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Earnings Management and the Cost of Publicly Issued Debt

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Abstract

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Key words: Earnings management, bond yields, credit ratings, Credit rating agencies, IFRS.

Purpose: The purpose is to empirically test whether earnings management (both accruals-based and real) has an impact on the cost of public debt (approximated by credit ratings and bond yields) issued on the European bond market.

Methodology: Using a cross-sectional approach, accruals-based and real earnings management are estimated. The estimates are then used as explanatory variables in both an ordered regression, using bond ratings as dependent variables, and an OLS-regression with the yield spread as dependent variable.

Theoretical Foundation: The theoretical framework consists of previous research on earnings management and its impact on credit ratings and bond yields, as well as main theories such as the agency theory, signaling, asymmetric information and moral hazard.

Empirical Foundation: The study is based on a sample of 124 firms. The collected data covers a period from 2010 to 2015, amounting to a total of 770 bond issuances.

Conclusion: The findings of this study suggest that the real earnings management practice of sales manipulation of issuing firms has a significant negative relation to the issue's bond yield. Overall, earnings management does not appear to have any major influence on the credit rating decision of credit rating agencies nor the pricing of bonds.

List of Abbreviations

<i>Abbreviation</i>	<i>Description</i>
TACC	Total accruals measured as earnings before extraordinary expenses - operating cash flow
NDA	Non-discretionary accruals
DA	Discretionary accruals
EM	Earnings management
<i>DA</i>	Discretionary accruals
<i>AbnCFO</i>	Earnings management through sales manipulation
<i>AbnProd</i>	Earnings management through overproduction
<i>AbnDisex</i>	Earnings management through discretionary expenses
TA	Total assets
SALES	Sales/Turnover
AR	Accounts receivable
PPE	Gross Property, Plant and Equipment
ROA	Return on assets
CFO	Operating cash flow
Rating	Initial credit rating of the bond given by Standard and Poor's
Orthogonal rating	Residuals from the estimated bond rating models
Maturity	Amount of years between the issuance date and maturity date
STDRET	Volatility in stock returns measured on a daily basis the year prior the issuance date
STDROA	Volatility in annual ROA for the 5 years preceding the bond issuance
Beta	The equity beta estimated with the market model using 5-year monthly returns
Size	The issuer size measured as the natural logarithm of total assets
Leverage	Leverage measured as long-term debt denoted by total assets
Income	Operating income denoted by total assets
AEM	Accruals-based Earnings Management
CRAs	Credit Rating Agencies
EM	Earnings Management
IAS	International Accounting Standards
IFRS	International Financial Reporting Standards
REM	Real Earnings Management
GAAP	General Accepted Accounting Principles
SG&A	Sales, General and Administrative Expense
R&D	Research and Development

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Chapter 1. Introduction

In this chapter the background of our research will be presented in relation to earnings management and the cost of debt. It provides a detailed problem discussion on factors influencing the European bond market over the past five years and highlights why it is of essence to investigate the phenomena. Consequently, the purpose of this study is presented and followed by limitations, audience and finally the structure of the report.

1.1. Background

In consequence to several large corporate accounting scandals, referring to Enron, WorldCom, Xerox, Parmalat and Ahold Royal to name a few, earnings management is repeatedly associated with opportunistic behavior on managers' behalf. Stakeholders, such as creditors, employees, and other investors, have consequently come to require transparent disclosure of the firm's financial performance. There is a quite extensive literature existing on earnings manipulation and specific corporate events, yet, previous studies have typically focused on the influence of earnings management on stock returns in the lead up to an initial public offering or seasoned equity offering (Gounopoulos & Pham, 2015; Rangan, 1998, Shivakumar, 2000; Teoh *et al.*, 1998a, 1998b).

Whilst the combination of equity and debt markets represent the primary foundation of raising external capital for business entities in the capital market system, earnings predictability effects' concerning the cost of debt capital differs from the cost of equity capital in several aspects. Though bondholders and equity holders have somewhat similar downside risk i.e. both can lose their entire investment, they differ substantially in their upside risk potential. Straight debt holders can hope to, at most, receive interest and the principle payments on schedule, whilst equity holders are more concerned about the firm's ability to generate positive excess returns, which are translated into gains for the shareholder through price appreciation (Crabtree & Maher, 2005; Crabtree *et al.*, 2014; Ge & Kim, 2013). This difference establishes that the primary concern of bondholders is the firm's default risk, and its ability to make scheduled interest and principal payments over the life of the bond. Debt financing (both private and public), nevertheless, forms an important source of external financing to firms. Especially bond markets constitute an important source, as Florou and Kai (2014) note that "*during 2000-2011, the average European country had a corporate debt market almost twice the size of its equity market*".

The corporate bond market in Europe has become a focus of attention past years as European corporates have started to use debt capital markets more intensively, the volumes of corporates bond issues have grown and yields have come down. As the availability of bank lending has been shrinking in some countries due to the enduring impact of the financial crisis and new regulatory requirements, corporations are increasingly turning to debt capital markets (DB, 2013). Here, credit rating agencies act as independent gatekeepers, where the assigned credit ratings serve as a vehicle to reduce information processing costs for investors (Frost, 2006). Ratings provide information about default risk, which determines issuers' cost of debt capital. Many institutional investors are limited or prohibited from investing in speculative grade debt or holding debt downgraded to non-investment grades. Additionally, bond covenants often contain ratings-dependent clauses (Demitras & Cornaggia, 2013). Meanwhile, previous research has shown that ratings do hold meaning to managers (Kisgen, 2006; Demitras & Cornaggia, 2013), and managers therefore have incentives to engage in earnings management.

The most recent studies on earnings management and the cost of debt, to the authors' knowledge, are conducted by Crabtree *et al.* (2014) and Ge and Kim (2014), which both find a negative relation to credit ratings and a positive relation to bond yields. Also Chen *et al.*, (2014) find a significant positive relation to bond yields. Meanwhile, Caton *et al.* (2011) find a negative relation between earnings management and bond yields. Worth noting is that the various studies investigating the effects of earnings management on the cost of debt (Alissa *et al.*, 2013; Caton *et al.* 2011; Chen *et al.*, 2014; Crabtree *et al.*, 2014; Demitras & Cornaggia, 2013; Ge & Kim, 2014; Kim *et al.*, 2013; Liu *et al.*, 2010; Prevost *et al.*, 2008) are conducted on the U.S. market, which may not be conclusive for the European market, due to the differences in accounting standards. Since 2005, all companies listed on EU stock exchanges have been required to prepare their consolidated financial statements in accordance to International Financial Reporting Standards (IFRS). The aim of the IFRS adoption was part of a broader initiative to improve capital markets through increased financial disclosure, increased enforcement and improved governance regimes (ICAEW, 2015). U.S. GAAP allows managers discretion in selecting reporting methods, estimates and disclosures. The reporting flexibility is aimed at assisting managers' communication with outsiders. When it comes to revenue recognition, U.S. GAAP standards are extensive and could be described as a mix between rule- and principle based application. IFRS on the other hand, is solely based on principles (PwC, 2015). How changes in inventory are reported constitutes another

interesting difference. Firms operating under the U.S. GAAP are allowed to report changes inventory costing in a variety of ways, namely, FIFO, LIFO and the weighted average cost (*ibid.*). This implies that U.S. firms have a better ability in managing their COGS, and thus, the cash flow from operations than their European counterpart.

The focal emphasis on Europe can be further supported by the significant amount of follow-up reforms implemented after the financial crisis of 2007-2009. Banks are now feeling the aggregate impact of the recent regulatory requirements that were introduced in the aftermath of the financial crisis.

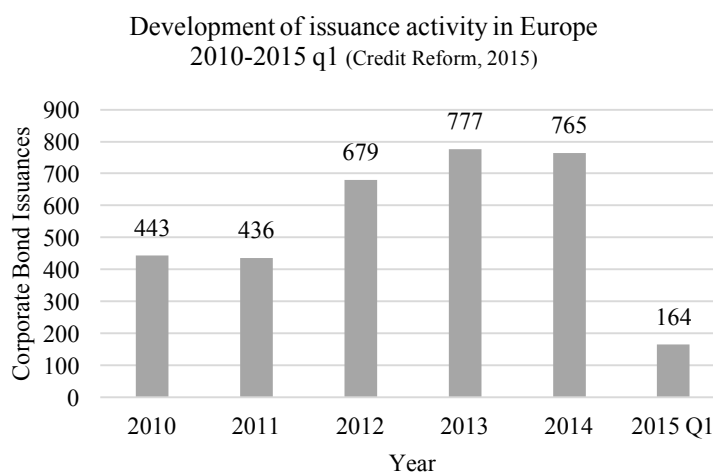


Figure 1: Issuance Activity in Europe 2010-2015Q1

In Europe, a series of regulatory packages have been implemented, such as the Capital Requirements Directive, CRD IV, Markets in Financial Instruments Directive, MiFID, and the European Market Infrastructure Regulation, EMIR (CapGemini, 2014). Basel III, which will be effective in the EU from January 1, 2014, denotes that banks will need to follow stricter requirements on both the quality and quantity of capital in the future, which ultimately will lead to less lending, as they struggle to maintain a regulatory minimum (CapGemini, 2014; Credit Reform, 2015). As predicted by McKinsey&Company (2010), the announcement of Basel III had a significant impact on the European banking sector, despite the relatively long transition period. As the current economic environment is characterized by sluggish growth and structural upheavals in the banking sector, whilst the capital market-based financing in Europe is relatively weak when compared to other judicial areas, the corporate bond markets are becoming more and more important and can be seen as a crucial source of financing not only for large corporations, but also smaller ones (Credit Reform, 2015). Consequently, the increased activity on the European bond market since 2010 (see Figure 1) could imply auxiliary incentives for managers to manipulate their earnings, as bondholders use the firm's income to forecast cash flows as a tool to determine risk premiums.

1.2. Problem Discussion

This study is predominantly based on previous studies performed by Crabtree *et al.* (2014), Ge and Kim (2013), Chen *et al.* (2014), Liu *et al.* (2010), and Caton *et al.* (2011), on the American bond market. A significant amount of studies (Alissa *et al.*, 2013; Demitras & Cornaggia, 2013; Kim *et al.*, 2013; Prevost *et al.*, 2008) has documented discretionary accruals as a tool for earnings management and is thus regarded as a proxy for earnings management. Recent studies have accentuated the switch from accruals-based earnings management towards real earnings management being more common (Kim *et al.*, 2013), why real earnings management (measured by sales manipulation, overproduction and reduction of discretionary expenditures), considered as a less detectable earnings management strategy (Graham *et al.*, 2005), will be examined. The intention is hence to identify whether earnings management (both accrual-based and real) has an impact on credit ratings and bond yields (ultimately, the cost of debt), since the impact documented on American bond market by previous researchers might not be conclusive for the European bond market. Consequently, it is possible to investigate whether credit rating agencies acknowledge earnings management and if this yields a lower credit rating, as well as investigating whether market participants perceive earnings management, and if this has an impact on the bond yield.

Despite that IFRS partially was implemented to reduce the asymmetric information on the market, indirectly also be a tool to reduce earnings management by enforcing fair-value accounting, studies show mixed results. Aubert and Grudnitski (2012) find a decline in the magnitude of the proxy for earnings management coincidental with IFRS adoption. Also Barth *et al.* (2007) find that firms applying IAS evidence less earnings management, more timely loss recognition and more value relevance of accounting amounts. Meanwhile, Capkun *et al.* (2011) find that the greater flexibility in IAS/IFRS standards has led to greater earnings management. Doukakis (2014) argue that IFRS had no significant impact on neither accruals-based nor real earnings management. The results of Cormier *et al.* (2015), suggest that IFRS improve investors ability to distinguish between earnings managed opportunistically and earnings management that provides a credible signal about future cash flows.

