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Did the '08 financial crisis change the Norwegian bond market?

Comparing the equity effect of a new debt issue for the period before and after 2008-2009 in the Norwegian bond market

By

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and

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Abstract

Since the beginning of the 21th century, there has been a great development in the Norwegian bond market. It has gone from a small market with few, usually government controlled, issuers, to a market characterized by large issue volumes of high yield corporate bonds. When a market experiences higher activity, the efficiency in the market should increase. There is a casual relationship between the issuance of new debt and the equity value of the firm. In this thesis we are investigating whether the financial crisis in 2008 had an impact on the valuation effect of a new bond issue. To this end we conduct an event study looking at firms listed on the Oslo Stock Exchange, comparing the equity market reaction to new bond issues before and after the crisis. We find that before the crisis new bond issues lead to a significant negative equity response, while after the crisis a new bond issue had no significant effect. This suggest that the Norwegian bond market has become more efficient.

Preface

This master thesis concludes our Master of Science degree with specialization in Economic Analysis and Applied Finance at the University of Stavanger Business School. The topic is motivated by the increase in the activity in the bond market, seen in the Norwegian bond market the last 10 years. Our objective is to share light on the development by comparing the time periods before and after the crises, to get a broader understanding of the efficiency of the bond market.

Six months ago we started this research out of interest for the development in the bond market. It turned out to be long battle, with glorious and less glorious days, against excel sheets, dusty articles and procrastination. This paper is the results of this long process. It will never fully express the long days spent working in the hope for good results, and the sadness and tiredness with each failed attempt, and the joy of the final results.

We would like to thank our supervisor Bernt Arne Ødegaard for his inspiration that lead us to pursue this topic, providing us with a great deal of good advice and guidance along the way. We would also like to thank each other for a great partnership thorough the process. Lastly, we would like to express thanks to friends and family for being here for us, although they did not understand much of this thesis.

Stavanger, June 13, 2014

Erika Christie Berle   Helga Christin Ersland

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1 Introduction and summary

The last 25 years the global bond markets have changed dramatically. According to analysis by Morgan and Standly (2012), the market has grown significantly from 15.4 trillion USD in 1989 to 99.5 trillion USD in 2011. However, the financial crisis from 2008-2009 had a large impact on all financial markets, including bond markets. When the bond market becomes a major source of funds, there is broad evidence that it will affect the equity market. Gebhardt, Hvidkjaer and Swaminathan (2005) points out that bonds and stocks have the same underlying operating cash flows and are affected by the same company fundamentals. Because bonds cannot move independently of equities, correlations between new bond issues and the equity market should be expected. The direction of the correlation is however a topic of discussion. In an efficient bond market the equity response to a new bond issue should be close to zero. However, the bond market has a reputation of being quite inefficient because of low activity. Therefore it can be interesting looking at the Norwegian bond market that has grown by 70 percent in outstanding volumes from 2000 to 2010 (Haugen 2013). During the financial crisis, there were several events that might have affected the capital inflow to the bond market, among other banking regulations and the establishing of government bond fund. The change in activity in the market suggest that the market has become more efficient. A more efficient market opens up for better ways of accessing new capital and could increase the bond markets position as a way of achieving new financing.
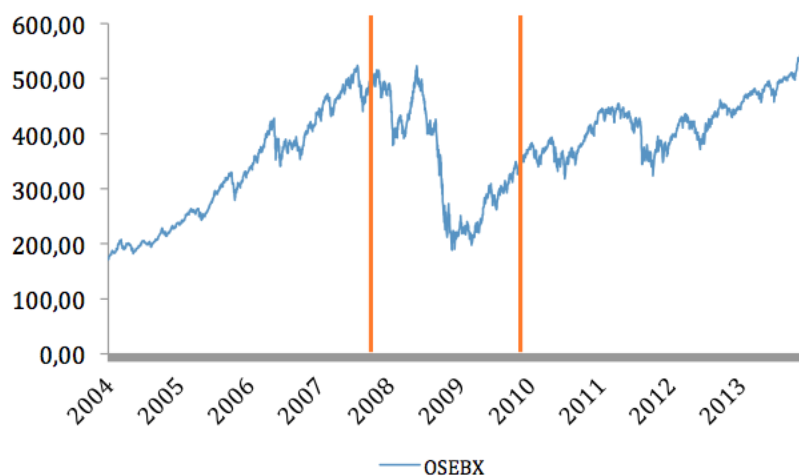

Figure 1: The Oslo Stock Exchange benchmark index fluctuations for the sample period

This paper look at the effect on equity value when firm issue a new bond. We examine the impact

of new bond issue on the equity returns 4 years before and 4 years after the financial crisis of the issuing companies on the Oslo Stock Exchange. The article aims to contribute to existing research by the comparison of two different periods, before and after 2008-2009 (see figure 1). This is important because the heated bond market might suggest that the market has gone from an inefficient to more efficient market. As far as we know there has been no study that compare pre- and post- crisis respond to new debt issue. In order to distinguish between negative, zero and positive impact hypothesis, the cross-sectional average abnormal return associated with debt offerings is examined.

Our finding suggest that the bond market has become more efficient. The main findings are illustrated in figure 2. Using the market model to calculate abnormal return, we find that the response to a new bond issue has been significantly reduced after the financial crisis. Before the crisis the equity respond to a new bond issue was significantly negative. After the crisis the impact of a new bond issue cannot be distinguished from zero. We conclude that the bond market has become more efficient, and relate the change in effect to increased capital inflow as a result of amongst others, changes in regulation, changes in the determinants of the bond prices and banking regulations.
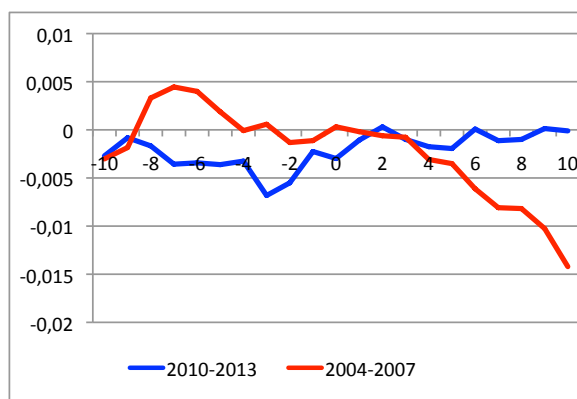
Figure 2: The cumulative average abnormal returns for the period before and after the crisis

The paper is structured as follows. In the first part we review earlier research on firms capital structure, starting with the general capital structure theory and evidence from earlier research. The second part give a brief introduction to the development in the Norwegian bond market from 21 century. The third part characterize events occurring under and after the financial crisis that might effect the equity response of new bond issues. This section includes regulation effects, credit risk and illiquidity. The fourth part describe our sample strategy. The fifth part describe the empirical testing strategy in

relation to new bond issues. The sixth part interpret our findings and sample strategy. The last part is left open for discussion, conclusion and topics for further research.

2 Underlying theories and empirical evidence on the effect of bond issuance and its determinants

To understand why there is an equity response to a new bond issue, we have to understand why capital structure matters in the first place. This chapter starts with a brief introduction to capital structure theory and continues with empirical evidence from earlier research on the equity effect of new bond issues (for a more in-depth analysis see Myers, 2001).

2.1 Capital structure theory

Capital structure theory tries to understand and explain the way a corporation finances its assets through some combination of equity, debt, or hybrid securities. Most of the studies look at the proportion of debt vs equity. In general, there are several capital structure theories. However, there is no optimal theory that capture every aspect that drives thousand of corporations debt versus equity choices. Instead there are several theories, each more or less helpful depending on the specific attributes of the companies. For companies with high cost of financial distress equity financing might be the first choice, while for corporation with low financial distress and relatively safe assets it makes sense to lever up to gain tax advantages.

