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Resolution of Financial Distress

Determinants of Restructuring Outcome in the Norwegian Bond Market

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Abstract

This thesis analyses possible determinants explaining restructuring outcomes for financially distressed firms in the Norwegian bond market. This includes both Norwegian firms and foreign firms issuing bonds in the Norwegian market, restricted to bonds issued or matured in the seven year period between January 1st 2005 and December 31st 2011.

Our findings indicate that firms resolving financial distress only by postponing obligations have better financial performance, are larger measured in total assets and sales, and have significantly lower interest expenses to sales than all other firms involved in a credit event. Further, liquidated firms are financed by significantly more public debt, and more of their debt is senior secured than firms succeeding to restructure. They also have significantly less intangible assets than debt restructuring firms. Fewer of the liquidated firms have access to bank financing, but given that a firm has access to such financing we found no substantial difference either in levels or the importance of determinants compared to firms without bank debt. Somewhat surprisingly, firms restructuring by selling assets have significantly more convertible debt.

As opposed to previous research on U.S. firms, we find no significant effect of the level of trade credit, current ratios or leverage measured by debt level. This may be due to a limited sample size.

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1. Introduction

The objective of this thesis is to reveal the determinants explaining restructuring outcome for financially distressed firms in the Norwegian bond market. Our focus is on the resolution of distress for the firm as a whole, and not returns for the individual stakeholders. We have chosen not to take either the corporate or investor side for two reasons. First, a recent thesis by Brekke and Haugland (2010) covered the investor perspective of the Norwegian bond market by studying recovery rates in the high yield market. Second, a better understanding of the restructuring process and its key determinants benefits all involved parties, from management to investors and trustees, and enables them to make more informed decisions.

The past decade the Norwegian bond market has grown at a tremendous pace, and bonds have become an important part of the capital structure for a growing number of Norwegian firms. This development of the debt market has expanded the investment universe for investors and firms, and projects have gained more efficient access to capital. This implies that riskier firms and projects, that banks previously would not lend money to, will be able to issue debt directly in the market.

Additionally, stricter regulations of banks by the new Basel requirements will reduce their ability to participate as creditors in risky firms. It will also increase the cost of bank financing, encouraging more firms to issue bonds instead. This is expected to increase the popularity and importance of bond financing further in the years to come.

Unfortunately, a broader access to capital does not come without caveats. As a direct consequence of allocating more debt to riskier firms we observe an increasing number of defaults. And with the forecasts of increasing popularity for public financing, the frequency of observing firms struggling to meet their obligations is likely to increase further. Having this in mind, a better understanding of the debt renegotiation process will be helpful both to investors and firm management. By knowing what the typical obstacles to a solution are, or who the dominant players dictating the outcome under different scenarios are, it would be easier to avoid making suboptimal decisions when they find themselves involved in a distressed situation.

Firms that default on interest payments or debt installments may still have viable business plans and prospects to become profitable. To liquidate these firms would be inefficient.

Hence, these firms would have to undertake a restructuring to endure, which leads us to the core objective of this thesis. Given a default, we want to find what makes a firm worth restructuring and what determines the methods used for restructuring. By default we do not restrict ourselves to actual defaults, but also cases where a default would be inevitable without action. Our criteria for selecting credit events are based on the FAS15 definition of troubled debt restructurings by the U.S. Financial Accounting Standards Board.

We have divided the credit events into categories that we believe will have significant differences in financial data explaining the restructuring outcome. These categories are liquidation, asset restructuring and financial restructuring. The latter, we have divided into two subcategories: changes in capital structure and postponement of obligations, within which postponement is the least severe of all categories. It is important to note that since several comprehensive restructurings are often preceded by attempts to postpone obligations, like extending maturity, our most recent cases may not be completely resolved yet. This could bias our restructuring categories and results, but a closer examination of these cases indicates no alarming tendency of this.

Similar research on U.S. firms has typically categorized firms based on whether they file for Chapter 11 or not. Even though Norwegian bankruptcy legislation provides a similar option to distressed firms, larger firms rarely use it. Thus, using a similar legislative categorization is not feasible to analyze the Norwegian bond market at the moment.

Early on, practitioners warned us that gathering data for a thesis like this would be challenging, which is the primary reason why there has not been extensive research conducted on this field in Norway. This meant that the data for restructuring cases would not be readily accessible in a database and would have to be gleaned from annual reports and loan documents to manually construct a dataset. To make the job more manageable we have limited this thesis by mainly two aspects: time and market. First, we have limited the scope to credit events occurring in the time period from January 1st 2005 to December 31st 2011. This is both because the high yield bond market, and thus the number of defaults prior to 2005 was very limited, and that the quality of data on each these restructurings is poorer. Second, we have limited the scope to include credit events in what can be perceived as the high yield bond market. This cannot be precisely defined, as many smaller firms are not rated, but by excluding certain industries and investment grade rated firms, we have constructed an approximate high yield sample. Since we did not have an overview of

defaults in the Norwegian bond market we manually went through each firm's loan documents. By narrowing the scope down to the Norwegian high yield market, we thus filtered out most firms without credit events and still include most defaults.

The thesis is organized as follows. We start by describing relevant theory on bonds and restructurings, and introduce possible determinants and testable implications. The subsequent section provides an overview of the Norwegian bond market and insolvency legislation in Norway. The Data section describes the data gathering process and features of the final sample, after which it discusses methodology and challenges with statistical analysis on small samples. Our results are presented in the Findings section, following which, we concludes the thesis.

2. Theory

In this section we will present relevant theory, previous research on debt and asset restructurings and possible determinants of outcome. We begin by presenting standard theory on bonds, which describes characteristics of different types of bonds. We then present our framework for determining restructuring cases, before we review relevant studies and research on resolution of financial distress. Finally, we introduce possible determinants of outcome of distressed situations and the testable implications for our analyses.

2.1 Bonds

A bond is in its simplest form a debt contract between two counterparts, the creditor and the borrower. The creditor lends an amount to the borrower at issue date and receives interest payments on pre-specified dates. At the maturity date the borrower pays back the borrowed amount. These terms are all subject to contractual specifications, tailoring the firm's financing to the firm's needs and investors' risk appetite. The key contractual specifications are the borrowed amount, time to maturity at time of issue, payment schedule, listing, technical transaction related issues, law and dispute resolutions and transaction costs (Mjøs, 2011).

2.1.1 Types

There are numerous types of bonds with overlapping characteristics. However, we will only present the issue types we later face in our sample, which are the most common ones: plain vanilla bonds, zero-coupon bonds, convertible bonds and callable bonds.

Plain vanilla bonds (also termed 'regular', straight bonds or just bonds) are in principle the same as bank debt without installments before the maturity date. Bonds issued with less than one year until maturity are called certificates. In this thesis we do not distinguish certificates from straight bonds because they in principle are the same debt instruments. A bond is issued at its settlement date and paid back to the bondholder (creditor) at maturity. The issued amount is called the principal. Interest payments on bonds, the compensation to the bondholders, are called coupons. Coupons are stated as a percentage of the principal amount outstanding and are usually paid quarterly, semi-annually or annually. The coupon can be

stated as a fixed percentage (fixed rate bonds) or with a margin to another interest rate, e.g. LIBOR (Floating Rate Notes or FRN).

Zero-Coupon bonds (also termed ‘discount bonds’) have similar characteristics to the plain vanilla bonds. For the purpose of this thesis it is only worth mentioning the main differences – that they make no interest payments before maturity and are issued at a deep discount to their face value. The face value is the amount paid to bondholder at maturity.

Convertible bonds (also termed ‘Convertibles’) have similar characteristics as the straight bond, but in addition to the “regular” bond the bondholder has a right to call the bond. In return the borrower pays a lower coupon rate. Calling a convertible bond means converting parts or the entire principle amount into equity at a conversion price stated in the contract. The option to convert the bond is often limited to certain points in time stated in the contract.

Callable bonds are also similar to regular bonds, but embed a call option held by the firm to redeem the bond before the maturity date. This can typically only be done on pre-specified dates, and is exercised by the firm by paying the effective call price. This is defined as:

$$\text{Effective call price} = \text{Principal} + \text{Accrued Interests} + \text{Call Premium}$$

The call premium is also specified in the contract, and typically decreases as maturity approaches. Bonds may be both callable and convertible, a feature that is not unusual (Stamland, 2010).

2.1.2 Seniority and collateral

A firm’s capital structure represents all claims on the firm’s cash flows and assets. It can be seen as layers of capital with different risk profiles, based on the claims’ respective priority in case of a default. The priority of a claim is also known as its seniority, and is based on contractual agreements. Common equity has the lowest priority, and is theoretically only entitled to residual payments. All debt contracts are senior to both common and preferred stock, but the debt is typically split further into three creditor classes. The most senior claims are the senior secured, where specific assets of the firm collateralize the creditors’ claims. Senior unsecured claims are not secured by any specific assets, but are still ranked above the subordinated debt claims.

Figure 2.1 - Capital Structure and Seniority

The table illustrates the ranking of the capital structure in terms of seniority, risk and cost of capital.

	Seniority	Risk	Cost of Capital
Senior Secured Debt	<i>Highest</i>	<i>Lowest</i>	<i>Lowest</i>
Senior Unsecured Debt	↑	↓	↓
Subordinated Debt			
Preferred Stock	↑	↓	↓
Common Stock			

Figure 2.1 illustrates the relationship between different liability classes and seniority. The absolute priority rule states that senior claims should be repaid in full before more junior claims receive any payments. In practice however this seldom happens, and subordinated claims typically receive more than they are entitled to according to the absolute priority rule (Stamland, 2010). This could be due to ambiguity in the debt contracts on how different claims should be ranked, but the relative negotiation strength is also an important factor. It is claimed that short-term contracts in effect are more senior than longer-term debt, even if they contractually are less senior. First, short-term subordinated debt may be repaid in full while senior long-term debt is not, just because it matures earlier. Second, since short-term debt can force the firm into bankruptcy in the short-term they may use it in negotiations to gain more than they are nominally entitled to.

2.1.3 Risk and ratings

Bond investors primarily face two types of risks: credit and liquidity risk. Credit risk is the risk of your counterparty not fulfilling his obligations, in this case the issuer not meeting his interest payments or installments. Credit risk is measured by the credit spread, which is the difference between the bond's and an equal maturity, risk free security's yield to maturity. Liquidity risk is the risk of not being able to sell the bond at market value at any given point in time. This thesis will not touch upon the latter.

Table 2.1 – Rating definitions across agencies

This table summarizes and explains briefly the rating scales used by the three major rating agencies, Standard and Poor's, Moody's and Fitch.

	S&P	Moody's	Fitch	Description
Investment grade	AAA	Aaa	AAA	Highest rating
	AA+	Aa1	AA+	Very strong capacity to meet financial commitments
	AA	Aa2	AA	
	AA-	Aa3	AA-	
	A+	A1	A+	Strong capacity to meet financial commitments, but somewhat susceptible to adverse economic conditions
	A	A2	A	
	A-	A3	A-	
	BBB+	Baa1	BBB+	Adequate capacity to meet financial commitments but more subject to adverse economic condition
	BBB	Baa2	BBB	
	BBB-	Baa3	BBB-	
BB+	Ba1	BB+	Less vulnerable in the near-term but faces major ongoing uncertainties to adverse business, financial and economic conditions	
BB	Ba2	BB		
BB-	Ba3	BB-		
High Yield	B+	B1	B+	More vulnerable to adverse business, financial and economic conditions but currently has the capacity to meet commitments
	B	B2	B	
	B-	B3	B-	
	CCC+	Caa1	CCC	Currently vulnerable and dependent on favorable business, financial and economic conditions to meet financial commitments
	CCC	Caa2		
	CCC-	Caa3		
CC	Ca		Currently highly vulnerable	
C				
Default	D	C	DDD	Payment default on financial commitments
			DD	
			D	

Sources: Fitch Ratings (2012), Moody's (2009), Standard & Poor's (2012)

Large international companies that issue bonds often have official credit ratings from one or more of the three, Standard & Poor's, Moody's and Fitch. These major rating agencies analyze the companies' credit profile and rate them on scales from AAA to default. Table 2.1 summarizes the rating scale across the three agencies and gives a brief explanation for different ratings based on S&P's descriptions. In the Norwegian bond market most firms are not rated, and the implications of this will be discussed in later sections.

In general we split the bonds in two categories: Investment grade and high yield. The investment grade bonds have credit rating BBB- or higher, and high yield have BB+ or below. The assumption is that there is a negative correlation between probability of default and high credit ratings.

2.2 Troubled debt restructurings

2.2.1 FASB Definitions

When determining what type of restructuring a company has been through, we use the US Financial Accounting Standards Board's (FASB) FAS 15, "Accounting by Debtors and Creditors for Troubled Debt Restructurings" as a framework. This allows us to be consistent with other research in the field (e.g. Hamer, 1985) and to make comparisons with previous studies, as most of these are done on U.S. firms. Besides, the definitions are firm-specific rather than country-specific, and are just as applicable to Norwegian firms.

According to FAS 15, two criteria must be met for a restructuring to be a troubled debt restructuring. First, a concession must have been granted to the debtor that would otherwise not have been considered by the creditor. Second, the borrower must be experiencing financial difficulties. Acceptable situations that could be considered financial difficulties were clarified in an update from FASB (ASU 2011-01), as one or more of the following indicators:

- The borrower is in default on payment of any of its debt, or it is probable that it will be in default in the foreseeable future
- The borrower is in bankruptcy
- There is substantial doubt about the borrower's ability to continue as a going concern
- The borrower's securities have been delisted
- The borrower has insufficient cash flow to service its debt
- Without modification, borrower cannot obtain funds from other sources other than existing creditors at an effective rate equal to current market rate for similar debt for a non-troubled borrower

The following categories are described in FAS 15 as troubled debt restructurings

- Transfer from the debtor to the creditor of receivables from third parties, real estate, or other assets to satisfy fully or partially a debt (including a transfer resulting from foreclosure or repossession).
- Issuance or other granting of an equity interest to the creditor by the debtor to satisfy fully or partially a debt unless the equity interest is granted pursuant to existing terms for converting the debt into an equity interest.

- Modification of terms of a debt, such as one or a combination of:
 1. Reduction (absolute or contingent) of the stated interest rate for the remaining original life of the debt.
 2. Extension of the maturity date or dates at a stated interest rate lower than the current market rate for new debt with similar risk.
 3. Reduction (absolute or contingent) of the face amount or maturity amount of the debt as stated in the instrument or other agreement.
 4. Reduction (absolute or contingent) of accrued interest.

A company may use one or a combination of several of these, and as noted in the Standard, the list is not exhaustive.

A restructuring may still also include other amendments to the debt contracts that are not covered by the categories above. A frequently observed amendment to the loan agreement is some sort of change of covenants. The most commonly amended covenants in Norwegian bond restructurings are

- Extension of maturity
- Allowance for Payment in Kind (Kind refers usually to debt)
- Reduction of the contract's minimum debt to equity ratio

For our purposes a reorganization of the categories will be useful, which we will return to after the next subsection.

2.2.2 Asset Restructurings vs. Debt Restructuring

Another perspective on types of restructuring that can be instructive when determining restructuring issues under different scenarios, is used in John (1993) and Hotchkiss, John, Mooradian and Thorburn (2008). They begin by splitting a firm's liabilities into hard and soft contracts. The hard contracts are typically debt contracts, where the debtor is obligated to make periodic payments to the creditor. Other examples are trade payables and government charges. If these payments are not paid on time, the contract is violated and creditors may legally pursue the debtor to receive their claims. On the other hand we have the soft contracts, comprising common stock and preferred stock. The holders of such contracts cannot demand regular payments from the firm. To a larger degree they receive residual payments made at the management's discretion. In particular, such payouts depend

on the liquidity of the firm, and may be suspended for periods without any legal consequences.

A similar categorization can be made for the assets based on liquidity. The liquid part of a firm's assets includes cash and various marketable securities. The illiquid or hard assets comprise long-term investments that may not be sold as easily and converted to cash.

Based on these categories John (1993) naturally defines financial distress as follows:

A firm is in financial distress at a given point in time when the liquid assets of the firm are not sufficient to meet the current requirements of its hard contracts.

In other words, there is a mismatch between the hard and soft parts of the firm's balance sheet, and solutions to the financial distress are those that rectify this mismatch.

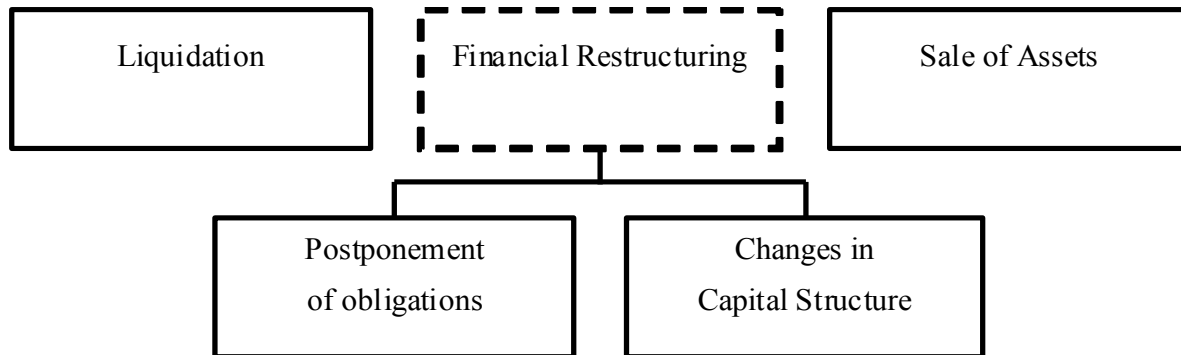
One set of options can be categorized as asset restructurings. This focuses on the asset side of the balance sheet and involves liquidating all or parts of the hard assets in order to generate liquid assets to pay off current obligations to the hard contracts. The other set of options is categorized as debt restructuring and focuses on the firm's liabilities. This category includes several mechanisms, but have in common that they want to soften the contracts to reduce the financial distress. Examples are renegotiations of the hard contracts to reduce or defer payments, or replacing hard contracts with softer securities, for example through a debt to equity conversion. A third restructuring category should also be mentioned, which involves raising additional liquidity by issuing new financial claims on the firm. This leaves the original contracts unaltered, but if the new contracts are softer with longer maturity it may solve the financial distress.

2.2.3 Restructuring Categories

To explain different outcomes of a restructuring with financial data we have to choose categories that describe the severity of the restructuring and the characteristics of the firm. As liquidation is the most severe possible final outcome of a distressed situation it is a natural first category. Second, as John (1993) argued above, troubled debt restructurings can be divided in two distinct categories based on what side of the balance sheet it involves, namely asset and debt restructurings. The latter can be combined with the third option mentioned, raising additional capital, to comprise financial restructurings. This category will encompass every change a firm makes on the financing side of the balance sheet.

Figure 2.2 – Restructuring Categories

This figure illustrates our categorization of troubled debt restructuring cases. Liquidated firms form a natural category, while we have split the successful restructurings in those involving the firm's assets and those involving only the liability side of the balance sheet. This latter category is further split between firms succeeding to only postpone their obligations and those that in some way alter the capital structure through the restructuring.



Based on FAS 15's definition of trouble debt restructurings we find a further split of the financial restructuring category useful. The most serious category would include firms that have made changes in the capital structure. This includes debt to equity conversions, raising additional capital, debt buybacks and changes in covenants such as reduction of principal amount. All these have in common that creditors effectively forgive some of their claims. The second category comprises the least severe restructuring cases, and we call this Postponement of obligations. This category includes solutions where extension of maturity and changes in covenants such as allowance of payment in kind has been sufficient. Figure 2.2 summarizes these categories.

2.2.4 Restructuring issues

The kind of restructuring method a firm chooses depends on the relative costs and benefits for the firm (Hotchkiss et al. 2008). The efficiency of a restructuring method can be measured by the loss in firm value during the restructuring period, and we may assume that the firm will prefer the method with the lowest marginal cost. The costs depend on several factors, like the firm's capital structure, institutional framework and market efficiency. However, the most efficient method from an overall perspective may not always be the optimal outcome for all stakeholders. Different claimants have different interests, some in conflict with maximizing firm value. Since aligning these interests may be challenging, the negotiation strength and skills of the claimants will also affect the final outcome.

2.2.4.1 Asset restructuring

If the secondary asset market is illiquid, financial restructurings will typically dominate, since the costs of asset restructurings are likely to be high. Shleifer and Vishny (1992) studied the costs of liquidating assets due to financial distress and found three determinants of market liquidity, which they called (i) fungibility (the number of distinct uses and users for a particular asset), (ii) participation restrictions (regulations on foreign acquisitions and anti-trust restrictions), and (iii) credit constraints in the industry. Based on this they argue that distressed assets may be sold at significant discounts if there are few possible buyers and if the whole industry is financially distressed.

Several papers from the U.S. have found asset restructuring to be frequently used by financially distressed firms. Brown, James and Mooradian (1991) also found that distressed firms selling assets are typically multidivisional firms or firms with multiple subsidiary operations, and contrary to the firm not selling assets only have one division. Further they find indications that creditors have influence over the liquidation decision, since the greater portion of short-term bank debt, the more likely sales proceed are to be paid out to creditors.

The debt level seems in general to be an important determinant of asset sales. According to studies by Ofek (1993) and Kruse (2002), the probability of asset sales increases in debt level. However, measuring aggregated debt levels across different industries may be unfortunate, especially for smaller samples. What is perceived as a high or low debt level may differ substantially between different industries. In one industry a debt to asset ratio of 0.8 may be normal, while in another it may be seen as dangerously high. When analyzing debt levels without controlling for such industry specific differences, we may reach dubious conclusions. One solution to this potential issue is found in Kruse (2002) and Pulvino (1998), who also test what they call the firm's debt capacity. According to them a firm has a low additional debt capacity if the long term debt ratio is above industry average and the current ratio is below industry average. They create a dummy variable assigning the value one for firms fulfilling these criteria. They both find a strong positive relation between firms with low debt capacity and asset sales.

In addition Kruse (2002) found a positive relation between industry growth and the probability of asset sales, which supports Shleifer and Vishny's (1992) arguments above. When the rest of the industry is in distress the price of an asset sale is likely to be lower, making other restructuring methods more attractive.

Even though asset restructuring is a common remedy of financial distress, John (1993) in his survey of restructuring literature finds evidence suggesting that it in most cases is used in conjunction with debt restructuring.

2.2.4.2 Debt restructuring

Most theory and research on distressed debt restructuring focuses on the choice between out-of-court workouts and Chapter 11 restructuring, which is a different question than what this paper examines. Nevertheless, we may obtain important insight in the determinants of restructuring method from this research, as many of the arguments can be extended to fit our focus.

To understand the issues of debt restructuring, a useful framework is to look at the choice between liquidation and some sort of debt restructuring. If the firm is economically unviable the optimal solution is to liquidate the firm and sell the assets to recover as much as possible of the creditors and shareholders' value. But for an economically viable firm, liquidating would be suboptimal, and stakeholders would forego a positive value by not restructuring the firm for continued operations. Let us denote this value ΔV , as the difference in firm value between the restructuring solution and liquidation. When this is positive, it would be possible to restructure the firm's claims in a way such that all claimants would be better off. The larger ΔV is, the stronger are the claimholders' incentives to restructure.