Given that past research (Alissa *et al.*, 2013; Caton *et al.* 2011; Chen *et al.*, 2014; Crabtree *et al.*, 2014; Demitras & Cornaggia, 2013; Ge & Kim, 2014; Kim *et al.*, 2013; Liu *et al.*, 2010; Prevost *et al.*, 2008) have found very mixed results on how earnings management is used

with regards to debt financing, and that, to the authors knowledge, there are no other studies on the effects of earnings management on the cost of debt on the growing European bond market after the financial crisis, the topic becomes a relatively newfangled research avenue in a fairly specific niche of the vast earnings management literature.

1.3. Purpose

Extending on previous research (Caton *et al.*, 2011; Chen *et al.*, 2014; Crabtree *et al.* 2014; Ge & Kim, 2013; Liu *et al.*, 2010), which was heavily US-centric, the purpose of this study is to examine whether earnings management, in the form of discretionary accruals and real activities, affect credit ratings and bond yields to the same extent and direction in Europe as in the U.S. Aiming to contribute to the existing body of research, our focus therefore lies on earnings management of European firms between 2010 and 2015. This leads us to the following research question:

“How is earnings management (both accruals-based and real) influencing the cost of debt (approximated by initial credit ratings and bond yields) on the European bond market?”

1.4. Limitations

The explicit focus of this study is bonds issued by firms on the European market with a European domicile nation, who are required to use the international financial reporting standards (IFRS) when disclosing their financial statements. Because of differences in accounting regulations, financial firms are excluded in this study. Moreover, due to the increased bond issuance activity on the European market following the revelation of Basel III in 2009, the subsequent years (2010-2015) are of particular interest for this study. Finally, only bonds characterized by non-convertibility are to be included.

1.5. Audience

With this being a fairly new topic, our target audience are academics doing research in the area of earnings management. Further on, the thesis aims to give institutional investors an insight in corporations’ opportunistic behavior in a steady growing European bond market.

1.6. Report Structure

The subsequent section following this thesis is chapter two, which presents the theoretical framework, including an explanation of earnings management in general and motivations for it, the role of credit rating agencies, and the linkage to both credit ratings and corporate bond yields. Chapter two further includes a review on previous research in the area and is

concluded with a presentation of the hypotheses. Chapter three aims to explain the methodology adopted, including a presentation of the sample selection, data collection, regression model and method criticism. The fourth chapter presents and discusses the implications of our empirical analysis in connection to the theoretical framework and previous research. The fifth chapter provides a throughout analysis of our results and the last chapter provides a concluding summary and suggestions for further research.

Chapter 2. Literature Review and Hypothesis Development

In this section an overview of the earnings management literature is provided. First, earnings management is defined and explained. Then the theories behind incentives for earnings management and debt financing will be presented followed by a discussion of how the practice is perceived by CRAs and the market. Finally, the hypotheses are developed, using previous research on the area in addition to the theory.

2.1. A Definition of Earnings Management

Healy and Wahlen (1999) define earnings management as managerial judgments and decisions in financial reporting that alter financial reports to either mislead some stakeholders about the underlying economic performance or to influence contractual outcomes. Depending on objective, earnings management is accomplished by shifting reported income between current and future periods. Opportunities to manipulate earnings arise as reported income includes both cash flows and changes in firm value that are not reflected in current cash flows. While cash flows are relatively easy to measure, the estimation of change in firm value that is not reflected current cash flows involves a lot of discretion (Bergstresser & Philippon, 2006).

Earnings management includes both legitimate and less than legitimate efforts to smooth earnings over accounting periods or to achieve a forecasted result. Postponing a transaction until a later period, or accelerating expenses when earnings are high and postponing expenses when earnings are low, constitute examples of legitimate efforts of earnings management. It requires co-operation among reporting lines, and will often involve boards and senior management at some level (Millstein, 2005). There are two ways to manage current earnings. First, the accruals component of earnings captures the wedge between firms' cash flows and reported income, and a great deal of managerial discretion goes into their construction (Bergstresser & Philippon, 2006). Exercising discretion over accrual choices to reach a desired level of earnings is referred to as accrual-based earnings management (Ge & Kim, 2013). Unlike accrual-based earnings management (hereafter: AEM), real earnings management (hereafter: REM) can have direct consequences on current and future cash flows. Roychowdhury (2006) define REM as "*management actions that deviate from normal business practices, undertaken with the primary objective of meeting certain earnings thresholds*". Therefore, real earnings management is more difficult for average investors to understand, and are normally less subject to monitoring and scrutiny by board, auditors,

regulators and other outside stakeholders. It is regarded a long-term strategy (Jung *et al.*, 2013) and also less detectable by managers (Graham *et al.*, 2005) as they can alter the timing and scale of real activities such as production, sales, investment, and financing activated throughout the accounting period in such a way that a specific earnings target can be met (Roychowdhury, 2006). Aiming to find empirical methods to detect real activities manipulation, Roychowdhury (2006) argue that there are three main types of REM: (1) sales manipulation, that is, accelerating the timing of sales and/or generating additional unsustainable sales through discounts or more lenient credit terms, (2) overproduction, or increasing production to report lower cost of goods sold and (3) cutting discretionary expenses.

2.2. How is Earnings Management Relevant when Discussing Debt Financing?

2.2.1. An Agency Problem

The theoretical underpinning of earnings management is closely tied to agency theory, and becomes relevant in debt contracting when there is asymmetric information about the firm's true financial performance. In the theory of the firm, the environment places significant constraints on firms, which affects both strategy and decisions making (Child, 1972; Williamson, 1975), and earnings management would be one of the strategic responses to the constraining uncertainties (Ghosh & Olsen, 2009). It is, meanwhile, in the firm's interest to reduce variability of reported earnings and information asymmetry between managers and investors (Gul *et al.*, 2003; Ghosh & Olsen, 2009), since the cost of capital has been documented to decrease with transparent earnings (Diamond & Verrecchia, 1991). Since investors base their decisions on information provided by analysts and public earnings announcements, disclosure is one of the strategies some firms opt for when the line between legitimate and less legitimate fades. So, in order to bolster investor interest, managers might manipulate earnings to influence the perception of outsiders and to reap private payoffs (Ogden *et al.*, 2001). Viewing corporations as "*legal fictions which serve as a nexus for a set of contracting relationships among individuals*" (Jensen & Meckling, 1976), management acting in stockholders' best interest has incentives to form the firm's operating characteristics and financial structure in ways which benefit the stockholders. Consequently, if the firm has outstanding debt, management has a derived incentive to take actions to reduce the market value of the debt, if such actions serve simultaneously to increase the market value of the

firm's equity. Management would thereby attempt expropriate wealth from the creditors to the shareholders (Smith & Warner, 1979).

Subsequently, given that bonds provide an important mechanism by which firms obtain new funds to finance new and continuing activities and projects, earnings management becomes relevant to discuss with regards to debt financing as it signifies one source of potential conflict between stakeholders.

2.2.2. A Signal of Credit Risk

In practice, there are many markets in which buyers use some market statistic to judge the quality of prospective purchases. The difficulty of distinguishing good quality from bad quality is inherent in the business world and may indeed explain many economic institutions and may in fact be one of the more important aspects of uncertainty. The lemons model developed by Akerlof (1970) can be extended to make comments on managers' incentives to manipulate earnings, hence the accounting quality of the firm. In line with Akerlof (1970), SEC chairman Arthur Levitt (1998), who chastised firms for their use of "cookie jar" reserves to manage earnings, contended that earnings management as a practice creates asymmetric information. He further claimed that when corporations engage in window-dressing earnings, the financial strength and losses of a firm is rightfully questioned. Although financing new projects with internally generated cash would be optimal according to the pecking-order theory, issuing debt is seen as a better signal than issuing equity (Myers and Majluf, 1984). The underlying rationale discussed by Myers and Majluf (1984) is that companies can share private information with financial intermediaries, and thus, lower the information asymmetry. Another way of mitigating the information asymmetry would be through certification (e.g. a credit rating), which sends clear signals to the market (Ogden *et al.*, 2003). The signaling role of credit rating agencies will be further discussed in section 2.3.

The implication is that, although issuing debt provides a signal by itself, asymmetric information is perceived as lower with the opinion of a third, independent party. Indeed, earnings management arise from the game of information disclosure that executives and outsiders play (Degeorge *et al.*, 1990), and it can be used to convey private information to users, influencing the confidence level of investors regarding firm performance. This is for instance the conclusion Subramanyam (1996) make, when finding a positive relationship between earnings management and stock returns. The increases in stock returns may serve as

incentives for managers to consequently increase their bonuses. At the time of debt initiations, financial statements pose an important source of information for lenders in both public and private markets. Outside investors and analysts typically rely on current period earnings when forming their expectations on future earnings, and a variety of contractual obligations are linked in most cases to current period reported earnings (Kim & Sohn, 2013), so it may very well have an impact on the firm's cost of debt by influencing the perception of the firm's credit risk. Informational earnings management would reduce information asymmetry (Bartov & Bodnar, 1996) and capital costs (Francis *et al.*, 2005).

2.2.3. Perceptions of Earnings Management

Extending on the signaling argument, those arguing that earnings management can be beneficial, i.e. informational, say that it can be used as a tool to improve the value relevance of earnings by conveying, that is, signaling, private information to investors, consequently leading to a better view of firm performance (Arya *et al.*, 2003; Chaney *et al.*, 1998; Jiraporn *et al.*, 2008; Subramanyam, 1996). Jiraporn *et al.* (2008) argue that empirical evidence supports the notion that earnings management is not detrimental to firm value. Also Loy (2016) argue that stakeholders could benefit from earnings management since this could end up in the firm doing business on better terms with other stakeholders. Meanwhile, Degeorge *et al.* (1999) argue that managers are not explicitly motivated to manage earnings, stating that there are threshold values for earnings that might trigger the manipulation.

The opportunistic perspective explains earnings management as a harmful financial manipulation that is detrimental to all parts, except managers that benefits (Desai *et al.*, 2004; Healy & Palepu 2001; Olsen & Zaman, 2013; Teoh *et al.*, 1998a, 1998b). Those arguing that earnings management is a detrimental activity, argue that it masks the true financial performance and allows the firm to operate on better terms than it deserves (Millstein, 2005). Due to the different agency problems that can arise between managers and bondholders, a common resort is contractual agreements, many of which are based on financial accounting ratios, to hinder the expropriation of wealth by managers (Watts & Zimmerman, 1986). Relying more heavily on covenants as debt increases is a common practice among bondholders, in order to mitigate agent problems. Meanwhile, since the cost of default is high (Beneish & Press, 1993; Chen & Wei, 1993), opportunistic managers have incentives to use accounting methods that reduce the likelihood of debt covenant violations (Dichev & Skinner, 2002; Beatty & Weber, 2003). Confirming this, DeFond and Jiambalvo (1994)

found significant earnings management efforts in the year prior and the year of covenant violation. In addition, it has been suggested that firms relying heavily on debt financing might be willing to bear higher costs of borrowing from lower earnings quality as the benefits of avoiding potential debt covenants violations exceed the higher borrowing costs (Ghosh & Moon, 2010). Another negative aspect of EM is that a firm that ignores the (potential) presence of earnings manipulations could overestimate future information (Loy, 2016), indirectly increasing the credit risk. Relevantly, Ge and Kim (2013) find that earnings management is perceived as a credit risk increasing activity. However, Shivakumar (2000), following a rational expectations framework argues that in a world with managerial discretion over accounting numbers, earnings management by issuers and subsequent price reversal by investors may be the unfortunate outcome.