2.1.1 Modigliani and Miller

Modigliani and Miller (1958) show that in perfect capital markets financing decisions does not matter. Their first proposition states that a firms value is derived from its real assets, not by the securities it issues. Such that capital structure is irrelevant as long as the firms investment decisions are taken as given. Proposition 1 state that the cost of capital for the firm is constant, regardless of debt ratio and type of security. The economic intuition is quite simple; the value of the pie, does not depend on how it is sliced. However, it is hard to test the MM propositions because capital markets are not sufficiently perfect. Myers (2001) however, bring the attention to the numerous innovation in design of securities and financing schemes. If financing tactics never added value for the firm, there would be no incentive to innovate. "The propositions say that financing does not affect value expect for specifically identified costs or imperfections" (Myers, 2001, pp. 86).

2.1.2   Tradeoff theory

The tradeoff theory states that a firm seek debt levels that balance the tax advantage of additional debt, against the costs of possible financial distress. The costs of financial distress refer to the costs of bankruptcy or reorganization. As pointed out by Myers (2001), the tradeoff theory is in trouble. A value maximizing should never pass up interest tax shields when the probability of financial distress is low. So can the trade-off theory explain how companies actually behave? In one way, yes it can. The trade-off theory explains many industry differences in capital structure. High tech companies where assets are intangible, usually have low debt ratios, where airlines usually have higher debt ratios, because assets are tangible and relatively safe. But on the other side, trade-off theory does not explain why some of the superior credit ranking firms operates with low debt ratios, including Google and Merck. It appears that public companies rarely make shifts in capital structure due to tax advantages (see Mackie-Mason, 1990), and it is difficult to detect the present value of interest tax shield in the value of the company. Lemmon, Roberts and Zender (2008) find large, long-lived, differences in capital structure of firms within the same industry even after controlling for attributes that the tradeoff theory notes as important.

2.1.3   Peking order theory

The peking order theory research the effect of asymmetric information, that managers know more about their companies perspective, risk and values than investors. The theory, developed by Myers and Majluf (1984) and Myers (1984), look at a firm with a growth opportunity that require additional financing (Myers, 2001). Asymmetric information affect the choice of financing, and give a peking order of preferred choices between internal and external financing. The issue of equity would reveal a growth opportunity with a positive net present value, but it is bad news if managers believe that the equity in place is overvalued by investors, and decide to issue overvalued shares. This would transfer the value of existing shareholders to new investors, and lead to a drop in share price. This does not however apply to high-tech industries, where the issue of once equity is preferable due to the high cost of debt issue as assets are intangible. Highlighted by Myers (2001, pp. 92) "Debt has the priori claim on assets and earnings; equity is the residual claim. Investors in debt are therefore less exposed to errors in valuing the firm. The announcement of debt issue should have a smaller downward impact on stock price

than announcement of an equity issue." A debt issuance diminish the information advantages held by the managers. An optimistic manager would rather issue debt than equity, because any attempt to sell shares will reveal that the shares are not a good buy. However, when debt is costly, for example for high-tech industries where assets are intangible, equity issues will be preferred to debt. This lead to a peking order of financing where internal is preferred to external, information asymmetries only applies to external financing, and debt is preferred to equity. A model introduced by Miller and Rock (1985) also show that internal financing outperform external financing. Miller and Rock suggest that external financing, larger than expected, reveals a cash flow lower than expected. The Miller Rock model suggest a negative correlation between the stock price and the unanticipated amount of new debt offered, while Myers and Majluf model suggest that the riskier the security issued the greater negative market value of the firm. However, Miller and Rock do not divide external financing into debt and equity.

2.1.4   Agency cost and financial objectives of the firm

All the theories above assume that the interest of the firms managers are the interest of its shareholder. This assumption however seems to be impossible in practice. Ever since Berle and Means in 1932 came up with a theory that highlighted consequences of the separation of ownership and control in public corporations, ownership structure has been a topic of interest. Jensen and Meckling (1976) develop a theory of the ownership structure of the firm. They investigate the nature of the agency costs generated by the existence of debt and outside equity. Managers, the agents, will inevitably act in their own best interest and seek higher salary and better benefits that do not necessary benefit the firm. The investors can discourage such behavior by independent consultants and managements, bonuses, and other mechanisms of monitoring, but these measures are costly and subject to decreasing returns (see Shleifer and Vishny,1989). Agency cost can also arise from conflicts between debt and equity holders. Debt holder have no interest in the income or value of risk of the firm. However, when there is a risk of default, shareholders can gain at the expense of debt investors. Equity is a residual claim, so equity holders gain when the value of debt decreases. Suppose there is a risk of default, and managers act on the interest of shareholders. In this case, managers will try to transfer value from debt holder to shareholders. There are several ways to do this, see Jensen and Meckling (1976). The potential conflicts between lenders and stockholders, first recognized by Jensen and Meckling (1976), was a

significant contribution to the tradeoff theory. Before this, the cost of financial distress was limited to the transaction costs post-bankruptcy. Jensen and Meckling (1976) highlight that a mere threat of default can affect the investment and operating decision of a firm. A higher debt ratio in a firm forces the company to pay out cash. For firms that have large cash flows and are in the danger of over investment, debt might "add value by putting the firm on a diet" (Myers (2001, pp. 98). However, increasing debt ratios more often lead to pressure from outside investors, as leverage buyouts. The signaling model assumes that corporate financing decisions communicate confidence in the future of the company. Managers are assumed to have superior information about the value of the company. Under the assumption that it is costly for low valued firm to mimic the financial structure of high-valued firms, investors could separate between high and low valued firm through capital structure (Ross, 1977; Heinkel, 1982). An unexpected increased leverage can be seen as a signal of higher expected cash flows, and therefore cause a positive reaction to new bond issues (Barclay and Smith, 2005).

2.2   Evidence from studies of bond issues

Based on the fundamental theories of capital structure, several researchers examined the equity effect of issuance of new debt. Our research ties into several strands of existing literature. The equity effect of a new bond issue has been a subject to several studies, such as Masulis (1980), Dann (1981), Vermaelen (1981), Dann and Mikkelson (1984) research on convertible securities, Eckbo (1986) on the effect of bond issue, Ghosh, Varma and Woolridge (1990) for exchangeable bonds and Ammann, Fehr and Seiz (2006) looking at convertible and exchangeable bonds. The classic survey by Smith (1986) and the article by Magennis, Watts and Wright (1998) give an overview of the literature.

Masulis (1980) used a sample of 165 offers from companies listed on the NYSE or ASE, and consider the announcement impact of changes in capital structure on security prices. He finds that firms offering to exchange debt for common stock on average experience a statistically significant increase in the stock price over a two day trading period.

For the US domestic market, Dann and Mikkelson (1984) find evidence of a negative average 2-days return of -2.31 percent when a firm offers convertible debt. They also find a small, significant negative effect of -.37 percent after a straight debt offering. However, the specific nature of the unfavorable

information is not accounted for in the article. Mikkelson and Partch (1986) also find significantly negative effect on the issuance date for the US market.

Eckbo (1986) examine the effect of over 700 leverage increasing corporate debt announcements on the market value of the issuing firm. He finds that debt offerings have a non-positive impact on the firms stock price. Eckbo (1986) does not find any correlation between abnormal return caused by straight debt issue and credit risk. Eckbos findings are as he put it "surprisingly light" with a negative impact of -.06 percent for straight debt offering, and -.2 percent on mortgage bond issuance.

