ X_2 = \frac{\text{retained earnings}}{\text{total assets}} \]
\[ X_3 = \frac{\text{earning before interest and taxes}}{\text{total assets}} \]
\[ X_4 = \frac{\text{book value of equity}}{\text{book value of total liabilities}} \]
\[ X_5 = \frac{\text{sales}}{\text{total assets}} \]

The cutoff scores for prediction of bankruptcy are:

\[ Z'_{\text{distress zone}} < 1,23 < Z'_{\text{ignorance zone}} < 2,9 < Z'_{\text{safe zone}} \]

The lower the Z’-Score, the larger risk for bankruptcy in the firm. Z’-score is therefore a way of predicting defaults and serves as a satisfactory proxy for credit risk.
Statistical tests

Since our study contains several factors that are assumed to affect the bond spread, a model that handles multiple variables is necessary. All variables cannot be assumed to equally affect the distribution. Therefore, weighing the variables according to impact is required. With that set of criteria in mind we use the ordinary least squares (OLS) method for linear regression. To verify the significance we use the t-test statistics presented by the statistics software SPSS. The OLS research method has also been used by in several similar studies (Guedes & Opler, 1996; Begley & Feltham, 1999; Collin-Dufresne et al., 2001; Reisel, 2010; Nikolaev, 2010).

When using multiple regression analysis there are assumptions that must be fulfilled in order for the results to be relevant. Firstly, the independent variables must be uncorrelated with the dependent variable. Secondly, there should be no deviance from the linear relationship. Thirdly, the variables must assume different values and not be constant. Fourthly, the anticipation of normal distribution in the dependent variable must be fulfilled. Furthermore, diagnostically statistics are required to ensure that there is no autocorrelation, exact collinearity or homoscedasticity (Gujarati & Porter, 2009, pp. 189-206). If there seems to be a correlation in the residuals it is necessary to test for autocorrelation. To test autocorrelation we use the Durbin-Watson test. A score that is less than 1,0 or greater than 3,0 give evidence for autocorrelation and a score close to 2,0 is desirable (Andersson et al., 1994, pp. 183-185). Correlation between the independent variables is a sign of colinearity. A correlation matrix is therefore needed in order to assess this component (Andersson et al., 1994, p. 110). In addition, we use the Variance Inflation Factor presented by SPSS where a score above 10,0 is an indication of multicollinearity (O’Brien, 2007). For the purpose of testing for homoscedasticity we use a covariance matrix to compare variances in the dependent variable and the independent variables (Gujarati & Porter, p. 65). We will use the following thresholds for correlation ± 0-0,4 (low), ± 0,4-0,6 (moderate) and ± >0,6 (high) as proposed by Kazdin (1995).

Hypothesis 3 will result in an equation with the dependent variable bond spread as a function of independent variables. Firstly, a regression with all variables will be made. Secondly, cross-test variables and exclude all variables that prove to be statistically insignificant. This is the multiple linear regression equation form: Bond spread = C + \beta_1X_1 + \beta_2X_2 + \ldots + \beta_nX_n, where C is the intercept in the linear regression, in other words the bond spread if all the independent
variables equals to zero. We will use a one-tailed 5% level (Sig. < 0.05) as significance level as it is generally accepted. Significances close to this threshold will be commented. For the regression we will use goodness-of-fit ($R^2$) as a reference since the value indicates how much of the dependent variable can be explained by the independent variables.

Hypothesis 1 will be tested with Final sample (covenants), H2 will be tested with Final sample ($Z'$-score) and H3 will be tested with Final Sample ($Z'$-score). The reason for this is to maximise the number of observations in each test.

VI. RESULTS

*In this section, we first present the results from the Final Sample (Covenants). Secondly, we present the results from the Final Sample ($Z'$-Score). Thirdly, we explain the results from the all-significant regression.*

**Final Sample (Covenants) results**

In the linear regression we looked at the unstandardized beta for each variable to see the impact on spread of each variable, the standardized beta for each variable to see every variables relative impact, and the significance of each variable. As our sample was normally distributed (see Appendix A), we used the t-test value for each variable to determine its significance.