Notwithstanding the discussion, managers will always be tempted to manipulate earnings to a certain extent, as meeting projections and “guidance” accommodates everyone, from executives whose compensation is based on the firm’s performance and earnings, to option holders and analysts. Consequently, two conclusions can be drawn based on the preceding discussion. First, debt holders have lower credit risk when firms report earnings that are more informative about future economic performance. Managers acting in the best interest of its stakeholders have incentives to provide as informative reports as possible to reduce a firm’s cost of borrowing. Hence, if earnings management increases the *informativeness* of earnings, it is beneficial for shareholders, and the practice gives the firm business on better terms with other stakeholders, it would be considered a desirable practice for both stakeholders and creditors. However, if the practice just masks the true financial performance of the firm, it would be considered detrimental to both shareholders and creditors. The firm would be rewarded with a lower cost of debt than justifiable, knowing its true financial performance; consequently it would be regarded as opportunistic behavior on managers’ behalf.

2.3. Credit Rating Agencies and Their Signaling Role

Credit rating agencies (hereafter: CRAs) has a signaling role by serving as gatekeepers, providing an independent assessment of the creditworthiness of a borrowing firm by conducting due diligence and reviewing both financial and non-financial sources of information (Frost, 2006). As stated by Frost (2006), credit ratings have been increasingly important in debt contracts as they are considered efficient benchmarks of credit quality. As CRAs are excluded from Regulation FD they have access to nonpublic information that is

relevant to the creditworthiness of a firm, they thus convey both public and private information about the firm and are contributing to the reduction of information asymmetries in the market. They fulfill a key function of information transmission in debt markets.

However, following the growing amount of accounting scandals, criticism against CRAs has risen, questioning their disclosure practices, potential conflicts of interest, unfair practices, due diligence and competence. Empirical evidence appears to support that the large CRAs dual roles of providing timely information to market participants and serving regulatory and contracting functions, create conflicting interests (Frost, 2006). Credit rating agencies frequently claim that they evaluate issuers based on public information, including information in financial statements, prospectuses and auditor reports (see for e.g. Ashbaugh-Skaife *et al.*, 2006; Demirtas & Cornaggia, 2013). According to the managing director of S&P Rating Services, R. Barone, the ratings are based on public information, audited financial information and qualitative analysis of a company and its sector; consequently, they have “no subpoena power to obtain information that a company is not willing to provide” (Shen & Huang, 2013). Credit rating implications include signaling; maintain relationships with third parties; and maintaining firms’ credit ratings in line with creditors (Kisgen 2006). A credit rating implies a signal of overall quality, and if a firm desires to signal a certain quality, then an upgrade would signal that.

2.3.1. Credit Ratings Are Meaningful to Firms

According to Graham and Harvey (2001), chief financial officers (CFOs) pay strong attention to their firms’ credit rating when making capital structure decisions. The assigned credit rating contains important information about the bond issue and its subsequent yield. The yield spread between rating categories can be substantial, as Huang and Huang (2012) document that the yield spread between Baa and Ba rated debt often averages over 100 basis points (bp). Caouette, Altman and Narayanan (1998) find that the average cost from dropping from an A rating to a BBB rating is just 59 bp, indicating a nonlinearity in the cost of a low bond rating, while a drop from BBB to BB costs the firm an average of 112bp. This can mean a substantial difference in nominal payments for a bond issue. This nonlinearity in the cost of a low bond rating stipulates for increased levels of motivations for earnings management efforts as bond ratings fall below that level. Furthermore, the significant stock and bond market response to rating changes provides strong incentives for bond issuers to change rating agencies’ perception of their credit risk, i.e. credit ratings (Jung *et al.*, 2013).

In addition, as Kisgen (2006) and Jung *et al.* (2013) find that firms with a plus or minus notch rating target ratings, the cost implications are more significant for these categories, suggesting stronger incentives to maintain or improve their ratings. Findings that firms that are near a broad rating upgrade are more likely to inflate earnings as compared to firms that are not near a broad rating upgrade (Ali & Zhang, 2008), and that that managers target specific minimum credit rating levels (Kisgen, 2006, 2009; Alissa *et al.*, 2013, Jung *et al.*, 2013) are with studies on the importance of beating benchmarks. Kim *et al.*, (2013) found firm managers engage in earnings management to affect the future rating when firm managers have private information about the upcoming credit rating change. Taking these studies together suggest that firms do focus on specific credit ratings and that these ratings hold meaning for managers.

Accruals-based earnings management and Credit Ratings

Since accruals have been shown to be predictive of future returns (Brochet *et al.*, 2008; Dechow *et al.*, 2008; Penman & Zhang, 2002; Sloan, 1996), they offer a way for management to signal information about the firm's prospects to creditors and investors (Stocken & Verrecchia, 2004). Meanwhile, it has also been used by firms to exploit the information asymmetry between managers and shareholders.

Past research on AEM with regards to ratings are of mixed results. For instance, Alissa *et al.* (2013) find a significant positive relationship between abnormal accruals and credit ratings, suggesting that firms below or above their expected credit ratings may be able to successfully achieve a desired upgrade or downgrade through the use of AEM. Also Demitras and Cornaggia (2013) found that accounting accruals, especially abnormal current accruals, are significantly positively related to initial credit ratings. This suggests that managers use financial reporting strategies to impact perceptions of credit risk, hence their credit ratings.

Meanwhile, Caton *et al.* (2011) tested whether agencies are misled by firms' attempts to manipulate earnings and argued aggressive earnings management activities must lead to an overstated initial bond rating relative to the ratings of less aggressive firms. It was found that aggressive earnings management efforts are associated with lower initial ratings, and specifically firms rated AAA, A-, BBB, BBB-, B+, and B- significantly managed their earnings upward, consistent with the findings by Jung *et al.* (2013). In addition, although

Crabtree *et al.* (2014) primarily focused on examining the influence and effects of real earnings management, a significant negative relation was found between accruals-based earnings management and credit ratings. Kim *et al.* (2013) also find a significant negative relation between AEM and credit ratings, and conclude that credit rating agencies perceive AEM as a negative signal. These findings are consistent with the conclusion that CRAs adjust for AEM.

Despite the mixed results on the effect of AEM on credit ratings, evidence shows investors using predictions based on current accounting data are better off taking accruals into account (Brochet *et al.*, 2008). The documented positive impact of AEM on credit ratings can be explained by two assumptions. First, CRAs are unable to detect and account for AEM and as a consequence they are misled by firms reporting abnormally high accruals. Second, it is possible that CRAs detect AEM, but “go along” due to conflicting interests (Frost, 2006). Both arguments provide support the notion that earnings management is an opportunistic activity performed by managers, but it might be seen as either dodgy or desirable from CRAs’ perspective. Consequently, it is first hypothesized that credit rating agencies find earnings management as an opportunistic activity by managers, and the practice will have a negative impact on initial bond ratings in Europe, hence:

H_{1.A}: Accruals-based earnings management is affecting bond ratings negatively (managerial opportunism hypothesis).

Meanwhile, following the argumentation that AEM improves the value relevance of earnings by conveying private information to investors, it may also be seen as a desirable action to both CRAs and creditors, hence:

H_{1.B}: Accruals-based earnings management is affecting bond ratings positively (desirable action hypothesis).

Real Earnings Management and Credit Ratings

Zang (2012) argues that accruals-based and real earnings management are substitutes and finds that firms engage in more real earnings management when the cost of accruals management is higher and the flexibility of using discretionary accruals is low. In line with Graham *et al.* (2005) findings that executives prefer to manipulate real activities rather than accruals, Kim *et al.* (2013) find that firms with upcoming credit rating changes are likely to

engage in real activities earnings management, whereas they tend to decrease discretionary accruals before credit rating changes. This might be due to AEM being more likely to attract audit or regulatory scrutiny than real activities about pricing, spending and production. Hence, it is perceived as less detectable (Graham *et al.*, 2005) and therefore not even CRAs are always able to detect it.

The findings on REM and credit ratings are, however, alike the studies conducted on AEM, rather mixed. Kim *et al.* (2013) find a positive relationship between REM and credit rating upgrades, but no relation to downgrades. Alissa *et al.* (2013) find that REM can be used to successfully achieve a desired upgrade or downgrade. Meanwhile, Ge and Kim (2013) find that the real management activity of overproduction impairs credit ratings, and Crabtree *et al.* (2014) indicate a negative association between all three real earnings management methods and perceived credit risk resulting in a lower bond rating. This negative effect was found to be particularly significant for firms who only achieve the earnings forecast by utilizing real earnings management methods.

REM camouflages a firm's current period unmanaged performance and to the extent that these actions deviate from optimal business operations, it can harm a firm's competitive advantage in the long-run (see for e.g. Cohen & Zarowin, 2010; Ge & Kim, 2013). However, given that it might be difficult to distinguish what the optimal business decisions are for a firm from a stakeholders' perspective, REM can be seen as either a desirable or an opportunistic action. Arguing, that manipulated earnings cannot serve as a reliable measure of firm performance as it distorts earnings quality and increases information asymmetry with respect to firm performance between managers and for instance, bond holders, it can be seen as opportunistic behavior from managers' behalf. This is in line with the results found by Crabtree *et al.* (2014). Hence, a negative relation is hypothesized between REM and bond ratings:

H_{1,C}: Real earnings management is affecting bond ratings negatively (managerial opportunism hypothesis).

Meanwhile, if REM improves the value relevance of earnings, it may be perceived as optimal business decisions, why it also would be considered a desirable action. Gunny (2010) find support for the notion that firms use REM in order to achieve their earnings targets and that, the use of it is positively associated with future earnings performance for the firms that just

meet or beat their earnings benchmarks. Implications are thus that REM is perceived as a strategy and thus yields positive signals about the firm's prospects, so a positive relation is hypothesized between REM and bond ratings:

H_{1,D}: Real earnings management is affecting bond ratings positively (desirable action hypothesis).

2.4. Earnings Management and Bond Yields

Recent studies have shown that, unlike private debt holders, bondholders tend to mainly rely on bond pricing rather than on debt covenants to protect themselves from managerial opportunism (Ge & Kim, 2013). In an early attempt to study the relationship between earnings predictability, bond ratings and yield spreads, Crabtree and Maher (2005) find that better predictability is positively related to ratings, and negatively related to yield spreads for new bond issues conducted between 1990 and 2000. Nevertheless, when it comes to earnings manipulations and the cost of debt, the evidence is of mixed conclusions. By looking at the yield spread of new bond issues, Liu *et al.* (2010) examine the relationship between discretionary accruals and the cost of debt for new bond issues. Further on, they find evidence of firms issuing bonds significantly increase their discretionary accruals years before as well as during the event year of the issue. Thus, a negative relationship between the cost of debt (measured as the yield spread of the bond at the time of the issue) and discretionary accruals implies that firms engaging in earnings management experience a lower cost of debt.