Let us first consider a scenario where both creditors and the firm have perfect information, the debt contracts are complete and perfectly enforceable, and creditors' interests are aligned. In such a scenario a distressed situation can always be solved efficiently as long as the ΔV is positive, as noted by for example Hotchkiss et al. (2008). In practice however, when the above assumptions are violated a costless resolution of distress do not exist, and give rise to a set of issues we can categorize as creditor coordination problems. Gilson, John and Lang (1990) sub-categorize the coordination problems in an instructive way for exploring them further, respectively as (i) holdout problems, (ii) information asymmetry and (iii) conflicts of interest among different groups of creditors.

2.2.4.3 Holdout problems

The holdout problem is a well-known issue for both debt and equity securities when they are diffusely held. In a restructuring process it may appear when bondholders are given an exchange offer with the option to swap their bonds with a package of new securities or keep

their original bonds. If the bondholders expect the bonds to be worth more after a successful exchange offer than the new securities, they prefer keeping their bonds while the other bondholders accept the offer. But since all bondholders have the same incentives no one will accept, and the restructuring proposal will fail. Two solutions are used to mitigate this problem. One option is coercive participation in the exchange offer, where all members of the credit class must participate if the proposal receives a majority of the votes in a bondholder meeting. Another option is to design the offer such that the loss of not participating exceeds the benefits, for example by removing or amending various covenants for the original bonds (John, 1993).

2.2.4.4 Information asymmetry

Information asymmetry is another important explanation of the creditor coordination problem. Typically, the management and insiders of the firm have more information about the state and value of the firm than outside creditors. This information asymmetry tends to increase as the number of creditors increase, since each creditor has weaker incentives to monitor the firm closely. When this is the case, the creditors do not know the true value of the restructuring proposals from the firm to them. They also know that when management acts in the interests of the shareholders, they have incentives to misprice the firm's value. With symmetrical information and a single creditor Brown (1989) argues that a private workout always will be successful. But as showed by Giammarino (1989), asymmetric information may lead creditors to reject mutually beneficial restructurings. Another consequence of information asymmetry can be extension of the negotiation period where several restructuring proposals are necessary before an agreement is reached (Carapeto, 2004). This is harmful to the firm value, since the process itself is costly and the firm's strategic maneuverability is limited during this period.

2.2.4.5 Conflicts of interest

Conflicts of interest between different creditors can also create difficulties when trying to resolve financial distress, and is closely linked to the seniority of claims. A typical firm has a variety of creditors, from bondholders to trade creditors, the government and banks. When restructuring debt contracts the claims on a firm's cash flow is also altered, and especially for highly levered firm the creditors often have conflicting interests in the restructuring process. On one hand you have the senior creditors, whose value decreases with increased risk. Since their claims are secured, they have first priority when the values are distributed.

The result is that they often prefer liquidation, even when suboptimal, since they are sure to recover most of their claims. On the other hand are the junior or subordinated creditors. In a distressed situation their claims are somewhat similar to equity and equities' option-like features, since they have limited downside and a large potential upside. They would prefer restructuring for continued operations, even for economically unviable firms (Hotchkiss et al., 2008). Gertner and Scharfstein (1991) are among those modeling these issues of multiple creditor classes.

Gilson, John and Lang (1990) also show that the probability of a successful out-of-court restructuring is higher when a firm has fewer distinct classes of debt. This is intuitive, since fewer conflicts of interest exist, and those that still are present are easier to coordinate. Another observation they made was that the greater portion of bank debt the firm had, the more common workouts were. At first this may be counterintuitive given the above argument that secured debt more often prefers liquidation. But as Gilson et al (1990) argues, banks usually are better informed, especially if they are the firm's dominant creditor. This may reduce informational asymmetries, making a renegotiation easier. With a high portion of bank debt, the importance of restructuring increases as well, forcing the bank to internalize more of the restructuring costs. However, not all studies have confirmed this. Frank and Torous (1994) did not find more bank debt among out-of-court restructuring cases. One posed explanation was that their sample included larger firms, typically less reliant on bank debt. These firms also use syndicated bank debt to a greater extent, and involving several banks increases information asymmetry, conflicts of interest and holdout problems.

Asquith, Gertner, and Scharfstein's (1994) results are also somewhat contrary to Gilson et al. (1990) and more in line with our original argument that senior debt is not as conducive to debt restructurings. They find that banks rarely forgive principal, and explain it with their security and seniority. Instead they saw that bank restructurings typically involved loosening some covenants, like extending maturity, delaying interest payments or waiving covenants. Another characteristic was that as they loosened one element they often tightened other parts of the contracts, for example by converting an unsecured line of credit into a secured line as the maturity was extended. Chatterjee, Dillon and Ramirez (1996) support these findings, showing that firms ending in Chapter 11 have significantly higher levels of bank debt.

The amount of trade credit and number of trade creditors are also found to affect the outcome of financial distress. Gilson et al. (1990) argue that coordination problems are particularly severe for trade credit, since this debt is typically owed to a large number of trade creditors with heterogeneous claims. This makes it hard to use exchange offers to restructure the debt, as firms do for publicly traded bonds. Coordinating a consensus among trade creditors is also difficult, as these tend to be both acrimonious and unsophisticated according to practitioners Gilson et al. (1990). Chatterjee et al. (1996) confirm this, finding significantly lower levels of trade credits among firms avoiding Chapter 11.

Conflicts of interest can also be present between creditors and management. When a manager receives private perquisites, status or other pecuniary or non-pecuniary benefits from his job that he cannot get elsewhere, he or she is interested in keeping the job. Due to this, the management has incentives to not voluntarily reveal if a firm is economically unviable. Another possible conflict of interest between management and creditor that may occur in financial distress is that managers have incentives to undertake high risk projects with negative net present value (Aghion, Hart and Moore, 1992, and White, 1996). This can happen if managers do not risk losing much more if the project fails, but get a significant share of the upside if it succeeds, at the expense of bondholders.

Shareholders also have incentives to present the terms of a restructuring proposal as more favorable than they really are to creditors. This introduces another conflict of interest between shareholders and creditors. De Angelo et al. (1990) indicate that firm management, acting on behalf of shareholders, use accounting accruals to influence negotiations with lenders. Since we assume that creditors are aware of this overvaluation problem, a 'lemons problem' may arise causing restructuring failure.

2.2.4.6 Other issues and research observations

As discussed above, economically viable firms should be the ones succeeding with a restructuring. One would believe that these firms are characterized by better performance measures, leading to a positive relation between performance and successful resolution of distress. But Asquith, Gertner and Sharfstein (1994) do not find evidence of such a relation. They find that once in economic distress, a firm with better performance measures, like operating income or book-to-market equity ratios, just as often ends in bankruptcy or sell assets as firms any other firm. Chatterjee et al (1996), however, find such a relation, where firms filing for Chapter 11 have a significantly lower EBITD margin than those restructuring

out of court. Their results suggest that firms succeeding with a voluntary restructuring indeed have better economic prospects.

One of the strongest determinants of successful restructuring in previous studies is firm size. Moulton and Thomas (1993), Gilson et al. (1990) and Chatterjee et al. (1996) have all found evidence that larger firms have better prospects at succeeding with a restructuring attempt than smaller firms. This result is due to several reasons. First, since large firms have more and varied assets they are better prepared to survive substantial losses and write-downs of firm value than smaller firms. Second, they are also more likely to have some viable businesses that the restructured firm can rely on, or assets they can sell to generate cash for continued operations. Larger firms typically also have more administrative staff with better skills in maneuvering distressed firms, and if not they have more financial strength to hire consultants with expertise in helping them finding a solution to the distress situation.

Moulton and Thomas (1993) also emphasizes that the very size of large firms make liquidation or acquisition less likely. Few investors have the resources to acquire very large bankrupt firms or all of its assets, while there are more investors or firms willing to take over a smaller firm in bankruptcy. In addition, antitrust regulations may come into play for mergers and acquisitions of very large firms within an industry. The sum of these arguments seems to give large firms a competitive advantage in resolving financial distress.

Jensen (1989) argues that highly levered firms prefer private restructurings rather than filing for Chapter 11. The reason is that when the debt ratio is very high a majority of the marginal cost of restructuring falls on the creditors. Chapter 11 restructuring is perceived to be both more expensive and value deteriorating than a private restructuring, since it typically draws out in time and sends signals that the firm is in deeper troubles. Creditors then have an incentive to restructure out of court, since the marginal cost of reduced firm value is perceived as higher than the reduction of claims.

Empirically there is evidence both for and against this prediction. On one hand Chatterjee et al. (1996) found that firms filing for Chapter 11 had significantly lower leverage ratios than firms restructuring out of court. But others, like Franks and Torous (1994), made the opposite observation where Chapter 11 firms had more debt. Others again have found no significance for debt level as a determinant, like Gilson et al. (1990). The conflicting results may be due to sample differences. Franks and Torous (1994) only used firms with public

debt in their sample, which typically are larger. For such firms other factors may be more crucial, since they often have a higher debt capacity.

2.3 Determinants of outcome and testable implications

The theory and previous research presented give indications of the determinants that might explain the outcomes of financial distress. Based on this, we present the possible determinants that we will later test empirically. The determinants are categorized partly based on Chatterjee et al.'s (1996) empirical paper, as those expressing degree of economic distress, coordination problems and leverage and liquidity levels. In addition, we look at asset composition and other firm characteristics.

Table 2.2 - Summarized determinants of outcome

This table summarizes the categories of determinants we test in our analysis, the variables we use as measures of the respective determinants and our hypothesized relations.

Determinant	Variables	Hypothesis
Degree of Economic Distress	EBITDA-margin EBITDA/Total Assets	The more troubled firms would be liquidated and the less trouble firms would be allowed only postponing obligations
Creditor Coordination Problems	Credit / Total Assets Different types of Debt / Total Debt #Public Contracts	Complex capital structures can lead to misalignments in stakeholders' view of maximizing value and therefore will firms with complex capital structures be more likely to be liquidated
Liquidity	Current ratio (CR) CR adj. for industry avg.	Firms with low additional debt capacity are more likely to sell assets in a restructuring
Leverage	Liabilities / Total Assets Industry adj. debt ratio LTD / Total Assets	The higher leverage the more severe the restructuring is likely to be. We expect to find less leverage on the firms only postponing obligations
Asset Liquidity	Intangibles / Total Assets PP&E / Total Assets	Firms with assets that are easy to sell will more often be forced to a sale of assets in a restructuring
Size	Total Assets Sales	Larger firms will be more likely to sell assets/business divisions in a restructuring
Age	#Years since start up	An older firm has more and better relations to creditors and are therefore less likely to be liquidated

2.3.1 Degree of Economic Distress

The degree of economic distress a firm is facing should determine if the company is to be liquidated or restructured. Ideally, economically nonviable firms should be liquidated and viable firms should restructure. But White (1994) shows that managers in the U.S. are incentivized by Chapter 11 to restructure rather than liquidate, and hence there are a number

of economically nonviable firms attempting a restructuring. The empirical implication tested in this thesis is that economically nonviable firms actually are liquidated. Since this thesis is looking at final outcomes, the most recent restructurings may still end up as liquidation cases, i.e. our restructuring categories may be biased. This could lead to our null hypothesis not being rejected more often than it should.

To test this we will measure economic distress in terms of past performance, more specifically the ratio of EBITDA to sales and total assets. We expect to find better performance among restructuring cases than liquidation cases, and that firms postponing obligations have better EBITDA ratios than firms undergoing more comprehensive restructurings.

2.3.2 Coordination Problems

Coordination problems among creditors are found to be among the major obstacles to a successful resolution of financial distress. We will test several of the implications and findings from previous research concerning these issues.

A common observation is that the more different creditors a firm has, the harder it is to find a quick restructuring solution. We hypothesize as Gilson et al. (1990) that firms with several distinct creditor classes more often end with liquidation or asset sales than those managing to restructure the debt terms. Since bonds may be traded publicly and have more dispersed ownership, we also believe firms with more such financing show similar trends.

The dominating type of public debt should also help determining the outcome of distress. Following the reasoning from Hotchkiss et al. (2008), when most of the firm's debt is senior secured the creditors may get full recovery from liquidating and prefer this to a more uncertain outcome from a restructuring. Hence, firms liquidating or selling assets should have more senior secured debt than other firms. When the majority of the bonds are unsecured, those creditors will not be left with much if the firm is liquidated in distress. More often they would prefer to waive some of their claims and hope the firm will recover from distress. We would thus believe that firms with a lot of unsecured debt more often manage to make creditors agree on a debt restructuring.

Both Gilson et al. (1990) and Chatterjee et al. (1996) find the amount of trade credit to be an important determinant of financial distress outcome, because trade creditors are typically

dispersed and not very sophisticated. We believe such a relation should be evident among firms in the Norwegian bond market as well, where firms with high levels of trade credit are less able to find easy solutions to their financial troubles. Thus, they will more often liquidate, sell assets or be forced into bigger capital restructurings.

An interesting factor in previous research is the level of bank debt. Some, like Gilson et al. (1990), found the level of bank debt to positively affect the probability of restructuring success, arguing that banks may be better informed than other creditors. Others, like Asquith, Gertner, and Scharfstein (1994), has made opposite observations, indicating that banks seldom make concessions on their claims. This would imply that firms with more bank debt more often is liquidated or forced to sell assets, since the banks are secured by the firm's assets and are not as exposed to losses. The dominant effect will depend on the anatomy of firms in the Norwegian bond market, and more specifically on our sample. From previous research there are indications that the positive effect of bank debt is more evident for samples with smaller firms, where the bank debt is a large part of the total debt and owed to only one or two banks.

In addition to the level of bank debt itself, we want to analyze if firms with and without access to bank financing behave differently when in distress. A common perception is that firms with bank debt are better quality firms, since banks have more restrictive policies on lending. This should induce a selection issue in our sample with the better quality firms with bank debt on one hand, and the poorer quality firms with less access to bank debt on the other. If this selection is prominent, the firms with access to bank financing may be less responsive to some determinants of outcome than firms without bank debt, and vice versa.

2.3.3 Liquidity

According to Kruse (2002), firms with low additional debt capacity are more likely to sell assets to navigate through short-term liquidity problems. These are firms with both their leverage ratio above industry average and their current ratio below industry average. We expect firms in the Norwegian bond market to behave similarly, and find lower additional debt capacity among asset selling firms. Liquidation cases should also be characterized by low debt capacity, since many firms go bankrupt due to lack of funding.

2.3.4 Leverage

Whether high leverage is a significant determinant of restructuring method has both been proved and disproved by previous research. We will test the prediction by Jensen (1989) that Gilson et al. (1990), Franks and Torous (1994) and Chatterjee et al. (1996) have tested, that highly levered firms, if possible, avoid large and time consuming restructurings.

On the other hand, firms with high leverage are in deeper trouble than less levered firms in case of an economic downturn. High leverage per se is not a problem as long as the firm has sales, or more importantly incoming cash flows, to meet their obligations when they are due. Startup firms in particular often use a lot of debt to finance startup investments, but are not obliged to start repaying until the date they expect to start earning money. But when sales disappoints or deviate from expected cash flow, firms with higher leverage must make larger amendments to their financing structure than firms with less debt to adapt to the situation. The reason is that their obligations towards creditors cannot be postponed in the same manner as towards equity. Thus, given that a firm is in financial distress, we expect the highly levered firms to undertake larger restructurings to resolve their problems.

Another indication of high leverage is very high interest expenses. If a firm has large interest expenses compared to sales it indicates that their way of financing is expensive, and if these are too high over time it may not be sustainable. When this is the case, an extension of maturity or interest payments is not enough to solve the underlying problem. The firm will either have to refinance their debt to make it cheaper or scale down operations to a sustainable level by selling assets. Based on this we believe to find that firms undertaking large debt or asset restructurings make bigger interest payments prior to the restructuring than those where a postponement of obligations is sufficient.

2.3.5 Asset liquidity

When a large fraction of a firm's values are intangible, creditors obviously recovers less of their claims through an asset sale or liquidation. Thus, we expect liquidation and asset sale cases to have less intangible assets on their balance sheets than those renegotiating or restructuring their debt. Furthermore, as Shleifer and Vishny (1992) predict, the more liquid a firm's assets are, the greater is the probability of selling it for a decent price. This should imply that firms selling assets have the most tangible fixed assets, since these are usually sold in asset restructurings.

2.3.6 Size

Several studies have found size to be among the most significant determinants of a successful restructuring. Both Gilson et al. (1990), Moulton and Thomas (1993) and Chatterjee et al. (1996) have found indications that larger firms have a competitive advantage in the restructuring process. We expect to find similar trends in the Norwegian market, where firms succeeding in restructuring the firm are larger in general, measured by total assets.

Brown, James and Mooradian (1991) found evidence that larger multidivisional firms are more likely to restructure by selling assets or business divisions. Hence, we expect the asset sale category to be the largest of the four.

2.3.7 Age

There is no research indicating that age is a significant determinant in resolving financial distress, but under certain circumstances it might represent underlying contributing factors that are harder to measure. Older firms have typically grown tighter bonds to customers, suppliers and creditors. If these relations are good they will help lower the perceived information asymmetries and the different stakeholders might stretch a bit further to help keep the firm away from bankruptcy. Firms that have been in the game for a while may also have a track record of previous achievements earning the firm a reputation that can help convince creditors that the firm still is viable. In addition, an older firm may have a stronger organization that is more resilient to periods of financial distress, and also more knowledge and experience to handle tough situations. Based on this, we hypothesize that older firms are more successful resolving financial distress and because of relations less likely to be forced into an asset sale.

3. The Norwegian market

To relate the theory to the specific market this thesis will cover we have included a brief introduction of the Norwegian corporate bond market, key market participants and governing laws on insolvency and bankruptcy.

3.1 The Norwegian corporate bond market

3.1.1 Market size

Over the past decade the Norwegian bond market has grown from NOK 58 billion in outstanding amount to NOK 244 billion at the end of 2011. Figure 3.1 Panel A illustrates the development in market size from 2000 until December 31st 2011. We see that the market has grown every year since 2000, with one exception in 2009 when it declined by 5 percent. This is most likely the effect of the credit crisis, when many firms were facing a tough financial situation and investors were reallocating their wealth to more secure assets than corporate bonds. Most of the restructuring cases that will be analyzed later in this thesis are from this period.

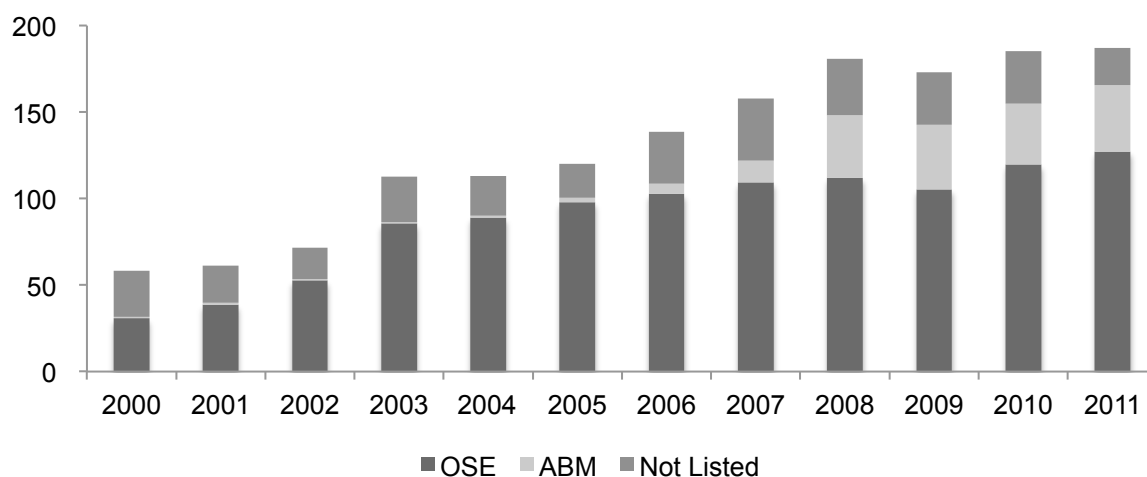
Figure 3.1 Panel B shows the cumulative growth in outstanding corporate bonds and bank loans. Corporate bonds have grown at a higher pace since 2000 than bank loans. Based on this the corporate bonds seem to have become a more important part of corporate firms capital structure. Note that this is only a relative comparison, and over the same period we have actually seen a slight decline in debt to capital from 63 percent to 60 percent (SSB, 2006, 2008 and 2011).

The process of determining the corporate bond issuers will be described under 3.1.3 Issuers.

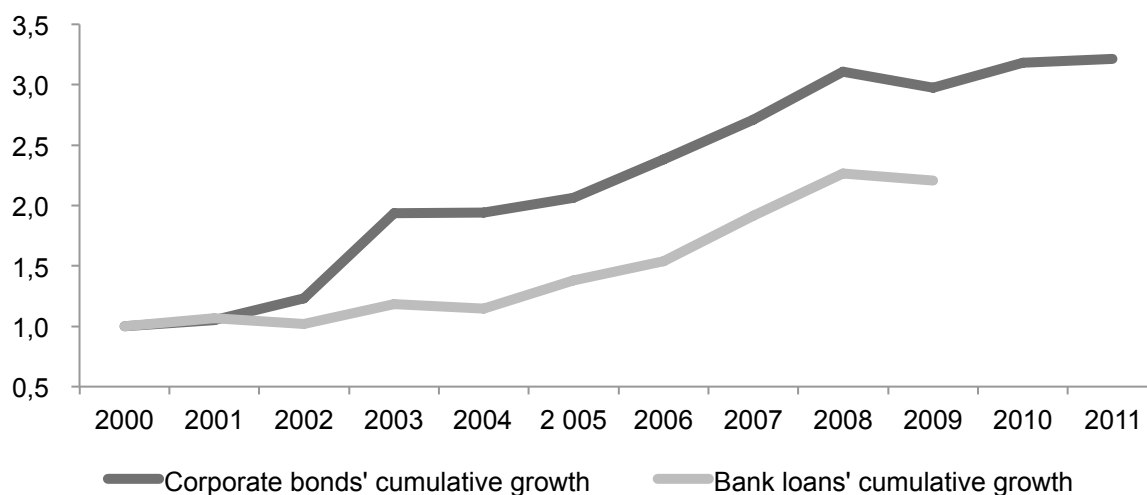
Figure 3.1 – Outstanding corporate bonds

Panel A shows outstanding amount of corporate bonds in the Norwegian market since 2000. The data is divided into listed and not listed bond issues, where the former ones either are listed on the Oslo Stock Exchange (OSE) or the Oslo Alternative Bond Market (ABM). Panel B compares the growth in outstanding amount of corporate bonds with corporate bank debt. This indicates that corporate bonds have become a relatively more important source of financing. (Panel A figures are in BNOK, Dec 31st)

Panel A: Outstanding corporate bonds



Panel B: Comparison of growth in outstanding corporate bonds versus corporate bank loans

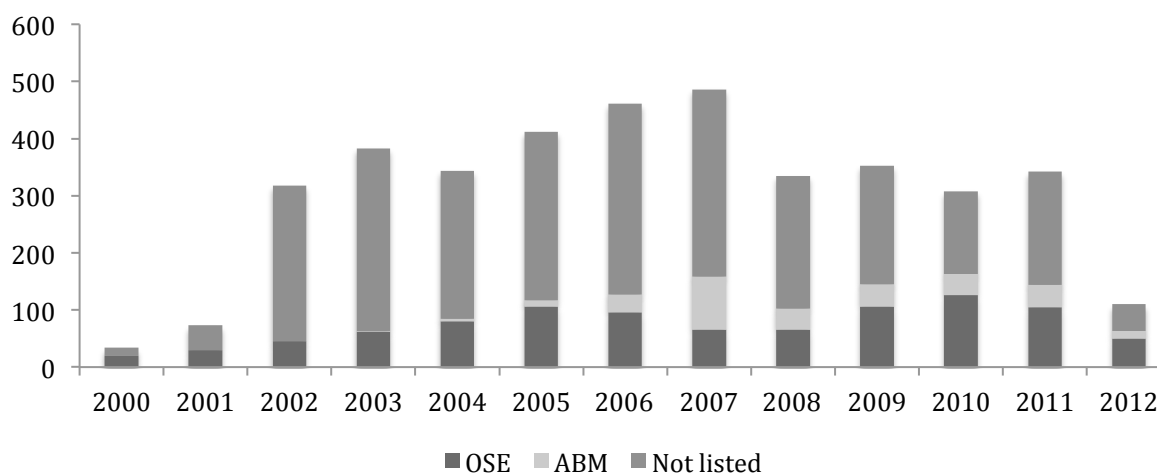


Sources: Stamdata Statistics and Mjøs and Phan (2011)

Norwegian bond issues are either listed on Oslo Stock Exchange (OSE) or Oslo Alternative Bond Market (ABM), or not listed at all. ABM was started in 2005 as a reaction to the European regulations that made listing of bonds on stock exchanges a more comprehensive and costly process. Listing on Oslo ABM has less demanding requirements with respect to

Figure 3.2 - Number of Norwegian corporate bond issues per year

The figure shows the number of issues in the Norwegian corporate bond market from 2000 to 2012. The 2012 column includes issues from Q1 only. The bonds are listed on the Oslo Stock Exchange (OSE) or the Oslo Alternative Bond Market (ABM).