**Table 6**

Results from Final Sample (Covenants)

<table>
<thead>
<tr>
<th>Model</th>
<th>Unstandardized Coefficients</th>
<th>Standardized Coefficients</th>
<th>t</th>
<th>Sig.</th>
<th>Collinearity Statistics</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 (Constant)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Secured</td>
<td>0.498</td>
<td>0.319</td>
<td>0.081</td>
<td>1.562</td>
<td>0.119</td>
</tr>
<tr>
<td>Has Call Option</td>
<td>0.456</td>
<td>0.334</td>
<td>0.078</td>
<td>1.363</td>
<td>0.174</td>
</tr>
<tr>
<td>Has Poison Put</td>
<td>1.108</td>
<td>0.304</td>
<td>0.204</td>
<td>3.639</td>
<td>0.000 **</td>
</tr>
<tr>
<td>Has Dividend Restrictions</td>
<td>1.665</td>
<td>0.338</td>
<td>0.298</td>
<td>4.932</td>
<td>0.000 **</td>
</tr>
<tr>
<td>Has Equity restrictions</td>
<td>0.908</td>
<td>0.300</td>
<td>0.169</td>
<td>3.026</td>
<td>0.003 **</td>
</tr>
<tr>
<td>Has Accounting related cov.</td>
<td>0.663</td>
<td>0.317</td>
<td>0.107</td>
<td>2.093</td>
<td>0.037 *</td>
</tr>
<tr>
<td>Days to Maturity</td>
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<td>0.000</td>
<td>-0.055</td>
<td>-1.149</td>
<td>0.252</td>
</tr>
<tr>
<td>Has Pledge</td>
<td>-0.007</td>
<td>0.280</td>
<td>-0.001</td>
<td>-0.024</td>
<td>0.981</td>
</tr>
</tbody>
</table>

a. Dependent Variable: Spread  
*<5% level  
**<1% level

The goodness-of-fit ($R^2$) of the test is 0.43, meaning that 43% of the spread can be explained by the independent variables in our regression (see Table 6). No multicolinearity is found,
based on the high tolerance values and the low VIF values. A Durbin-Watson test score of 1.6 proves that there is no autocorrelation.

Moderate correlations were found between the spread and dividend restrictions (0.557), poison put (0.486), and equity restrictions (0.415), and between dividend restrictions and call options (0.479), and poison put options (0.461). No other moderate or high correlations were found (see Appendix A).

```
Chart 3
Regression between spread and number of covenants
```

Relation between bond spread and the number of covenants
The bond spread is dependent on the number of covenants the bond agreement (see Chart 3 and Appendix A). The goodness-of-fit of 0.37 states that the number of covenants can explain 37% of the spread. Every covenant adds 88.3 basis points to the spread’s intercept of 139.1 basis points, i.e. the spread of the bond when no covenants are included. These results are highly significant (Appendix A).

secured/Unsecured
The impact is 0.498, which means that a bond that is secured should have 49.8 basis points higher spread than an unsecured bond. The significance of the result is moderately high, but cannot be signified at even a 10% level, even though it is close with a t-value of 1.562.

Call option
The impact is 0.456, which means that a bond that includes a call option should have 45.6 basis points higher spread than a bond that does not include a call option. The significance of
the results is moderate, but cannot be signified at even a 10 % level, and is barely close with a t-value of 1.363.

Poison put option
The impact is 1.108, which means that a bond that includes a poison put option should have 101.8 basis points higher spread than a bond that does not include a poison put option. The significance of the results is very high, and significant at a 1 % level with a t-value of 3.639.

Dividend restriction
The impact is 1.108, which means that a bond that includes a poison put option should have 101.8 basis points higher spread than a bond that does not include a poison put option. The significance of the results is very high, and significant at a 1 % level with a t-value of 3.639.

Equity restriction
The impact is 1.665, which means that a bond that includes an equity restriction have 166.5 basis points higher spread than a bond that does not include an equity restriction. The significance of the results is very high, and significant at a 1 % level with a t-value of 4.932.

Accounting-related covenants
The impact is 0.663, which means that a bond that includes additional accounting-related covenants have 66.3 basis points higher spread than a bond that does not include an equity restriction. The significance of the results is high, and significant at a 5 % level with a t-value of 2.093.

Days to maturity
The impact is -0.0004, which means that a bond that has a longer maturity have 0.0004 basis points lower spread for each day until maturity. The significance of the results is moderately low, and not significant at a 10 % level with a t-value of -1.149.