In order to see whether firms conducting seasoned bond offerings intentionally mislead both rating agencies and investors, Caton *et al.* (2011) examine changes in discretionary accruals prior to SBO's. With initial bond ratings and the cost of debt going hand in hand, as well as bond ratings being heavily influenced by the firms reported financials, Caton *et al.* (2011) provide evidence of earnings management (measured as discretionary accruals) increases significantly prior to bond offerings. Interestingly enough, their results are not in line with Liu *et al.* (2010). Instead of being misled by the managers' opportunistic behavior, both rating agencies and the market see through the earnings management attempt which leads to a negative impact on bond ratings as well as the yield spread (Caton *et al.*, 2011). According to Shen and Huang (2013), the negative effect of earnings management is mitigated for countries with more extensive and effective banking regulations, but aggregated in countries with less robust banking regulations.

Credit ratings and the cost of debt suffer a negative impact from earnings management, that is, both AEM and REM (Caton *et al.*, 2011; Crabtree *et al.*, 2014; Chen *et al.*, 2014; Ge & Kim, 2014). By measuring attempts to manipulate earnings through both discretionary accruals and real activities, studies show that these activities have a negative relation to credit ratings, and it is positively related to yield spreads. Meanwhile, Liu *et al.*, (2010) finds contradicting results. Following the discussion on whether earnings management actually is detrimental to firms, these results can be interpreted in two ways. The negative relationship between accruals-based earnings management and bond yields can be explained by the notion that bondholders view the practice as opportunistic behavior from managers, and is thus considered credit risk increasing (Crabtree & Maher, 2005). On the other hand, as argued previously, earnings management can be regarded as desirable to a certain extent, if it sends a signal of the firm's prospects. Therefore, a positive relationship between earnings management and the pricing of bonds can be hypothesized. Trailing the above discussion, the following competing alternative hypotheses are developed against the null of no relationship between accrual-based and real earnings management and the cost of bond financing:

H_{2.A}: There is a positive relationship between the cost of new corporate bond issues and the level of accruals-based earnings management (managerial opportunism hypothesis).

H_{2.B}: There is a negative relationship between the cost of new corporate bond issues and the level of accruals-based earnings management (desirable action hypothesis).

H_{2.C}: There is a positive relationship between the cost of new corporate bond issues and the level of real earnings management (managerial opportunism hypothesis).

H_{2.D}: There is a negative relationship between the cost of new corporate bond issues and the level of real earnings management (desirable action hypothesis).

2.5 Summary of Relevant Articles

Author(s)	Time-period	Sample size	Region of Study	Accruals-based Earnings Management		Real Earnings Management	
				Credit Ratings	Bond Yields	Credit Ratings	Bond Yields
<i>Alissa et al. (2013)</i>	1985-2010	447 firms in 1985 to 2012 in 2004. 23,909 firm-year obs.	U.S.	Positive (Sig.)	x	Positive (Sig.)	x
<i>Caton et al. (2011)</i>	1995-2005	925 firms	U.S.	Negative (Sig.)	Positive (Sig.)	x	x
<i>Chen et al. (2014)</i>	2001-2008	9565 bond obs.	U.S.	x	x	x	Positive (Sig.)
<i>Crabtree et al (2014)</i>	1990-2007	2583 new issues and 1579 firm-year obs. for 626 firms	U.S.	Negative (Sig.)	Positive (Sig.)	Negative (Sig.)	Positive (Sig.)
<i>Demitras & Cornaggia (2013)</i>	1980-2003	1257 firms	U.S.	Positive (Sig.)	x	x	x
<i>Ge & Kim (2013)</i>	1993-2009	1934 bond issues	U.S.	x	x	Ab_Prod: Negative (Sig.) Ab_CFO & Ab_Dexp: Positive (Insig.)	Ab_CFO & Ab_Prod: Positive (Sig.) Ab_Dexp: Negative (Insig.)
<i>Kim et al. (2013)</i>	1990-2011	29,882 firm-year obs. representing 3585 firms	U.S.	Negative (Sig.)	x	Positive (Sig.)	x
<i>Liu et al. (2010)</i>	1970-2004	2839 firm-year obs. representing 1571 firms	U.S.	x	Negative (Sig.)	x	x
<i>Prevost et al. , 2008)</i>	1994-2005	2943 firm-year obs.	U.S.	x	Positive	x	x

Table 1: Summary of Relevant Articles

Chapter 3. Methodology

This chapter provides a description of the methodological approach used in order to answer the proposed research topic. First, the research approach is presented, followed by the process used for data gathering and sample filtering. Moreover, the different models used for measuring the proxies of earnings management (i.e. discretionary accruals and real activities management) are presented. Finally, the chapter culminates into a presentation of the models used in the estimation of the impact earnings management has on cost of debt, as well as a discussion regarding methodological issues.

3.1. Research Approach

The aim of this study is to investigate how earnings management affects a company's cost of publicly issued debt (measured as the credit rating and yield spread), by empirically investigating bonds issued by firms with a European domicile nation on the Euro-market. Using a quantitative approach, secondary data is collected from available databases (see section 3.2.) and analyzed using a deductive approach, as our theoretical framework derives the hypotheses being tested (Bryman & Bell, 2013).

3.2. Data Collection

The primary source of data collection on corporate bonds is SDC Platinum provided by Thomson ONE Banker. SDC provides us with all issue related info for each specific bond (e.g. issue size, maturity date, bond type and credit ratings). Since this database does not provide us with firm-specific information, completing financial data such as balance-, income- and cash flow statement items is then collected from COMPUSTAT Global through Wharton Research Data Services (WRDS) and DataStream for both non-issuing and issuing firms when estimating earnings management.

3.2.1. Sample Filtering

In order for a bond issue to be included in the sample, the following criteria have been applied:

<i>Criteria</i>	<i>Comment</i>
<i>European</i>	Firms operating on European markets are since 2005 forced to adapt the International Financial Reporting Standards (IKAEW, 2015). Thus, firms that have a European domicile nation are originally included in the sample. Further on, in order to have somewhat homogeneous characteristics, to be included in the sample

	are only western European firms.
<i>Non-financial</i>	As previous studies do not include financial (i.e. non-industrial) firms because of the different accounting policies used. This approach is followed by filtering out companies with a two-digit standard industry classification (SIC) code between 60 and 67. This way, the potential problem of model misspecification (arising from the differing accounting rules) when measuring accruals is reduced (Peasnell <i>et al.</i> , 2000).
<i>Public</i>	The data is filtered with regard to public firms in order for there to be a measureable yield spread. Thus, only public firms are included in this study.
<i>Bonds</i>	The sample initially consists of all types of bond issues. However, the only type of issues included in the data sample are emerging market, high yield, and investment-grade corporate bonds. Bonds issued with a specific structure, such as mortgage/asset-backed loans are not included in this sample. Using non-convertible bonds allows this study to capture the cost of debt without any other components affecting it, allowing us to study bonds solely affected by the risk of corporate default (Crabtree <i>et al.</i> , 2014). Since some issue types such as preferred stock and convertible bonds have an equity component to them, they are not to be included, in line with previous literature (<i>ibid.</i>).

As a final notation, in order for firms to be included, data (such as initial bond ratings) had to be available since this will later be used as the dependent variable. After filtering the data to meet the specific criteria as presented in Appendix A, there is a sample of 770 bond issues (conducted by 141 individual firms) left, before cleaning up for missing data in terms of accounting information.

3.3. Analysis of Firm Exclusion

The applied commands presented in appendix A show no systematic mistakes when excluding firms. Since 14 of the 141 sample firms originally included had been included twice due to change of the corporate name, they had to be filtered out. Lastly, depending on what model is used, some firms are excluded because of missing accounting information that has to be included in the estimated models.

3.4. Measuring Earnings Management

As there are several models attempting to estimate accruals¹, Dechow *et al.* (1995) conducted a study evaluating the power of the most popular ones. These models use different approaches in their estimations, going from straightforward ones to more complicated ones (*ibid.*). Three major insights were provided from Dechow *et al.* (1995); (1) all the models appear to be well specified when applied to a random sample, (2) all models generate tests of low power for earnings management of economically plausible magnitudes, and (3) all models reject the null hypothesis of no earnings management at rates exceeding the specified test-levels when applied to samples of firms with extreme financial performance. Among the tested models, the modified Jones model (1991) exhibited the most power in detecting accruals-based earnings management, why this also is the model used in this study to test for accruals-based earnings management (*ibid.*). Furthermore, real earnings management is estimated by measuring normal levels of real activities for non-issuing European firms, presented in section 3.3.3.

3.4.1. A Cross-Sectional Approach to Measuring Discretionary Accruals

The most common approach to measure discretionary accruals is to divide total accruals into a non-discretionary, and a discretionary part (Dechow *et al.*, 1995). Hence;

$$TACC = NDA + DA \tag{1}$$

With total accruals² being the most common starting point in the literature (Dechow *et al.*, 1995), there is a significant difference between the models in their way of estimating normal (as well as discretionary) levels of accruals. Furthermore, early studies within this research area have used time-series and panel-data when estimating the non-discretionary (i.e. normal levels of) accruals. By using an event window where there is no suspicion of firm managing earnings, what is considered to be a normal level of accruals can be measured (*ibid.*). Measuring normal levels of accruals by including firms that have data for a specific time period available could potentially bias the results tremendously by exposing the sample to what Brown *et al.* (1995) call survivorship bias, discussed in section 3.5. In addition, it is important to note that Type I-errors tend to increase when firms that have performed very well financially are included in the sample (Dechow *et al.*, 1995).

¹ Such models include The Healy model, The DeAngelo model, The Jones model, The Modified Jones model and The Industry model.

² Total accruals measured as Earnings before extraordinary expenses – Operating Cash Flow

Later studies have started to question the approach used by Dechow *et al.* (1995). Peasnell *et al.* (2000) point out the fact that the approach used by previous authors (i.e. measuring discretionary accruals through time-series data) lead to rough estimates of discretionary accruals. Instead, Peasnell *et al.* (2000) apply a cross-sectional approach. When estimating accruals, this approach has several benefits. First, the problem of omitting inactive firms is avoided, and thus, we control for survivorship bias, which will be discussed later on. Second, the extent to which estimates will be affected by past macroeconomic factors will be severely reduced (*ibid.*). Meanwhile, the downside of using the cross-sectional approach is the negligence of firm-specific difference within the cross-section (*ibid.*). With this in mind, this study will use a cross-sectional approach in the estimation of the different components of total accruals, where discretionary accruals will be used as a proxy for earnings management.

3.4.2. The Modified Jones model

Originally developed by Jones (1991), the underlying assumption of earlier models measuring earnings management (where the non-discretionary component of total accruals being constant over time) is loosened by using additional variables in order to control for the macroeconomic environment of a company. However, Dechow *et al.* (1995) modify the Jones model even further in order to control for conjectures by subtracting the change in accounts receivables from the change in sales.

Both Dechow *et al.* (1995) and Peasnell *et al.* (2000) agree upon the modified Jones model being the most powerful way to detect earnings management through discretionary accruals. Meanwhile, it is highly relevant to point out that the original model used in the mentioned studies does not contain any variable measuring financial performance, something that could potentially bias our results by increasing the Type-I error as mentioned previously (Dechow *et al.*, 1995). Therefore, in line with Crabtree *et al.* (2014), return on assets (ROA) is added as an indicator of firm performance. Using the cross-sectional modified Jones Model, normal levels of non-discretionary accruals are estimated as:

$$TACC_i = \beta_0 + \beta_1 TA_{it-1}^{-1} + \beta_2 (\Delta SALES_{it} - \Delta AR_{it}) + \beta_3 PPE_{it} + \beta_4 ROA_{it} + \varepsilon_{it} \quad (2)$$

In order to estimate the normal level of accruals, this model is run for the firms not included in our sample for each year. Many previous studies divide their samples into their 6-digit

SIC-industry, but because of the time limitations for this paper we are not able to collect data for such amount of firms. Instead, in line with Siregar and Utama (2008), we divide our samples into manufacturing and non-manufacturing firms based on their standard industry classification code.