Norden and Weber (2005) examine stock and credit default swap markets and the response to rating announcement by the three major rating agencies. They find that both markets have a negative response to downgrades. In addition, the size of the abnormal return depends on the old credit rating.

Ammann, Fehr, and Seiz (2006) investigate the Swiss and German market in the period from January 1996 to May 2003. They research the announcement and issuance effects of convertible and exchangeable bonds, and find significantly negative abnormal returns associated with the announcement. Interestingly, they also find that the abnormal returns "are significantly more pronounced when previous market returns have been negative" (Ammann et al 2006, pp. 2).

A study conducted by Chin and Abdullah (2013) research the effect of bond issue announcement for the Malaysian market for the period 2001-2007. They use a relatively long event window of +/- 60 days, but only find significant effect for the +/- 10 days around the announcement. Their findings support the Jensen and Meckling (1976) model of agency costs.

Magennis, Watts and Wright (1998) highlight that the issuance of debt is not associated with a significant stock price reaction in any direction. The issuance of convertible bonds and exchangeable bonds are related to a significant negative reaction, but pure equity issues is association with a stronger negative reaction.

Empirical evidence are conflicting, to the direction of the effect. While some find a positive effect, other find a negative effect. However, as discussed in the previous chapter, there might not be one theory or one direction true to all cases, it depends on the characteristics of the market, industry and the firms. In this paper we focus on the change in effect and do not investigate in depth the direction of the effect. This could be a topic for further research.

3   An overview over the Norwegian bond market

This section looks at the development of the Norwegian bond market from 2000 to 2012. The numbers for 2013 are still not available from Statistics Norway in May 2014. The numbers in this section are based upon numbers from the Norwegian Central Bank (see Haugen, 2013) and the Oslo Stock Exchange. For the last 14 years, the Norwegian bond market has gone through a significant development. From 2000 to 2012 the value of nominal value listed bonds has quadrupled. At end-2012 the total amount of bonds outstanding in the Norwegian market came to 1530 billion, where corporate non-financial bonds accounted for 270 billion, almost one fifth. In 2012, non-financial enterprises issued NOK 97 billion in bond debt, this is around 30 percent of the increase in outstanding debt (Haugen, 2013).

Between 2001 and 2005, the annual growth in bonds outstanding was around 12 percent. Then, from 2006 to 2007, the net issuance volumes rose from 35 billions in 2006 to 53 billions in 2007, an increase of 35 percent. According to Haugen (2013), the sudden high increase in growth was due to market increase in gross-issuance. From 2007 to 2011, the financial crisis took place, and the growth in volumes outstanding was limited. One explanation for this, is that much of the debt that was due during 2008 was not refinanced (rolled over). In the subsequent years, large maturities contributed to moderate growth. Activity increased again in 2012. Between 2011 and 2012, the gross volumed doubled to NOK 97 billion. In the end, the growth in 2006, 2007 and 2012 contributed to nearly 70 percent of the growth in outstanding volume for the period 2000-2012.
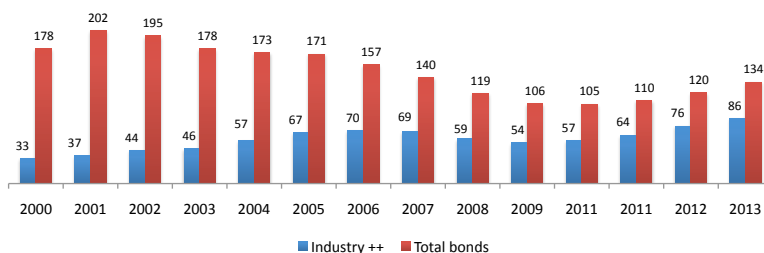

Figure 3: Number of industrial bond issues compared to number of total bond issues (statistics from the Oslo Stock Exchange, 2014)

In the early 2000s, there were between 20 and 40 companies that issued corporate bonds in the Norwegian market each year, see fig 4. According to Haugen (2013), most of the issuers were involved in

electricity production, usually utility enterprises. Another sizable group were issuers from manufacturing industries (see fig 5). Coinciding with a sharp increase in nominal values of bonds outstanding, there is an increase in number of issuers from the non-financial industries. Much of the increase from 2006 to 2007 came from companies operating in the oil and gas industry and shipping. The oil and gas sector went from 8 percent of volumes outstanding, to 32 percent in the period from 2005 to 2007. In 2012, shipping accounted for 30 percent of the growth, followed by manufacturing, utilities and property sector that each contributed around 20 percent. The property sector has become more active in the later years. According to Haugen (2013), around half of the property companies entering the market in 2012 had not been there before.

Chart 5: Volumes outstanding of corporate bonds in the Norwegian market. Corporate sector. In billions of NOK. 2000 - 2012
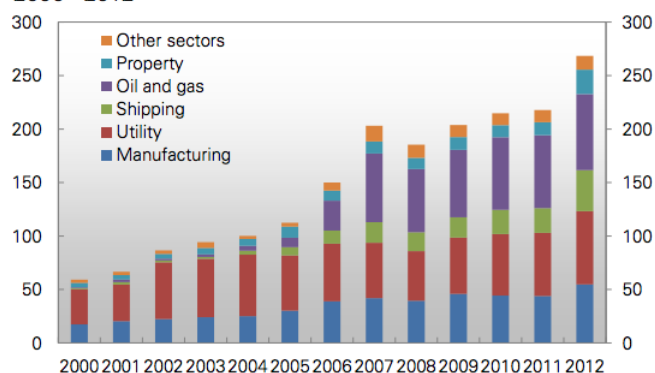
Source: Stamdata

Figure 4: Volumes outstanding of corporate bonds in the Norwegian market by sector in the period 2000 to 2012 measured in billions (from Haugen, 2013, pp. 3)

Increase in the corporate bond market also reflected another change. While the electricity and water supply industries are characterized by stable cash flows and low credit risk, many of the companies now entering the market was risky enterprises. As we can see from the graph below, high yield enterprises were responsible for most of the growth in the period right before the financial crisis (see fig 5). Before 2005, high yield companies accounted for almost 25 percent of the growth in outstanding volumes. After 2007, this share has been over 50 percent.
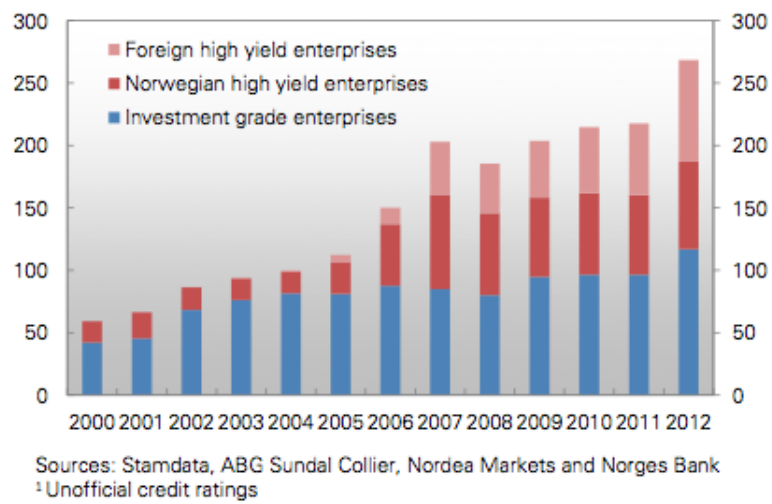
Figure 5: *Volumes outstanding of corporate bonds in the Norwegian market in billions (from Haugen, 2013, pp. 3)*

4   Changes in the period 2004-2013 that might affect the equity response to new bond issues

In order to understand why there might be an increased efficiency in the Norwegian bond market, it is important to understand the impact of the financial crisis. As pointed out by Friewald, Jankowitsch and Subrahmanyam (2012), the financial crisis of 2008 stands out from earlier crisis, due to the phase and degree to which both liquidity and credit quality detoriated. The severity of this crisis lead to changes in several factors that might result in a change in the equity response of a new debt issue. First, the change in banking regulations lead to a reduction in supply of capital, forcing companies to find alternative markets for financing. Second, the establishment of the Norwegian Government Bond Fund in 2009 increased the supply of capital to the bond market. Third, bond issues with higher yield might suggest higher credit risk. The correlation between higher credit risk and higher excess return on bonds might lead investors seeking higher payoff by investing in the bond market.