Pledge/negative pledge
The impact is -0.007, which means that a bond that includes a pledge or negative pledge have 0.007 basis points lower spread than a bond that does not include a pledge or negative pledge. The significance of the results is non-existent, and not significant at a 95 % level with a t-value of -0.024.
Final sample (Z'-score) findings

**Z’-Score**

Table 7  
Results from Final Sample (Z'-score)

<table>
<thead>
<tr>
<th>Model</th>
<th>B</th>
<th>Std. Error</th>
<th>Beta</th>
<th>t</th>
<th>Sig.</th>
<th>Collinearity Statistics</th>
</tr>
</thead>
<tbody>
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<td>B</td>
<td>Std. Error</td>
<td>Beta</td>
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<td>Tolerance</td>
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</tr>
<tr>
<td>Secured</td>
<td>0,535</td>
<td>0,463</td>
<td>0,073</td>
<td>1,156</td>
<td>0,249</td>
<td>0,778</td>
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<td>0,573</td>
<td>0,410</td>
<td>0,089</td>
<td>1,397</td>
<td>0,164</td>
<td>0,760</td>
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<tr>
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<td>2,839</td>
<td>0,005 **</td>
<td>0,657</td>
</tr>
<tr>
<td>Has Dividend Restrictions</td>
<td>1,916</td>
<td>0,409</td>
<td>0,330</td>
<td>4,685</td>
<td>0,000 **</td>
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<tr>
<td>Has Equity restrictions</td>
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<td>0,195</td>
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<td>0,664</td>
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<tr>
<td>Has Accounting related cov.</td>
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<td>0,074</td>
<td>1,146</td>
<td>0,253</td>
<td>0,748</td>
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<tr>
<td>Days to Maturity</td>
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<td>0,000</td>
<td>-0,103</td>
<td>-1,790</td>
<td>0,075</td>
<td>0,940</td>
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<td>Has Pledge</td>
<td>0,397</td>
<td>0,377</td>
<td>0,067</td>
<td>1,054</td>
<td>0,293</td>
<td>0,755</td>
</tr>
<tr>
<td>Z'-score</td>
<td>-0,284</td>
<td>0,148</td>
<td>-0,114</td>
<td>-1,928</td>
<td>0,056</td>
<td>0,890</td>
</tr>
</tbody>
</table>

a. Dependent Variable: Spread  
*<5% level  
**<1% level

For the Z'-score we used our reduced sample consisting of 184 observations. The regression’s goodness-of-fit is 0.46. We conducted the same validity tests as for Final Sample (Covenants) and no anomalies were found.

As seen in Table 7, the impact is -0.284, which means that a bond in our sample have 0.284 basis points lower spread for every one point added to its Z'-score. The significance of the results is relatively high, and almost significant at a 5 % level with a t-value of -1.928.

**The all-significant linear regression**

Table 8  
The all-significant linear regression

<table>
<thead>
<tr>
<th>Model</th>
<th>Unstandardized Coefficients</th>
<th>Standardized Coefficients</th>
<th>t</th>
<th>Sig.</th>
<th>Collinearity Statistics</th>
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<tbody>
<tr>
<td></td>
<td>B</td>
<td>Std. Error</td>
<td>Beta</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 (Constant)</td>
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<td></td>
<td>7,219</td>
<td>0,000 **</td>
</tr>
<tr>
<td>Has Poison Put</td>
<td>1,309</td>
<td>0,365</td>
<td>0,234</td>
<td>3,583</td>
<td>0,000 **</td>
</tr>
<tr>
<td>Has Dividend Restrictions</td>
<td>2,291</td>
<td>0,391</td>
<td>0,395</td>
<td>5,858</td>
<td>0,000 **</td>
</tr>
<tr>
<td>Has Equity Restrictions</td>
<td>1,146</td>
<td>0,358</td>
<td>0,201</td>
<td>3,201</td>
<td>0,002 **</td>
</tr>
<tr>
<td>Z'-Score</td>
<td>-0,313</td>
<td>0,144</td>
<td>-0,125</td>
<td>-2,174</td>
<td>0,031 *</td>
</tr>
</tbody>
</table>

a. Dependent Variable: Spread  
*<5% level  
**<1% level
For the all-significant linear regression we used our reduced sample consisting of 184 observations. The regression's goodness-of-fit is 0.43. We conducted the same validity tests as for Final sample (covenants) and no anomalies were found.