Further on, following previous literature (e.g. DeFond & Jiambalvo, 1994; Peasnell et al., 2000), we use a portfolio consisting of non-issuing public firms in order to estimate normal levels of the parameters. This leaves us with a total of 3994 unique public European firms for the years 2010-2015. The estimated parameters from equation 2 are then used on our suspect firms in equation 3, with the residual from the expected level of total accruals (i.e. discretionary accruals) as a proxy for earnings management.

$$DA_i = TACC_i - [b_0 + b_1TA_{it-1}^{-1} + b_2(\Delta SALES_{it} - \Delta AR_{it}) + b_3PPE_{it} + b_4ROA_{it}] \quad (3)$$

As a final notation, previous studies denote all variables throughout the model with lagged total assets in order to adjust for heteroscedasticity (Liu *et al.*, 2010). This approach is also known as generalized least squares (GLS), which is used when the underlying cause of the model being heteroscedastic is known (Brooks, 2014).

3.4.3. Measuring Real Earnings Management

Although a plethora of the earnings management literature focuses on the use of accruals, the literature of earnings management has seen a switch towards measures of real activities manipulations. According to Roychowdhury (2006), it is highly unlikely that this is the only way for firms to engage in earnings management. Consequently, Roychowdhury (2006) examines firms' engagement in real activities manipulation made possible through manipulation of sales, discretionary expenditures, and overproduction.

Earnings management through operating cash flows can be exercised in various ways, one being sales manipulations (Roychowdhury, 2006). This way, managers can create sales through heavy price discounts, or alleviated credit terms for customers (*ibid.*). In line with previous studies measuring this type of real earnings management (e.g. Crabtree *et al.*, 2014; Ge & Kim, 2014; Roychowdhury, 2006), real activities management through operating cash flows is measured as:

$$CFO_{it} = \beta_0 + \beta_1 TA_{it-1}^{-1} + \beta_2 SALES_{it} + \beta_3 \Delta SALES_{it} + \varepsilon_{it} \quad (4)$$

Another way of managing real activities is through reducing the amount of discretionary expenses (measured as the sum of SG&A, R&D-, advertising- expenses) in order to create higher (albeit temporary) earnings (Roychowdhury, 2006). Doing this, discretionary expenses can reach abnormally low levels, which results in earnings being synthetically driven up (*ibid.*). With the required accounting data not always being available, in line with Cohen *et al.* (2008), abnormal discretionary expenses are measured through SG&A if available, while R&D and advertising expenses are assumed to be zero in case they are missing. This could be due to the fact that there is no current regulation requiring a separate reporting of advertising expenses, as it can be included under sales, general and administrative expenses (Stickney *et al.*, 2010). In line with previous literature (Roychowdhury, 2006; Crabtree *et al.*, 2014), normal levels of discretionary expenses are estimated for each year and firm classification as:

$$Disexp_{it} = \beta_0 + \beta_1 TA_{it-1}^{-1} + \beta_2 SALES_{it-1} + \varepsilon_{it} \quad (5)$$

The last proxy used for real earnings management included in this study is overproduction. The occurrence of overproduction allows firms to artificially increase profit margins by temporarily increasing production, causing an overall decrease in cost of goods sold (Roychowdhury, 2006). In order to isolate the abnormal levels of overproduction, theory suggests that production costs (measured as the sum of COGS and changes in inventory between two periods) should be captured using the following model (Roychowdhury, 2006; Crabtree *et al.*, 2014):

$$Prod_{it} = \beta_0 + \beta_1 TA_{it-1}^{-1} + \beta_2 SALES_{it} + \beta_3 \Delta SALES_{it} + \beta_4 \Delta SALES_{it-1} + \varepsilon_{it} \quad (6)$$

The approach used to estimate an abnormal level of real activities management is similar to the one used when measuring abnormal levels of discretionary accruals. Equations 4-6 are estimated cross-sectional for each year and different classification of firms, where every variable is denoted by a firm's total assets from the previous year-end. The residuals are then used as proxies for real earnings management (Roychowdhury, 2006; Crabtree *et al.*, 2014; Ge & Kim, 2014). However, the measured residuals from model 4 and 5 (i.e. the abnormal cash flows and abnormal discretionary expenses) are multiplied by (-1). Consequently, the

interpretation of these proxies is that the higher the value of the residual, the higher the likelihood of firms engaging in earnings manipulations through real activities (Crabtree *et al.*, 2014; Ge & Kim, 2014).

3.5. Previous Studies and Survivorship Bias

As mentioned earlier, survivorship among firms when using time series could possibly bias the estimates of abnormal accruals since inactive (or dead) firms are systematically excluded from the sample (Peasnell *et al.*, 2000). Originally observed by Brown *et al.* (1995), studies using time-series tend to be biased and lead to spurious relationships not only in event studies, but in general for research conducted empirically within finance. However, by using a cross-sectional approach, in line with Peasnell *et al.* (2000) this study includes both inactive and active firms in the sample, and thus, minimizing the potential problem of survivorship bias in the estimation of expected normal levels of accruals as well as real activities.

3.6. Variable Definitions

3.6.1 Credit Ratings and Yield Spreads (Dependent Variables)

In order to measure the impact of earnings management on the cost of debt, first, the dependent variables used in the study have to be specified and measured. With credit ratings varying not only due to company characteristics, but also across different bonds for the same company, as well as bond ratings changing throughout time, it is of great importance to measure the rating correctly. Hence, the issue's rating at the offering day (in other words the initial rating of a specific bond) is used as a proxy for the cost of debt. The second proxy used is the yield spread of a bond on the day of the issuance. When measuring the yield spread, the swap spread has been retrieved from the databases used. In this case, the spread to a European Treasury bond with similar characteristics (such as duration) is used for estimations. This approach is in accordance with Crabtree *et al.* (2014).

3.6.2. Earnings Management (Variable of Interest)

As mentioned previously, both discretionary accruals and real earnings management, measured as the residuals from the estimated regressions (equations 2, and 3 to 6), will be used as proxies for earnings management. By including each proxy, this study is able to control for earnings managed with discretion, as well as earnings managed through real activities as discussed under section 3.4.3.

3.6.3. Control Variables

The body of literature existing on earnings management and its effect on corporate credit ratings and yield spreads differ in the sense of the explanatory variables being included. Therefore, a discussion regarding this question should take place in order to motivate the including of explanatory variables in the different models. Although this is a study within the area of earnings management, the literature of credit ratings and yield spreads constitutes a good source when getting the best explanatory variables possible for the models used to estimate the cost of debt.

Choosing control variables for the models used has to be done carefully in order to avoid model misspecifications. According to Brooks (2014), two types of mistakes typically affect bias, consistency and efficiency of estimators, namely, omitting variables that should be included, or on the other hand, including variables that should not be included. The effect of excluding a variable from a regression results in biased as well as inconsistent estimators as long as $\rho(x_{Excluded}, x_{Included}) \neq 0$ (*ibid.*). Thus, the statistical conclusion drawn from regressions where important variables are omitted would be incorrect. On the other hand, including variables that should not have been included leads to inefficient (although still unbiased and consistent) estimates (*ibid.*).

Taking this into consideration, this study includes variables that are significant according to economic theory (eg. Kaplan and Urwitz, 1979) when deciding what variables to include. According to Kaplan and Urwitz (1979), few variables are needed in order to predict a firm's credit rating. According to Brooks (2014), variables that are significant are to be included, since omitting those is a much more serious problem than including too many variables. Subsequently, the following variables are included in this study:

<i>Maturity</i>	Although not originally included in Crabtree <i>et al.</i> (2014), both Liu <i>et al.</i> (2010) and Ge & Kim (2014) include the number of years to maturity as an explanatory variable for both ratings and yield spreads. According to Ge & Kim (2014) the number of years to maturity exposes the firm for interest risks. Hence, we should expect a negative relationship between the time-horizon, ratings and yield spreads.
<i>Volatility of stock returns (STDRET)</i>	Crabtree <i>et al.</i> (2014) argue that a higher volatility in stock returns (measured on a daily basis during the year prior to the issue day) makes the

future of the firm less predictable, and thus, yields a lower credit rating and a higher spread. The variable is measured as:

$$s_i = \sqrt{\frac{\sum_{i=1}^n (x_i - \bar{x})^2}{n - 1}}$$

Volatility of Return on Assets

The volatility of our chosen measure of profitability is estimated using annual data for the last 5 years prior to the issue date (in accordance with Crabtree *et al.* (2010)), the volatility of return on assets is calculated as:

$$STDROA_i = s_i \left(\frac{Net\ Income}{Total\ Assets} \right)$$

Orthogonal Rating

In line with previous studies (eg. Liu *et al.*, 2010; Crabtree *et al.*, 2014; Ge & Kim, 2014) the residuals achieved from the ordered response are used in the OLS-regression. This way it is possible to estimate the pure impact of the rating on the yield spread, excluding the impact of earnings management and other control variables (*ibid.*).

Equity Beta

Originally included in the model of Kaplan and Urwitz (1979), the equity beta of a firm measures the non-diversifiable risk. Many models could be used to estimate the market risk (i.e. Beta) of a firm ranging from sophisticated ones (such as CAPM) to simpler ones such as the market-model (MacKinlay, 1997). Using a broad European index (*Dow Jones Euro Stoxx*), we estimate the beta using monthly returns on data from the last 5 years the following way:

$$\beta_i = \frac{Cov(R_i, R_m)}{\sigma_i^2}$$

Issuer Size

Measured as the natural logarithm of the firms' capitalization, the firm size is a common variable in models regarding bond ratings and cost of debt in previous studies (e.g. Crabtree *et al.*, 2014; Ge and Kim, 2014). Included in the model of Kaplan and Urwitz (1979), this measure is strongly significant and suggested to be included in bond rating models. The logic behind the variable being so important is due to the fact that firm size is negatively related to risk, which leads to larger firms in general having a lower cost of debt (Liu *et al.*, 2010).

Leverage The leverage ratio is used as a proxy for the risk of corporate default (Liu *et al.*, 2010), and is another highly significant variable included in the model of Kaplan and Urwitz (1979). Thus, we include the leverage ratio measured as:

$$LEVERAGE = \frac{Long\ Term\ Debt}{Total\ Assets}$$

Operating Income As financial ratios should be included in the bond rating models (Kaplan and Urwitz, 1974), in line with the research conducted by previous studies (e.g. Liu *et al.*, 2010; Crabtree *et al.*, 2014; Ge and Kim, 2014), the ratio of operating income scaled by total assets is included.

Operating Cash Flow In line with several previous studies (e.g. Caton *et al.*, 2011; Crabtree *et al.*, 2014; Demirtas & Cornaggia, 2013) we include cash flows from operations as a control variable in both our credit rating and yield spread models. This is due to the fact that a higher OCF allows the firm to meet its interest obligations (Crabtree *et al.*, 2014).