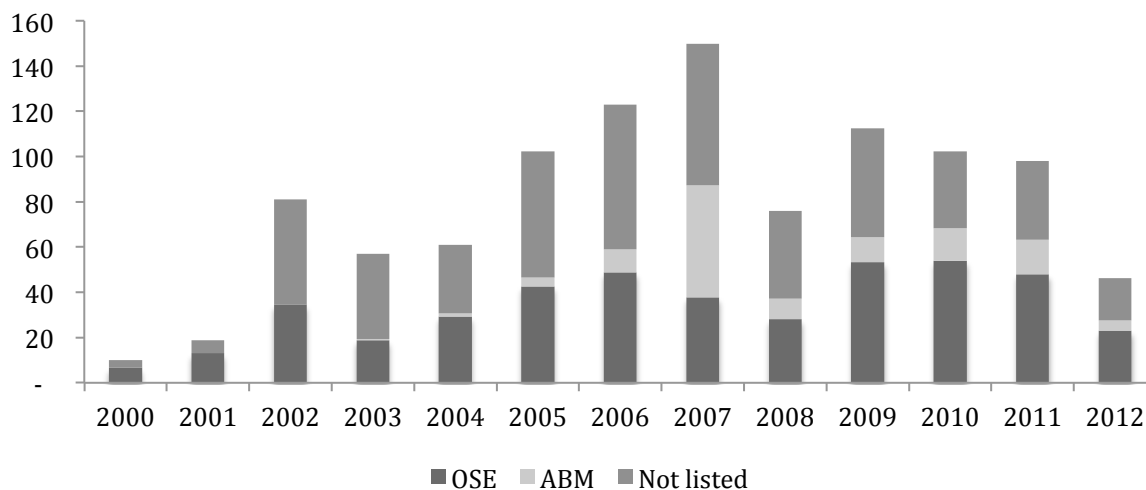


elements like issue prospectus and reporting standards. While the OSE dominates this market in terms of volume, the not listed bonds dominate the number of issued bonds. We can also see that, since initiation, ABM's market share has grown from 4 percent in 2005 to a peak of 33 percent in 2007 with NOK 50 billion. In 2011 the volume was down to NOK 15 billion, or 10 percent of total issued amount this year.

The total issued amount per year has also grown, from NOK 10 billion in 2000 to the current peak of NOK 150 billion in 2007. The decline during the credit crisis is more visible when looking at new issues rather than outstanding amount, as the issued amount halves in 2008. This has picked up again, and both gross and net issues are expected to grow even more in years to come (Dun & Bradstreet, 2010). From Figure 3.3 below we see that during Q1 2012 the issued amount was more than NOK 46 billion.

Figure 3.3 – Issued amount

The figure reports issued amounts in the Norwegian bond market excluding financial and government bonds from 2000 to 2012. The 2012 column includes issues from Q1 only. The alternative bond market (ABM) was started in 2005 as a reaction on the new regulations the EU imposed on bond issuers. The ABM market share in 2004 includes bonds initially issued on OSE or without listing later listed on ABM. (Figures in BNOK)



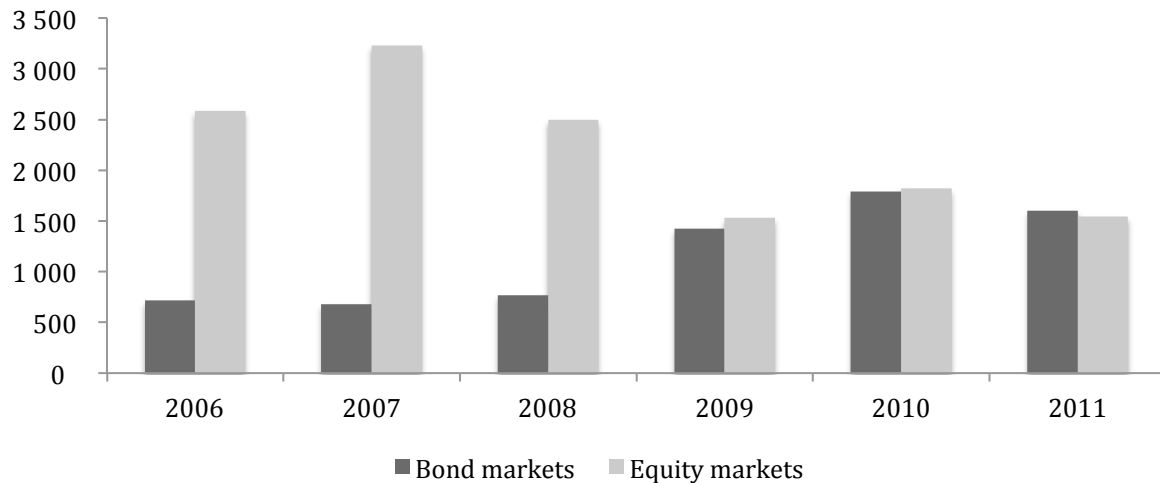
Going forward we are likely to see an increase in both volume and issues in global and Norwegian bond markets. These expectations are based on the introduction of higher capital requirements for financial institutions imposed by Basel III, which effectively means that more firms have to use the bond market for debt financing (Dun & Bradstreet, 2010).

3.1.2 Liquidity

In 2006 the volume of bonds traded in Norway was only NOK 690 billion, which was only 0.27 times the volume of the equities on Oslo Stock Exchange. Over the past six years the liquidity in the Norwegian bond market has improved significantly, and in 2011 it had exceeded the Norwegian equity market, with a turnover of NOK 1,601 billion (see Figure 3.4). This is 1.05 times more than the equity market, which is closer to the characteristics of mature bond markets according to World Federation of Exchanges (2012). It should however be noted that this metric has improved by reduced turnover in the equity market as well, which has dropped by 40 percent in the same period.

Figure 3.4 - Annual turnover

The figure shows aggregated numbers from the Norwegian bond markets, OSE and ABM, and the Norwegian equity markets, Oslo Stock Exchange and Oslo Axess. Not listed bonds could be traded over the counter, but we have been unable to find reliable data for these turnover rates.



3.1.3 Issuers

Bank, Public sector and Finance are the three most active bond-issuing sectors in Norway. After this the energy and utilities sector is fourth both in terms of volume and issues. In this thesis we have excluded financial institutions and government secured entities, as practitioners do not consider these as part of the corporate bond market, and the bankruptcy dynamics of financial institutions are different from that of other firms.

Table 3.1 is an aggregated overview of bond issuers in the Norwegian bond market since 1993 through 2011, and we can see the sectors we have excluded include more than three quarters of the issued bonds.

Table 3.1 - Issues in the Norwegian bond market 1993-2011

The table summarizes the total issued volume in the Norwegian bond market from 1993 through 2011 including all sectors. All figures are retrieved from the Stamdata database.

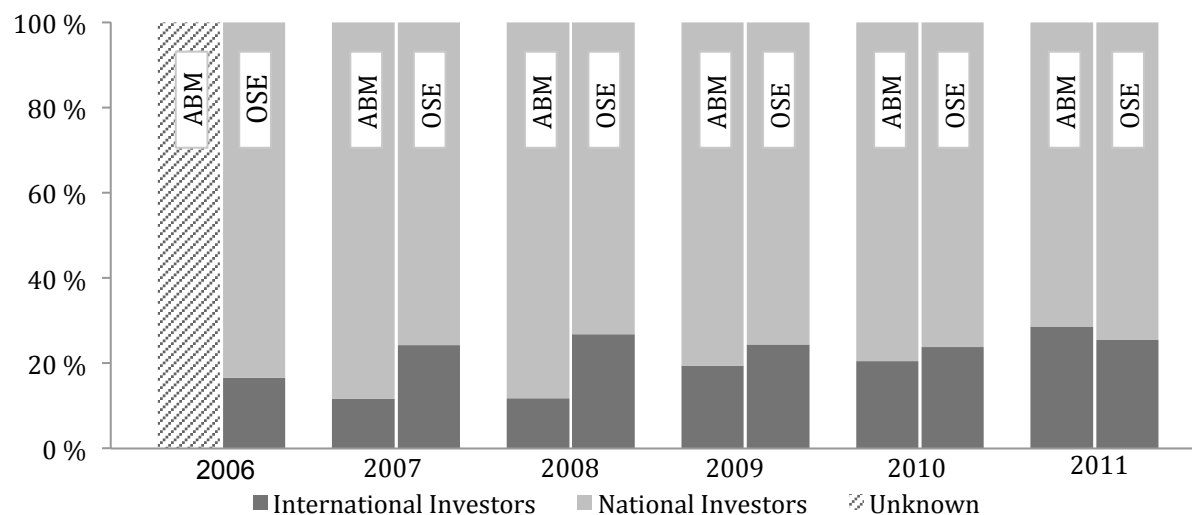
Industry	Volume (mNOK)	Number of Issues	Average Volume (mNOK)
Public Sector	2 941 001	3 669	714
Bank	1 819 143	6 802	142
Finance	995 391	1 214	348
Energy and Utility	366 830	1 495	219
Oil and Gas	175 698	306	423
Property	107 930	627	158
Industry	95 268	404	209
Food and Beverages	70 600	303	215
Service	61 758	336	166
Shipping	55 955	173	249
Transportation	52 992	231	216
Wholesale and Retail	45 410	277	150
Telecom/IT	38 834	168	221
Pulp and Paper	14 656	48	277
Media	11 748	37	267
Fishery	6 916	25	238
NA	3 197	51	53
Insurance	1 017	10	102
Auto	41	2	21
Total Volume	6 864 385		
# Issues		16 176	
Average issued size			424

3.1.4 Investors

The investors in the Norwegian bond market are mainly Norwegian, with international investors holding about a quarter of the market, measured in volume. The less regulated ABM-market has historically had a lower share of international investors, but this has increased and now there are slightly more international holders of the ABM bonds. We have not found data on ownership structure in the non listed bonds.

Figure 3.5 - Ownership structure in the Norwegian Corporate Bond Market

This figure shows the relative share of Norwegian vs. international owners of bonds in the Norwegian bond market. ABM is reported in the left columns and Oslo Stock Exchange in the right. We see that approximately three quarters of the investors are now Norwegian. The share of international investors at ABM has increased from 2007, and is now a larger than the international share at OSE. Figures are extracted from Oslo Alternative Bond market and Oslo Stock Exchange statistics.



3.1.5 Norwegian Trustee

The Norwegian Trustee, Norsk Tillitsmann, is an intermediate between bond issuers and bondholders. The trustee represents the bondholders and may act on behalf of them. There is no legal obligation to use a trustee in Norway. However, approximately 95 percent use one and out of these, 90 percent use the Norwegian Trustee. Further, the bond exchanges require its use to approve a listing of bonds (Sandvik, 2011).

The trustee has three main tasks. First, before the issue they help preparing the loan documents. Second, they monitor the bond issuers and make sure they comply with the covenants in their debt contracts. Third, if these covenants are breached the trustee handles the crisis management, including managing restructuring negotiation.

Bonds are often owned by many investors, which may cause problems if the issuer needs to contact them to restructure a contract. However, by using a trustee the issuer only relates to one party in this process, making it easier to coordinate a restructuring. Another benefit is that the trustee may undertake minor changes and make clarifications of the contracts without a bondholders' meeting.

3.1.6 Bond rating problems

The largest bond investors in the Norwegian market are life insurance companies and pension funds. These are funds with a low risk profile that allows them only to invest in investment grade bonds, and they tend to sell bonds that are downgraded to high yield. However, there are only a handful of Norwegian bond issuers that have an official rating, for instance Statoil and Hydro. This could be an issue to low risk profile investors, as they need to confirm the investment grading of the bonds they invest in. In the absence of official ratings they use so-called “shadow ratings”, which are unofficial credit ratings performed at the time of a bond issue, usually by the investment bank issuing the bond. The Norwegian Fund and Asset Management Association collects these ratings for investors to form their own opinion of a firm’s credit rating, but unlike official ratings these are not continuously updated. This implies that investors in the Norwegian bond market to a larger degree will have to analyze and monitor the issuers’ credit risk themselves, which may be a costly process.

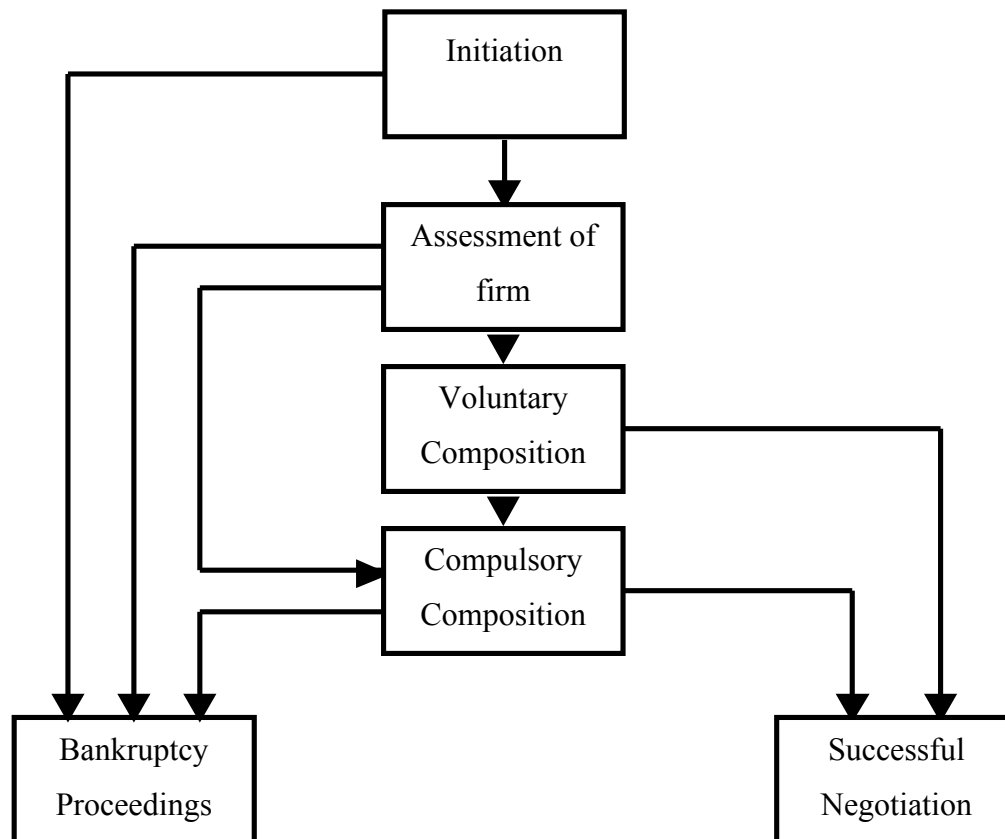
3.2 Norwegian bankruptcy proceedings

Since most research on similar topics is on firms underlying U.S bankruptcy law, while the majority of our sample is subject to Norwegian law, a short review of Norwegian bankruptcy proceedings is necessary to highlight important differences. The most notable difference is that even though Norwegian legislation since 1984 has had a Chapter 11-like facility, it has never achieved its expected popularity (Gisvold, 2012).

The Debt Negotiation and Bankruptcy Act (DNB Act) of 1984 (Lov om gjeldsforhandling og konkurs) and The Creditors Recovery Act of 1984 (Lov om fordringshavernes dekningsrett) are the two core documents in Norwegian insolvency and bankruptcy legislation. The latter regulates recovery, priority among claims and what assets creditors have access to, while the former act covers administration and proceedings for debt negotiation and bankruptcy.

Figure 3.6 - Progression in Norwegian bankruptcy proceedings

This figure illustrates the possible sequences in a Norwegian bankruptcy proceeding based on the Debt Negotiation and Bankruptcy Act of 1984. After debtor or creditor initiates the proceedings, an assessment of the firm is carried out. A voluntary composition is typically proposed initially, followed by an attempt for compulsory composition if not successful. The court has discretion to skip directly to compulsory proposition or bankruptcy if another agreement is unlikely to be reached.



To initiate bankruptcy proceedings, the debtor or creditor must apply to the Probate Court, and the firm must be documented as insolvent and insufficient for such proceedings to be opened. Debt negotiations can only be initiated by the debtor, and follow three steps. First, the firm's financial situation is assessed and a proposal is prepared. In the second phase, the proposed solution is negotiated for a voluntary composition (*frivillig gjeldsordning*). To be approved the proposal must receive full consent among unsecured creditors (DNB Act, §27). In the third phase a compulsory composition (*tvangsakkord*) is negotiated. An arrangement in this phase cannot leave creditors will less than 25 percent of face value of their claims, and must be approved by 60 or 75 percent of unsecured creditors (DNB Act, §§33 and 43). The second phase may be skipped if the court sees it as unlikely to reach an agreement here.

The legislation also gives the court discretion to proceed directly to bankruptcy when the requirements of compulsory composition are unlikely to be met.

If an agreement is not reached, or the court has deemed a solution unlikely, the firm proceeds to bankruptcy, regulated by the second part of the DNB Act. In this phase all assets are confiscated and liquidated to distribute money to the creditors. A creditors committee led by a lawyer takes care of the practical aspects of the bankruptcy proceedings. How the funds from liquidation are distributed is determined by priority rules, and for unsecured creditors the residual funds are distributed based on strict mathematical parity.

The first part of the DNB Act, regulating voluntary and compulsory debt settlement, was built on the same principles as the U.S. Chapter 11 procedures, and was meant to encourage more debt forgiveness or moratoriums from creditors to help economically viable firms to continue operations. However, this has not become as popular as predicted when the Act was signed in 1984 (Gisvold 2012). According to Gisvold two reasons may explain this. First, even though such debt negotiations are supposed to be non-public, the market and general public are quickly informed when a firm initiates debt negotiations. This is potentially very damaging to the firm. Customers and suppliers may lose faith in them and become reluctant to do business with them in the future. The firm also loses more of their strategic maneuverability under a public debt renegotiation, and they have to cover charges of involving the legal system. Secondly, the court is not given the same flexibility as in the U.S. with regards to steering the process towards an acceptable solution for all involved parties. This has also contributed to making firms prefer out-of-court negotiations to solve problems when possible.

The number of announced debt negotiations confirms that distressed firms prefer out-of-court restructurings. All court-supervised debt negotiations, both voluntary and compulsory, should be announced through Brønnøysundregisteret. A search shows that between 2005 and 2011 only 77 debt negotiations were announced, several of them concerning the same entities or groups of entities. In addition, close to all of them are small non-public firms. The only firm in our sample that has announced a court-supervised (voluntary) debt negotiation is Marine Subsea AS.

4. Data

In this section the data gathering process for our analysis is described. This was a two stage process. First we identified companies with credit events between 2005 and 2011 according to our troubled debt definition. Second we gathered financial accounting data and other firm specific data for the companies in our final sample. At the end of this section we also describe the statistical methods used in our analyses, and why some common statistical tools are inappropriate on our sample.

4.1 Identifying Companies

Stamdata is the Norwegian trustee Norsk Tillitsmann's database and includes virtually all bond issues in Norway since 1993. We use this database to define the Norwegian bond market and start out with all issued bond tranches registered here. Per March 23rd 2012 this included 1,015 companies and 24,837 bond tranches with an aggregated volume of NOK 6,884 bn. The initial sample is described in the Table 3.1 in the section on the Norwegian bond market.

4.1.1 Filtering process – finding high yield firms

There are currently no public databases, to our knowledge, that will give us an extensive list of companies with credit events. Thus, in order to identify defaults we had to search through loan documents for each company individually. To make this job manageable we had to funnel out most of the companies from our initial sample without excluding important cases. To do this we used different criteria that narrowed our sample down to high yield companies, since the likelihood of a credit event occurring in these firms is higher. The final high yield sample, covering firms with bonds outstanding in the seven-year period from January 1st 2005 to December 31st 2011, comprises 268 companies and 786 bond issues.

The first filter we applied was limiting the time period to bonds maturing after January 2005 and issued before January 2012. We then excluded companies within industries like banking, finance and insurance. Due to regulations these firms cannot be in a financial position where they are considered high yield, and the government often guarantees them. Utilities were also excluded for the same reason because this is a fairly stable industry without large unexpected volatility. Further, companies with an aggregated issued amount of less than

NOK 30 million were excluded from the sample. In Brekke and Haugland (2010) a list of investment grade companies, compiled by Pareto Securities, was used to identify a high yield sample. These investment graded companies were excluded from our sample as well. Finally we compared the sample against Pareto Securities High Yield Bond Reports, dated July 2011 and January 2012, and added 7 companies with high yield bond issues from 2005 through 2011 to the sample.

By using these filters we found 268 companies that we define as our high yield sample. To identify the firms involved in a credit event we searched through these firm's loan documents, and came down to 87 companies that either had been liquidated or where some sort of amendment to the loan agreement had been made. Six of these firms did not satisfy our definition of a troubled debt restructuring, and where thus excluded. The 81 remaining firms are all listed in Table 4.1. The sample included 14 companies that has either been acquired or changed names. In order to find relevant financial data for these we used the name at the time of restructuring.