When only including the call options variable, poison put option variable, dividend restrictions variable and Z'-score variable into the linear regression, we manage to verify all variables on the 5 % level, and three of the variables on the 1 % level (see Table 8). In this case, the inclusion of poison put options, dividend restrictions and equity restrictions increase the spread, and a higher (lower) Z'-score reduces (increases) bond spread. Dividend restriction has the largest impact, followed by poison put options and then equity restrictions. The Z'-score impact is dependent on what Z'-score the issuer is given.

VII. ANALYSIS

In this section, we analyse the findings based on literature and earlier findings. Firstly, each variable included in H1 is analysed separately. Secondly, the relation between Z'-score and spread is analysed. Thirdly, the OLS regressions and the variables' economic and statistical significances are analysed.

Analysis of H1

H1 Bonds with (without) covenants will have a higher (lower) spread.

Relation between bond spread and the number of covenants
Covenants can be used to mitigate agency costs and limit managerial behaviours that would result in a reduced value of the bonds. Covenants will be included more regularly when there is a larger conflict between bondholders and stockholders (Jensen & Meckling, 1976; Smith & Warner, 1979). The conflict is affected by financial distress, whereas a higher degree of distress leads to a larger conflict. A larger conflict and higher financial distress should increase the bond spread (Merton, 1974; Jensen & Meckling, 1976; Malitz, 1986; Nash et al., 2003). Therefore, covenants should occur more frequently when the spread is high. Our findings are significantly consistent with theory, as the spread is dependent upon the number of covenants included in the debt agreement (see Chart 3 and Appendix A).

Seniority covenant
The seniority of debt decides claim priority, and more senior debt have higher return rate in case of default (Merton, 1974; Altman, 2006 pp.233-235; Hull 2006, pp. 6-7). Roberts &
Viscione (1984) show that this is the case in a study on pairs of bonds with similar credit ratings. Billett et al. (2007) show that almost all corporate debt is senior. The companies in our sample are on average close to being in financial distress according to their $Z'$-score, which might be a motivation to all bonds being senior (Brauer, 1983). With regard to earlier findings and financial position of companies in our sample, it is not surprising to find that all bonds are senior. Since the variable is constant, no further analysis can be conducted.

**Secured/unsecured covenant**

By making bonds secured, agency costs can be mitigated, and claim dilution and the asset substitution problem be reduced. Our results show that the secured covenant has a low correlation with all covenants, and especially with equity restrictions and accounting-related covenants. These findings are according to theory, since the use of secured debt should reduce the number of restrictive covenants (Barclay & Smith, 1995; Nash et al., 2003). On one hand, Roberts & Viscione (1984) show that secured bonds should have a lower spread unsecured bonds, ceteris paribus. On the other hand, firms that face financial distress are more likely to issue secured debt, since collateral reduces the credit risk (Nash et al., 2003). Our findings indicate that a secured bond has higher spread than an unsecured, though not in a significant way. Our results support the notion that secured bonds to a larger extent are issued by riskier issuers, and therefore could be associated with bonds of higher spread. The correlation between the secured variable and the $Z'$-score is low but slightly negative, indicating that companies with lower $Z'$-scores issue secured debt more frequently.

**Pledge/Negative pledge covenant**

The pledge/negative pledge covenant is commonly used according to earlier findings, which is also true for our sample where 42 % of bonds include this covenant (Nikolaev, 2010; Reisel, 2010). Bondholders anticipate the risk of subsequent debt being given a higher priority when pricing bonds; therefore the inclusion of a pledge/negative pledge should be more commonly used when there is a risk for claim dilution problems (Smith & Warner, 1979; Begley & Feltham, 1999; Nikolaev, 2010). No conclusions can be drawn from our findings regarding the pledge/negative pledge covenants since neither correlation nor t-test proves any significance.
**Dividend Restriction covenant**

Dividend restrictions help bondholders ensure that wealth is not transferred to stockholders. Our findings significantly show that the bonds in our sample that include dividend restrictions have a 166.5 basis points higher spread. This is supported by theory, which states that dividend restrictions are more common in bonds issued by financially distressed companies, and therefore should be associated with a higher spread (Black 1976; Bodie & Taggart, 1978; Reisel, 2010). Dividend restrictions are commonly used in our sample, which correspond well with earlier findings (Pratt & Livingston, 1993; Begley & Freedman, 1998; Begley & Feltham, 1999; Nikolaev, 2010). The dividend restrictive covenant should occur more often together with equity restrictive covenants and call options. Our sample shows a fair correlation between dividend restrictive covenants and equity restrictions (0.387) and a moderate correlation between dividend restrictive covenants and call options (0.479), which are both according to theory.