Subordination Kaplan and Urwitz (1974) state that this variable should be included when modeling bond ratings. To control for subordination, a dummy variable with following underlying characteristics is created:

$$Subordination = \begin{cases} 1, & \text{if subordinated} \\ 0, & \text{otherwise} \end{cases}$$

3.7. Model Specifications

3.7.1 Ordered Response Model

With a dependent variable measured on a non-ratio scale, the output of running an OLS regression would make no sense when doing an interpretation (Brooks, 2014). This is due to the fact that estimates of ordered models are interpreted as probabilities, whilst an OLS (i.e. a linear probability model) could assign probabilities with the attribute of $pr \neq [0,1]$ (*ibid.*). Hence, an ordered response model is to be used for correctly interpreting the estimates (*ibid.*). A minor issue taken into consideration is the latency of the dependent variable (i.e. credit ratings). For illustrational purpose, the categorization of Standard and Poor's credit ratings is presented below:

$$RATING_i = \begin{cases} 23 \text{ if } R_i^* \geq AAA \\ 22 \text{ if } AA+ \leq R_i^* < AAA \\ 21 \text{ if } AA \leq R_i^* < AA+ \\ \dots \\ 4 \text{ if } C \leq R_i^* < CC \\ 3 \text{ if } R_i^* < C \end{cases} \quad (7)$$

Furthermore, in order to measure the impact of the different measures used for earnings management (EM in equation 8) on the cost of debt, approximated by the credit rating of a bond at the time of the issue, the following ordered response model is computed:

$$RATING_i = \beta_1 EM_i + \beta_2 Total\ Assets_i + \beta_3 Leverage_i + \beta_4 Income_i + \beta_5 STDRET_i + \beta_6 STDROA_i + \beta_7 Maturity_i + \beta_8 Beta_i + \varepsilon_{it} \quad (8)$$

3.7.2 Ordinary Least Squares (OLS) Regression

The second part of this study measures the cost of debt, which is approximated by the spread of the corporate bond and its matched risk-free benchmark (Crabtree *et al.*, 2014). In order for the model to be unbiased, consistent and efficient, the five underlying assumptions of Gauss-Markov have to be fulfilled (Brooks, 2014). Consequently, the following assumptions are controlled for when running the OLS-regression:

- | | | |
|------|--------------------------------|-----------------------------------|
| I. | $E(u_i) = 0$ | [Mean value of error term is 0] |
| II. | $Var(u_i) = \sigma^2 < \infty$ | [Homoscedasticity] |
| III. | $Cov(u_i, u_j) = 0$ | [No Autocorrelation] |
| IV. | $Cov(x_i, u_i) = 0$ | [No Endogeneity] |
| V. | $u_i \sim N(0, \sigma^2)$ | [Normally distributed error term] |

Assumption: $E(u_i) = 0$ [Mean value of error term is 0]

The first assumption states that the expected value of the estimated error terms is to be 0. With the objective of an OLS being to minimize the RSS (i.e. Residual Sum of Squares) (Brooks, 2014):

$$RSS = \sum_{t=1}^T [y_i - (b_0 + b_1 x_i + \dots + b_n x_n)]^2$$

This assumption is fulfilled as long as an intercept is included in the estimated regression (*ibid.*). Therefore, all the models used in this study include a constant term in the regression.

Assumption: $Var(u_i) = \sigma^2 < \infty$ [Homoscedasticity]

The second Gauss-Markov assumption states that there is homoscedasticity, i.e. the error terms do not increase as the measured variables increase (Brooks, 2014). This assumption is vital to test for since the interpretation of the economic effect of the estimates (although the estimates are still unbiased) would be incorrect, since the standard errors, and consequently, the t-statistics would be biased (*ibid.*). For potential heteroscedasticity to be discovered, this study uses a White's test and White's corrected standard errors in case of the data suffering from heteroscedasticity. However, since the estimates of earnings management are also regressed, a Generalized Least Squares (GLS) (i.e. manually adjusting for heteroscedasticity (Brooks, 2014)) approach is used by denoting all variables with the total assets of a firm.

Assumption: $Cov(u_i, u_j) = 0$ [No Autocorrelation]

For the OLS assumptions to hold, the error terms cannot be auto correlated throughout time, nor cross-sectionally (Brooks, 2014). Not controlling for this assumption would lead to similar problems as the previous assumption, i.e. the estimates would be unbiased, albeit inefficient (*ibid.*). This study controls for the assumption by controlling for Durbin-Watson statistics.

Assumption: $Cov(x_i, u_i) = 0$ [No Endogeneity]

One of the concerns occurring when designing models for the cost of debt (as discussed in the methodology), is omitting variables that should originally be included in the model. This is actually reasons for endogeneity issues occurring, meaning that the explanatory control variable is actually being explained by something excluded from the model (Brooks, 2014). Recent studies have shown distress over the measure of discretionary accruals potentially being endogenous (e.g. Liu *et al.*, 2010; Ge and Kim, 2014). Consequently, it is necessary to control for this issue, which this study does by conducting a manual Hausman-test presented in the section of results.

Assumption: $u_i \sim N(0, \sigma^2)$ [Normally distributed error term]

The last assumption of Gauss-Markov is the error terms being normally distributed with the expected value of 0, and a variance of σ^2 (Brooks, 2014). By conducting a Jarque-Bera test, this assumption is controlled for with the null hypothesis of skewness and kurtosis being 0 and 3 respectively (*ibid.*). If these criteria are not fulfilled (i.e. the null hypothesis not being accepted), the error terms are not normally distributed. As a final note, the test for normal distribution of the error terms is highly sensitive to the impact of extreme values being included in the sample (*ibid.*). Consequently, Brooks (2014) states that the OLS regression will still give BLUE as long as the rest of assumptions hold.

Given that these assumptions are fulfilled, the estimates and their impact on the yield spread can be interpreted correctly. The cost of debt is consequently approximated with the yield spread on the issuance day, which is estimated by running the following structural regression:

Equation 1: Yield Spread

$$\begin{aligned}
 \text{YieldSpread} = & \beta_0 + \beta_1 EM_i + \beta_2 \text{Orthogonal Rating}_i + \beta_3 \text{Total Assets}_i + \\
 & \beta_4 \text{Leverage}_i + \beta_5 \text{Income}_i + \beta_6 \text{STDRET}_i + \beta_7 \text{STDROA}_i + \beta_8 \text{Maturity}_i + \beta_9 \text{Beta}_i + \varepsilon_{it}
 \end{aligned}
 \tag{9}$$

Chapter 4. Results

In this chapter, the empirical results and descriptive statistics regarding the sample are provided. Before interpreting the regression outputs, issues regarding multicollinearity, endogeneity and other statistical matters are addressed. Lastly, the chapter unfolds a summary of the hypotheses stated in the literature review with corresponding economic outcomes.

4.1. Sample Characteristics and Descriptive Statistics

The sample of bond issuing firms on the European market used in this study consists of 127 individual firms as presented in figure 2. The sample has similar characteristics to the actual corporate bond issuance activity on the European market, where French corporations constitute the largest amount of bonds issued, and together with the United Kingdom, Scandinavia and Germany comprises two-thirds of the issued corporate bonds in Europe (Credit Reform, 2015). Hence, it can be concluded that the sample in general matches the European corporate bond market overall and that no country or region is overrepresented in the sample.

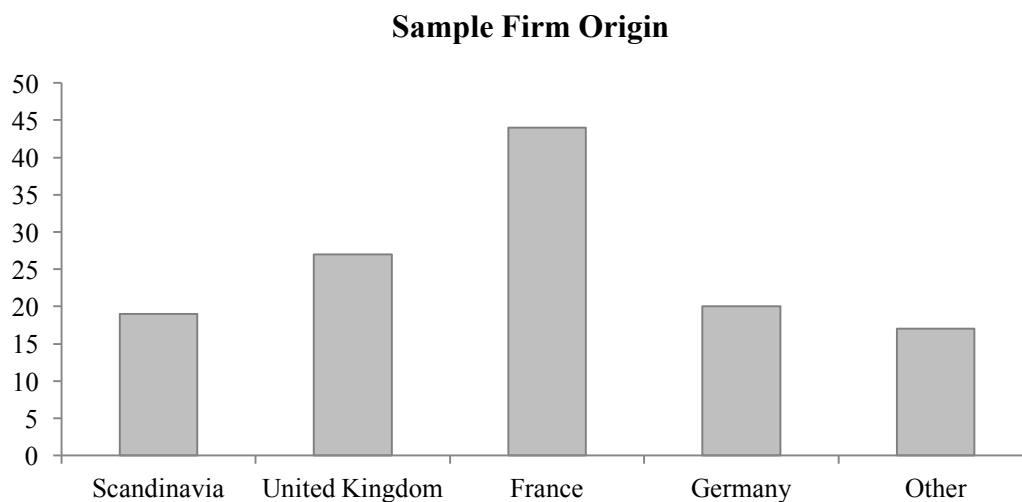


Figure 2: Sample Firm Origin

Further on, by looking at the sample distribution of ratings (Figure 2), it is clear that the sample follows the actual distribution of ratings of corporate bond by Standard and Poor's. Thus, it can be concluded that the distribution of the ratings used in the sample follows the actual population distribution reasonably closely, although there are some ratings overrepresented in the sample when it comes to bonds assigned a BBB+ to BB- rating.

Rating Distributions

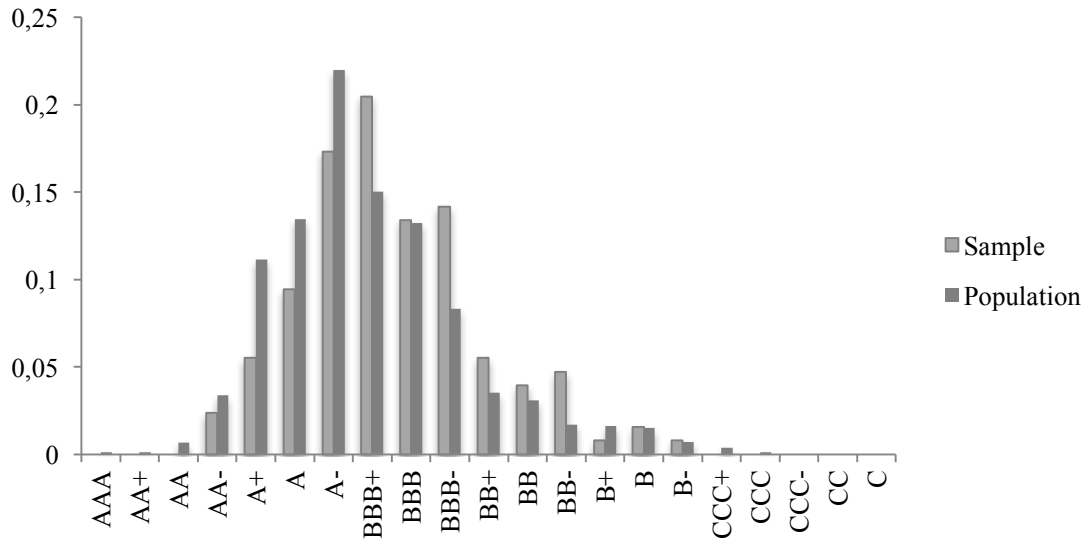


Figure 3: Rating Distribution

Table 2 presents the descriptive statistical characteristics of the sample. Considering the Jarque-Bera test for normality of each variable, it is notable that most of the variables included in this study do not follow a normal distribution. Although this violates the normality assumption, as mentioned in section 3.7.2, this does not constitute a great problem in the OLS estimation as long as remaining assumptions hold (Brooks, 2014). The Jarque-Bera test for normality is as mentioned very sensitive to extreme values included in the sample (*ibid.*), and since there are extreme values, the question of how to handle them arises. Winsorizing values tends to have a minimal effect on the sample, while truncation of data often biases the estimates (Leone et al., 2013), Along with previous literature (eg. Ge & Kim, 2014), the variables of interest have been winsorized at the bottom and top 2 percent.