Out of this sample of 81 companies we were unable to find relevant annual reports and/or loan documents for 5 companies. These where either liquidated or acquired, and had due to this typically not completed the annual report for the preceding year. For this reason we could not include them in our statistical analysis, and will refer to the remaining 76 companies as the final sample.

Table 4.1 – Final Sample

The selection of firms included in the analysis organized alphabetically by category.

<i>Panel A: Postponement of Obligations</i>		
Aker Biomarine ASA	Cecon ASA	Norwegian Energy Company
Apptix ASA	Fairstar Heavy Transport NV	Oceanlink Ltd
Austevoll Seafood ASA	Interoil E&P ASA	TTS Group ASA
Belships ASA	Marine Subsea AS	Domstein ASA
Bergen Group ASA	Master Marine AS	Selvaag Bolig AS
Bergen Oilfield Services AS	Neptune Marine Invest AS	
<i>Panel B: Changes in Capital Structure</i>		
Aladdin Oil & Gas Company	Handelseiendom II AS	RXT ASA
American Shipping Company	Hurtigruten ASA	Rowan Drilling Norway AS
Blom ASA	Malka Oil AB	Seabird Exploration PLC
Cecon ASA	Marine Accurate Well ASA	Songa Offshore SE
Codfarmers ASA	Metallkraft AS	Umoe Bioenergy ASA
Crew Gold Corp	Nattopharma ASA	Valhalla Oil and Gas AS
Eitzen Chemical ASA	Oceanteam Shipping ASA	Valiant Petroleum Holdings AS
Eitzen Maritime Services ASA	Oren Oil ASA	Wega Mining AS
Emerging Europe Land Develo.	Peterson AS	Ziebel AS
Equinox Offshore Ltd	Petrolia ASA	
Front Exploration AS	Proserv Group AS	
<i>Panel C: Sale of Assets</i>		
Frontline Ltd	NOR Energy AS	Sevan Marine ASA
Krillsea Group AS	Norse Energy Corp. ASA	Transeuro Energy Corp
Nexus Floating Production Ltd	Rocksource ASA	Wentworth Resources Limited
<i>Panel D: Liquidation</i>		
Ability Drilling ASA	Nordic Heavy Lift ASA	Songa Floating Production ASA
Club Cruise	Petrojack ASA	Svithoid Tankers AB
Estatia Resort Property AS	PetroMena ASA	Tandberg Data ASA
FPS OCEAN AS	PetroProd Ltd	Tandberg Storage ASA
Monitor Oil PLC	Remedial Ltd	Thule Drilling AS
MPF Corp Ltd	Scan Geophysical ASA	TMG International AB
MPU Offshore Lift ASA	Seametric International AS	Viking Drilling ASA
<i>Panel E: Firms excluded due to unavailable financial data</i>		
Bluestone Offshore	EOAL Cyprus Holdnings Limited	Primorsk International Shipping
Delphin Kreuzfahrten GmbH	IBB Byg A/S	

4.2 Final sample

Of the 268 companies in the high yield sample we identified 81 with credit events by going through their loan documents in Stamdata. Even though our final sample is restricted further to 76 companies due to data limitations, we will include all 81 in most of the following description of the sample. We do this to provide an as complete as possible overview of troubled debt firms in the time period covered.

4.2.1 Categories and Year of Default

As previously described we split our firms into four categories: Liquidation, Sale of Assets, Change in Capital Structure and Postponed Obligations. Table 4.2 shows how our sample is spread over these categories in different years. We observe that the most common outcomes of financial distress are Change in capital structure and Liquidation. As much as 30 percent of the firms with difficulties in handling their debt obligations end up being liquidated, while close to 40 percent need a comprehensive restructuring to solve the problems. There are fewer observations where a postponement of obligations has been sufficient and only 10 cases where sale of assets has been the solution.

Table 4.2 - Sample Firms by Year and Category

This table shows the number of firms involved in troubled debt restructurings in the time period 2005 to 2011 by category and year of event. We have no observations from 2005.

<i>Panel A: All 81 firms with troubled debt restructurings and liquidation</i>							
	2006	2007	2008	2009	2010	2011	Sum
Liquidation	0	1	9	11	1	2	24
Sale of Assets	0	0	1	7	0	2	10
Change in Capital Structure	1	0	3	14	6	7	31
Postponed Obligations	0	3	2	9	2	0	16
Sum	1	4	15	41	9	11	81

<i>Panel B: The final sample of 76 firms used for analysis</i>							
	2006	2007	2008	2009	2010	2011	Sum
Liquidation	0	1	9	9	1	0	20
Sale of Assets	0	0	1	6	0	2	9
Change in Capital Structure	1	0	2	16	6	6	31
Postponed Obligations	0	3	2	9	2	0	16
Sum	1	4	13	40	9	9	76

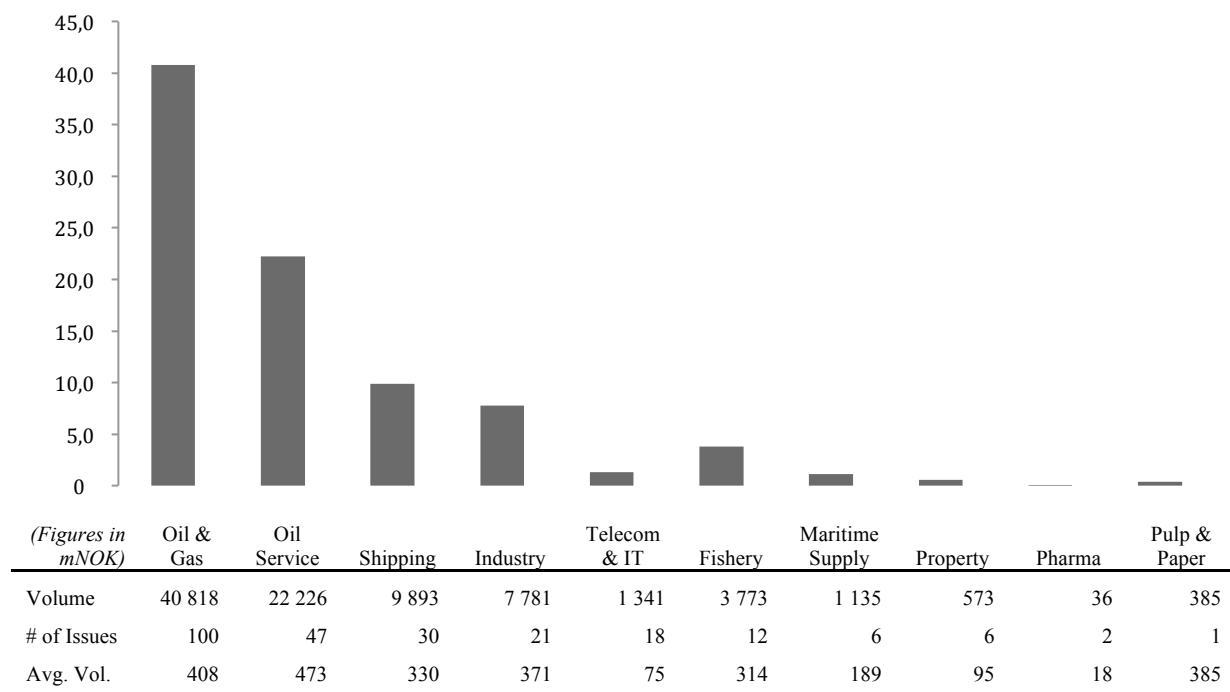
Not surprisingly, most cases occurred in 2009, and most of these were directly related to the economic downturn at the time. More than 50 percent of all restructurings or liquidations in the 7 year period we cover happened this year. There is, however, no substantial difference in the relative size of categories this year compared to the period as a whole. We also note that there are no observations from 2005 in any category. This gives another indication that restricting the covered time period to 2005 is reasonable, since there seems to be barely any cases of interest prior to this.

4.2.2 Industries

Oil and gas and oil service companies are dominating the final sample, not surprisingly since they dominate the Norwegian business and industry landscape in general. The chart in Figure 4.1 below shows that these firms constitute 60 percent of the issues and 70 percent of the volume in our sample.

Figure 4.1 - Firms by Industry

The figure below shows the final sample's volumes categorized by industry. In combination with the table below, we see that the Oil and Gas has the highest volume and number of issues while the Oil Service industry has the largest issues (Y-axis in BNOK, table in mNOK).



Since the Oil and Gas industry based on the Stamdata categorization is so large relative to the others that we decided to separate the Oil and gas category into two separate categories.

We define the Oil and Gas category to include only exploration and production companies, while the Oil service category includes firms delivering support to E&P companies. Additionally, some firms had been categorized erroneously, like the Oil service company Proserv Group AS that was found in the Finance industry. All firms that we reclassified for these two reasons are listed in Table 4.3.

Table 4.3 - Industry reclassification

The table shows the firms in our sample that has been reclassified from its original industry according to Stamdata to more appropriate industry classes.

Issuer	Original Industry	Reclassification
Ability Drilling ASA	Oil and Gas	Oil Service
Aker Biomarine ASA	Industry	Fishery
Aladdin Oil & Gas Company ASA	Service	Oil and Gas
American Shipping Company ASA	Industry	Shipping
Blom ASA	Service	Telecom/IT
Bluestone Offshore Pte Ltd	Oil and Gas	Oil Service
Delphin Kreuzfahrten	Oil and Gas	Shipping
Eitzen Maritime Services ASA	Wholesale and Retail	Maritime Supply
Equinox Offshore Accomodation Ltd	Oil and Gas	Oil Service
FPS OCEAN AS	Service	Oil and Gas
Fred Olsen Energy ASA	Oil and Gas	Oil Service
Ignis AS	Wholesale and Retail	Telecom/IT
Marine Accurate Well ASA	Oil and Gas	Oil Service
Marine Subsea Cyprus Holding Ltd	Oil and Gas	Oil Service
Monitor Oil PLC	Oil and Gas	Oil Service
MPU Offshore Lift ASA	Oil and Gas	Oil Service
Nattopharma ASA	Industry	Pharmaceuticals
Neptune Marine Invest AS	Oil and Gas	Oil Service
Oceanlink Ltd	Transportation	Shipping
Petrojack ASA	Oil and Gas	Oil Service
PetroMena ASA	Service	Oil and Gas
PetroRig III	Oil and Gas	Oil Service
Primorsk International Shipping Ltd	Oil and Gas	Shipping
Proserv Group AS	Finance	Oil Service
Rocksource ASA	Service	Oil and Gas
Scan Geophysical ASA	Service	Oil and Gas
Seametric International AS	Oil and Gas	Oil Service
Umoe Bioenergy ASA	Finance	Oil and Gas
Valhalla Oil and Gas AS	Service	Oil and Gas
Valiant Petroleum Holdings AS	Service	Oil and Gas

4.2.3 Type of bonds

We have categorized the type of bonds of our sample firms along two dimensions, seniority and time horizon. Seniority is typically described by the three creditor classes senior secured, senior unsecured and subordinated debt, in descending order. Panel A of Table 4.4 shows the

number of issues and issued amount by seniority of the bonds in our sample. To attain this information we had to search through each individual bond's loan agreement, as seniority is not reported in the Stamdata database. We observe that close to half the bond issues in our sample are senior secured bonds. 30 percent are issued as senior unsecured, while less than a quarter of the issues are subordinated. That secured bonds are dominating this sample is not unreasonable. First, since a majority of the firms in our sample are in industries with intensive use of tangible assets it is natural for these to provide security for their loans in these assets. Second, since most of these were probably perceived as risky at time of issue, offering security in assets would reduce the cost of financing. We also note that the average issued amount is larger for higher seniority bonds.

Table 4.4 - Type of bonds

This table shows the number of issues and issued amount for the bonds of our sample firms for different types of bonds. The upper panel categorizes the bonds based on seniority, while the lower panel split the bonds between regular bonds, notes and convertible bonds.

<i>Panel B: Type of bonds by seniority</i>				
Type	Issues	% of total issues	Issued Amount (mNOK)	Avg. issued amount (mNOK)
Senior Secured	113	46.5 %	46 419	411
Senior Unsecured	73	30.0 %	24 649	338
Subordinated	57	23.5 %	16 893	296
Total number of issues	243			
Total issued amount (mNOK)			87 961	
Average issued amount (mNOK)				362

<i>Panel B: Type of bonds by time horizon</i>				
Type	Issues	% of total issues	Issued Amount (mNOK)	Avg. issued amount (mNOK)
Bonds	130	53.3 %	63 810	491
Notes	39	16.0 %	7 655	196
Convertibles	74	30.5 %	16 496	223
Total number of tranches	242			
Total issued amount (mNOK)			87 961	
Average issued amount (mNOK)				362

In Panel B we look at whether the issued bonds are regular bonds, notes or convertibles. The first category is a fairly wide one, and includes bonds with both fixed and floating interest rate and zero-coupon bonds. They have in common that they have a time to maturity of more than one year. This is also the dominant type of bond, with over 50 percent of the issues. A substantial fraction of the bonds have convertible rights, but the issues are on average substantially smaller than the bonds without conversion rights. Notes, which are bonds with

maturity less than a year, are the least prevalent both in terms of number of issues and issued amount.

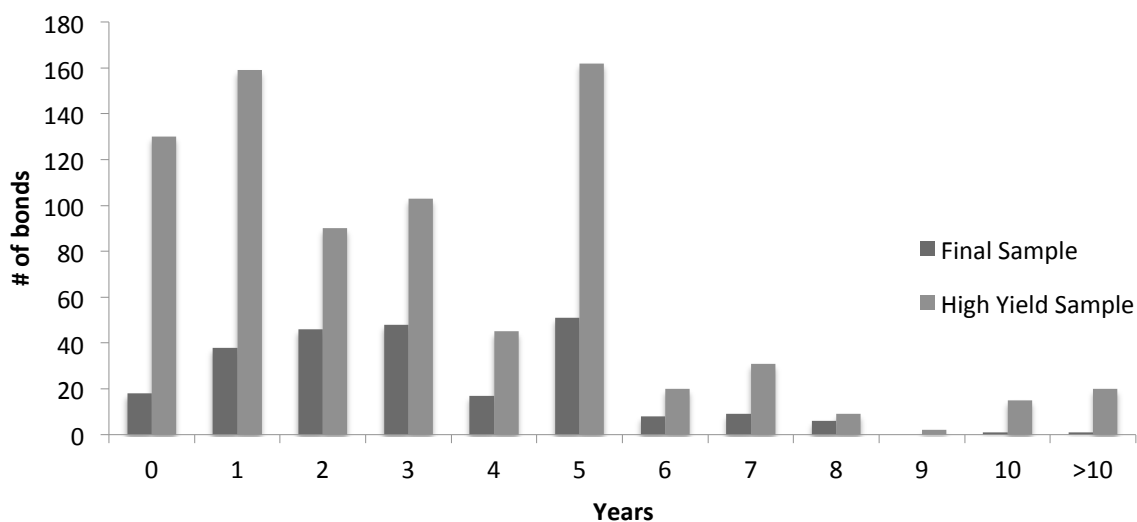
4.2.4 Original maturity

Figure 4.2 below shows that a majority of our sample firms have bonds with original time to maturity of five years or shorter. This does not appear to be very different from the rest of our high yield sample, as we see from the comparable columns. The total high yield sample does have more bonds with original maturity of 10 years or longer, however this constitutes a very small fraction of the total issued amount.

Figure 4.2 - Original Maturity

This figure shows the original time to maturity at the bond's issue date for our final sample compared with the High Yield sample. We see that there are no noteworthy differences between these.

Comparison of original maturity



4.3 Financial Accounting Data

4.3.1 Sources of data

Our main source of financial accounting data was SNF's database on accounting and enterprise information for Norwegian companies. This database comprises financial statements, accounting variables and key information about entities registered in Brønnøysundregisteret from 1992 to 2010 (Mjøs and Øksnes, 2012).

We have restricted ourselves to financials for the two years prior to the credit event. One may argue that using averages over three years would be better, like Chatterjee et. al. (1995) since it better smoothes out extraordinary gains or losses. However, we use only one to two years of data due to two reasons. First, for averages to be meaningful a company must be in a fairly stable state where their operations have been established for a while. In our sample 28 companies were founded less than 4 years before their first credit event, and another 17 experienced it in their fourth year. Thus, for many companies we would not even have enough data to make a three year average. And since startup companies normally use some years to settle their business and start normal operations, using averages will give a downward biased picture of a company's sales, profits and size. Second, the most recent values of assets and liabilities give the most accurate picture of the state of the firm when the credit event occurs. Some years back the company may have other bonds and liabilities with different profiles or another risk profile in general, and using this will blur the data we use in our analyses.

4.3.2 Choice of base year

Since we use annual financial statement data a precise definition of the base year is important. Our variables must consistently reflect the financial and economic situation in our firms, without being affected by the restructuring itself. The base year is set to the year the credit event took place, and data is collected for the year or two years prior to this. However, the diverse nature of the events raises the need for further clarifications.

When companies are on the verge of financial trouble they often initiate informal discussions with bondholders before any formal steps are taken. When such discussions are initiated is hard to determine for external parties. Therefore we have chosen to use the date of the first letter to bondholders about the event published on Stamdata to determine base year. Gilson

et al. (1990) have in a similar way used the first and last reference to the restructuring in the Wall Street Journal to define the interval of the restructuring period.

In some cases the negotiation period before a solution is finally agreed upon draw out and may span over several years. Here we use the date of the first announced restructuring proposal. If a company has been through several restructurings, we restrict ourselves to look at the restructuring that solved the first period of financial distress, in line with previous research (Chatterjee et al., 1996). One example is Interoil Exploration and Production ASA. They ran into financial trouble during spring 2009, but were not able find a solution before summer 2010. Here we use 2009 as base year, since that is when the problems became evident.

4.3.3 Corrections and supplements to the database

Even though the SNF database is extensive it does lack information on some companies, and the quality of the data is not always flawless. In particular, the database was incomplete on the variables most important to us, like correct debt categorization. Since having high quality data is so important to our analysis due to our limited sample size, we needed to make several corrections and supplements to our sample.

First, since the database only comprises firms incorporated in Norway we lacked data on all foreign companies. We registered these manually based on their annual reports, defining the variables like the SNF database. The Norwegian companies lacking data were treated the same way. In addition, several variables were incomplete, classified incorrectly or very inaccurate, especially the debt variables. This forced us to go through all companies' annual reports to quality check the data, and to specify the debt structure in more detail. To the extent it was possible we specified the amount of convertible debt, bonds, subordinated bonds, bank loans and notes, and split it in its current and non-current portion. Using the loan agreements published on Stamdata for all bonds in our sample, the public debt was also classified as senior secured, senior unsecured and subordinated. From Stamdata the number of outstanding bonds at the time of default was also found.

The SNF database reports all figures in NOK, but several companies publish their financial statements in other currencies. When comparing these we found that the SNF database uses a common exchange rate for all firms reporting in the same currency for a given year. In order to have consistent data we used this exchange rate when making adjustments and manual

registrations. For years and currencies where we not were able to extract an exchange rate from the database, we use the year-end closing rate (see appendix for exchange rates). Most of the data we collected were used as ratios, hence the choice of exchange rate would not matter. The only impact this choice has is on the absolute difference tested for the line items sales, total assets, total liabilities and long-term debt. These figures are mostly reported year-end and hence we choose to use the year-end exchange rate. Accounting principles used for foreign currency translation and re-measurements into reporting currency also supports using average exchange rates for sales and year-end rates for assets and liabilities (Swieringa, 2011).

4.3.4 Industry specific ratios

Since what is perceived as normal levels of debt, current ratios and trade credits varies substantially between different industries, adjusting these for industry averages is necessary to avoid finding spurious relations in our analyses. In order to gather data for this we used the companies' NACE Rev. 2 codes to find comparable peers. We gathered data for both worldwide and Norwegian averages for the years 2005 through 2011, since the ratios can vary according to economic conditions at the time. These were used to adjust the figures of each firm for its respective industry and year.

4.4 Statistical methodology and challenges

In our analysis we want to test whether there are significant differences between the firms in our four categories of financially distressed firms. But as previously noted, analyses of debt restructurings in Norway suffer from a small number of observed cases. We have only detected 76 cases between 2005 and 2011 with sufficient available accounting data to perform analyses on. This raises several challenges in making statistical inferences, as necessary assumptions for many common statistical tools are violated and the frequent presence of outliers increases the risk of spurious results. Due to this we decided to rely on the non-parametric Mann-Whitney U-test, as this proved to be the most robust one for our purposes. We have also run logistic regressions with few independent variables, which qualitatively yielded the same results as the U-tests. But since we should be cautious drawing conclusions from the magnitudes of coefficients based on so few observations, the logit regressions are not able to tell us much more than the U-tests. Due to this we decided

not to report the logit regression results under Findings, though they can be found in the Appendix. This section first describes the Mann-Whitney test, before we discuss why other statistical tools are inappropriate for our sample.

4.4.1 The Mann-Whitney U-test

A common test statistic for analyzing differences between groups is the student's t-test, which tests the difference in means between two groups on a specific variable. However, this test requires the populations comprising our categories to follow a normal distribution and the compared populations to be independent. This can hardly be said about our sample. The violation against the normal distribution assumption is the biggest problem, due to a small sample and many extreme observations on various variables.

Instead of the t-test we use a Mann-Whitney U-test, also known as the Wilcoxon rank-sum test. This also tests whether one group tends to have larger observation values than another group, but as opposed to the t-test it is a non-parametric test. Technically it ranks all values of the tested variable from both groups from smallest to largest. It then sums the rank numbers of all observations in each group to a rank sum. It tests the following null and alternative hypothesis

H_0 : There is no difference between the ranks of the two groups

H_A : The rank of one pre-specified group is larger than the other

In our testing we typically have a qualified opinion on which sample will have higher values than the other. Based on this we use one-tailed tests, as indicated by the above hypotheses, to test whether one pre-specified group has larger observations than the other group or not. Preferably we would use a significance level of 5 percent, but due to our fairly small sample size this may be hard to achieve. Thus, we will also conclude that there are probable differences at 10 percent significance level if there seems to be economical differences between the groups.

For small samples sizes, the decision to keep or reject the null hypothesis is based on a calculated U statistic. But for larger samples, this U is approximately normally distributed, and by standardizing the U we can use critical values from the normal distribution. With a sample size of 20 or larger, preferably with 10 observations in each group, this is expected to be approximately true (Keller, 2009). For some of our pairwise comparisons we are close to

this lower limit, as we only have 9 observations of firms selling assets. However, unless otherwise is stated we will assume our test statistics to be approximately normal distributed and consider the normalized z statistic.

Using the Mann-Whitney test has several advantages for our purposes. Most important, we do not need to assume that our samples come from a normally distributed population. Since it only considers the rank sum it is also much less sensitive to outliers than a t-test, which reduces the risk of finding spurious relations. As we return to under the findings section this would have been a major concern to us, as many sample means are skewed substantially by a few extreme observations. Some of the determinants we are testing are also ordinal or at least not in continuous intervals, like the number of public debt contracts or debt capacity, which makes Mann-Whitney the natural choice of test.