4.1   Regulation

Over the last twenty years, one of the greater changes in commercial banking industry has been the implementation of capital adequacy requirements under the guidance of the Basel framework (see Cannata and Quagliariello, 2009). However, the restrictions posed by the Basel 2 framework did, most likely, not have a significant effect before the crisis, because it was implemented in 2007, shortly before the crisis (Balterzen, 2013). Regulatory authorities generally recognize the capital adequacy requirements as an effective mechanism for controlling the risk of commercial banks. Capital requirements significantly reduce the systematic risk in the banking system, by establishing an link between the riskiness in bank assets and the amount of bank capital, which motivates banks to internalize the cost of excessive risk-taking behavior available to corporate borrowers has fallen. However, with stricter bank capital requirements the availability of credit has been limited.

Norway did not experience wide spread consequences of the financial crisis. There are several reasons for this, for example high oil prices, macroeconomic factors (see Talyor, 2012; Harvey, 2010), and transparent banking sector (Balterzen, 2013). Transactions between subsidiaries are regulated and a shadow market has never come into place as it has in the USA. In addition, the government has a

restrictive line on documentation of securities. Norway did not experience a major credit contraction as a result of the financial crisis, but there was a low growth in new bonds to corporate bond market, and in period negative. Through covered bonds Norwegian banks secured financing in a period of great international turmoil. According to Balterzen (2013), banking regulation are to a large extent harmonized within the EEA. When the EU adopt stricter capital and liquidity requirements, the harmonization will increase further. However, there is room for national adjustment to safeguard economic conditions and national characteristics.

In order to meet the stricter requirements, the banks need to hold back capital, which suggest less lending at least for the transition period. There are several research papers that find evidence for this. Ma, Lui, Dai and Huang (2013) examine the effect of stricter capital requirements on small businesses lending opportunity in China. Their finding suggest that commercial banks do discriminate against small businesses in lending operations, and capital requirements would intensify such discrimination, making it harder to obtain loans. Borrowers need other means to acquire capital, one of them being the bond market. Despite the increase in bond issuing by non financial firms, bank and mortgage lending is still the dominant source of funding for non-financial corporations. Ulltveit-Moe et al (2013) argues that in the corporate market, the banks face competition from foreign banks and large non-financial firms that have access to other funding sources. From 2000 to 2012, the value of corporate bond issued by non-financial firms more than doubled.

4.2 Credit risk

Bond issues by non-financial corporations and governments will normally give a higher yield. This is because of an increased risk of bankruptcy, that the corporation do not pay back the debt. During the last 10 years there has been a healthy development in the Norwegian bond marked, supported by high growth in the oil- and gas industry and their need for capital (Trondsgaard, 2013). The bond marked is today characterized by large issue volumes of high yield corporate bonds, see figure 5 (Haugen, 2013). High yield bonds are generally featured by higher credit risk and higher returns (see Thomas, 2013). Globally, high yield bond were among the worst performing fixed income asset classes during the financial crisis. Their value fell close to one third of the total value from the peak in October 2007 to November 2008. However, the bond market has continued to have a high performance through the crisis. This might be because of the decline in underlying risk free rates. There is a negative correlation

between bond prices and the risk free rate of return. It might also be a consequence of a weak and uneven growth in the stock market. Returns from the bond market come in three ways; reliable coupon income, rising bond prices due to low risk free rates, and tender premia as issuer refinance at lower rates (Berk and DeMarso, 2010). The combinations of relatively safe investments in the bond markets, and relatively low and volatile return in the equity market, could have increased investment in the bond market and thereby reduced illiquidity. If there is a correlation between credit risk and return on bonds, as suggested by Thomas (2013), the growth in junk bond might in itself get attention from investors. High yield bonds are still less risky than investment in stock markets, and gives a higher premium than long term treasury yields.

4.3   Illiquidity

The bond market is smaller than the stock market, and it is harder to sell in a secondary market, therefore liquidity affect the bond pricing. Junk bonds, or high yield bonds, have a higher liquidity risk because their issue size are relative small compared to investment grade issues. Moreover, many institutional investors, including pension funds, are prohibited from investing in junk bonds, further limiting the portion of potential buyers. These assumptions are supported by Friewald, Jankowitsch and Subrahmanyam (2012), who shows that the liquidity premium is expected to change over time. They find that liquidity effects account for approximately 14 percent of the market wide changes in corporation yield spread. They also find that the economic impact of liquidity is significantly larger in periods of crisis for speculative grade bonds. The growth in outstanding debt in the Norwegian bond market is mainly due to an increase of bond issuance from national and foreign risky enterprises. This could suggest that the equity effect of a new bond issue should be higher than before 2008. In 2009, the Norwegian Government established the Norwegian Government Bond Fund of NOK 50 billion, too contribute to increase liquidity and capital inflow to the Norwegian corporate bond market (Folketrygsfondet, 2014). The Funds capital can be placed in account loans, deposits and interest bearing instruments where the issuer is resident in Norway. The money cannot be invested in loans issued by local or national government. This may have reduced the illiquidity in the Norwegian bond market. Rakkestad, Skjeldtorp and Ødegaard (2012) review the overall activity in the secondary bond market for Norwegian debt securities in the period 1999-2011. They find a relationship between increased trading activity on the secondary market and an increase of new bond issues. However, they

find that the intensity of trading is quite low. On average, securities are traded 4 days per quarter. This implies that there is a large number of issues that are not traded on a quarterly basis. However, the general increase in trading activity suggest an increase in liquidity. The combination of relative safe investments in the bond market after the crisis might lead investors to seek other markets, increasing number of buyers in the bond markets and increase trade in the secondary bond market.

4.4   Information asymmetries

There is an apple - orange problem that occurs when borrowers know more than lenders, or in this case bondholders. If the risk taker cannot distinguish between high and low quality bonds, it results in higher premium for good borrowers. Strong financial companies have advantages compared to weaker companies, because they have the capital to pay higher premiums. Bond ratings are one measure to decrease premium on information. Tang (2009) examines the impact of more refined rating information on credit market access, financial decision and investment policies. He finds that firms with rating refinement upgrades, experienced a decrease in the ex-post cost of borrowing compared to those with downgrades. Higher rated firms also issued more bonds and relied on debt financing over equity, while the opposite was found for those with downgrades. The transparency related to the bond issue is obtained from public reporting of new bond issues. From 1. May 2010, Finanstilsynet took control over prospects for transferable securities, where publications of approved prospects happens as they are controlled (Finanstilsynet, 2010). However, the buy side has been quite opaque. At the Oslo Stock Exchange, over the counter transactions shall be reported to the exchange at least by the end of the trading day A well-functioning Norwegian market depends on well established regulatory framework. Strong regulation and quality could decrease bond prices.