	DA	AbnCFO	AbnProd	AbnDisexp	Rating	Yield Spread	Income	Operating Cash Flow	Size	Leverage	STDROA	STDRET	Maturity	Beta
Mean	0.037416	-0.071987	0.046214	0.138846	15.42520	173.2336	0.115872	0.086277	9.935345	0.221362	0.024736	0.016017	9.354331	-0.146061
Median	0.017816	-0.067761	0.060477	0.125271	16.00000	130.0000	0.103873	0.083006	10.04598	0.200193	0.016367	0.015195	7.000000	-0.320564
Maximum	0.821626	0.043985	0.261625	0.409215	20.00000	834.0000	0.385036	0.252190	12.77491	0.749063	0.266687	0.046160	61.00000	21.25378
Minimum	-0.731734	-0.215460	-0.204457	0.000560	8.000000	15.00000	0.006399	-0.012301	6.918497	0.065326	0.000520	0.000000	1.000000	-3.043570
Std. Dev.	0.172363	0.074218	0.129310	0.108976	2.388862	141.0149	0.057594	0.046827	1.287967	0.108541	0.031130	0.006324	9.405780	2.340334
Skewness	1.031292	-0.262952	-0.271232	0.710621	-0.625961	2.107768	1.307686	0.605635	-0.202447	1.583542	4.729863	1.036479	4.451902	6.537428
Kurtosis	10.89728	2.030820	2.308621	2.755552	3.375910	8.717986	6.254958	4.045780	2.329095	7.328904	33.03822	6.195407	23.59240	58.36777
Jarque-Bera	352.5377	6.434063	4.054430	10.91834	9.041429	224.9947	91.53334	13.55106	3.249366	148.6441	5248.175	76.16584	2663.427	16991.85
Probability	0.000000	0.040074	0.131702	0.004257	0.010881	0.000000	0.000000	0.001141	0.196974	0.000000	0.000000	0.000000	0.000000	0.000000
Sum	4.751871	-9.142330	5.822934	17.49464	1959.000	18536.00	14.59986	10.95723	1261.789	27.44893	3.141483	2.018146	1188.000	-18.40365
Sum Sq. Dev.	3.743320	0.694044	2.090144	1.484465	719.0394	2107831.	0.414639	0.276294	209.0162	1.449074	0.122100	0.005000	11147.06	684.6456
Observations	127	127	126	126	127	107	126	127	127	124	127	126	127	126

Table 2: Sample Descriptive

4.2. Issues Regarding Multicollinearity

Before running the regressions, potential multicollinearity issues are checked for. Variables are considered multicollinear when their correlation coefficient ρ higher (lower) than 0.7 (-0.7) (Brooks, 2014). This would potentially distort the standard errors of the variables in such way that variables can seem insignificant because of the wide-ranging confidence intervals (*ibid.*). The correlation matrix in appendix C, show that both credit rating and yield spreads have a significant negative correlation. However, because these variables are not running in the same regressions, nor are they explanatory, they do not raise any problems of multicollinearity. Further on, we notice that operating cash flow and operating income suffer multicollinearity. According to Brooks (2014), there are several possible remedies for multicollinearity between independent variables. First off, one could simply ignore it because it does not affect the properties of linear regressions. Further on, it is possible to transform the variables into ratios. Finally, one could exclude one of the variables. With this in mind, since none of these variables are variables of interest, we choose to drop the variable “*Operating Cash Flow*” from our model.

4.3. Endogeneity-Concerns Regarding Discretionary Accruals

Concerns regarding endogeneity stem from two sources in this study. As the variable of interest is included among the independent variables, it is inevitable not to test for the fourth Gauss-Markov assumption. First off, with omitting variables being one of the foremost reasons of endogeneity (Brooks, 2014), it is of great necessity to control for endogeneity since the models used to measure the cost of debt have been constructed without a clear line from previous literature. Secondly, there are rising concerns in the literature of earnings management regarding discretionary accruals being endogenous (e.g. Liu *et al.*, 2010; Ge and Kim, 2014). Consequently, a manual Hausman-test (appendix A) is conducted in order to control for this issue. In accordance with previous literature (*ibid.*), the absolute value of total accruals (AA) is used as an instrument variable (IV). The output of the Hausman-test (presented in appendix A) shows no evidence of endogeneity. Therefore, no measures against endogeneity have to be undertaken.

4.4. Regression Outputs

4.4.1 Bond Ratings

The regression outputs for the ordered response model where the cost of debt is approximated using initial credit ratings as a dependent variable is presented in table 3. The results indicate that earnings management using discretionary accruals has a positive impact on bond ratings

(although insignificant). On the other hand, the measures used for real earnings management all show a negative impact on the credit ratings (also insignificant), meaning that higher levels of real activities manipulations result in a lower bond rating.

As for the control variables, the bond rating is positively affected by firms with a higher operating income, as well as greater capitalization, which is statistically significant for each of the variables throughout all models. Furthermore, volatility in stock returns, leverage as well as equity betas all have a significant negative impact on ratings throughout the models. This suggests that higher leverage, stock volatility and macroeconomic risk exposure lowers the rating. Lastly, volatility in return on assets, and the time horizon of maturity do not have a significant impact on when rating agencies determine the bond rating.

4.4.2 Yield Spreads

Table 4 presents the outputs of the OLS-regressions used when the cost of debt is approximated by the yield spread (measured in bps). As can be seen, consistent with the previous model, discretionary accruals tend to have a positive effect on yield spreads, since a higher amount of discretion used by the firm lowers the spread to its risk free treasury equivalent. However, this result is not of economic significance. On the other hand, managing real activities also show consistency with the corresponding rating model. A higher value of abnormal activity management affect yield spreads (i.e. the cost of debt) negatively. Interestingly enough, these results show statistical significance for sales manipulations (AbnCFO) at a 5% level.

For the remaining control variables, a higher income, capitalization and ratings have significant lowering impacts on yield spreads of corporate bonds in each model. Furthermore, leverage, equity betas, and volatility in past-year stock all have a significant negative impact on the spread (i.e. raising the spread). Lastly, the volatility in return on assets is the only variable in the OLS-regression not having a significant impact on the spread.

4.4.3 Explanatory Power of Models

Looking at the explanatory power of the models, the rating model has a low explanatory power (Pseudo R-squared) compared to previous studies. This could be affected by the exclusion of the subordination variable which should be included according to Kaplan and Urwitz (1979). However, as mentioned in previously, because the variable had no variance it could not be included in the model. Furthermore, the explanatory power (Adj. R-squared) of

68% for each model measuring the yield spread is in line with previous studies.

Model	Rating			
	(1)	(2)	(3)	(4)
<i>DA</i>	0.0116 (0.9934)			
<i>AbnCFO</i>		-1.9740 (0.3995)		
<i>AbnProd</i>			-0.4877 (0.7131)	
<i>AbnDisexp</i>				-1.7503 (0.2356)
<i>Income</i>	11.8066 (0.0003)**	10.8240 (0.0015)**	11.5332 (0.0005)**	12.2719 (0.0001)**
<i>Size</i>	0.6635 (0.0000)**	0.6571 (0.0000)**	0.6667 (0.0000)**	0.6615 (0.0000)**
<i>Leverage</i>	-3.7333 (0.0153)*	-3.6745 (0.0168)*	-3.7238 (0.0150)*	-4.1320 (0.0087)**
<i>STDROA</i>	-4.2899 (0.4370)	-4.5364 (0.4086)	-4.2745 -4322	-4.0835 (0.4689)
<i>STDRET</i>	-86.2005 (0.0034)**	-83.5510 (0.0045)**	-84.8469 (0.0041)**	-91.2048 (0.0021)**
<i>Maturity</i>	0.0100 (0.5627)	0.0101 (0.5560)	0.0099 (0.5607)	0.0085 (0.6121)
<i>Beta</i>	-0.2040 (0.0169)*	-0.2001 (0.0187)*	-0.2079 (0.0151)*	-0.2083 (0.0145)*
Observations:	124	124	124	124
Pseudo R-squared:	0.1063	0.1076	0.1065	0.1088
F-statistic:	NA	NA	NA	NA
Prob(F-stat):	NA	NA	NA	NA

Table 3: Regression Output, Bond Ratings

	Yield spread			
Model	(1)	(2)	(3)	(4)
<i>DA</i>	-73.9090 (0.3358)			
<i>AbnCFO</i>		204.5001 (0.0457)*		
<i>AbnProd</i>			34.5672 (0.6073)	
<i>AbnDisexp</i>				117.0911 (0.1246)
<i>C</i>	233.0233 (0.0019)**	222.6461 (0.0022)**	222.4123 (0.0020)**	195.4018 (0.0099)**
<i>Rating</i>	-123.0267 (0.0000)**	-120.6740 (0.0000)**	-122.1375 (0.0000)**	-121.3211 (0.0000)**
<i>Size</i>	-24.8433 (0.0004)**	-22.8845 (0.0006)**	-23.9950 (0.0004)**	-23.6923 (0.0003)**
<i>Leverage</i>	228.6849 (0.0015)**	222.8003 (0.0015)**	240.1031 (0.0006)**	272.5718 (0.0003)**
<i>Income</i>	-555.3393 (0.0001)**	-490.1642 (0.0002)**	-570.0387 (0.0001)**	-617.7732 (0.0000)**
<i>STDROA</i>	1004.0275 (0.0641)	1065.8489 (0.0540)	1039.6391 (0.0587)	997.0816 (0.0716)
<i>STDRET</i>	9386.4619 (0.0000)**	9258.1332 (0.0000)**	9312.5827 (0.0000)**	9762.5456 (0.0000)**
<i>Maturity</i>	3.6968 (0.0003)**	3.4847 (0.0000)**	3.5222 (0.0002)**	3.6340 (0.0002)**
<i>Beta</i>	15.5712 (0.0243)*	14.6823 (0.0286)*	15.6115 (0.0246)*	15.2076 (0.0243)*
Observations:	105	105	105	105
R-squared:	0.7123	0.7134	0.7087	0.7107
Adj. R-squared	0.6850	0.6863	0.6811	0.6833
F-statistic:	26.1283	26.2780	25.6818	25.9369
Prob(F-stat):	0.0000	0.0000	0.0000	0.0000

Table 4: Regression Output, Yield Spread

4.5. Summary of Hypotheses

As a final notation, a summary of all measures of earnings management and their corresponding impact is presented in Table 5.