**Equity restriction**

Equity restrictions are more likely to be included in bonds issued by financially distressed firms, and should therefore be associated with a higher spread. Financially distressed or leveraged companies face higher agency costs, and there is a higher risk for asset substitution problems (Jensen & Meckling, 1976; Malitz, 1986; Nash et al., 2003). Creditors therefore have strong incentives to control the leverage of a firm, and equity restrictions are an efficient mean for this (Malitz, 1986). Our findings show that bonds that include an equity restriction have 90.8 basis points higher spread than a bond without on a significant level. This corresponds well with theory. The largest gains from including an equity restriction covenant should from a combined use with a dividend restriction (Malitz, 1986). Our findings do not show convincing support for this notion, but there is a fair correlation (0.387) between the two, indicating that companies might practice this theory.

**Call options**

Call options help mitigate agency costs and should occur more frequently when there is a higher risk for underinvestment problems, since call options reduces the underinvestment problem and gives managers increased flexibility (Bodie & Taggart, 1986; Nash et al., 2003). Call options have a larger value for stockholders than bondholders, i.e. leads to a price premium being added to the spread (Myers, 1971). Our findings show that the inclusion of a call option leads to the spread increasing by 45.6 basis points. The results are not significant,
but might provide an indication of the impact being positive, and that stockholders are willing to pay a price premium for the added flexibility. Call options should be more frequently used in bonds that include dividend restriction covenants since the call option enables stockholders to rid themselves of the restrictions and subsequently make dividend payments (Nash et al., 2003). The correlation in our sample between the two covenants is moderate (0.479), and therefore proves that this notion could be true.

**Accounting-related covenants**

There is a link between accounting information and the costs of debt. Accounting-related covenants can help recognize timely losses and hinder opportunistic behaviour by managers. Bondholders therefore consider such covenants (Ball & Brown, 1968, Nikolaev, 2010; Reisel, 2010). As in the case of equity restrictions, firms can lower the credit risk by using accounting-related covenants to control profitability levels and leverage. Such covenants should therefore be more common when the issuer is financially distressed, i.e. when the credit risk is higher. This is consistent with our findings, which significantly state that bonds that include accounting-related covenants have a 66.3 basis points higher spread. An important consideration is that several specific measures are grouped into this general variable, and results should therefore not be perceived as applicable for all accounting-related covenants. The proxy is relatively noisy, but our findings indicate that accounting information matters.

**Poison put options**

Poison put options are more likely to occur in bonds issued by financially distressed companies or when there is a risk for asset substitution problems (Nash et al., 2003; Chava et al., 2010; Reisel, 2010). The poison put option should therefore be associated with bonds of a higher spread, which is consistent with our findings. The inclusion of a poison put option has a significant positive impact on spread of 110.8 basis points in our sample. The poison put is more commonly used in our sample (42 %) than in earlier findings (29 %), which might not be surprising because of the nature of our sample.

**Maturity**

A shorter maturity can help mitigate both the underinvestment problem and the asset substitution problem. Earlier findings show that short-term debt most often is issued by either the highest quality or the lowest quality firms (Barclay & Smith, 1995; Guedes &
Opler, 1996; Nash et al., 2003; Billett, et al., 2007). Our results are neither of economic nor statistical significance. They could well be consistent with theory and earlier findings, but since our research method does not allow for testing ambiguous variables that are not normally distributed, we cannot say for certain.

**Summary of H1 analysis**
We partially accept H1 since we find a positive relation between the inclusion of covenants and a higher bond spread. The acceptance is partial since we cannot prove this relation for all individual covenants statistically.