4.4.2 Other statistical tools

4.4.2.1 OLS regressions

With a larger sample we would prefer using OLS regressions when comparing our four categories. One possibility would be to let the determinant, for example firm size, be the dependent variable and create dummy variables for the categories. This would give a model similar to this

$$\begin{aligned} Total\ Assets &= \beta_0 + \beta_1 Asset\ Sales + \beta_2 Change\ in\ Capital\ Structure \\ &+ \beta_3 Postponed\ obligations + \epsilon \end{aligned}$$

Here the coefficients are interpreted as how much larger or smaller the firms within each category are compared to the base category, which here arbitrarily is set to be the Liquidation category. This specification would also enable us to control for other factors by adding appropriate independent variables.

Another approach would be to use linear probability models. Here we could make pairwise comparisons of the groups with binary dependent variables, for example by letting 1 denote Liquidation and 0 denote Asset sale. When the dependent variable y is binary, it is always true that $P(y = 1|\mathbf{x}) = E(y|\mathbf{x})$, where \mathbf{x} is a vector of the independent variables. In other words, the probability of being in the liquidation category given the independent variables equals the expected value of the dependent variable given the same independent variables. Then we could analyze the outcome's relations to the determinants through models similar to this

$$P(y = 1|\mathbf{x}) = \beta_0 + \beta_1 \text{EBITDA/Sales} + \beta_2 \text{Total Assets} \\ + \beta_3 \text{Number of public contracts} + \epsilon$$

This is just an example model with arbitrarily chosen independent variables. In such a model the coefficients measure the predicted change in probability of being in the Liquidation category.

Both these approaches could provide useful information as we try to understand how the categories are distinguished from each other. By appropriate use of multiple independent variables we would also be able to comment on the relative importance of different determinants. But unfortunately, the small sample size limits the conclusions we are able to draw substantially. First, when we include several variables very few of the coefficients are likely to be statistically significant, because the model uses too many degrees of freedom relative to the sample size. This reduces our ability to control for different factors in our models.

In general, the linear probability model has certain shortcomings. First, it violates the homoskedasticity assumption for OLS regressions. With a binary dependent variable there must be heteroskedasticity unless the probability does not depend on any of the independent variables (Wooldridge, 2009). This does not cause bias, but regular t and F statistics are invalid even with large samples in the presence of heteroskedasticity. Additionally, the linearity assumption is troublesome outside a certain interval. With linear independent variables, the expected probability of outcome may take values below 0 or above 1, which does not make sense. As distressed firms often have extreme values for the determinants we measure, this could make predictions from such models awkward.

However, the biggest problem our sample has with OLS regressions is the presence of outliers for many of our variables. These outliers, combined with a small sample size, introduce a significant risk of finding spurious or overstated relations between our determinants and the categories. The reason is that since the OLS method minimizes the sum of squared residuals, outliers are given a disproportionately high weight.

There are several methods available to reduce the problem of outliers. We may simply drop the observation completely, but given our already small sample this is not feasible. Another option we discussed was winsorization of the variables, which limits all outliers to a specified percentile of the data, like 90 percent. Values below the 5th percentile and above

the 95th percentile are then adjusted up and down to the cutoff value. This would make our OLS regressions more robust to outliers (Wilcox, 2012).

However, we chose not to do this. The main advantage of using OLS above a non-parametric test like Mann-Whitney is that it enables us to say something more about the magnitudes of the differences. With small sample sizes one should be extremely cautious in drawing any conclusions based on these magnitudes, as the outliers easily can make us overstate or understate the true values. Winsorising the data could reduce some of the problem, but at the same time it reduces the variance of the sample. And even after doing this, we should be careful using the regression results for more than qualitative purposes.

Based on these arguments the OLS regressions are not able to tell much more than the Mann-Whitney test with a sample like ours, and are then just less robust ways of drawing the same conclusions as the Mann-Whitney tests. Due to this we decided not to report any results from such regressions, except noting that the results are in line with those from the Mann-Whitney tests.

4.4.2.2 Logistic regressions

Logistic regressions are used in the same situations as linear probability models, where we want to analyze the probability of different outcomes. The advantage is that they avoid many of the problems linear probability models face, as described above. We will not elaborate on the mathematical specifications of logistic regression models here, but they account both for the heteroskedasticity problem and ensure that predicted values are strictly between 1 and 0 (Wooldridge, 2009). Using a logistic distribution would also reduce the sensitivity towards outliers, as this distribution has heavier tails than the normal distribution, and make our models more robust. Additionally, by using multinomial logistic models we are able to compare more than two groups simultaneously something that would be useful for our purposes.

Since logistic regression models solve many of the issues OLS models face, it may be used for analyzing our sample. But the sample size is still small, thus we should not interpret the coefficients from these regressions too literally. Since we do not feel confident trusting more than the qualitative implications of the regressions, they are not able to enhance our understanding more than our simple Mann-Whitney tests. Even though logit models are more robust to outliers than OLS models, they are still less robust than non-parametric tests

for a sample like ours. Based on this we decided to rely mostly on the Mann-Whitney tests, and rather use the logit regressions to back up the conclusions.

4.4.2.3 Spearman's rank correlation coefficient

The Spearman rank correlation coefficient measures the statistical dependency between two variables. The coefficient is calculated in the same manner as the more often used Pearson correlation coefficient, but instead of using the absolute values it measures the correlation between the ranked values. In other words it is a non-parametric tool like the Mann-Whitney test (Keller, 2009).

Using this would avoid the problems of outliers that OLS regressions suffer from, and still reveal something about the relative dependency of various determinants and outcome. Unfortunately our categories are categorical and not ordinal, hence they cannot be ranked in a meaningful way. This implies that a Spearman correlation must be calculated for two and two categories, where the outcome variable would be binary. However, this is basically the same as performing a Mann-Whitney test on two outcome categories, and would not give us much more than we know from these tests. Due to this we see no further benefits from computing the Spearman rank correlation coefficients.

5. Findings

In this section we test the significance of our proposed determinants from the theory section. When analyzing these determinants we want to test whether there are significant differences for the variables between our four categories. Due to the small sample size and extreme observations such analyses are challenging, and we must be cautious when interpreting the results. Based on this we rely heavily on the Mann-Whitney U-test, as it is the most robust for our purposes. This allows us to make pairwise comparisons between our four categories without worrying that our results are biased by individual observations of extreme magnitude. Simple logistic regressions are also used, but as they draw similar conclusions, their results are reported in the Appendix.

The determinants will be analyzed individually in the same order that they were categorized in the theory section, before we explore further whether firms with access to bank financing behave differently than firms in general for any determinants. Finally we discuss the robustness of our findings, implications of dealing with a small sample and potential biases.

5.1 Determinants of outcome

5.1.1 Degree of Economic Distress

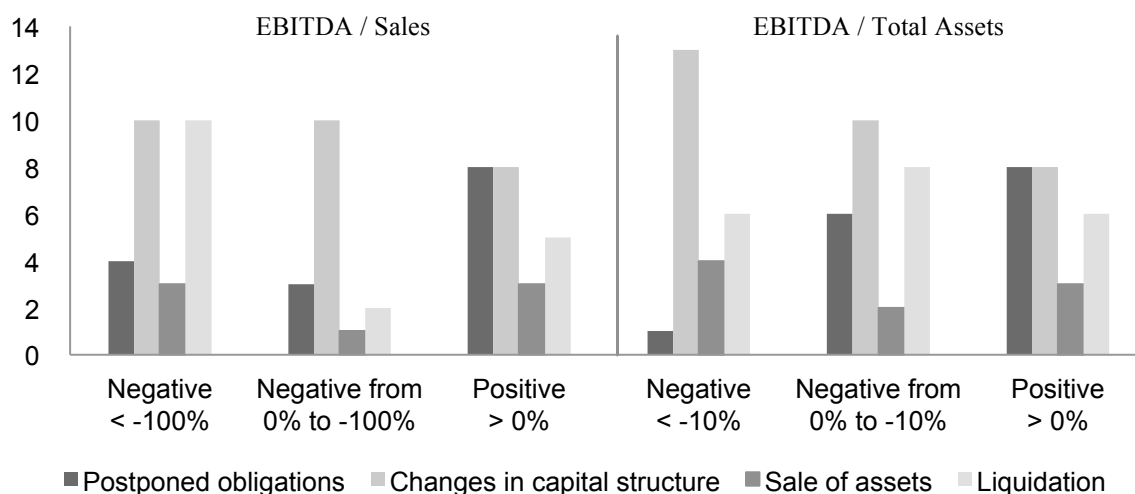
As many other empirical studies have done, we use a firm's past financial performance to measure the degree of economic distress. From a theoretical perspective we expected restructured firms to show better financial performance leading up to the distressed period than those liquidated. The firms with more comprehensive restructurings should also perform poorer than firms that only postpone their obligations.

To measure financial performance we use EBITDA ratios to sales and total assets. Tests have been performed both with data from the year prior the credit event and with average figures over the past two years. As discussed in the data section there are arguments for using both of these measures. The most recent financial statement should normally give the most accurate picture of the state of the firm. But extraordinary gains or losses, that are particularly common among distressed firms, may give biased results for a firm's underlying operations. Averages over several years would smooth out such events and also better reflect long term trends in profitability, but since our sample includes a large number of very young

firms we have restricted ourselves to a two year average in order to not lose too many observations.

Figure 5.1 - Distribution of performance measures

This figure illustrates the financial performance of our sample firms by restructuring outcome. The left chart shows EBITDA to Sales ratios and how many firms in each outcome category with ratios below negative 100 percent, between 0 and negative 100 percent or above 0. The right chart shows the number of firms with EBITDA to Total Asset ratios below negative 10 percent, between 0 and negative 10 percent and above 0.



As Figure 5.1 shows, our firms generally show poor financial performance. Within all classes except Postponed Obligations, there is a majority of firms with negative EBITDA ratios, as expected from financially distressed firms. Average ratios are not meaningful to discuss here, because a few firms pull the figures down excessively. These have typically not fully established their operations, such that their expenditures heavily outweigh their modest income. This yields extreme EBITDA to sales ratios, like Discover Petroleum's -32,543 percent, and computing sample averages including these will not give a proper picture of the situation.

Medians give a better picture and as we see in Table 5.1, Postponed obligation is the only category with positive median ratios. An interesting observation is that Liquidation has the lowest median ratio to sales, but when we look at EBITDA to total asset the median value of this category is better than both Sale of assets and Changes in capital structure. One possible explanation can be that firms soon to be liquidated have written down more assets than other firms, which will improve this ratio.

Table 5.1 - Degree of Economic Distress and Restructuring Outcome

This table compares measures of the degree of economic distress for firms in our four categories. Economic distress is measured as the EBITDA ratio to total sales and total assets one year and averages over two years prior to the event. Panel A shows median and mean values, while Panel B shows Z-statistics from pairwise Mann-Whitney U-tests.

<i>Panel A: Median values. (Means in parentheses.)</i>						
	Sale of assets	Changes in capital structure	Postponed obligations	Liquidation		
<i>Year prior to default</i>						
EBITDA / Sales	-1.94 (-41.78)	-0.42 (-53.01)	0.02 (-2.85)	-0.94 (-6.96)		
EBITDA / TA	-0.12 (-0.11)	-0.09 (-0.32)	0.02 (0.01)	-0.03 (-0.12)		
<i>2 Year Averages</i>						
EBITDA/ Sales	-1.00 (-30.91)	-0.28 (-21.45)	0.02 (-3.97)	-1.26 (-15.10)		
EBITDA / TA	-0.07 (-0.10)	-0.08 (-0.16)	0.02 (0.02)	-0.03 (-0.10)		
<i>Panel B: Pairwise comparison Mann-Whitney U-test Z-statistic</i>						
	Liquidation vs. Sale of assets	Liquidation vs. Capital structure	Liquidation vs. Postpone	Asset sales vs. Capital structure	Asset sales vs. Postpone	Capital structure vs. Postpone
<i>Year prior to default</i>						
EBITDA / Sales	0.106	-0.153	-1.621*	-0.124	-0.802	-1.683**
# Observations	15 vs. 7	15 vs. 28	15 vs. 16	7 vs. 28	7 vs. 16	28 vs. 16
EBITDA / TA	-0.094	1.350	-2.133**	0.599	-1.359*	-2.919***
# Observations	20 vs. 9	20 vs. 31	20 vs. 16	9 vs. 31	9 vs. 16	31 vs. 16
<i>2 Year Averages</i>						
EBITDA/ Sales	-0.540	-0.866	-1.756**	-0.206	-0.952	-1.300*
# Observations	17 vs. 9	17 vs. 28	17 vs. 16	9 vs. 28	9 vs. 16	28 vs. 16
EBITDA / TA	0.094	0.772	-1.867**	0.502	-1.461*	-2.613***
# Observations	20 vs. 9	20 vs. 31	20 vs. 16	9 vs. 31	9 vs. 16	31 vs. 16

* = significant at 10 %, ** = significant at 5 %, *** = significant at 1 %

As we already have indicated, the category Postponed Obligations stands out from the other three. These firms have significantly higher EBITDA ratios to assets than the rest, and towards firms reorganizing the capital structure the difference is significant at a 99 percent confidence level. The results are similar for EBITDA to sales figures, but here the difference towards asset selling firms does not reach a significant level.

Between the categories Liquidation, Sale of Assets and Changes in capital structure there are no significant differences in financial performance. Liquidation cases have relatively more cases of very bad performance when we measure EBITDA to sales, where close to 60 percent have negative ratios larger than 100 percent. This trend is not present when looking at the ratio to total assets. Here the firms altering the capital structure are relatively more

present among the worst performing ones. As mentioned above, this may be caused by larger write-downs among liquidation cases, which result in a decreased denominator. These tendencies are anyway far from statistically significant on any level.

Hence, our analysis shows that in our sample, firms that only have to make minor amendments to resolve the distressed situation perform significantly better prior to the credit event than firms that liquidate or undertake larger restructurings. This is in line with what we expected, and makes intuitive sense. When a minor amendment is sufficient it is unlikely that the firm is in severe trouble. Such firms instead have decently sound underlying operations, and the problems are more temporary due to constraints in the credit market or delays in project deliveries. Since the financial performance of the firms work as a proxy for their economic viability, these firms exhibit stronger results than the ones with more severe problems.

From an economic theory perspective, we also expected the liquidated firms to perform worse than those restructuring through an asset sale or capital structure change, as the latter two groups should show more economic viability. The failure of finding such a relation lends support to Asquith, Gertner and Sharfstein (1994), who were not able to find any relation between performance and successful resolution of distress either. This implies that when a firm first has run into serious financial distress, their past performance cannot help predict whether they will be liquidated or manage to restructure successfully.

This last result would suggest that financial performance is not a good determinant of the outcome of a distressed situation. However, most firms heading into financial distress first attempt to solve the problem with an extension of maturity or delayed interest payment, perhaps hoping that the problems are only temporary. In many cases there are given several extensions of maturity before the firm finally acknowledges that a more comprehensive restructuring is necessary. Our results suggest that when a firm first announces a proposal of delayed payments, their past performance can be an important determinant to whether this is sufficient or if the firm later needs a larger restructuring. If their financial performance is not too bad, a small amendment is likely to be enough, while if the firm has performed badly, especially over time, a comprehensive restructuring or liquidation is a more probable outcome.

This is of particular interest to investors in the firm, both those holding debt and equity. A larger restructuring is far more costly, both in terms of direct and indirect costs. The direct costs, like legal fees or costs for paying consultants helping with the restructuring proposals, will increase with the complexity of the restructuring. The indirect costs may be even bigger. These are costs related to restricted strategic maneuverability during the restructuring period and deteriorated reputation among customers, suppliers and others. The longer the restructuring period, the higher these costs will typically be. If an investor could predict whether such a restructuring is necessary, he would rather exit now than risking a lower recovery rate later. Conversely, if an investor observes a firm with distressed securities due to a proposed payment delay but with decent underlying operations, he may buy it at a discount now and receive full recovery when the temporary troubles are resolved.

To summarize, the firms that are able to resolve their financial problems through smaller amendments, like postponing obligations, perform significantly better prior to the credit event than other financially distressed firms. When a firm already is in deep financial trouble, there is no significant difference between the firms liquidating and those undertaking asset or debt restructurings.

5.1.2 Creditor Coordination Problems

From theory we know that coordination problems among creditors should be important determinants of how financial distress is resolved. These problems may appear at several levels within a firm, and below we present findings on measures for many of these.

5.1.2.1 *The level of trade credit*

Trade creditors are known to be a difficult group to negotiate with due to their dispersed and unsophisticated nature. This should imply that firms with high levels of trade credit are, more often, forced to liquidate or sell assets. Chatterjee et al. (1996) confirmed this by finding significantly higher levels of trade credit among firms filing for Chapter 11 than those restructuring out of court.

We, however, fail to find any such relation among our categories. Table 5.2 shows the level of trade credit to total assets and corresponding z-statistics from the pairwise Mann-Whitney U-tests. There is in fact a weak tendency that liquidated firms have less trade credit than others, as the median liquidated firm has the lowest trade credit to total assets at 4.3 percent. Also after we control for industry differences by subtracting the industry average ratio for each firm, we find no significant differences between our categories. As the median and mean values in Panel A shows, there is virtually no difference from the industry average in any category. There are no obvious reasons why trade creditors in Norway should behave differently than those in the U.S., and be better organized or more forgiving. The overall level of trade credit among firms in our sample is not notably different from the U.S. firms in Chatterjee et al.'s (1996) sample, so it is not because they are less important creditors.

The reason why we do not find significant differences in trade credits may be found in our categorization of firms and differences in the institutional framework. Chatterjee et al. (1996) find significant differences between Chapter 11 and out-of-court restructuring cases, but equivalents to Chapter 11 are close to non-existent among firms in the Norwegian bond market. As mentioned earlier this is why such a categorization of our sample is impossible. A direct comparison between Chapter 11 cases and liquidation cannot be made either, since many Chapter 11 cases successfully restructure under formal procedures and continue operations.

Table 5.2 - The Level of Trade Credit and Restructuring Outcome

This table compares measures of the level of trade credits for firms in our four categories. We use the ratio of trade credit to total assets from the firms' financial statements one year prior to the credit event. The adjusted trade credit to total assets ratio is found by subtracting the industry average ratio for each firm. Panel A shows median and mean values, while Panel B shows Z-statistics from pairwise Mann-Whitney U-tests.

<i>Panel A: Median values. (Means in parentheses.)</i>						
	Sale of assets	Changes in capital structure	Postponed obligations	Liquidation		
Trade Credit / TA	0.07 (0.09)	-0.42 (-53.01)	0.02 (-2.85)	-0.94 (-6.96)		
Adj. Trade / TA	0.009 (0.026)	0.014 (0.012)	-0.004 (0.010)	0.000 (0.003)		

<i>Panel B: Pairwise comparison Mann-Whitney U-test Z-statistic</i>						
	Liquidation vs. Sale of assets	Liquidation vs. Capital structure	Liquidation vs. Postpone	Asset sales vs. Capital structure	Asset sales vs. Postpone	Capital structure vs. Postpone
Trade Credit / TA	0.106	-0.153	-1.621*	-0.124	-0.802	-1.683**
Adj. Trade / TA	0.000	-0.444	-0.800	-0.211	-0.507	-0.410
# Observations	20 vs. 9	20 vs. 31	20 vs. 16	9 vs. 31	9 vs. 16	31 vs. 16

* = significant at 10 %, ** = significant at 5 %, *** = significant at 1 %

Since debt negotiation under court administration is so seldom in Norway, larger and more senior creditors are left with two options. First, they may force the firm to liquidate and collect what they are entitled to according to their seniority, but if the firm and/or industry are in distress they risk ending up with only a fraction of their original claims. The other option is to accept some type of restructuring or renegotiation where they perhaps must forgive some claims, but in total recover more. Even though these creditors must carry a majority of the restructuring costs, a premature liquidation may be even more costly, and the level of trade credit does not seem to be high enough to affect this decision.

5.1.2.2 The level of bank debt

Previous research has found evidence both for and against a positive relation between the level of bank debt and successful debt restructuring. As Table 5.3 shows, our first test seems to support Gilson et al.'s (1990) results, that the firms with high levels of bank debt are more likely to resolve their problems successfully. The Mann-Whitney test indicates lower levels of bank debt among liquidated firms than all other groups. However, the only significant difference is between Liquidation and Postponed obligations, and only on a 90 percent confidence level. The weak significance may be due to the small sample size.

Table 5.3 - The Level of Bank Debt and Restructuring Outcome

This table compares measures of the level of bank debt for firms in our four categories. As bank debt we have included all short and long term debt to credit institutions reported in the financial statements one year prior to the credit event. The first measure includes all firms in our sample, while the second includes only firms with some bank debt. Both are ratios to total debt. The bank dummy variable takes the value 1 if a firm has bank debt and 0 when it has no bank debt in the capital structure. Panel A shows median and mean values, while Panel B shows Z-statistics from pairwise Mann-Whitney U-tests.

<i>Panel A: Bank debt relative to Total Debt. Median values. (Means in parentheses.)</i>						
	Sale of assets	Changes in capital structure	Postponed obligations	Liquidation		
<i>Year prior to default</i>						
Bank Debt / Debt	0,08 (0,16)	0,08 (0,22)	0,11 (0,25)	0,00 (0,18)		
Bank (>0) / Debt	0,36 (0,30)	0,25 (0,31)	0,26 (0,31)	0,33 (0,40)		
<i>Panel B: Pairwise comparison Mann-Whitney U-test Z-statistic</i>						
	Liquidation vs. Sale of assets	Liquidation vs. Capital structure	Liquidation vs. Postpone	Asset sales vs. Capital structure	Asset sales vs. Postpone	Capital structure vs. Postpone
<i>Year prior to default</i>						
Bank Debt / Debt	-0.426	-1.264	-1.526*	-0.676	-1.087	-0.645
# Observations	20 vs. 9	20 vs. 31	20 vs. 16	9 vs. 31	9 vs. 16	31 vs. 16
Bank (>0) / Debt	0.200	0.740	0.768	0.062	-0.049	-0.102
# Observations	9 vs. 5	9 vs. 22	9 vs. 13	5 vs. 2	5 vs. 13	22 vs. 13
Bank Debt Dummy	-0.517	-1.836**	-2.186**	0.858	-1.346*	-0.758
# Observations	20 vs. 9	20 vs. 31	20 vs. 16	9 vs. 31	9 vs. 16	31 vs. 16

* = significant at 10 %, ** = significant at 5 %, *** = significant at 1 %

If we just consider the overall statistical test for all firms it would seem like banks less often let firms go bankrupt, and are more willing to facilitate continued operations than other creditors. However, a closer examination of the underlying figures raises questions about this. As Panel A shows, the median firm among the liquidation cases does not have any bank debt at all, while the average value is almost in the same range as for the other three categories. We also find that while 81 percent of the Postponed obligation firms have some bank financing, only 45 percent of the liquidated firms do. For the Asset sale and Change in capital structure categories the figures are 56 and 71 percent, respectively. This suggests that within the groups there seems to be a distinction between those with bank debt and those without.