<i>Bond Ratings</i>	<i>Hypothesis</i>	<i>Outcome</i>
<i>Accruals-based Earnings Management:</i>		
Discretionary Accruals	$H_{1,A-B}$	<i>Not supported.</i>
<i>Real Earnings Management:</i>		
Sales manipulation	$H_{1,C-D}$	<i>Not supported.</i>
Overproduction	$H_{1,C-D}$	<i>Not supported.</i>
Discretionary expenses	$H_{1,C-D}$	<i>Not supported.</i>
<i>Yield Spread</i>	<i>Hypothesis</i>	<i>Outcome</i>
<i>Accruals-based Earnings Management:</i>		
Discretionary Accruals	$H_{2,A-B}$	<i>Not supported.</i>
<i>Real Earnings Management:</i>		
Sales manipulation	$H_{2,C}$	<i>Supported, significant at 5%.</i>
	$H_{2,D}$	<i>Not Supported.</i>
Overproduction	$H_{2,C-D}$	<i>Not supported.</i>
Discretionary expenses	$H_{2,C-D}$	<i>Not supported.</i>

Table 5: Summary of Hypotheses

Chapter 5. Analysis & Discussion

In this chapter the empirical findings from the performed regressions are presented and analyzed. The first part will scrutinize the effect of earnings management on credit ratings, the latter the effect of earnings management on bond yields.

5.1. Earnings Management

The empirical results show limited evidence on earnings management with regards to public debt issuance and credit ratings in Europe. The extent to which earnings management is significant varies between accruals-based and real activities manipulation. Dividing this study into two sub-studies, the first focusing on credit ratings, the conducted regressions results show that earnings management is not significantly affecting credit ratings, meaning we fail to reject the null of no relation between earnings management and the cost of debt (approximated by credit ratings). Meanwhile, we can reject the null of no relationship between earnings management the cost of debt (approximated by the yield spread), regarding the real activity of manipulating sales.

5.2. Earnings Management and its effect on Credit Ratings

The arguments for earnings management stemming from managers' opportunistic behavior are based on the logic that firms near their benchmarks, such as a broad credit rating change, have incentives to direct their earnings either through accruals or by engaging in real activities to arrive at the desired rating. This study attempts to test the opportunistic behavior with hypotheses $H_{1,A}$ and $H_{1,C}$. Arguments for earnings management being considered a beneficial activity, argue that the activity increases the information value of earnings. Hence, earnings management may be seen as valuable by sharing the firms' prospects to the firm's stakeholders, leading to the desirable action hypotheses $H_{1,B}$ and $H_{1,D}$.

We find that as firms engage in higher levels of earnings management via accruals, they are more likely to receive a higher bond rating than those who do not, supporting $H_{1,B}$. This is consistent with the desirable action hypothesis. In line with Demitras and Cornaggia (2013) and Alissa *et al.* (2013), this implies that firms can influence their credit ratings. The underlying argument for accruals manipulation being considered a desirable action by the firm's stakeholders is that it would be interpreted as a signal of the firm's prospects. However, the positive implications of AEM on credit ratings implied in the regression might also be explained as a conflict of interest between CRAs and firms. As Frost (2006), states, there is

evidence that supports that CRAs face a conflict of interest whilst acting to provide both timely information to the market and serve regulatory and contracting functions. Considering that CRAs claim that they base their ratings on what is disclosed to them by the issuing firm and they are reluctant to change ratings often, the arguments for the desirable action hypothesis appears weak when taking CRAs point of view. Also Demitras and Cornaggia (2013) conclude that the evidence is consistent with “borrowing future-earnings” to obtain more favorable initial credit ratings, and that the evidence documented is consistent that the average ratings are influenced by opportunistic earnings management. However, since the regression show that the impact is not statistically significant, no further conclusions can be made.

The results for real earnings management on credit ratings are all in line with managerial opportunism. The implied negative relation between REM and credit ratings is in line with the results found by Crabtree *et al.* (2014). Following Roychowdhury’s (2006) argumentation that manipulated earnings cannot serve as a reliable firm performance measure for investors and bondholders, since it masks the true performance of the firm by distorting earnings quality and increases the information asymmetry, it can be interpreted as opportunistic behavior from managers’ behalf. Arguably, CRAs detect managers’ suboptimal business decisions and regard these activities (overproduction, sales manipulation and reducing discretionary spending) as credit risk increasing, resulting in a lower credit rating. Despite the argument for using REM is that it is a less detectable strategy (Graham *et al*, 2005), the insignificance of this regression suggests that it does not have positive nor negative implications for credit ratings.

5.3. Earnings Management and its effect on Bond Yields

In line of Liu *et al.* (2010), the results indicate that it is beneficial, meaning that a lower yield spread can be achieved, for European firms to engage in earnings management using discretionary accruals. The implied positive relation between AEM and bond yields suggest that investors on the European market do not see accruals manipulation as a negative signal and thus, reward firms with a lower yield spread. Hence, the discretionary part of accruals appears to signal future prospects of a firm, in in line with the desirable action hypothesis. The results however, do not show any statistical significance.

Managing earnings through real activities on the other hand, does not show support for the desirable action hypothesis stating that abnormal levels of sales, production and discretionary expenses could be seen as a successful strategy implementation from the firm's point of view. Instead, the implication is that abnormal levels of real activities penalize the firm by yielding a higher spread on corporate bonds (holds for all three REM measures). The two REM measures, overproduction and reduction of discretionary spending, are found to be statistically insignificant, why no clear implications can be drawn. However, the positive relation between sales manipulation and bond yields is in line with both Crabtree et al. (2014) and Ge and Kim (2014). The interpretation would thus be that bondholders perceive REM as a credit risk increasing activity, which needs to be adjusted with a risk premium. Abnormal level of sales shows a statistically significant negative relation to REM at 5%, suggesting that managers engaging in sales manipulation, i.e. creating sales through large discounts and alleviate credit terms for customers. This implies that bond market participants view the engagement in REM (through sales manipulation) as an opportunistic action on managers' behalf, which they penalize through higher risk premiums.

Chapter 6. Conclusion and Future Research

6.1. Conclusion

With the purpose to test how earnings management is influencing the cost of debt, this study finds results in line with past research. In particular, this study contributes to the literature by demonstrating how two earning management techniques are perceived by bond market participants. By investigating the assignment of a specific rating to a new bond issuance, and then exploring the pricing of the actual bond issue by the market place, the employment of real earnings management techniques is found to have negative implications; this is statistically significant for the REM practice of manipulating sales. Consequently, engaging in REM increases the firms' cost of debt on the European bond market, reflecting the managerial opportunism hypothesis

The ongoing debate on whether earnings management as a practice is detrimental or beneficial provides an interesting way to interpret earnings management. What initially is an indirect attempt to create value for the firm, the motivations for using earnings management appear to actually backfire and yield a higher cost of debt, which ultimately destroys firm value. This implies that firms fail to convey private information to creditors and other investors when issuing corporate bonds, and is continuously viewed as a malpractice.

6.2. Future Research

For future studies, it would be interesting to examine the valuation consequences of earnings management and the process of credit ratings in more detail. Also, given the different legal origins prevailing in Europe, it would be interesting to see the effect across countries within Europe. In addition, it would also be interesting to control for other variables, such as corporate governance and institutional ownership, as well as market risks and differences between broad credit rating categories.

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Appendices

Appendix A: Endogeneity

Step	Hausman test		
	(1)	(2)	
Dep. Var:	DA	Yield Spread	
<i>Da</i>		323.188300 (0.8371)	
<i>C</i>	0.106393 (0.3921)	-97.804255 (0.6406)	
<i>Rating</i>	-0.009331 (0.6338)	128.157785 (0.0000)**	
<i>Size</i>	-0.011728 (0.2346)	4.641757 (0.8233)	
<i>Leverage</i>	-0.071410 (0.5064)	293.149115 (0.0244)*	
<i>Income</i>	0.419129 (0.0374)*	-621.648392 (0.3617)	
<i>STDROA</i>	-0.464523 (0.1861)	1341.022053 (0.0739)	
<i>STDRET</i>	-0.752036 (0.6789)	10635.213291 (0.0000)**	
<i>Maturity</i>	0.002973 (0.0096)**	2.344737 (0.6328)	
<i>Beta</i>	0.005016 (0.2680)	14.474823 (0.1683)	
<i>AA</i>	0.151902 (0.6114)		
<i>Residual from eq1</i>		-373.845100 (0.8132)¹	
Observations:		124	105
R-squared:	0.1346	0.6869	
Adj. R-squared	0.0662	0.6536	
F-statistic:	1.9693	20.6216	
Prob(F-stat):	0.0492	0.0000	

¹Comment: As the p-value of this test is > 5%, there is no concern for endogeneity.

Appendix B: Sample Selection

<i>Filter</i>	<i>Command</i>	<i>Description</i>	<i>Sample</i>
Macro industry	Exclude	Financial Firms	169 913
Public status	Include	Public firms	95 760
Maturity	Include	Non-perpetual	78 776
Issuer region	Include	Western Europe	9 165
Issuing period	Include	01.01.2010- 12.31.2015	3 311
Bond type	Include	Emerging market corporate High yield corporate Investment grade corporate	3 031
Rating	Include	Standard and Poor's	3 031
Target market	Include	Europe	770

Appendix C: Statistical tests

<i>OLS regression</i>	<i>Assumption I</i>	<i>Assumption II</i>	<i>Assumption III</i>	<i>Assumption IV</i>	<i>Assumption V</i>
(1) DA	Constant included	White's robust S.E. used	Not adjusted (D-W stat. = 1.96)	No adjustment needed (see Hausman test)	No adjustment needed
(2) AbnCFO	Constant included	White's robust S.E. used	Not adjusted (D-W stat. = 1.88)	No IV available	No adjustment needed
(3) AbnProd	Constant included	White's robust S.E. used	Not adjusted (D-W stat. = 1.89)	No IV available	No adjustment needed
(4) AbnDisex	Constant included	White's robust S.E. used	Not adjusted (D-W stat. = 1.91)	No IV available	No adjustment needed

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Appendix D: Correlation Matrix

Correlation matrix														
Probability	DA	AbnCFO	AbnProd	AbnDisex	Rating	Yield Spread	Income	Operating Cash Flow	Size	Leverage	STDROA	STDRET	Maturity	Beta
DA	1.000000													
AbnCFO	-0.073478	1.000000												
AbnProd	-0.209046	0.411432	1.000000											
AbnDisex	0.035284	0.004324	0.120086	1.000000										
Rating	0.087801	-0.133595	-0.178135	-0.093838	1.000000									
Yield Spread	-0.080726	0.260153	0.211061	0.104333	-0.743669	1.000000								
Income	0.187305	-0.356988	-0.383012	-0.003441	0.192902	-0.217822	1.000000							
Operating Cash Flow	0.136350	-0.401494	-0.376903	0.126188	0.208892	-0.258672	0.855175	1.000000						
Size	-0.039271	-0.012201	0.074503	-0.065382	0.415684	-0.344370	-0.244832	-0.221137	1.000000					
Leverage	-0.079562	0.023264	-0.098012	0.177539	-0.156824	0.154816	0.307563	0.346553	-0.247960	1.000000				
STDROA	-0.095925	-0.042012	0.000201	-0.046012	-0.253149	0.328625	0.026516	0.003159	-0.267184	0.056594	1.000000			
STDRET	-0.026822	0.113370	0.210483	-0.231677	-0.361393	0.521563	-0.209608	-0.332687	-0.210667	-0.138183	0.182306	1.000000		
Maturity	0.086424	0.024466	-0.007656	0.057952	0.168128	0.097340	-0.078940	0.005364	0.156944	-0.014691	-0.068817	-0.147182	1.000000	
Beta	0.070376	0.012139	-0.068704	0.119873	0.013722	0.033174	0.173751	0.102534	-0.044290	0.135967	-0.175951	-0.017815	0.053854	1.000000