**Analysis of H2**

**H2** Bonds with a lower (higher) $Z'$-score will have a higher (lower) spread.

Credit risk affect bond prices (Merton, 1974). The $Z'$-score is a method for estimating the risk of bankruptcy in companies (Altman, 2006, pp. 233-235). The results show that a higher $Z'$-score is associated with a lower spread (see Table 7). For every unit in the $Z'$-score, the spread decreases by 28.4 basis points. A lower $Z'$-score implies increased credit risk, increased agency costs and a higher risk for bondholder-stockholder conflicts, which all increase the bond spread. Earlier results show that the accuracy of the $Z'$-score is between 58 – 95 % (Altman, 1968; Altman, 2000; Grice & Ingram, 2001). The impact of default is severe to bondholders, and recovery rates are usually very low in relation to par value. Increased risk of default should therefore result in a higher price (Merton, 1974; Altman, 2006, pp. 6-7; Hull, 2006, p. 483). Our results confirm this theory.

**Analysis of H3**

**H3** Rational investors consider all factors affecting a bond contract.

A regression can be modulated describing the impact of each of the above covenants on bond spread. The H3 analysis concerns two regressions; the regression in Table 7 that includes all variables, and the regression in Table 8 that only includes significant variables. Rational investors consider both credit risk and restrictions in the loan agreement when pricing a bond, which is also true for our results (Merton, 1974; Leland; 1994; Collin-Dufresne, 2001). As seen in Table 7 and Table 8, a lower risk for default reduces the bond spread in both
regressions. There is also a link between the inclusion of covenants and a higher spread in both regressions.

Our final regression significantly proves that dividend restrictions, poison put options, equity restrictions and the $Z'$-score can explain 43% of the bond spread. The covenants might seem to have a relatively large impact on spread relative to credit risk, consider though that the $Z'$-score is a scale variable, which can assume larger values than the dummy variables. Dividend payment is an obvious conflict between bondholders and stockholders, and the most obvious way of expropriating wealth from bondholders to stockholders. Its significance is therefore expected. That poison put options should be associated with bonds with high spread is also expected, since it is a means for controlling sensitive and difficult bondholder-stockholder relationships. It is also expected that equity restrictions should be significant, there are greater incentives to control leverage when the bond issuer is financially distressed. The least surprising result would be that credit risk affects bond price.

**VIII. CONCLUSIONS AND FURTHER RESEARCH**

**Conclusions**

This study on the relation between covenants, credit risk and bond spread provides insights into the inclusion of covenants in corporate debt agreements. By using data from Norwegian Trustee, we construct a dataset consisting of bond and covenant data in the Norwegian bond market. We test for three hypotheses regarding relations between (1) covenants and bond spread, (2) financial distress and bond spread, and (3) between covenants, bond spread, and financial distress. The impact is tested through OLS regressions, and the results are verified statistically.

Firstly, covenants in general have a strong relation to higher bond spreads. This could seem contradictory, since covenants should give more power to bondholders and therefore reduce the cost of borrowing. This might be true, but other factors must also be taken into consideration. Covenants seem to be included only when there is a high degree of bondholder-stockholder conflict, and in riskier bonds. Covenants therefore more frequently occur in high spread issues. Our findings explain 43% of the bond spread, and we find several significant relations. Therefore, we partially accept H1.
Secondly, our findings show that covenants have different impact on spread. It is not surprising that dividend restrictions have the strongest relation to a high spread. Dividend payment is the most obvious conflict between bondholders and stockholders, and means for wealth expropriation from bondholders to stockholders. The poison put is probably included when bondholders perceive a high risk for certain events occurring, which would have decisive effect on the value of the bonds. We find that equity restrictions are more common when there is a higher spread. This is not surprising, since the incentive for controlling the issuer’s ability to fulfil debt obligations should increase with risk. We also find that a high Z’-score for an issuer results in a lower spread in the issued bond, which underlines the importance of credit risk.

Thirdly, our final regression can explain 43 % of the bond spread through the following equation:

\[
\text{Spread} = 2,339 + 1,309 \times "\text{Poison Put}" + 2,291 \times "\text{Dividend Restrictions}" + 1,146 \times "\text{Equity Restrictions}" - 0,313 \times "\text{Z’-score}"
\]

We regard our regression to be consistent with theory and earlier findings, even though it does not provide a complete explanation on bond spread. Since every issue is unique, we believe it improbable that a regression can be modulated which fully explains bond spread. Therefore, we regard our findings as relevant indicators on the relation between covenants, credit risk and bond spread on the Norwegian corporate debt market.