5   Sample selection

To investigate a potential change in equity effect of new bond issues we conducted two event studies. The sample includes observations from firms listed on the Oslo Stock Exchange in the period from 2004-2013. The 372 corporate debt offerings in the data base were selected using the following procedure;

1) Produce a list over all new bond issues to be listed, found on the Oslo Stock Exchange database Newsweb. News and stock exchange notifications are registered on Newsweb in accordance with "Verdipapirloven paragraf 5-12" (Lovdata, 2014). There are a total of 1321 new bond issues after removing duplicates. Some notifications of new bond issues are not market by Ticker, but the information in the notification is enough to reveal the issuer. In these circumstances we sat the date of the market notifications as event date.

2) Companies that were not listed on the Norwegian stock exchange were sorted out, this left 1015 observations. We excluded financial institutions (banks) in the sample. This because banks are expected to issue bonds in the bond market and it should have a low effect on the stock price. After excluding banks from the sample there were 456 observations left.

3) For each firm we used Newsweb to identify the date of the first mentioning of new debt. We double checked with the The Financial Supervisory Authority of Norway, that publish all approved prospects. We found that the information was first available at Newsweb. To control for any leakage from the company we check annual reports and other financial publications. We found no leakage from public available information before the news at the Oslo Stock Exchange.

4) To calculate the abnormal return we used the Oslo Stock Exchange Benchmark Index (OSEBX), an investible index which comprises the most traded shares on the exchange.

5) We removed all observations where the company had been listed for a shorter time period than the estimation window of 252 days.

6) In some cases there were several debt issues from the same company around the same time, such that the event windows were overlapping. In this case we included only the first event. For example, Hafslund often issue bonds with 2-5 days interval. In these occasions only the first of the bond issues are included in the sample, such that the event windows do not overlap.

At the end, the sample produced consisted of 372 observations by 138 firms. Table 1 shows the annual distribution of the offerings contained in the sample by number of offerings and average issue size. The smallest issue of NOK 21 millions, and the largest was NOK 4900 millions.

A typical company issue 1.5 amount of bonds per year. The highest number of bond issued by a company in one year was 6 bonds, in the periods we are comparing. We have had some discussions around the information value of later bond issues, when a company issue several bonds in a year. It might be that the equity holders might see it as intuitive that if a company issue one bond, they are going to issue more. We did some manipulation of our sample, accounting only for the first issue every year, and found that our results were the same. However, the average abnormal return were reduced. This implies that a second and third bond issue are not expected by the market. Some researchers choose to aggregate the bond issues in one year to one single observation (see Chin et al, 2013), other do not do anything with it (see Eckbo,1986, Ammmann, Fehr and Seiz, 2006). Recognizing that our sample had a low average bond issues per year and a median of 1, we choose not to manipulate our sample.

In our sample there is a steady increase of number of bond issues and number of companies issuing, and generally illustrates the changes in the Norwegian bond market highlighted in section 3.

Table 1: Description of the annual distribution of the total sample including, Number of new issues and companies issuing, average size of bond issues, total size of bond issue and change in total bond issue

Year	Number of new issues	Number of issuing companies	Average size bond issue	Total bond size issue	Change in total size bond issue
2004	33	19	627,9	11930,74	
2005	35	21	921,2	19345,54	62 percent
2006	43	34	527,5	17934,73	-7 percent
2007	33	29	714,2	20711,1	15 percent
2008	25	16	1112,9	17806,2	-14 percent
2009	38	24	1051,2	25228,5	42 percent
2010	34	20	920,0	18400,9	-27 percent
2011	32	23	760,4	17490	-5 percent
2012	54	36	819,7	29508,495	69 percent
2013	46	31	844,1	26167,5	-11 percent

5.1   Potential clustering effects

The figure below illustrate the number of bond issues per day during the period of 2004-2013. In a 30 day period there are at the most 9 bond issues. As the figure illustrates, the issuance of new debt is

quite evenly distributed. We therefore conclude that there is little clustering potential in the sample.
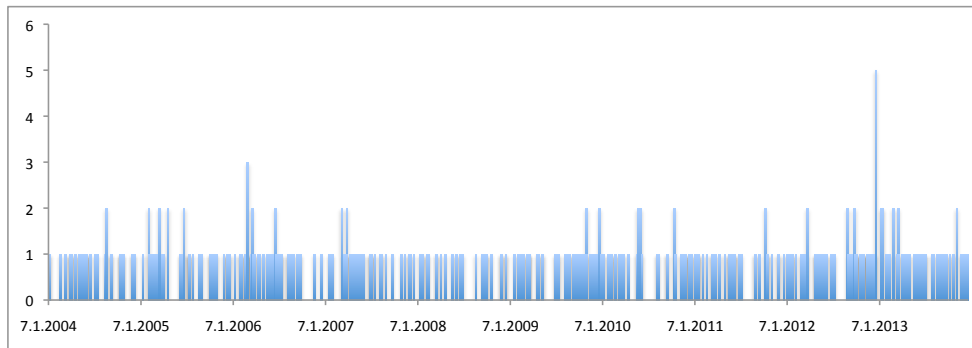

Figure 6: Number of bond issues per day during the period from 2004-2013 in our sample

6   Empirical test strategy

6.1   Event study

To measure the valuation effect of a new debt issue before and after the financial crisis, we conducted two event studies. An event study seek to uncover statistical significant market reactions to an event that could affect the value of the firm. Value of a company is defined as expected future cash flows discounted at an appropriate discount rate. An event that affect the value of the company will either have changed the expected future cash flow, the discount rate or the value effect between them. MacKinlay (1997) argues that in a rational market, the effect will be reflected in the market over a short period of time. The argument is based on the assumption that markets react quickly to new information. If this is true, it is possible to measure the effect of news over a short period of time. To distinguish between zero, positive or negative impact hypothesis of a new bond issue, the cross-sectional average abnormal return associated with the new bond issue is examined. The framework for the estimation of abnormal return is based on MacKinlay (1997), Kothari and Warner (2008) and Eckbo (1986). Returns are sorted using time τ, measured in daily arithmetic returns. The data is divided into three windows: estimation window, event window and post event window.
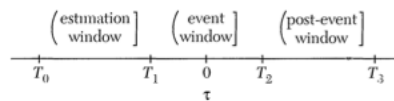
Figure 7: (from MacKinlay (1997) pp. 11)

Where $\tau = 0$ equals the event date. $\tau = T_1 + 1$ to $\tau = T_2$ is the event window and $\tau = T_0 + 1$ to $\tau = T_1$ is the estimation window. The length of the estimation window is equal to $L_1 = T_1 - T_0$, and $L_2 = T_2 - T_1$ is the length of the event window.