If the firms with bank debt are different from those without, for example by being higher quality firms, we are likely to suffer from a self-selection bias. Firms with bank debt handle financial distress better because they are better firms in general, not because they have bank

debt. A common technique for correcting selection biases is to use the Heckman correction method. The two step approach of the method uses an instrumental variable to correct for the selection bias, similar to a two-step least squares regression (Kennedy, 2003). To make such a correction here we must have an instrumental variable that is correlated with whether a firm has bank debt or not, but uncorrelated with the outcome. To find such a variable proved difficult, as most firm specific characteristics related to the use of bank debt also have some impact on outcome. Due to this and the general shortcomings of OLS regressions described in the Data section, we chose not to use the Heckman correction method.

An alternative is to only consider the firms with bank financing as a way of isolating the effect of bank debt in a negotiation process. When we exclude the firms without bank financing, we see that liquidation firms on average have 40 percent bank debt to total debt, while the three restructuring categories only have averages about 30 percent. We are not able to confirm a significant difference between the groups with a Mann-Whitney test, but the failure of doing so is largely due to the very small samples we are left with when excluding firms without bank debt.

We also construct a dummy variable taking the value 1 when the firm has some bank debt in its capital structure and 0 when it uses no bank debt. A Mann-Whitney test of this variable will indicate if there are relatively more firms with bank debt in one or the other category. From Table 5.3 we observe that in the Liquidation category there are significantly fewer firms with access to bank debt than in our debt restructuring categories. Towards the Asset sale category there is no significant difference.

One should be careful when interpreting these figures with so few observations, especially in our second test. But there may be two possible lessons we can learn from this. First, since fewer firms among the liquidated have access to bank financing, the presence or absence of bank debt seems to indicate the quality of the firm. Better firms are given bank debt, and because they are better they less are less often liquidated. This finding also indicates that banks are doing a decent job managing risk, as they often stay clear of the most severe cases.

Second, when we only look at firms in financial distress where banks are involved, we saw that bank debt on average constitute a larger part of total debt in liquidated firms. Even though our sample is too small to confirm that this difference is significant, the tendency is clear. If this is true also for larger samples or the population, the level of bank debt will be

negatively correlated with the probability of a successful restructuring. This would support Asquith et al.'s (1994) results that banks rarely provide debt forgiveness. Chatterjee et al. (1996) made similar findings, indicating that firms filing for Chapter 11 had significantly higher levels of bank debt than those restructuring out of court. This is an economically appealing result. Since banks typically hold secured claims, they will be treated better in liquidation than unsecured claimants. Due to this, banks' expected recovery value from liquidation should be higher than from restructuring in more cases than it would be for an unsecured creditor.

To summarize, the strongest determinant of outcome is whether the firm has access to bank financing or not, the relative size is less important. Still, if a distressed firm has bank debt it is more likely to be liquidated the bigger portion bank debt constitutes of the total debt.

5.1.2.3 The level of Public Debt

Since public debt is designed such that it may be held more dispersed than private debt, the creditor coordination problem should increase the larger fraction of a firm's debt that is public. We define public debt as the bonds not specifically deemed private in our sample firms' financial statements. Virtually all of these issues are also registered in the Stamdata database.

Table 5.4 shows the median and average value of public debt to total liabilities. We observe that liquidation cases have most public debt among the categories, with a median ratio of 68 percent. While the Sale of assets and Change in capital structure categories are about the same at 58 and 59 percent, respectively, the median value of postponed obligations is only 33 percent. Below the median and average figures we have the results for the pairwise Mann-Whitney tests. These show that firms postponing obligations have significantly less public debt than both liquidated and asset selling firms. Compared to firms that liquidate, the difference is significant up to a 98 percent confidence level, while the latter is significant at 90 percent. We also find significantly lower levels of public debt among firms reorganizing the capital structure than liquidation cases at 90 percent confidence level.

Table 5.4 - The Level of Public Debt and Restructuring Outcome

This table compares the level of public debt for firms in our four categories. As public debt we use the outstanding amount of bonds and certificates in the financial statement one year prior to the credit event as a ratio to total debt. The number of public contracts is a firm's number of outstanding bonds at time of the credit event, found in the Stamdata database. Panel A shows median and mean values, while Panel B shows Z-statistics from pairwise Mann-Whitney U-tests.

<i>Panel A: Median values. (Means in parentheses.)</i>						
	Sale of assets	Changes in capital structure	Postponed obligations	Liquidation		
Public / Tot. Debt	0.58 (0.57)	0.59 (0.51)	0.33 (0.42)	0.68 (0.62)		
# public contracts	1.00 (1.89)	1.00 (2.00)	1.00 (1.56)	2.00 (2.00)		

<i>Panel B: Pairwise comparison Mann-Whitney U-test Z-statistic</i>						
	Liquidation vs. Sale of assets	Liquidation vs. Capital structure	Liquidation vs. Postpone	Asset sales vs. Capital structure	Asset sales vs. Postpone	Capital structure vs. Postpone
Public / LTD	0.424	1.389*	2.101**	0.405	1.529*	0.965
# public contracts	0.988	0.981	1.399*	-0.165	0.000	0.330
# Observations	20 vs. 9	20 vs. 31	20 vs. 16	9 vs. 31	9 vs. 16	31 vs. 16

* = significant at 10 %, ** = significant at 5 %, *** = significant at 1 %

Another proxy of the number of creditors, used by for example Chatterjee et al. (1996), is the number of public debt contracts. Our analysis of this is based on the number of outstanding bonds registered in Stamdata at the time of the credit event. Table 5.4 also shows medians, averages and test statistics for this variable. One may question whether using this variable is suitable for the Norwegian bond market. Since most firms are relatively small, the majority of our sample firms only have one outstanding bond. Still, we see the tendency that liquidated firms have more debt contracts than the other categories, and towards Postponed obligations this difference is significant at a 90 percent confidence level.

These results support our hypothesis that firms with widely held debt more often are forced to liquidate or sell assets. Creditors even within the same creditor class may have different risk profiles for their portfolios, and thus prefer different solutions. When a firm has several debt contracts and higher outstanding amounts of debt it is reasonable to expect that the holders of this debt are more numerous and with more divergent interests. This increases the potential coordination problem and the difficulty of finding a solution all creditors can agree on. Thus, we can conclude that high levels of public debt tend to complicate the negotiation to resolve financial distress, and result in more liquidation of firms or selling of assets.

5.1.2.4 Seniority and different creditor classes

We concluded above that firms with high levels of public debt seem to have bigger problems coordinating their creditors in a restructuring process, which may result in premature liquidations and asset sales. But by examining the public debt compositions closer we should be able to be more accurate in predicting the outcome of financial distress. As discussed in the theory section, creditors with senior and secured claims will more often prefer liquidation, while more subordinate creditors know that liquidation in many cases will leave them with nothing. Instead they rather prefer forgiving some of their claims, hoping for an improved recovery over time. Knowing this, the seniority of the dominant creditor class should be an important determinant of outcome.

We have split up the public debt in three categories, senior secured, senior unsecured and subordinated debt. The classification is based on the original loan documents of each bond. Further we have carved out the portion of the debt that is convertible, a category that comprises both secured convertible bonds and subordinated convertible bonds.

In Table 5.5 we find figures for these variables relative to total liabilities. Medians are not meaningful to discuss here, because since a majority of firms only have one outstanding bond two out of three creditor classes will have a zero value for these observations. Averages are more appropriate, and tell us that all firms in general have more senior secured bonds than unsecured bonds. This is not surprising, as investors are more willing to lend money to high-risk firms when their loans are collateralized. However, Liquidation and Sale of asset firms on average have more senior secured bonds, both as a portion of total liabilities and relative to the unsecured creditor classes. Liquidation cases have the largest average ratio at 42 percent, while asset-selling firms on average have 35 percent senior secured bonds. The last two categories are down at 23 and 26 percent. When it comes to the two unsecured creditor classes the categories are more similar, with averages between 10 and 15 percent for each. But this implies that sale of asset and liquidated firms relatively have less unsecured bonds.

Table 5.5 - Creditor Classes and Restructuring Outcome

This table compares the relative size of different creditor classes for firms in our four categories. Using loan documents published on Stamdata the bonds have been categorized as senior secured, senior unsecured or subordinated. Convertibles are found in all three categories. All measures are ratios to total debt. Panel A shows median and mean values, while Panel B shows Z-statistics from pairwise Mann-Whitney U-tests.

<i>Panel A: Median values. (Means in parentheses.)</i>						
	Sale of assets	Changes in capital structure	Postponed obligations	Liquidation		
Senior Secured / Total Debt	0 (0.35)	0 (0.23)	0 (0.26)	0 (0.42)		
Senior Unsecured / Total Debt	0 (0.11)	0 (0.13)	0 (0.04)	0 (0.10)		
Subordinated / Total Debt	0 (0.11)	0 (0.15)	0 (0.12)	0 (0.10)		
Convertible / Total Debt	0 (0.29)	0 (0.17)	0 (0.08)	0 (0.09)		

<i>Panel B: Pairwise comparison Mann-Whitney U-test Z-statistic</i>						
	Liquidation vs. Asset sale	Liquidation vs. Capital structure	Liquidation vs. Postpone	Asset sales vs. Capital structure	Asset sales vs. Postpone	Capital structure vs. Postpone
Senior Secured / Total Debt	0.409	1.802**	1.362*	1.114	0.790	-0.430
Senior Unsecured / Total Debt	-0.776	-0.908	0.060	0.073	0.758	0.979
Subordinated / Total Debt	0.604	-0.256	-0.111	-0.412	-0.683	0.077
Convertible / Total Debt	-2.183**	-0.679	-0.199	1.714**	2.012**	0.399
# Observations	20 vs. 9	20 vs. 31	20 vs. 16	9 vs. 31	9 vs. 16	31 vs. 16

* = significant at 10 %, ** = significant at 5 %, *** = significant at 1 %

These indicated differences are confirmed by statistical tests. The z-statistics from the Mann-Whitney tests reported in Table 5.5 show that liquidated firms have significantly higher levels of senior secured bonds than firms altering capital structure and postponing obligations. The differences are significant at 95 and 90 percent confidence level, respectively. Sale of asset firms also show tendencies of having more secured bonds, but these differences do not reach significant levels.

The results confirm our hypothesis that financially distressed firms with more senior secured bonds more often end up being liquidated than firms with more unsecured bonds. This is not surprising from a theoretical perspective. Secured bondholders have incentives to push for liquidation or asset sales, since they are guaranteed to have priority on the proceeds of the

liquidated assets. Unsecured bondholders on the other hand have more to lose on premature restructuring.

What is interesting here is that some practitioners in the Norwegian high yield bond market have previously claimed that the sense of solidarity and collaboration across creditor classes is stronger than one would expect (Brekke and Haugland, 2010). If this was true we would see a weaker relation between different risk classes and the outcome of financial distress in Norway than has been found in studies of the U.S. bond market. However, according to our findings we have no clear evidence to support this claim. In a similar analysis in Chatterjee et al. (1996), they found most of the debt contracts among Chapter 11 firms to be senior, while the majority of debt contracts in firms restructuring out of court were junior.

Since we found all our categories to have relatively more secured than subordinated debt, also in the debt restructuring categories, one could argue that the claim is correct and that secured bondholders indeed show more solidarity in debt restructuring cases even when they are the largest public creditor class. However, this may also be attributed to differences between the Norwegian and U.S. high yield bond markets. The U.S. market is much more mature and liquid, and bonds are traded much more frequently. As compensation for low liquidity, the bondholders may be given security in assets in order to reduce the cost of financing for the firm. Hence, the fact that liquidation, asset restructuring and debt restructuring cases all have more senior secured bonds may simply be because investors in the Norwegian market generally prefer secured bonds, and that unsecured bonds become too expensive for the firms to issue.

An interesting observation in our analysis is regarding the amount of convertible debt. As Table 5.5 shows, the firms restructuring through asset sales have significantly more convertible debt than all other categories. Compared to postponed obligations and liquidation cases the difference is significant at a 2.5 percent significance level, while towards capital structure changes it is significant at a 5 percent level. When studying the underlying data we see that 7 out of 9 asset selling firms had convertible bonds, while a majority of firms in the other three categories did not have any. This could explain some of the large differences in average level of convertible debt, but among the firms with such debt the tendency is similar. If we compute the average after excluding firms without convertible debt, Changes in capital structure firms is slightly higher at 40 percent of total debt with asset selling firms come in at

37 percent. The two remaining categories are still far behind, at 18 percent for firms postponing obligations and 25 percent for liquidated firms.

There are no obvious reasons for this result. Among the convertible bonds there are both senior secured and subordinated in all categories without any overweight of either in any category. If the convertibles in the asset restructuring class were secured by the specific assets that were sold it could explain some of the difference, but there are no indications of this. Since we cannot find any economically intuitive reason why high levels of convertible debt should increase the probability of asset restructuring, we suspect it to be a spurious result due to the small sample size for asset restructurings.

5.1.3 Liquidity

Based on theory and previous research we hypothesized that firms with low debt capacity are often forced to sell assets. To analyze this we measure the firms' current ratios and Pulvino's debt capacity measure, as described in the Theory section. Since what is perceived as a normal balance sheet structure varies between different industries, we have also controlled for this by subtracting the industry average for each firm. The industry ratios are found using averages from international peers corresponding to the fiscal year prior to the credit event.

The upper panel of Table 5.6 shows medians and averages for the four categories. The median current ratios of all categories are below or just above 1. A rule of thumb is that a current ratio between 1 and 1.5 is satisfactory, above 1.5 is good, below 1 is weak and below 0.5 is not satisfactory. The medians of our categories are all in the weak area, where those postponing obligations are just above one. This is not surprising, since all are in financial distress and have trouble handling their obligations. The average figures are not as appropriate to the discussion, because some extreme observations pull the average up disproportionately. One example is Remedial (Cyprus) Plc, with a current ratio of more than 36.

Table 5.6 - Liquidity and Restructuring Outcome

This table compares measures of liquidity for firms in our four categories. The current ratio is defined as the ratio between current assets and current liabilities. The adjusted ratio is found by subtracting the industry average ratio for each firm. Low debt capacity is a dummy variable taking the value 1 when the current ratio is below and the debt to total asset ratio is above industry average. Panel A shows median and mean values, while Panel B shows Z-statistics from pairwise Mann-Whitney U-tests.

<i>Panel A: Median values. (Means in parentheses.)</i>						
	Sale of assets	Changes in capital structure	Postponed obligations	Liquidation		
Current Ratio	0.67 (1.17)	0.84 (2.09)	1.07 (1.35)	0.86 (3.44)		
Adj. Current Ratio	-3.46 (-3.00)	-3.41 (-2.14)	-2.87 (-2.71)	-2.62 (-0.71)		

<i>Panel B: Pairwise comparison Mann-Whitney U-test Z-statistic</i>						
	Liquidation vs. Sale of assets	Liquidation vs. Capital structure	Liquidation vs. Postpone	Asset sales vs. Capital structure	Asset sales vs. Postpone	Capital structure vs. Postpone
Current Ratio	0.754	0.039	-0.255	-0.761	-0.793	-0.449
Adj. Current Ratio	0.801	0.463	0.032	-0.632	-1.019	-0.359
Low Debt Capacity	-0.839	0.130	0.410	0.959	1.109	-0.447
# Observations	20 vs. 9	20 vs. 31	20 vs. 16	9 vs. 31	9 vs. 16	31 vs. 16

* = significant at 10 %, ** = significant at 5 %, *** = significant at 1 %

When we adjust the current ratios by industry averages we see that all categories have substantially negative ratios. The interpretation of this is that most firms have current ratios well below what is normal in their respective industries, again not surprising given their distressed situation.

When we compare the current ratios in the different categories, we find no significant differences between any of them, though there is a slight tendency that asset selling firms have lower current ratios than firms in the other three categories. The tendency strengthens when we control for industry variations, and at the most the difference between asset selling and obligation postponing firms is significant at about 15 percent. This is however far from enough to support our hypothesis that firms with low current ratios more often end up selling assets to resolve their problems.

Another way to test the liquidity is to use Pulvino's measure of debt capacity. We have performed a similar test, where we have assigned the dummy value 1 to firms with both current ratio below and debt level above industry average, and 0 if not. The value 1 will then

indicate a firm with low debt capacity. At the bottom of Table 5.6 test statistics from the pairwise comparisons on this measure is reported. The results are similar to those we found when testing the current ratio alone. In the category Sale of assets, there seem to be more firms with low debt capacity than in the categories Liquidation, Change of capital structure and Postponed Obligations. The differences are however not significant here between any of the categories.

Hence, we have no significant evidence to support the findings of Kruse (2002) that firms with low debt capacity more often sell assets to resolve their financial problems. We also suspected liquidated firms to have lower debt capacity than debt restructuring firms, but there are no signs of this. This indicates that a firm's debt capacity in itself cannot predict the outcome of a restructuring process. The reason is probably that other factors are more important in determining the outcome.

5.1.4 Leverage

From the theory section we expected to find higher leverage among firms implementing more comprehensive restructurings. To test this we first compare the debt to capital ratio of firms in the different categories, before we compare the level of interest expenses.

5.1.4.1 Debt Ratios

Table 5.7 shows average and median figures for total debt and long-term debt to total assets. For total debt we have also controlled for industry differences as we did for the current ratios. The adjusted figures presented in the table represent debt ratios after subtracting the industry average ratio for each firm the corresponding year. Figures above zero indicate debt ratios above the industry average, and opposite for negative figures. In magnitude it can be interpreted as percentage points above or below industry average.

Table 5.7 - Leverage and Restructuring Outcomes

This table compares measures of leverage for firms in our four categories. Figures for total liabilities, long-term debt and total assets are all found in the financial statements one year prior to the credit event. The adjusted debt ratio is found by subtracting the industry average ratio from the total liabilities to total assets ratio. Panel A shows median and mean values, while Panel B shows Z-statistics from pairwise Mann-Whitney U-tests.

<i>Panel A: Median values. (Means in parentheses.)</i>						
	Sale of assets	Changes in capital structure	Postponed obligations	Liquidation		
Total Liabilities / Total Assets	0.71 (0.80)	0.79 (0.87)	0.77 (0.74)	0.67 (0.77)		
Adjusted Debt Ratio	0.17 (0.26)	0.25 (0.38)	0.21 (0.24)	0.23 (0.29)		
Long-Term Debt / Total Assets	0.48 (0.41)	0.36 (0.42)	0.37 (0.38)	0.44 (0.40)		

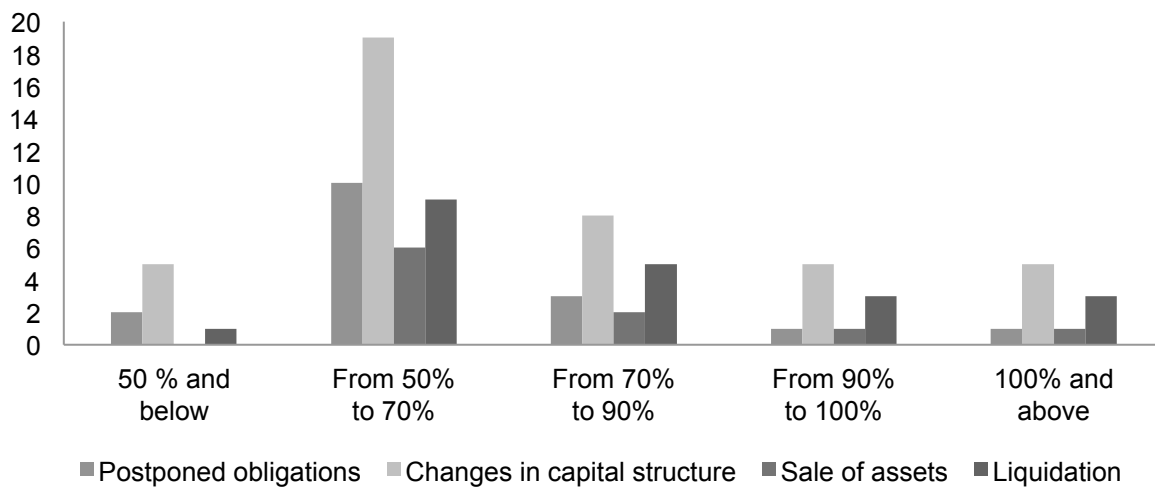
<i>Panel B: Pairwise comparison Mann-Whitney U-test Z-statistic</i>						
	Liquidation vs. Sale of assets	Liquidation vs. Capital structure	Liquidation vs. Postpone	Asset sales vs. Capital structure	Asset sales vs. Postpone	Capital structure vs. Postpone
Total Liabilities / Total Assets	-0.660	-0.270	-0.032	-0.233	0.396	0.359
Adjusted Debt Ratio	0.172	0.221	0.462	-0.052	0.089	-0.012
Long-Term Debt / Total Assets	-0.236	0.531	0.032	0.632	0.453	-0.180
# Observations	20 vs. 9	20 vs. 31	20 vs. 16	9 vs. 31	9 vs. 16	31 vs. 16

* = significant at 10 %, ** = significant at 5 %, *** = significant at 1 %

We observe that both median and average figures of total debt to assets for all categories are very high. The histogram in Figure 5.2 shows that the majority of firms in all categories have debt ratios between 50 and 90 percent, and there are also quite a lot of firms with debt ratios above both 90 and 100 percent. When the debt ratio exceeds 100 percent, the firm has negative equity. For more than 80 percent of the firms within each category the debt ratio exceed the industry average. This is not surprising, since firms in financial distress are typically characterized by having more debt than they are able to handle, either temporarily or more fundamentally.

Figure 5.2 - Distribution of debt to capital ratios

This figure illustrates number of firms in each category with debt to capital ratios in the given ranges. Firms with ratios above 100 percent have negative equity value.



What we are interested in is differences between the four different categories, but the histogram indicates that they are spread out relatively even across the groups. Mann-Whitney tests confirm this, and fail to reject the null hypotheses of no difference between the groups with wide margins'. After we control for industry differences, the categories seem even more similar as most of the test statistics are smaller. The level of long-term debt is also far from significant for any of the pairwise comparisons.

Based on this we have no reason to believe that the outcome of a distressed situation depends on the firm's leverage. High leverage is rather a determinant of why firms end up in distress in the first place, but when it has occurred, other factors play a more important role.

5.1.4.2 Interest expenses

Another variable that can give indications of whether a firm has unreasonably high leverage is how large their interest payments are. We have chosen to measure it as interest expenses relative to total sales from the firm's income statement one year prior to the credit event. This measure will indicate how large a fraction of a firm's annual income that is used to pay their ongoing financing costs. The higher this ratio is the less is the firm left with to pay other expenses. Based on this we expect firms with a high interest expense to sales ratio prior to the credit event to undergo more comprehensive restructurings or liquidate than those only postponing their obligations.

Table 5.8 - Interest Expenses and Restructuring Outcome

This table compares level of interest expenses for firms in our four categories. We measure the level of interest expenses as a ratio to total sales. All figures are found in the financial statements one year prior to the credit event. Panel A shows median and mean values, while Panel B shows Z-statistics from pairwise Mann-Whitney U-tests.