To conclude, we partially accept H1, accept H2, and partially accept H3. The contributions to researchers and practitioners from this study are the relation between covenants and high bond spreads, and that credit risk (measured through the Z’-score) affects bond price. The implications of this for investors is that covenants is a sign of bondholder-stockholder conflict, and underlines the importance of credit risk in the pricing of corporate debt.

There are some flaws in our research that needs to be considered. Firstly, the use of the private companies version of the Z-score instead of the public firm Z-score might have affected the test’s accuracy negatively. The retained earnings proxy might is also a factor which makes the Z’-score less accurate. Because of the nature of the Norwegian market, our sample is relatively narrow. Conclusions should therefore not necessarily be seen as generally applicable.
Further research
First of all, a similar study on a larger sample would be interesting concerning the generalizability of the findings, since Norway is a small market. Through pair testing of bonds issued by companies of similar credit risk and in similar industries, more insights into the value of a covenant could be deduced. We also believe that a qualitative study regarding whether covenants in some cases might be a necessary factor for the bond issuance to ever happen could provide valuable insights on the corporate debt market.
Appendix A – Statistics
Table 1 shows the correlations between the variables in the Final sample (covenants). Table 2 presents details on the regression between number of covenants included in the bond agreement and the spread. Chart 1 is a boxplot that shows the range of spreads in the Final sample (covenants). Chart 2 is taken from the SPSS and shows the distribution of spread in our sample. As seen, our sample is normally distributed.

Table 1. Pearson correlations for Final sample (covenants)

<table>
<thead>
<tr>
<th></th>
<th>Spread</th>
<th>Secured</th>
<th>Has Call Option</th>
<th>Has Poison Put</th>
<th>Has Dividend Restrictions</th>
<th>Has Equity Restrictions</th>
<th>Has Accounting related cov.</th>
<th>Days to Maturity</th>
<th>Has Pledge</th>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Secured</td>
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<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
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<tr>
<td>Has Call Option</td>
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<tr>
<td>Has Poison Put</td>
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<td>0.3869</td>
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<td></td>
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<tr>
<td>Has Accounting related cov.</td>
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<td>0.0359</td>
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<td>-0.2663</td>
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<td>0.0156</td>
<td>1</td>
</tr>
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</table>

Table 2. Number of covenants regression

<table>
<thead>
<tr>
<th>Model</th>
<th>Unstandardized Coefficients</th>
<th>Standardized Coefficients</th>
<th>t</th>
<th>Sig.</th>
<th>Collinearity Statistics</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>Std. Error</td>
<td>Beta</td>
<td></td>
<td>Tolerance</td>
</tr>
<tr>
<td>1 (Constant)</td>
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<td>0,221</td>
<td></td>
<td>6,290</td>
<td>0,000 **</td>
</tr>
<tr>
<td>Number of covenants</td>
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<td>0,070</td>
<td>0,607</td>
<td>12,531</td>
<td>0,000 **</td>
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</tbody>
</table>

a. Dependent Variable: Spread

*<5% level
**<1% level
Chart 1. Boxplot of bond spread (n=271)

Chart 2. Normal distribution of Spread

Source: SPSS, Final Sample (covenants)
Appendix B - Issuers and issues

Table 3 shows the total revenue in each sector and the average revenue for all companies in Final sample (Z'-score), and the outstanding bond volume of Final sample (covenants). Table 4 shows extracts from debt agreements that were commonly used to describe what covenants were included.

Table 3.

<table>
<thead>
<tr>
<th>Industry</th>
<th>Average revenue (MNOK)²</th>
<th>Outstanding bond volume (MNOK)¹</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fishery</td>
<td>6 254</td>
<td>1 237</td>
</tr>
<tr>
<td>Food &amp; Beverages</td>
<td>21 172</td>
<td>1 100</td>
</tr>
<tr>
<td>Industry</td>
<td>14 400</td>
<td>7 673</td>
</tr>
<tr>
<td>Media</td>
<td>10 106</td>
<td>1 200</td>
</tr>
<tr>
<td>Oil &amp; Gas</td>
<td>8 726</td>
<td>15 317</td>
</tr>
<tr>
<td>Property</td>
<td>2 573</td>
<td>6 672</td>
</tr>
<tr>
<td>Pulp &amp; Paper</td>
<td>22 832</td>
<td>220</td>
</tr>
<tr>
<td>Service</td>
<td>892</td>
<td>3 849</td>
</tr>
<tr>
<td>Shipping</td>
<td>2 524</td>
<td>18 433</td>
</tr>
<tr>
<td>Telecom/IT</td>
<td>12 722</td>
<td>1 300</td>
</tr>
<tr>
<td>Transportation</td>
<td>11 973</td>
<td>3 200</td>
</tr>
<tr>
<td>Wholesale &amp; Retail</td>
<td>827</td>
<td>3 413</td>
</tr>
</tbody>
</table>