The estimations in this event are based on daily returns and simple arithmetic returns. Using simple returns, and not log-normal returns, opens up for aggregation over time and stock. In our sample, the estimation window and event window do not overlap. In this way, estimators for the parameters of the normal return model are not influenced by the returns around the event. Including the event window in the estimation of the normal return parameters, could lead to the event returns having a

large influence on the normal return measure. In this case, both the normal returns and the abnormal returns would capture the event (MacKinlay, 1997). It is normal to set the event window broader than just the event date, to avoid errors from uncertainty around the time of the event. For example, the information published after closing of the stock markets on the event date is not accounted for until the next trading day. In addition, a broader event window reveal over or under reactions to the information, and possible information leak prior to the notification. Brown and Warner (1985) found some normality issues related to using daily return that generally applies to long horizon event studies. They find several problems concerning thick tails, autocorrelation for event studies with long event windows. However, for event studies with short estimation windows, they found that the market model and OLS was well enough specified for statistical inference on daily data. Similar results are found by Kothari and Warner (2006). They highlight that as long as the abnormal performance is concentrated in the event window, the short horizon methods usually are quite powerful. They also underline that short-time horizon methods are less sensitive to assumptions around cross sectional time-series dependence, and the benchmark model of the normal returns. Our event window is +/- 10 days, where the event date equals the notification date of the new bond issue on the Oslo Stock Exchange. Using the definition by Kothari and Warner (2008), long estimation windows are longer than 1 year. This study has a short event window, and the biases found by Brown and Warner should not apply. Since we are looking at market reaction to a specific event, we assume that the market quickly will adapt to the new information. The estimation window is set to 252 days, which equals an average trading year. The estimation window should be long enough to give robust estimates, but short enough to give clear estimates for the event window, according to McWilliams and Siegel (1997).

6.2   Calculation of abnormal returns

An event study requires a measure of abnormal returns. Abnormal return is defined as expected return of the firm over the event study, minus the return of the firm over the event window. Following the traditional findings in the literature, the market reaction to each issue related announcement is provided by the abnormal stock returns over the trading period that follows the announcement on Newsweb.

$$R_{it} = \mu + \epsilon_{it} \tag{1}$$

μ contains all new information in the event window. It is therefore important to remove observations where there is other news at the same time. The abnormal return is the actual ex post return of the security over the event window. The normal return is defined as the expected return without conditioning on the event taking place.

$$AR_{i\tau} = R_{i\tau} - E(R_{i\tau} \mid X_\tau) \tag{2}$$

Where AR is the abnormal return, R is the actual return. The last section is the expected (normal return) for time period τ conditional on the information of the normal return model.

6.2.1   Market model

There are several ways to estimate the market return of a stock (see MacKinlay, 1997 or Kothari and Warner, 2008). We used the market model to estimate the return of the stock to the event. The abnormal return over the period is estimated using the market model. The market model relates the return of any security of the market portfolio. The return for company i at time t is equal to the sum of new information and noise.

The market model relates the return of a security to the return of the market

$$R_{it} = \alpha_i + \beta_i R_{mt} + \varepsilon_{it} \tag{3}$$

$$E(\varepsilon_{it} = 0), \ \text{var}(\varepsilon_{it}) = \sigma^2_{\varepsilon_t}$$

R_{it} and R_{mt} equals the return for period t for security i. ϵ_{it} is the zero mean disturbance term and α_i, β_i and $\sigma^2_{\epsilon_i}$ are parameters of the market model. The parameters are estimated under general conditions ordinary least squares (OLS) conditions. The OLS is efficient under the assumptions that the assets return are jointly multivariate normal, and are independently and identically distributed through time. We removed the portion of return related to the variation in the market to increase ability to detect event effects, the variance of the abnormal return is reduced. The market model parameters are estimated under OLS conditions. Given these parameters one can measure and analyze the abnormal

returns. The abnormal return over period (-10,10) is estimated using the coefficient R_{it}. Using the market model to measure the normal return we can measure and analyze abnormal returns in the event window. For the event window the abnormal return is

$$AR_{in} = R_{it} - \hat{\alpha}_i - \hat{\beta}_i R_{mn} \tag{4}$$

The abnormal return is the disturbance term of the market model. Under the null hypothesis, the abnormal return will be jointly normally distributed with a zero mean and conditional variance $\sigma^2(AR_{i\tau})$ estimated

$$\sigma^2(AR_{i\tau}) = \sigma_{\epsilon_i}^2 + \frac{1}{L_1}\left[1 + \frac{(R_{m\tau} - \hat{\mu}_m)^2}{\hat{\sigma}_m^2}\right] \tag{5}$$

The variance has two components. The first is the disturbance variance and the second is the variance due to sampling error in α and β. The measurement error lead to a serial correlation of abnormal return, despite that the true disturbance are independent over time. As the estimation window become large, this error goes toward zero as the sampling error of the parameters vanishes. The first term, the variance of abnormal returns, and the abnormal return observation will become independent over time. The estimation window is usually chosen to be large enough to assume that the contribution of the variance in the second term is zero. Under the null hypothesis, the sample abnormal return for a given observation in the event window is normally distributed with a mean equal to zero and a variance

$$AR_{i\tau} \sim N(0, \sigma^2(AR_{i\tau})) \tag{6}$$

There are two dimensions in an event study across time and across securities. To draw the overall conclusion, the abnormal return observations must be aggregated. The aggregation through time is done to accommodate a multiple period event window. The cumulative average return is the sum of the included abnormal returns for τ_1 to τ_2, where $T_1 < \tau_1 \leq \tau_2 < T_2$.

$$CAR_i(\tau_1, \tau_2) = \sum_{\tau=\tau_1}^{\tau_2} AR_{i\tau} \tag{7}$$

The estimation of the variance can be used for reasonable lengths of L_1. Abnormal returns from short estimation windows should be adjusted for the effects of the estimation error in the normal model parameters, to adjust for serial correlation. When the length of the estimation increases, the variance of CAR_i is

$$\sigma_i^2(\tau_1, \tau_2) = (\tau_2 - \tau_1 + 1)\sigma_{\epsilon_i}^2 \tag{8}$$

To test the null hypothesis we need to further aggregate across observations of the event. We assume that there is no clustering effects, i.e. that the event window for different observations does not overlap. As long as there are no overlap between the event window and the estimation window, and the distributional assumptions holds, the abnormal returns and the cumulative abnormal returns will be independent across securities. Given that there is N events, the abnormal return can be aggregated using the estimated average return from (5)

$$AAR_\tau = \frac{1}{N}\sum_{i=1}^{N} AR_{i\tau} \tag{9}$$

for large estimation windows the variance is

$$var(AAR_\tau) = \frac{1}{N^2}\sum_{i=1}^{N} \sigma_{\epsilon_i}^2 \tag{10}$$

To analyze the abnormal returns they can be aggregated across the event window. It is the same approach as for the cumulative average return for each security, but now over the aggregated abnormal return. For any interval in the event window

$$CAAR(\tau_1, \tau_2) = \sum_{\tau=\tau_1}^{\tau_2} AAR_\tau \tag{11}$$

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$$var(CAAR(\tau_1, \tau_2)) = \sum_{\tau=\tau_1}^{\tau_2} var(CAAR_\tau) \qquad (12)$$

6.2.2 Test observation

To test the null hypothesis some inferences about the cumulative abnormal returns can be drawn. In practice, the variance of the market is unknown and the normal way to estimate it is through the sample variance measure from the market model. Using the market model to calculate the variance of aggregated abnormal returns (9), the zero hypothesis can be tested using

$$\theta_1 = \frac{CAAR(\tau_1, \tau_2)}{varCAAR(\tau_1, \tau_2))^{1/2}} \sim N(0, 1) \qquad (13)$$

The variance of the market is unknown, therefore an estimator must be used to calculate the variance of the abnormal returns as in equation 9. According to MacKinley (1997), the usual sample variance measure of $\sigma_{\epsilon_i}^2$ is the sample variance of the estimation

$$\hat{\sigma}_{\epsilon_i}^2 = \frac{1}{L_1 - 2} \sum_{\tau=T_0+1}^{T_1} (R_{i\tau} - \alpha_1 - \hat{\beta}_i R_{m\tau})^2 \qquad (14)$$

$H_0 = \theta_1 = 0$, the abnormal returns are not significant

$H_1 = \theta_1 \neq 0$, the abnormal returns are significant

At a 5 percent confidence level H_1 is true if θ_1 is larger than 1.96. At a 5 percent confidence level the probability of type 2, rejection of a true null hypothesis, is 5 percent. We test our results on a 1-, 5-, 10-, and 15 percent level.