<i>Panel A: Median values. (Means in parentheses.)</i>						
	Sale of assets	Changes in capital structure	Postponed obligations	Liquidation		
Interest expense / Sales	0.58 (0.57)	0.59 (0.51)	0.33 (0.42)	0.68 (0.62)		
<i>Panel B: Pairwise comparison Mann-Whitney U-test Z-statistic</i>						
	Liquidation vs. Sale of assets	Liquidation vs. Capital structure	Liquidation vs. Postpone	Asset sales vs. Capital structure	Asset sales vs. Postpone	Capital structure vs. Postpone
Interest expense / Sales	0.424	1.389*	2.101**	0.405	1.529*	0.965
# Observations	12 vs. 7	12 vs. 28	12 vs. 16	7 vs. 28	7 vs. 16	28 vs. 16

* = significant at 10 %, ** = significant at 5 %, *** = significant at 1 %

This measure can be said to reflect both the firm's leverage and liquidity. Large interest expenses are typically a result of high leverage, and the relationship is often exponential. At the same time will high interest expenses limit a firm's liquidity, since these are payments they are obligated to meet irrespective of whether the firm is doing well or not. We should keep this in mind for the following analysis.

Table 5.8 reports medians, averages and pairwise test results for all categories on this measure. Again the average values should not be emphasized too much, since a few extreme observations skew the averages upwards for all categories. Equinox Offshore Accommodation Ltd, being one example, pulls the average of the Capital Structure Change category up dramatically with its ratio of 222. Fortunately this does not pose a problem to us when using a Mann-Whitney test, as this test only consider the ranking of the firms based on the measure, not the absolute values. We should also mention that we have excluded all observations where figures on interest expenses were unavailable. These cases only disclosed net financial costs without specifying in the notes, thus making it impossible to extract the actual interest expenses. Most of these were liquidation cases, and combined with some firms not having sales our sample size for this measure is somewhat lower. However, we still have enough observations in all classes to perform statistical tests.

Based on the medians, the Postponed Obligation category seems to have substantially less interest expenses than the other categories. The highest median is found for Sale of asset firms, with a ratio of 0.4. Also the Liquidation and Capital Structure Change category have relatively high ratios at 0.33 and 0.24, respectively.

At the bottom of Panel B, we find test statistics from our Mann-Whitney tests. As expected we find firms postponing obligations to have substantially lower interest expenses than all other categories. Compared to Liquidation and Sale of Assets the difference is significant at a 2.5 percent level, and to Change in Capital Structure at 1 percent. This indicates a very strong relation between interest expenses prior to the credit event and the scope of the restructuring. This should not come as a big surprise. If a firm has high interest expenses, this is likely to continue if their way of financing is not altered. As long as their sales figures are strong this need not be a problem, but if they experience a downturn sales are unlikely to bounce right back up the year after. To adapt to this, firms are often forced to find a cheaper way of financing. And the larger interest expenses they have, the more comprehensive must the restructuring be.

From an investor point of view this conclusion could be useful when a firm first announces a proposal for extended maturity or postponed interest payments. If their interest expenses are very high compared to sales, the probability that they later must undertake a larger restructuring is rather high. In particular if the ratio exceeds 0.2 they should be aware, according to our data. Since a more extensive restructuring deteriorates more firm value they should consider whether they should continue as creditors or sell out. One may argue that the market would take this into account and adjust the price accordingly. But for this to hold we must assume the market to be reasonably well-functioning and informed. If this is true in Norway can be questioned, as particularly the high yield bond market is thin, and such information may not be fully incorporated in the market prices.

The differences between the three most severe categories are far from significant on any levels. When a firm first has ended up with higher interest expenses than they are able to handle, the absolute level is not an important determinant of outcome anymore. This is a sensible result. Given that the firm cannot handle their financial obligations a larger restructuring is necessary. But whether this will happen as a debt and/or asset restructuring or simply by liquidation depends on other factors, like the economic viability, creditors' ability to negotiate on a solution, tangibility of assets and so on.

To summarize, high leverage itself does not seem to explain or predict the outcome of financial distress. But the interest expenses paid to the debt leveraging the firm is one of the most significant determinants to whether firms end up postponing obligations or find it necessary with more comprehensive restructurings. We had expected to see some connection between the two, since the marginal cost of debt financing is known to increase exponentially at high debt levels. The reason why this relation is absent may be that firms in the Postponed obligation category have access to cheaper financing than the other firms, despite having just as high leverage. This can have several explanations, like more proficient management in debt negotiation settings. But a more likely explanation is that they are better firms, who the creditors are more confident will recover. Our results from analyzing EBITDA margins support this, as we found the firms postponing obligations to significantly outperform the other three categories. Since creditors have access to this information they are more willing to lend funds at a lower cost, because they assess the probability of incurring losses to be smaller.

5.1.5 Asset liquidity

Based on economic reasoning and previous research we hypothesized that the firms with high degrees of intangible assets less often would be liquidated or forced to sell assets. Our data show at a five percent significance level that both the Changes in capital structure and Postponed obligations category have relatively more intangible assets than liquidated firms. However, it shows no significant difference between these two and the asset restructuring category. The Sale of assets category as well has more intangible assets than the Liquidation category at a 10 percent level.

The second determinant we use to measure asset liquidity is the relative amount of property, plant and equipment. This is in many aspects just the opposite part of the firm's fixed assets, but there are some differences that make it worth testing as well. In addition to PP&E a firm's tangible fixed assets comprise financial assets. These are often highly liquid, and hence easy to sell to generate cash. But they are also often not closely related to the core operating activities of the firm, and we would like to analyze if firms with high levels of core tangible assets more often are liquidated or sell assets.

Table 5.9 - Liquidity and Restructuring Outcome

This table compares measures of the liquidity of assets for firms in our four categories. The first measures the ratio of intangible to total assets. The second measures the amount of property, plant and equipment relative to total assets. All figures are found in the financial statements one year prior to the credit event. Panel A shows median and mean values, while Panel B shows Z-statistics from pairwise Mann-Whitney U-tests.

<i>Panel A: Median values. (Means in parentheses.) Figures in % of Total assets (TA)</i>						
	Sale of assets	Changes in capital structure	Postponed obligations	Liquidation		
Intangible / TA	0.05 (0.27)	0.04 (0.22)	0.07 (0.19)	0.00 (0.07)		
PP&E / TA	0.71 (0.51)	0.48 (0.47)	0.31 (0.40)	0.60 (0.59)		

<i>Panel B: Pairwise comparison Mann-Whitney U-test Z-statistic</i>						
	Liquidation vs. Sale of assets	Liquidation vs. Capital structure	Liquidation vs. Postpone	Asset sales vs. Capital structure	Asset sales vs. Postpone	Capital structure vs. Postpone
Intangible / TA	-1.454*	-2.169**	-1.859**	0.049	0.285	0.068
PP&E / TA	0.141	1.196	1.878**	0.178	0.679	0.561
# Observations	20 vs. 9	20 vs. 31	20 vs. 16	9 vs. 31	9 vs. 16	31 vs. 16

* = significant at 10 %, ** = significant at 5 %, *** = significant at 1 %

We expected to find that firms either being liquidated or going through an asset restructuring would have a significantly larger portion of PP&E than the others, as these are often easier to sell. From Panel A in Figure 5.9 we observe that the median values of these two categories are notably higher than for the two others. However, the only significant difference found by our Mann-Whitney tests was between the liquidation cases and those postponing obligations.

The two variables tested above indicates that liquidated firms have less intangible assets, and compared to Postponed obligations and also more property, plant and equipment. These findings are on aggregate what we expected, that firms with more liquid assets would more often be liquidated than restructured. A priori we expected to see less intangible assets among asset selling firms that those undertaking debt restructurings, but the findings above are not unexplainable. Firms selling assets have more intangibles than liquidated firms probably because they are better quality firms. The intangibles express that these firms create value beyond the sheer value of their tangible assets, while the balance sheet of liquidated firms already one year prior to the credit event reflects their limited viability. The two categories have about the same levels of PP&E, indicating that they have just as much tangible assets to sell, but asset selling firms are of better quality.

From a creditors perspective the findings above seems rational, and might express a strategy they employ when investments run into distress. Intangibles are typically more worth to the owning firm than it would be in the market, and taking the risk to restructure the company for continued operations would often enhance the recovery rate. On the other hand, for the PP&E intense distressed cases it would be easier to recover a satisfactory amount at low risk by liquidating the firm.

These findings are also interesting for equity holders investing in distressed firms; their equity claim is safer the more intangible assets a firm have. This is also backed by Franks and Torous (1989) who concludes that equity owners often receive more than fair value of their claim in a restructuring. Note that these equity claims could still be diluted and we have not analyzed returns for equity owners or any of the stakeholders for that matter.

5.1.6 Size

Previous studies on U.S. data have found the size of a firm to be one of the most important determinants for the restructuring outcome. Gilson et al. (1990) find that smaller firms are less likely to conduct a successful out of court restructuring. These findings suggest that larger firms have a comparative advantage in restructurings, and since our sample, except for Marine Subsea, comprise of out of court restructurings we would expect to find that smaller firms are more likely to be liquidated than restructured. In the spirit of Gilson et al. (1990) we measure the firms' size by the total book value of assets the year prior to the event.

As we can see from panel A in Table 5.10 the total assets median for Sale of assets is lower than the rest, while Postponed obligations has the highest median, notably larger than the others. The means however are more in line with our expectations that the liquidated firms are the smallest. This is true even if we adjust for the extreme observation Frontline, which we have categorized as an asset sale and skews the average total assets for its category. The Mann-Whitney U-test however is only able to find differences between the Postponed obligations category and the rest on a five to ten percent significance level. Hence, our data suggest that larger firms are able to restructure only by postponing their obligations.

Inspired by Brown, James and Mooradian (1991) we expected large multi-division firms to use asset sales frequently when restructuring. The failure of finding such relation may be attributed to the small number of observation particularly in the Asset sale category.

Table 5.10 - Firm Size and Restructuring Outcome

This table compares measures of firm size for firms in our four categories. Size is measured in both total assets and total sales one year prior to the credit event. Panel A shows median and mean values, while Panel B shows Z-statistics from pairwise Mann-Whitney U-tests.

<i>Panel A: Median values. (Means in parentheses.) Figures in millions NOK</i>						
	Sale of assets	Changes in capital structure	Postponed obligations	Liquidation		
Total assets	627 (4 760)	1 355 (2 131)	1 741 (3 194)	1 003 (1 430)		
Sales	21 (942)	85 (646)	313 (944)	25 (171)		

<i>Panel B: Pairwise comparison Mann-Whitney U-test Z-statistic</i>						
	Liquidation vs. Sale of assets	Liquidation vs. Capital structure	Liquidation vs. Postpone	Asset sales vs. Capital structure	Asset sales vs. Postpone	Capital structure vs. Postpone
Total assets	0.519	-0.309	-1.789**	-0.534	-1.359*	-1.369*
Sales	0.000	-1.440*	-2.837***	-0.892	-1.925**	-1.527*
# Observations	20 vs. 9	20 vs. 31	20 vs. 16	9 vs. 31	9 vs. 16	31 vs. 16

* = significant at 10 %, ** = significant at 5 %, *** = significant at 1 %

Another way to measure the size of a firm is by total sales, as Chatterjee et al. (1996) does. We see from the medians in Table 5.10 that the sale of assets and liquidation categories seem to include the smallest firms. The averages however are also here skewed by Frontline that had approximately NOK 7 billion in total sales the year before restructuring. Our findings support the total assets results, that firms in the Postponed obligation category are generally larger than all the other categories. Additionally, firms restructuring by changing capital structure are generally larger than firms that are liquidated.

The reasons for our result suggesting that larger firms often resolve their problems only by postponing payments is in line with the theory presented, but our results are in one way stronger. Studies on U.S. data proves larger firms were more successful restructuring in general, while our results indicates that larger firms tend to avoid more severe restructurings. There can be several potential reasons for this, based on the same arguments made for U.S. firms. First, larger firms often have a more diversified asset base and can sustain write-downs and losses better. Second, they are more likely to have cash generating division or a division they can sell as a last resort for the creditors. Third, they often have more competent staff or can justify hiring consultants to help navigate through tough times. Additionally we would like adding a fourth argument, supported by our findings. Larger firms are more likely to have better control over financial and operational risks and competent staff to manage it.

Implying that if they foresee lower ability to meet obligations they quickly take action in order to maneuver away from a more severe restructuring.

5.1.7 Age

According to our logic the age of a firm could have an impact on the outcome of a restructuring, but no previous research has tried to find evidence for this. Our reasoning is based on older firms having more well-established relationships with stakeholders and a reputation or track record of satisfactory performance that help convince creditors to accept a restructuring proposal. We expect that older firms are less likely to be liquidated, and alternatively less likely to be forced into an asset sale.

Table 5.11 - Age and Restructuring Outcome

This table compares the firm age for firms in our four categories. We define age as the number of years between incorporation of the firm and the year of the credit event. Panel A shows median and mean values, while Panel B shows Z-statistics from pairwise Mann-Whitney U-tests.

<i>Panel A: Median values. (Means in parentheses.)</i>						
	Sale of assets	Changes in capital structure	Postponed obligations	Liquidation		
Age	10 (13)	4 (18)	4 (15)	4 (6)		
<i>Panel B: Pairwise comparison Mann-Whitney U-test Z-statistic</i>						
	Liquidation vs. Sale of assets	Liquidation vs. Capital structure	Liquidation vs. Postpone	Asset sales vs. Capital structure	Asset sales vs. Postpone	Capital structure vs. Postpone
Age	-2.097**	-1.459*	-0.724	0.905	0.826	0.478
# Observations	20 vs. 9	20 vs. 31	20 vs. 16	9 vs. 31	9 vs. 16	31 vs. 16

* = significant at 10 %, ** = significant at 5 %, *** = significant at 1 %

However, as Table 5.11 shows, the median age for the asset sales category was substantially higher, 10 years versus 4 years for the others. The average age shows a more promising picture, the two financial restructuring categories are on average the oldest and it seems that younger firms are more likely to be liquidated. Our dataset partially proves our logic right, as the z-statistic from the pairwise U-test is significant for two of the tests. Younger firms are more often liquidated than firms forced into an asset sale or changed capital structure. This result could be explained by our theory that creditors are more tractable when an old firm experiences financial distress.

One interesting result is that we fail to find a difference in age between the liquidation and postponed obligation category. This was not as expected, and looking closer at the dataset we find two different groups within the postponed obligations category, ten firms younger than five years and the remaining six firms are older than ten years. In the Liquidation category on the other hand only one out of twenty is older than ten years.

5.2 Access to bank financing

Above we have analyzed the various determinants on samples including all firms. But as we observed when examining the level of bank debt, we found notable differences between the firms with bank debt and those without. Due to this we will analyze if firms with access to bank financing are different on other parameters as well, and if the relations detected above also hold when we exclude firms without bank financing.

If a firm has access to bank financing or not is hard to firmly conclude. It may have no bank debt because it chooses to, not necessarily because it is unable to obtain it. But without any more reliable source available we assume that the firms with zero bank debt do not have access to obtain such financing.

Table 5.12 - Medians and means for firms with and without bank debt

This table reports median values of selected measures for firms with and without bank financing. The first reported figures are calculated based on firms with bank debt, while the figures for firms with zero bank financing are reported in parentheses.

	All categories	Sale of assets	Changes in capital structure	Postponed obligations	Liquidation
EBITDA/Total Assets	-0.03 (-0.03)	0.01 (-0.09)	-0.07 (-0.23)	0.03 (-0.03)	-0.09 (-0.01)
Trade Credit / TA	0.05 (0.04)	0.05 (0.08)	0.07 (0.02)	0.05 (0.02)	0.04 (0.04)
Public / Total Debt	0.35 (0.79)	0.51 (0.79)	0.32 (0.82)	0.32 (0.76)	0.40 (0.79)
Current Ratio	0.85 (0.94)	1.17 (0.13)	0.74 (0.94)	0.91 (3.77)	1.01 (0.71)
Adjusted. Current Ratio	-3.16 (-3.18)	-2.55 (-4.07)	-3.43 (-3.18)	-3.16 (0.01)	-2.57 (-2.70)
Total Liabilities / TA	0.77 (0.71)	0.70 (0.83)	0.79 (0.92)	0.77 (0.79)	0.84 (0.63)
Adjusted Debt Ratio	0.22 (0.23)	0.16 (0.32)	0.25 (0.41)	0.19 (0.40)	0.31 (0.20)
Long-term Debt / TA	0.37 (0.42)	0.48 (0.38)	0.36 (0.34)	0.23 (0.75)	0.47 (0.40)
Interest expense / Sales	0.15 (1.11)	0.33 (1.23)	0.16 (8.97)	0.07 (0.01)	0.23 (0.67)
Intangible / Total Assets	0.05 (0.00)	0.05 (0.37)	0.04 (0.21)	0.12 (0)	0.02 (0.00)
PP&E / Total Assets	0.48 (0.58)	0.81 (0.40)	0.57 (0.34)	0.27 (0.63)	0.60 (0.66)
Total assets	1200 (1300)	3 438 (246)	1 765 (689)	1622 (2300)	599 (1722)
Age	5 (3)	25 (6)	4 (3)	4 (3)	7 (3)
Number of observations	49 (27)	5 (4)	22 (9)	13 (3)	9 (11)

Table 5.12 compares median values for selected measures between firms with some bank financing and firms with no bank financing. Interestingly, there are few notable differences between the groups on an aggregate level. If better firms were given bank financing, they should on average perform better. This is true for the restructuring categories, but the liquidation firms with bank debt seem to perform worse. In total there is no reason to believe there are substantial differences. Firms without bank debt have significantly more public debt, but this is an obvious implication of the fact that without access to bank financing they must go public to get financed.

An interesting observation is that firms with bank debt have substantially lower interest expenses relative to sales than firms without bank debt. Since the latter group pays a higher cost to obtain financing they should be riskier firms according to sound economic reasoning. This implies that the level of interest expenses can indicate the quality of the firm, and thus both if the firm will obtain bank financing and if they are able to restructure successfully. It also indicates that our assumption that firms without bank debt do not have access to bank financing is reasonable, since if they could they would rather use at least some cheaper bank debt.

For the remaining variables there are no clear trends indicating that firms with access to bank financing differ substantially from the firms without bank debt. This is a noteworthy lesson by itself. When firms are in financial distress, the firms with and without bank debt are not significantly different other than for the obvious relation that firms with bank debt have more bank debt and less public financing. We should however be cautious when drawing any conclusions, as there are few observations within each category. With more observations more consistent trends may be revealed, but this is not possible here.

Even though there are few clear differences between firms with and without bank debt, we also want to analyze whether the relations we found between the various determinants and outcome above still holds when we only look at the firms with bank debt. Table 5.13 shows the results from pairwise Mann-Whitney U-tests performed on firms with bank debt only. If we compare these results with corresponding tests in the preceding sections, they find the same relations for most of the determinants. Firms postponing obligations still have better performance measures than firms in the other categories, though the only significant relation is towards Liquidation. Liquidation cases also have less intangible assets and more fixed assets that particularly the Postponed obligation category.

Table 5.13 - Mann-Whitney U-test for firms with access to bank financing

This table reports Z-statistics from pairwise Mann-Whitney U-tests between our four categories, where we have excluded all firms with zero bank debt.

	Liquidation vs. Sale of assets	Liquidation vs. Capital structure	Liquidation vs. Postpone	Asset sales vs. Capital structure	Asset sales vs. Postpone	Capital structure vs. Postpone
EBITDA / TA	-0.600	-0.522	-1.777**	0.499	-0.105	-1.838**
Adj. Trade credit / TA	0.467	-0.827	-0.924	-1.124	-1.160	-0.072
Public / Total Debt	0.067	0.914	1.569*	0.375	1.429*	0.785
Senior Secured / Total Debt	-0.214	0.571	-0.51	0.687	1.211	0.037
Senior Unsecured / Total Debt	-1.165	-1.48*	-0.444	0.132	0.703	1.229
Subordinated / Total Debt	1.403*	1.577*	1.011	0.000	-0.561	-0.343
Convertible Debt / Total Debt	0.068	1.007	1.535*	0.617	1.136	0.501
Adjusted Debt Ratio	1.025	0.610	0.772	-0.951	-0.527	0.195
Long-Term Debt / Total Assets	0.067	1.393*	1.503*	0.936	1.232	0.615
Interest exp. / Sales	0.568	-0.561	1.545*	-0.062	1.725	2.321**
Adjusted Current Ratio	0.200	0.696	0.835	0.874	0.739	0.034
Low Debt Capacity	-0.510	-0.603	-0.519	0.130	0.137	-0.277
Intangible / Total Assets	-0.886	-1.136	-1.652**	-0.312	-0.444	-0.444
Fixed Assets / Total Assets	-0.067	0.914	2.104**	0.437	0.838	0.956
Total assets	-1.400*	-2.263**	-2.771***	0.749	0.542	-0.512
Age	-1.405*	0.312	0.336	1.051	0.940	0.541

* = significant at 10 %, ** = significant at 5 %, *** = significant at 1 %

The most notable change is that there no longer are any significant differences in the level of senior secured debt. Instead the Liquidation category tends to have more subordinated debt than the other categories, where the test toward Asset sale and Change of capital structure are significant at a 90 percent confidence level. This latter finding is somewhat conflicting with our theoretical predictions, as subordinated creditors risk losing more by liquidation and is expected to try avoiding this if they can. The total level of public debt however is still larger for liquidated firms. This could indicate that if a firm has access to bank financing, it is the problem to coordinate creditors that make a restructuring fail rather than the relative negotiation strength of various creditors and their incentives. Bank debt is typically secured with the highest seniority. With many subordinated creditors there are larger discrepancies in interests between the most dominant groups of creditors. This could increase the risk of not managing to align behind a solution.

Other than this most tests give the same indications. Some are no longer significant and some are that previously were not, but this is rather due to randomness of a small sample than actual differences between the sample with and without bank debt. To summarize, we find no particular evidence that firms with access to bank financing respond differently for our examined determinants than if we consider all firms. The only indication is that the general coordination problem among creditors now is a more important determinant of outcome than the relative size of different seniority groups.

5.3 Robustness and criticism

One obvious limitation to our analysis is the size of our sample, as we have noted several times. Especially with only 9 observations in the category Asset Sales the strength of our results are somewhat limited, and we cannot be as certain that it can be generalized to the population. The small sample also limits the scope of statistical tools we are able to use. As described in the section covering statistical methods, there are several models that would enable a more comprehensive description of the relative importance and magnitude of determinants. But since the validity of the assumptions for using these models is so questionable for our sample, we found the risks of using them to outweigh their benefits.

The only additional tool we felt comfortable with besides the Mann-Whitney U-test was logistic regressions. These could in addition to the direction indicate the magnitude and relative importance of different determinants, but due to the small number of observations we are reluctant to emphasize and interpret the magnitude of coefficients too literally. When we take this stand, logit regressions do not add much more than we learn from the U-tests, and based on this the logit regressions should primarily be used for confirming the results from the U-tests. As the z-statistics of coefficients from simple logit regressions, reported in the Appendix, indicate do these in general convey the same trends as our corresponding U-tests reported above. This contributes to strengthen our conclusions.

Still, we acknowledge that interpreting results based on so few observations must be done with caution, and the economic differences should be emphasized more than statistical significance or the lack of such. But given the moderate size of the Norwegian bond market we must accept that the number of restructuring cases at our disposal will be limited.

Another limitation is the time period we have restricted ourselves to analyze. Ideally we should have analyzed a complete business cycle, by including more years prior to 2005. But since the market for high yield obligations, those typically involved in credit events, was so small prior to this we would not obtain many extra observations. This is confirmed by the fact that we have no observations from 2005. The limited available data as we move further back in time also reduces the feasibility of including earlier years.