Average 625 461

¹Based on 138 of the issues that are not matured or redeemed.
²Calculation is based on 10 year company average revenue on 184 companies from Thomson Reuters DataStream.
### Table 4. Coding of dummy variables

<table>
<thead>
<tr>
<th>Variable</th>
<th>Loan agreement content</th>
<th>Bond ISIN (year)</th>
<th>Coding (Dummy)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Seniority</td>
<td>&quot;The bonds shall be senior debt of the Issuer. The bonds shall rank at least pari passu with all other obligations of the Issuer [...] and shall rank ahead of subordinated debt&quot;</td>
<td>NO0010635212 (2012)</td>
<td>1</td>
</tr>
<tr>
<td>Security</td>
<td>&quot;The bonds are unsecured&quot;</td>
<td>NO0010538127 (2012)</td>
<td>0</td>
</tr>
<tr>
<td>Security</td>
<td>&quot;The bonds are secured by the Guarantees&quot;</td>
<td>NO0010607484 (2011)</td>
<td>1</td>
</tr>
<tr>
<td>Call option</td>
<td>&quot;The issuer may redeem parts [...] or the entire Bond Issue as follows (Call Option): (i) at any time from the Issue Date, but not including the Interest Payment Date in November 2010 at 108 % of par value&quot;</td>
<td>NO0010538127 (2009)</td>
<td>1</td>
</tr>
<tr>
<td>Poison Put</td>
<td>&quot;If a Change of Control takes place, each Bondholder shall have a right of pre-payment (Put Option) of the Bonds at a price of 101 % of par plus accrued interest&quot;</td>
<td>NO0010360100 (2007)</td>
<td>1</td>
</tr>
<tr>
<td>Dividend restriction</td>
<td>&quot;During the term of the Loan, the Borrower shall [...] (b) not make dividend payments&quot;</td>
<td>NO0010372493 (2007)</td>
<td>1</td>
</tr>
<tr>
<td>Dividend restriction</td>
<td>&quot;within a calendar year make any dividend payment, [...] more than, on consolidated bases, 50 % of the net profit after taxes of Group based on the accounts for the previous financial year.&quot;</td>
<td>NO0010322100 (2006)</td>
<td>1</td>
</tr>
<tr>
<td>Equity restriction</td>
<td>&quot;The issuer shall ensure that the Group maintains an Equity Ratio of minimum: (i) 25%&quot;</td>
<td>NO0010606197 (2011)</td>
<td>1</td>
</tr>
<tr>
<td>Equity restriction</td>
<td>&quot;During the entire term of the Bonds, the Issuer undertakes that the ratio of Total Debt to Total Equity shall not exceed 0.8&quot;</td>
<td>NO0010637952 (2012)</td>
<td>1</td>
</tr>
<tr>
<td>Accounting related covenants</td>
<td>&quot;(d) Gearing ratio The Issuer shall ensure that the Group maintains a Gearing Ratio of 2.25 or less.&quot;</td>
<td>NO0010593510 (2010)</td>
<td>1</td>
</tr>
<tr>
<td>Accounting related covenants</td>
<td>&quot;(b) Leverage ratio The issuer shall, on consolidated basis, ensure the Net Interest Bearing Debt to EBITDA does not exceed 4.5:1&quot; &quot;The Leverage Ratio and the Interest Coverage Ratio shall be calculated on a trailing four-quarter basis&quot;</td>
<td>NO0010609829 (2011)</td>
<td>1</td>
</tr>
<tr>
<td>Pledge</td>
<td>If indexed by Stamdata as having negative pledge or pledge</td>
<td>-</td>
<td>1</td>
</tr>
</tbody>
</table>
X. BIBLIOGRAPHY

Literature


Articles


**Government publications**