7   Empirical results

In general, we do see a change between the periods. We see that before 2008, the equity effect of a new bond issue were significantly negative in a +/- 10 days period. After 2009, we find no significant equity effect of a new bond issue in a +/- 10 days period. Our results suggest that the bond market has become more efficient after the financial crisis.

7.1   Analysis of cumulative abnormal return

The following figure illustrates the sample cumulative abnormal returns. Generally, in the period of 2004-2007, stock holders would experience a decrease in stock value for the period. The opposite is true for the stock holders after the financial crisis, for the period from 2010-2013. The period from 2004 to 2007, and the period from 2010 to 2013, experience a positive return the first day, and then it drops until day -2 and -3 respectively. For both periods we observe a slightly positive return around the announcement day, from two days before until one day after. The stock response after 2010 has experienced a drift around zero after the event, the period before experienced a significant drop from around zero to -1.5 percent. The significant drop from day 8 to day 10 cannot be explained in other research. It might be caused by delayed information, or it might be drift. It would be interesting to do an event study with a longer event window, observing the development in a longer interval. In general, we see less fluctuation in stock prices after the financial crisis compared to before the crisis. If these results are correct, it implies that the market has become more efficient after the crisis.
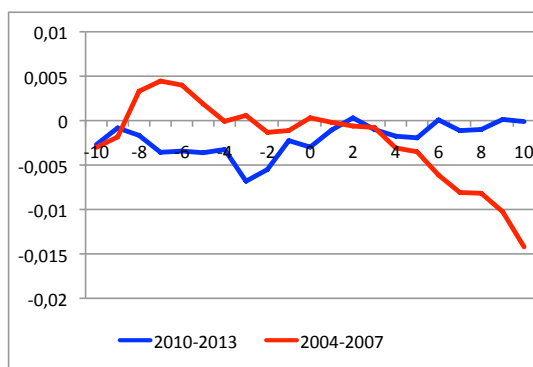

Figure 8: The cumulative average abnormal returns for the period before and after the crisis

7.2   Analysis of abnormal return

To examine the null hypothesis of whether the cumulative and average returns are significant, a t-test is carried out over different intervals. The following tables lists the abnormal return for each time period, 144 and 166 events respectively. The first column shows the day relative to the event. The second column is the average abnormal return across the sample of firms on the day. The third column shows the cumulative average return for the event period. The fourth and fifth column shows the daily t-value. The t-value is calculated using the standard deviation from the regression in the estimation window (see formula 14).

7.2.1   The period from 2004 to 2007

Table 2: Description of daily AAR, including CAAR, for the period 2004-2007

PERIOD 2004 TO 2007				
N=144	AAR %	CAAR %	t-test AAR	Significance level AAR
-10	-0,30	-0,30	-1,554052915	15%
-9	0,12	-0,18	0,607146813	
-8	0,52	0,33	2,650305079	1%
-7	0,11	0,45	0,587918043	
-6	-0,05	0,40	-0,234508931	
-5	-0,21	0,19	-1,092781525	
-4	-0,20	-0,01	-1,005643759	
-3	0,07	0,06	0,340473483	
-2	-0,19	-0,13	-0,978233018	
-1	0,02	-0,11	0,102885101	
0	0,14	0,03	0,737836854	
1	-0,05	-0,02	-0,260545488	
2	-0,04	-0,06	-0,216195326	
3	-0,02	-0,08	-0,080788473	
4	-0,23	-0,31	-1,188421031	
5	-0,04	-0,35	-0,220980154	
6	-0,26	-0,61	-1,344941589	
7	-0,20	-0,81	-1,012035771	
8	-0,01	-0,82	-0,045846544	
9	-0,21	-1,03	-1,068075388	
10	-0,40	-1,42	-2,036195744	5 %

Table 2 shows the average abnormal return (AAR), the cumulative average abnormal return (CAAR), t-test for AAR and significant level of the t-test for the period 2004-2007. The average abnormal returns are significant 10 and 8 days before the announcement day, and 10 days after. We see a

significant positive effect around 8 days before the issue. There is also a positive draft right before and on the announcement day, however this draft is not significant for the daily returns.

By looking closer at the average cumulative returns for various time intervals within the event window, we find support for a negative effect for the +/- 10 day period, with a negative effect of -1.42 percent, with a t-value of -1.6 (see Table 3The t-value is significant at a 11 percent level, and is considered relatively strong. We observe a positive draft the first 5 days in the event window. From day -5 there is a negative draft throughout the event window. We see a significant negative return from day 5 to 10 after the event. Why there is such a large negative effect in this interval we do not know, it might be drift or it might be delayed information. It would be interesting to expand the event window to see how this effect develops.

In general, we find that for the period before 2008 there were a negative respond to new debt issue. Looking at the cumulative average return, we see that most of the negative effect comes after the announcement day. However, there is a small, positive draft before the announcement.

Table 3: Description of CAAR for different intervals within the event window for period the from 2004 to 2007

N=144	CAAR %	t-value CAAR	Significance level CAAR
CAAR(-10,10)	-1,42	-1,60	11%
CAAR (-10,-1)	0,68	0,47	
CAAR(-10,-5)	0,19	0,39	
CAAR(-5,-1)	-0,51	-1,18	
CAAR(-2,2)	-0,12	-0,27	
CAAR (1,5)	-0,38	-0,88	
CAAR (5,10)	-1,11	-2,34	5%
CAAR (1,10)	-1,45	-2,25	5%

7.2.2 The period from 2010 to 2013

Table 4 shows the average abnormal return (AAR) and the cumulative average abnormal return (CAAR), t-test for AAR and significant level of the t-test for the period 2010-2013. Looking at the average abnormal return, we see that the only significant daily return is -.27 percent from the first day of the event window. Similar to the period before 2008, there is a positive drift around the announcement day. Generally, we observer a non significant drift in both directions for the daily returns.

Table 4: Description of daily AAR, including CAAR, for the period 2010-2013

PERIOD 2010 TO 2013				
N=166	AAR %	CAAR %	t-test AAR	Significance level AAR
-10	-0,27	-0,27	-2,348493143	5%
-9	0,19	-0,08	1,15520265	
-8	-0,08	-0,17	-0,422531611	
-7	-0,19	-0,36	-0,825501755	
-6	0,01	-0,34	0,053801891	
-5	-0,02	-0,36	-0,066124164	
-4	0,04	-0,32	0,12018383	
-3	-0,36	-0,68	-1,096744368	
-2	0,13	-0,55	0,380679798	
-1	0,33	-0,23	0,893925043	
0	-0,07	-0,30	-0,191315554	
1	0,19	-0,11	0,480289361	
2	0,14	0,03	0,330989931	
3	-0,13	-0,10	-0,303256517	
4	-0,08	-0,18	-0,16898663	
5	-0,02	-0,19	-0,041135366	
6	0,20	0,01	0,426092359	
7	-0,12	-0,11	-0,247071313	
8	0,01	-0,10	0,025316555	
9	0,11	0,01	0,219873487	
10	-0,02	-0,01	-0,046053098	

Looking at the average cumulative returns for various time intervals within the event window, we find that the average effect of new bond issue is -.01 percent for the period from 2010 to 2013, and it is not significantly different from zero. We find that there is a significant negative drift the first 10 days before the event day. Interestingly, we find a significant positive drift in the period around the announcement date.