Previous research on bond restructurings in Norway is very limited, and there are few to none available databases with a comprehensive overview of the high yield bond market and firms involved in credit events. Compiling a dataset including the affected firms and gathering data of sufficient quality required a significant amount of time. This limited our scope from what would be possible with a more readily available dataset.

We have not been able to find comparable research in Norway's neighboring markets such as Sweden or Denmark. These bond markets are also perceived as more developed than the Norwegian (Oslo Stock Exchange, 2006), which could give us more insights on likely developments in the Norwegian market. Either comparing our findings with such research or extending our scope to include other markets would possibly add to the significance level of our findings.

A possible source of bias in our sample is the firms experiencing financial problems close to the end of our sampling period. Since these cases are so recent we cannot be certain that the currently last restructuring attempt has solved their problems permanently. This could lead to misclassification, most obviously by categorizing a firm to have postponed obligations when they later must undertake a more comprehensive restructuring. But since none of our recent observations have been categorized as postponing obligations we do not fear this to be a big problem.

Another possible bias relates to the quality of our financial accounting data, especially for liquidated firms. We had to exclude several liquidation cases, since they had not finished any financial statement before they went bankrupt. And those we kept often had less detailed data than we wanted. Since these financial statements typically are not as worked through, we cannot guarantee for the quality and precision of the data.

6. Conclusions

The purpose of this thesis has been to identify determinants explaining restructuring outcomes for financially distressed firms in the Norwegian bond market. This includes both Norwegian firms and foreign firms issuing bonds in the Norwegian market. We have restricted the time period to bonds issued in the seven-year period from January 1st 2005 to December 31st 2011.

We identified 81 firms involved in a distressed credit event leading either to liquidation or some sort of restructuring in this period. Due to very insufficient available data on a few of these we were forced to drop five firms from our sample. This left us with a final sample for analysis of 76 firms. Out of these 9 were restructured by selling assets or parts of the business. 31 restructured their debt contracts in a way that altered the post-restructuring capital structure. 16 firms managed to resolve the financial distress by postponing their obligations for some time, while 20 firms were forced to liquidate. We have restricted ourselves to look at the first successful restructuring for each firm.

Based on historical financial accounting data for these firms, we tested the significance of possible determinants that could distinguish these categories. We found the category of firms postponing obligations to stand out in many ways. They performed significantly better prior to the credit event than other firms measured by EBITDA to total assets. They were also significantly larger measured both in total assets and sales than firms in the other categories. Third, we found their interest expenses to sales to be significantly lower than for other firms, indicating that the degree of distress is less severe for these firms.

Creditor coordination problems have been treated extensively in previous research, but primarily on U.S. data. Our findings support much of this research, but somewhat surprisingly fail to find some relations too. Liquidated firms are financed by significantly more public debt than firms succeeding with a debt restructuring, and also have significantly more senior secured bonds. Both these findings are as expected. Public debt, with more dispersed owners, makes it harder to unite creditors behind a solution. Senior secured bondholders also have less to lose by liquidating the firm.

Previous research has found strong negative relations between the level of trade credit and success of out-of-court restructuring, but we fail to find any such relation. An explanation

may be the lack of a well-functioning Chapter 11 framework in Norway. Since trade credits constitutes relatively small claims on the firm, larger creditors are better served by forgiving some of their own claims than liquidating or going through a public debt negotiation, since the latter alternatives may deteriorate more of their values.

Asset liquidity is found to be an important determinant of outcome. Liquidated firms have significantly less intangible assets than firms succeeding with a debt restructuring. Since tangible assets are easier to convert to cash, creditors lose less by liquidating such firms. Asset selling firms also have more intangibles than liquidated firms, but just as much property, plant and equipment. This indicates that their assets are just as liquid, but that they are more economically viable.

Apart from the statistically significant determinants, other interesting observations have been made. Virtually all firms in our sample have current ratios below industry average, but when a firm first has encountered financial problems, liquidity ratios cannot predict the outcome. The same is true for leverage, if we measure the debt level alone. Most of our firms have debt above industry average, but there are no significant differences between the groups.

Among the liquidated firms significantly fewer have access to bank financing than firms in the debt restructuring categories. The relative amount of bank debt to total liabilities is of less importance. However, given that a firm has bank debt, the banks seem to be reluctant to forgive debt, increasing the risk of liquidation as the level of bank debt increases.

We also analyzed if the outcome for firms with access to bank financing depend on other determinants than firms in general. Our findings suggest that many of the same determinants affect outcome regardless of bank debt access. However, when there are multiple creditor classes, the coordination problem seems to be more important than the relative size of the classes in determining outcome when bank debt is involved.

We have not found space in our thesis to analyze differences in returns or post-restructuring performance. With more available time and resources we would have looked into this, as it is a very interesting topic. However, the limited liquidity of the Norwegian bond market with few reliable market price quotations, especially for high yield bonds, requires a more sophisticated pricing method. Another classification of firms would also be appropriate for this analysis.

With more resources there are also a number of determinants we would find it interesting to test, like shadow ratings by credit analysts, investment activities prior to the credit events and the share of domestic versus international owners of the bonds if we had access to such data.

Another topic we would include with a wider scope was how bonds repaid at maturity without any credit events differs from our sample. It would be interesting to analyze whether financial data or other characteristics at time of issue can predict whether a bond will default or perform as intended. It would also be interesting to conduct a similar analysis as ours in some years' time. Then the analysis could be based on a larger sample, we could span over a complete business cycle, and the bond market would probably be more mature and well-functioning.

7. Appendix

7.1 Results from logistic regressions

In addition to the Mann-Whitney U-tests reported in the Findings section we ran simple logistic regressions on the same determinants. The models are constructed as pairwise comparisons using only one explanatory variable at the time. Multinomial logit regressions would allow including all categories in one regression, but to make the results more directly comparable to the Mann-Whitney tests binomial logit regressions are used.

An example model comparing the EBITDA to sales ratio between Liquidation and Sale of assets can be written

$$P(Liquidation|\mathbf{x}) = \beta_0 + \beta_1 EBITDA/Sales + \epsilon$$

Here Liquidation is the target group. We are interested in the significance of the EIBTDA/Sales coefficient. A positive β_1 would indicate that a larger EBITDA margin increases the probability of Liquidation and a negative β_1 would indicate the opposite. As discussed in the section on statistical method we are reluctant to interpret the coefficient too literally, due to the small sample size. Since we are more interested in the trend it indicates rather than absolute magnitude we have only reported the corresponding z-statistic for significance of the coefficient below. A negative z-statistic indicates that the explanatory variable is negatively correlated with the target group, which is the first mentioned in each heading, in the pairwise comparison.

When comparing the results to the corresponding Mann-Whitney U-tests, the logit regressions convey most of the same trends. Some determinants are not significant using logit regressions and opposite, but the general trends are more or less the same. This lends support to the conclusions and arguments we posed in the findings section.

Table 7.1 – Logistic regressions

	Liquidation vs. Sale of assets	Liquidation vs. Capital structure	Liquidation vs. Postpone	Asset sales vs. Capital structure	Asset sales vs. Postpone	Capital structure vs. Postpone
EBITDA / Sales (1yr)	0.96	0.80	-0.87	0.16	-0.76	-0.90
EBITDA / TA (1yr)	-0.08	1.210	-1.470*	0.870	-1.480*	-2.09**
EBITDA / Sales (2yr)	0.60	0.04	-0.79	-0.33	-0.97	-0.82
EBITDA / TA (2yr)	0.04	0.88	-1.74**	0.64	-1.64*	-2.20**
Trade credit / TA	-0.60	-0.70	0.41	0.18	0.88	1.11
Adj. Trade credit / TA	-0.54	-0.39	-0.27	0.39	0.42	0.12
Bank Debt / Tot Debt	0.13	-0.56	-0.80	-0.60	-0.90	-0.36
Bank Debt (<0) / Total Debt	0.67	0.71	0.68	-0.14	-0.13	0.03
Public / Total Debt	0.51	1.36*	1.99**	0.56	1.26	1.04
# of public contracts	0.23	0.00	1.41*	-0.17	0.66	0.90
Senior Secured / Total Debt	0.49	1.89**	1.39*	0.47	0.73	-0.27
Senior Unsecured / Total Debt	-0.15	-0.51	1.05	-0.24	1.20	1.46*
Subordinated / Total Debt	-0.08	-0.68	-0.38	-0.53	-0.19	0.29
Convertible Debt / Total Debt	-1.91**	-1.15	0.222	1.08	1.83**	1.19
Total Debt / TA	-0.30	-0.68	0.36	-0.34	0.77	0.80
Adjusted Debt Ratio	0.28	-0.59	0.59	-0.54	0.25	0.80
Long-Term Debt / Total Assets	-0.14	-0.20	0.20	-0.04	0.29	0.33
Interest exp. / Sales	0.39	-0.47	0.77	-0.60	-0.25	-0.99
Current Ratio	0.70	0.79	0.79	-0.76	0.36	0.82
Adjusted Current Ratio	0.70	0.83	0.78	0.73	-0.43	0.65
Low Debt Capacity	-0.83	0.13	0.42	0.94	1.08	0.46
Intangible / Total Assets	-1.93**	-1.89**	-1.76**	0.49	0.71	0.30
Fixed Assets / Total Assets	0.64	1.32*	1.87**	0.30	0.76	0.66
Total assets	-1.39*	-1.02	-1.41*	1.41*	0.65	-1.03
Age	-2.04**	-1.03	-1.30*	-0.37	-0.17	0.34

* = significant at 10 %, ** = significant at 5 %, *** = significant at 1 %

7.2 Potential determinants of outcome not tested

7.2.1 Ratings

An interesting variable to test would be the rating of firms, both at the time they issue the bonds involved in the restructuring and at the time of default. This could tell us whether ratings can predict a default in the future, or if it can predict the outcome given default. Barely any of our firms are rated by the major credit rating agencies. There are however ratings on several firms performed by various brokerage houses, and most of these are recorded in a database facilitated by The Norwegian Fund and Asset Management Association. But for many firms the ratings are seldom or never updated. There are also a non-negligible number of firms in our sample that never have been rated. This would make it impossible to consistently attribute ratings to firms either at time of issue or time of default, and based on such data we would not be able to perform any meaningful analysis.

7.2.2 Share of foreign vs. Norwegian creditors

One may hypothesize that Norwegian and foreign creditors behave differently in a renegotiation process, either due to fundamental cultural differences or because Norwegian creditors connect better with the debtor and the trustee. If this is true, the share of foreign vs. Norwegian creditors at time of default could be an important determinant for the outcome of distress. This information may be available for listed bonds through VPS (Verdipapirsentralen), but only about 2/3 of the bonds in our sample are listed. To attain this information at time of default for the non-listed firms would be too challenging given our restricted time and resources. With an already small sample size we could not afford omitting so many observations for such an analysis, even though this potential relation undoubtedly is among the most interesting.

7.2.3 The number of banks involved

In our analysis we have used the amount of bank debt relative to other sources of financing. But it would also be interesting to look at the number of banks involved in the firm at the time of default. As the number of involved banks increase, the coordination problem will increase in a similar way as for public debt. Being able to control for this could both clarify the effect of bank debt itself and say something about how large the coordination problems among banks are in debt negotiation processes. Unfortunately, most annual reports do not

disclose how many banks the firm has credit facilities at. A database of bank loans in Norway does exist, but since we were not guaranteed access to this database we chose not to pursue this further.

7.2.4 Time to maturity

The remaining time to maturity at default, original time to maturity and remaining relative to original time to maturity could be interesting determinants to test. It makes sense from an economical perspective that bondholders act differently in a restructuring depending on the remaining time to maturity. However, given our restructuring categories there are arguments in both directions for all our categories to have shorter or longer time to maturity at the restructuring date. We have not been successful in finding a way to control for these effects and consequently unable to construct a credible hypothesis.

7.2.5 Time spent under restructuring

One of the determinants used in international research is the time spent on the restructuring process and its effects on final outcome (Moulton et.al. 1993). The problem with testing this on Norwegian data is that there are only a few public restructuring cases. Most restructuring cases in the Norwegian market are kept quiet until the majority of the bondholders agree with the process and if such processes exist than the bondholders' meetings, where the suggestion is put to a vote, seem as formalities.

7.2.6 Shareholder involvement in the restructuring process

In some cases the restructuring solution has involved participation from shareholders, though issuing of new shares. It could be that firms where shareholders are involved in the restructuring distinguish themselves from the others. But given our approach and categorization analyzing this is not feasible. It would require another categorization, and rather an analysis of the differences in characteristics between these firms and others, which we find to be outside the scope of this thesis.

7.2.7 Industries

Brekke and Haugland (2010) found that the oil and gas and oil service industries were slightly overrepresented among defaulting firms relative to their total outstanding amount. It could be that certain industries are overrepresented in some our categories in a similar

manner. But using it as a determinant is not a good idea. Firms in the same industry typically have similar characteristics, but using it as a variable could blur the effect of the underlying variables, like asset liquidity. These underlying variables are both more precise and interesting to analyze. Secondly, we do not have enough observations in most industries to make any statistical comparisons.

7.3 Complete High Yield Sample

Table 7.2 – High Yield Sample

<i>High Yield Sample</i>			
AB Stena Metall Finans	Eastern Echo Holding Plc	Monitor Oil PLC	Seabird Exploration PLC
Aberdeen Bergerveien 12 AS	EDB Ergogroup ASA	Mosvold Drilling Ltd	SeaDragon Offshore Ltd
Aberdeen Eiendom Holding	Eitzen Chemical ASA	Mosvold Supply Plc	Seadrill Ltd
Norden/ Baltikum AS	Eitzen Maritime Services ASA	Movar IKS	Seadrill Norge AS
Ability Drilling ASA	Electromagnetic Geoservices ASA	MPF Corp Ltd	Seametric International AS
Aker ASA	Eltek ASA	MPU Offshore Lift ASA	Sevan Drilling Invest AS
Aker Biomarine ASA	Emerging Europe Land Development AS	Nattopharma ASA	Sevan Marine ASA
Aker Floating Production ASA	Enovation Resources Ltd	Neptune Marine Invest AS	Ship Finance International Limited
Aker Invest II KS	EOAL Cyprus Holdings Limited	Nextgentel Holding ASA	Sinoceanic Shipping ASA
Aladdin Oil & Gas Company ASA	Equinox Offshore Accomodation Limited	Nexus Floating Production Ltd	Sinvest AS
Altinex ASA	Estatia Resort Property AS	Njord Gas Infrastructure AS	Skdp 1 Ltd Cyprus
Altinex Oil Norway AS	Fairstar Heavy Transport NV	NOR Energy AS	Software Innovation AS
American Shipping Company ASA	Farstad Shipping ASA	Nordic Heavy Lift ASA	Sogndal Eigedomsselskap AS
APL ASA	Fauske Kommune	Nordic Mining ASA	Solstad Offshore ASA
Apptix ASA	Fesil AS	Nordic Ocean AS	Solstad Rederi II AS
Arrow Seismic ASA	Finnmark Bompengeselskap AS	Nordkapp Bompengeselskap AS	Solor Bioenergi
AS Alsten Fastlandsforbindelse	Fjellstrand AS	Norgani Hotels AS	Infrastruktur AS
AS Fastlandsfinans	Floatel Superior Ltd.	Norse Energy Corp. ASA	Songa Floating Production ASA
AS Fjellinjen	FPS OCEAN AS	Norske Skogindustrier ASA	Songa Offshore SE
Atlantic Oilfield Services Ltd	Fram Exploration ASA	North Atlantic Drilling Limited	Spectrum ASA
Austevoll Seafood ASA	Fred Olsen Energy ASA	Northern Offshore LTD	Standard Drilling ASA
Avantor AS	Frigstad Discoverer Invest Ltd (BVI)	Norwegian Air Shuttle ASA	StepStone AS
B&H Ocean Carrier Ltd.	Front Exploration AS	Norwegian Car Carriers ASA	Stolt-Nielsen Limited
Banetele AS	Frontier Drilling AS	Norwegian Energy Company ASA	Storebælt AS
Bassdrill Alpha Ltd	Frontline Ltd	Ocean Rig ASA	STX Europe AS
Bayerngas Produksjon Norge AS	Funcom N.V.	Ocean Rig UDW Inc.	Sunnhordland Bru- og Tunnelselskap AS
BB Finans ASA	Gamle Holding AS	Oceanlink Ltd	Svithoid Tankers AB
Belships ASA	Geopard A/S	Oceanteam Shipping ASA	Synnøve Finden AS
Bergen Group ASA	Glamox ASA	Odfjell SE	Solvtrans Rederi AS
Bergen Oilfield Services AS	Global Rig Company ASA	Offshore Heavy Transport AS	Tandberg Data ASA
BIR AS	Golden Close Maritime Corp Ltd	Olympic Ship AS	Tandberg Storage ASA
Blom ASA	Golden Ocean Group Ltd	Onetwocom AB (publ)	Teekay Offshore Partners L.p.
Bluestone Offshore Pte Ltd	Grieg Seafood ASA	Oren Oil ASA	Telio Holding ASA
Bluewater Holding B.V.			Thule Drilling AS

Boa OCV AS	Hambo Ab Oy	Oslofjordtunnelen AS	TMG International AB Tordenskjold ASA konkursbo
Bonheur ASA	Havila AS	Osterøy Bruselskap AS	
Borgestad ASA	Havila Shipping ASA	PA Resources AB	Transeuro Energy Corp Transocean Norway Drilling AS TrollDrilling & Services Ltd Trøndelag Bomveiselskap AS
BW Gas AS	Heritage Oil Corp	Panoro Energy ASA	
Camo AS	Hexagon Composites ASA Hitra Frøya	Peterson AS	
Cecon ASA	Fastlandssamband AS	PetroBakken Energy Ltd Petrobank Energy and Resources Ltd.	TTS Group ASA
Chloe Marine Corporation Ltd Club Cruise Entertainment & Travelling Services Eu	Host Hoteleiemdom AS Hurtigruten ASA	Petrojack ASA	Umoe AS
Codfarmers ASA	I. M. Skaugen SE	Petroleum Geo-Services ASA	Vadsø Vann og Avløp KF
Color Group AS	IBB Byg AS	Petrolia ASA	Valhalla Oil and Gas AS Valiant Petroleum Holdings AS
COSL Drilling Europe AS	Ibsenkvarålet Hjemmel AS	PetroMena ASA	
COSL Drilling Semi AS	Ignis AS Interoil Exploration and Production ASA	Petrominerales Ltd	Vann AS
Crew Gold Corp	J. Lauritzen A/S	PetroProd Ltd	Venture Drilling AS Vestfjorden Avløpsselskap (VEAS)
Dana Petroleum Norway AS	Jason Shipping ASA	PetroRig III	Viken Fibernet AS
Danmarks Radio	Jasper Explorer PLC	Polarcus Alima AS	Viking Drilling ASA
Dannemora Mineral AB	KCA DEUTAG Offshore AS	Polarcus Ltd (Cayman Islands) Primorsk International Shipping Ltd	Villa Organic AS
Davie Holding AS	Kragerø Fjordbåtselskap AS	Prosafe SE Realkapital European Opportunity AS	Visma AS
DDI Holding AS	Krillsea Group AS	Reitan Handel AS	Vmetro ASA
Deep Drilling 1 Pte. Ltd	Kungsleden AB (publ.)	Rem Offshore ASA Remedial (Cyprus) Public Company Limited	Volstad Maritime AS
Deep Sea Bergen Invest AS	Kverneland ASA Larvik Kommunale Eiendom KF	Remedial Cayman Limited Renewable Energy Corporation ASA Reservoir Exploration Technology ASA	Wega Mining AS Wentworth Resources Limited
Deep Sea Supply AS	Levanger Rådhus AS	Ringsaker kommune	Wilh. Wilhelmsen ASA
Deeptune AS	LK Holding I AS	Rocksourc ASA	Ziebel AS
Delphin Kreuzfahrten	London Mining Plc Lotos Exploration and Production Norge AS	Rowan Drilling Norway AS	Norwegian Property ASA
Det Norske Oljeselskap ASA	Malka Oil AB MARACC - Marine Accurate Well ASA	Roxar AS	Selvaag Bolig ASA
Didon Tunisia Ltd	Marine Harvest ASA	Rubicon Offshore Holdings	Morpol ASA
DNO International ASA	Marine Subsea AS Marine Subsea Cyprus Holding Ltd	Safetel AS	Subsea 7 Inc.
Dockwise Ltd.	Master Marine AS	Scan Geophysical ASA Scandinavian Airlines System Denmark - Norway - Sw	Umoe Bioenergy ASA
DOF ASA	Metalkraft AS Middle East Jackup I Company	Sea Production Ltd	Wintershall Norge ASA
Dof Subsea AS			Handelseiendom II AS
Domstein ASA			Proserv Group AS
DP Producer AS			
DSB			
DSB S-Tog A/S			
Eastern Drilling ASA			

7.4 Exchange rates used for conversion

This table summarizes the exchange rates used for converting annual report figures in foreign currencies to NOK. Panel A shows the implied exchange rates from the SNF database, which we was used to the extent possible to secure consistency. Panel B shows year-end closing rates retrieved from Yahoo! Finance. A further explanation of how the exchange rates are uses is found in the Data section.

Table 7.3 – Exchange rates

<i>Panel A: Implied exchange rates from the SNF Database</i>				
	USDNOK	EURNOK	CADNOK	SEKNOK
2006	-	-	-	-
2007	5.404	-	-	-
2008	6.999	9.867	-	-
2009	5.757	-	-	-
2010	5.849	-	-	-
2011	-	-	-	-
<i>Panel B: Official year-end exchange rates</i>				
	USDNOK	EURNOK	CADNOK	SEKNOK
2006	6.228	8.187	5.383	0.910
2007	5.432	7.932	5.469	0.840
2008	6.958	9.710	5.731	0.887
2009	5.781	8.282	5.522	0.807
2010	5.824	7.795	5.839	0.868
2011	5.979	7.744	5.852	0.868

7.5 Filtering process

The table describes the process of finding bond issues that have been involved in credit events. We start out with every bond in the Stamdata database, which is approximately 90 percent of the bond market (Oslo Stock Exchange, 2006). The filters applied are shown in the column to the left and the remaining bonds are shown on the same line.

Table 7.4 – Filtering process

	Issues	Volume (mNOK)	
Bond issues from '93 – '11	16 178	6 884 384	
Filter	Remaining issues	Remaining volume (mNOK)	
Maturity after 01.01.05 and settlement before 31.12.11	11 615	5 541 827	
Bank	6 761	4 195 507	
Finance	5 878	3 374 885	
Utilities	4 840	3 089 185	
Public Sector	2 144	603 656	
Insurance	2 140	603 004	
Under mNOK 30	2 139	603 004	
Determined as investment grade by Pareto	771	291 051	
Added back to sample	Issuers	Issues	Volume (mNOK)
Firms from Pareto High Yield Bond Report 12	266	786	298 219
Final Sample	Issuers	Issues	Volume (mNOK)
Firms involved in credit events	81	243	78 939
Debt involved in credit events with sufficient data	76	145	55 391

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