Table 5: Description of CAAR for different intervals within the event window for period the from 2010 to 2013

N=166	CAAR %	t-value CAAR	Significance level CAAR
CAAR(-10,10)	-0,01	-0,02	
CAAR (-10,-1)	-3,36	-2,46	5 %
CAAR(-10,-5)	-0,36	-1,28	
CAAR(-5,-1)	0,12	-0,55	
CAAR(-2,2)	0,71	1,73	10 %
CAAR (1,5)	0,10	0,25	
CAAR (5,10)	0,16	0,36	
CAAR (1,10)	0,29	0,49	

To summarize, we find no significant effect of a new debt issue after 2009. However, there is a negative effect in the days leading up to the announcement, and a positive effect after the announcement. If we

compare pre- and post- financial crisis findings we find that the abnormal drift is much smaller after the financial crisis than before. If this is the case, the market is more efficient after the crisis.

8   Discussion

Overall, equity holders experience a significant negative cumulative average abnormal return for the 21 days surrounding the announcement day at the $\alpha = .11$ level, before the financial crisis. After the crisis the effect is negative, but not significantly different from zero. A negative relationship between bond issuance and equity market return suggest that increasing the leverage position of a company can have a negative impact on stock prices. In summary, the equity market appears to react negatively to the issuance of bonds, however this effect is not significant after the crisis. In general, we find that after the crisis there a new bond issue has no significant effect on equity. In addition we observe a significant positive effect of .7 percent for the $+/-$ 2 day period after 2010. This might suggest that, if the market is sufficiently efficient, the equity effect is slightly positive after the financial crisis. However, an event window of $+/-$ 2 days is quite short, and for the longer event window ($+/-$ 10 days) the effect is insignificant.

Our negative findings before the crisis, -1.42 percent, correspond well with the findings of Ammann, Fehr and Seiz (2006), that finds a significant negative result of -1.5 percent for the event period for the German and Swiss market. The negative effect of -.2 percent after 2009 is surprisingly similar to Eckbo (1986), and Dann and Mikkelson (1984), that finds a negative return on -.06 percent and -.37 percent on straight debt offerings on a two day trading period with a z-value of -.44 and -1.78. Still, our results are not significantly different from zero effect, and therefore differs from the significant effect found by Dann and Mikkelson (1984).

In our sample it appears to be a positive drift right before and on the announcement day (see Table 2 and 5). Interestingly, we observer the same findings in Annmann, Fehr and Seiz (2006). They comment that the "significantly positive abnormal returns in the pre-announcement period suggest that managers tend to announce these securities when stock prices have increased" (Ammann, Fehr and Seiz, 2006, pp. 15). Our finding before 2008 support this observation. From Table 2 we see a positive drift on day -1 and zero, and the stock prices fell significantly after the announcement. Interestingly, after the crisis the average abnormal return on the announcement day is insignificantly negative, and the cumulative average return for the period after the issuance is insignificantly positive. It seems likely that the increase of capital to the bond market, has increased the efficiency of the market, and diminished the effect of a new bond issue. The substantial increase of high yield enterprises in the bond market (see

fig. 5) could, if our results do support the peking order theory, have resulted in a higher negative effect of a new bond issue. This suggest that the effect should be more negative after 2009. On the other hand, the high increase of activity in the bond market (see chapter 3 and 4) would have increased the capital inflow to the market an could have altered the effect in the opposite direction.

Our findings based on straight debt is smaller compared to studies investigating convertible debt. As noted by Dann and Mikkelson (1984, pp. 157) "The average valuation effect on common stock at the announcement of non-convertible debt offerings is only marginally negative, and is zero at issuance". If we examine our returns at the announcement day, we see that their observations correspond well with ours. The same observation is found in the review of event studies done by Magennis, Watts and Wright (1998). This applies well with general findings in other studies (See Eckbo, 1986 and Ammann, Fehr and Seiz, 2006) that find a much stronger negative effect on equity when a firm issue convertible debt.

Overall, for a +/-10 day event window the findings in this study are negative. Thereby, the results are inconsistent with the findings of Masulis (1980) that suggest a positive reaction to new bond issues, due to tax advantages. The findings are also inconsistent with Meckling and Jensen (1976) agent theory, suggesting that higher leverage could be positive because of increased monitoring from debt holders and signal new, positive net present value investment (Ross, 1977). Both our findings suggest negative returns, and are therefore consistent with the theories of Myers and Majluf (1984) and Miller and Rock (1985). Both theories predict a negative reaction to unanticipated external financing.

9   Conclusion

In this thesis, we present an empirical analysis of announcement effect of new bond issues for the Norwegian market, for the period 2004-2007 and 2010-2013. We find a negative cumulative average return for the event period. Moreover, we observe that before 2008, the market reacts significantly stronger than after 2010, when the effect is non-significant. Comparing the results from 2004-2007 and 2010-2013 reveal less drift in abnormal returns after 2009. However, average abnormal return for the event window in the period before 2008 is only significant at a 11 percent level. Our result corresponds well to the general capital market theories developed by Myers and Majluf (1984).

To understand why the effect of a new bond issue has changed, we analyze and describe the changes that might have affected this. In the sample period the Norwegian corporate bond market has experienced a high increase in overall activity. There has been a doubling of outstanding volumes and a doubling in the number of issuers. There has also been a change in banking regulations lead to a reduction in supply of capital, forcing companies to find alternative markets for financing. The establishment of the Norwegian Government Bond Fund in 2009 increased the supply of capital to the bond market. The increase of higher risk companies in the market, might suggest a higher excess return on bonds. This might lead investors seeking a more secure payoff than equity into the bond market, in a period with high uncertainty in the stock market. The increase in capital inflow to the bond market appears to have increased the efficiency of the bond market.

Our findings, if correct, are important. Bond market supply important cash for companies and for investors. A more efficient bond market with increased capital inflow could strengthen the secondary market, and contribute to a more efficient pricing mechanism in the secondary market (Trondsgaard, 2013). There will be more liquid cash available for growing companies and the economy to develop.

9.1   Topics for further research

There are limitations to this study that opens up for further research. First, we have not controlled for issue size compared to initial capital structure for each of the new bond issue. Larger bond issues compared to the initial capital structure might have a larger effect than smaller issues. In this way, some few, larger bond issues for a few companies might affect the abnormal returns more than the

general sample, and the abnormal return found in this study might not reflect the true value sufficiently. Second, the thesis does not take credit ratings into account. High yield bond issues might have a larger effect than investment grade bond issues. Eckbo (1986) find no statistical significant effect of credit ratings. Although earlier research show disagreement on the effect of credit ratings, it might be useful to see if such effect play a role in the Norwegian marked, recognizing the increase in high yield bond listed on the Oslo Stock Exchange. Third, it is recommended that types of debt securities and features such as maturity, coupon rate and reputation of underwriter could be incorporated into further studies. Fourth, the sample could be aggregated based on industry or business sector classifications. Companies operating in different sectors might address different responses to new debt issues. From Figure 4 we see a significant drop in cumulative abnormal returns before 2010. By increasing the length of the estimation window it might be interesting to see how the abnormal return developed on a $+/-60$ days event window. From the 21 of March 2014 the Norwegian Bank decided to end the Norwegian Government Bond Fund. If some of the increase in efficiency in the bond market can be attributed to this Fund, further research might address the liquidity changes after closing the fund. Will the markets have become sufficiently liquid on its own, or will there be a decrease in liquidity after 2014?

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