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Master Thesis

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Debt Issuance and Engagement in Earnings Management for U.S. Public Firms: A Study of Occurrence and Market Reactions From a Heterogeneous Debt Perspective

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Abstract

This thesis analyzes the relationship between earnings management and debt issuance and further addresses to what extent the market is able to detect earnings being managed in conjunction with debt issuance. It contributes to existing literature by addressing this from a heterogeneous debt perspective, looking at subcategories of loans and bonds. We draw on relevant existing literature on debt and capital structure, credit rating distributions, detection of earnings management and cumulative abnormal returns.

The thesis is based on U.S. public firms for 1996-2020, and variations of the Modified Jones model with ROA are used to detect earnings management. Additional econometric specifications are added to the original model in an attempt to increase the reliability of the model. Further, debt and capital structure regressions and event studies on issuance of different debt types construct the basis for our analysis.

Debt and capital structure regressions indicate a strong relationship between debt issuance and proxies for engagement in earnings management, with clear differences between the different types of debt. Our event studies indicate that the market is not able to detect firms' engagement in earnings management in conjunction with debt issuance. Additionally, there are clear differences in market reactions for the different types of debt. Our findings suggest that debt heterogeneity should be emphasized to a greater extent for future research investigating the relationship between debt and earnings management.

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Table of Abbreviations

Abbreviation	*Meaning*
A	Above
AMEX	American Stock Exchange
B	Below
BS	Balance sheet
CAR	Cumulative abnormal returns
CF	Cash flow
CIQ	Capital IQ
CO	Compustat IQ
CUSIP	Committee on Uniform Securities Identification Procedures
DACC	Discretionary accruals
EM	Earnings management
FC	Financial constraint
GAAP	Generally Accepted Accounting Principles
GVKEY	Global Company Key
I	In between
K&Z	Kaplan & Zingales
NASDAQ	National Association of Securities Dealers Automated Quotations
NDACC	Non-discretionary accruals
NYSE	The New York Stock Exchange
OLS	Ordinary least squares
Q1	Quartile 1
Q2	Quartile 2
Q3	Quartile 3
Q4	Quartile 4
R&D	Research & development
ROA	Return on assets
SEC	Securities and Exchange Commission
SIC	Standard industrial classification
SOX	Sarbanes-Oxley Act
S&P	Standard & Poor
TA	Total assets
TACC	Total accruals
WRDS	Wharton Research Data Services

Table 1: Abbreviations

1.0 Introduction

In the early 2000s, several large firms such as Enron, WorldCom, Adelphia, and Tyco ceased to exist due to financial scandals, with earnings management (EM) being the underlying reason for failure (El Diri, 2017). Such scandals have led to more discussion on how financial reporting reflects actual firm performance (Giroux, 2004), and there is a prominent need to obtain improved knowledge on the concept of EM.

EM can be defined as “purposeful intervention in the external financial reporting process with the intent of obtaining private gain” (Schipper, 1989). In other words, EM is the manipulation of financial records to alter the appearance of a firm's financial performance. EM is based on making decisions about reporting that are within generally accepted accounting principles (GAAP) but results in unrealistic financial reports. Earnings should, however, appropriately annuitize a firm's fundamental value and reflect its current and future operating performance (Dechow & Schrand, 2004). The concept of EM must not be confused with fraud which is the alteration of reporting numbers in a sense that does not comply with GAAP (El Diri, 2017).

When issuing debt, the relevant creditor(s) will assess a firm's financial statements to evaluate the firm's financial health, credibility, and viability (Ge, 2009). The assessment of the financial statements helps creditors decide whether or not to provide the firm with debt and what terms and conditions to set, which implies that management may strive to present their financial numbers in a specific way to increase the firm's chances of being granted the desirable debt. If stakeholders are not able to detect and adjust for EM, their perception of financial health, credibility, viability, and operational performance may be inaccurate. In addition, stock prices often change after an earnings announcement, based on whether or not the earnings announcement is consistent with previously announced projections. Hence, EM can

affect both stock prices and terms and conditions for issuance of debt. (Nakamura & Póvoa, 2012).

Issuance of debt in a firm facilitates investments and firm growth. However, an announcement of such issuance may result in reactions in the market - both positive and negative. Previous research has looked at how the market reacts to issuing debt. However, the majority has addressed debt as homogenous, meaning that they have studied how the market reacts to debt in general, not looking into the different types of debt (Nakamura & Póvoa, 2012).

Due to the potential comprehensive consequences of EM, it is of utmost interest to study this concept. Therefore, this thesis will investigate to what extent firms engage in EM when issuing different types of debt. Further, we aim to provide new evidence on how the market reacts to different types of debt issuing in connection to EM. Hence, our thesis will address the following research question:

From a heterogeneous debt perspective, to what extent do U.S. public firms engage in EM when issuing debt, and to what extent does the market react to this?

This thesis will provide interesting insight for practitioners and regulators as well as for researchers and academics in the field of capital and debt structure and accounting quality. It will also be of value to creditors seeking to understand EM from a heterogeneous debt perspective and for firms with access to different debt instruments. Following this introduction, section 2 provides a literature review of relevant concepts. In section 3, the methodological choices and research design is described, and section 4 contains analyses and discussions of findings. Last, section 5 provides the conclusion and limitations of the thesis as well as suggestions for future research.

2.0 Literature Review and Hypothesis Development

There is little to no literature on connecting different types of debt and EM to market reactions. However, the following literature is relevant to our research and will be used as the basis for the development of research hypotheses.

2.1 Earnings Management

2.1.1 Occurance of Earnings Management

2.1.1.1 Motivations for Earnings Management

Healey and Wahlen (1999) formulated three main motivations for engaging in EM. First, through *capital market motivations*, a firm can manage their earnings to alter how others perceive their financial health to reduce risk perception regarding investments in firm shares. Next, they argue that accounting numbers are often used to supervise and adjust contracts between firms and their stakeholders. Earnings can be managed to meet the required accounting numbers to maintain existing contracts or enter into new contracts, such as debt contracts. This is referred to as *contractual motivations*. Last, earnings can be managed to meet requirements imposed by laws and regulations through *regulatory motivations*. Managers in firms vulnerable to adverse political consequences or managers of firms applying for governmental protection or subsidy may manage earnings to seem less profitable.

2.1.1.2 Earnings Management in the US

Studies have found that market pressure in the U.S. leads to EM being prevalent among public firms (Beatty & Harris, 1999; Beatty et al., 2002). The U.S. has highly developed securities markets and a shareholder-oriented corporate governance system (Glaum et al., 2004). Hence, investors in the U.S are highly dependent on information from the financial statements of firms. As a result, the investor's expectations play an essential role as determinants of EM (Glaum et al., 2004).

The previously mentioned scandals concerning Enron, WorldCom, etc., occurred despite the U.S. having among the strongest investor rights, most accurate analysts, the strictest regulations for controlling the production of financial data, and the most comprehensive database for financial information in the world (Dechow & Schrand, 2004). Since 1934 the government agency Securities and Exchange Commission (SEC) has monitored EM for firms and the stock market in the U.S. (SEC, 2020). The Sarbanes-Oxley Act (SOX) was passed by the U.S. Congress in 2002 and implied new stricter rules and recordkeeping requirements for accountants, auditors, and corporate officers (Berry-Johnson & Kenton, 2020).

2.1.2 Earnings Management Techniques

Earnings can be managed upward (income-increasing) or downward (income-decreasing) through a variety of approaches and techniques, which are divided into two main categories; accrual EM and real EM (El Diri, 2017).

2.1.2.1 Accrual Earnings Management Techniques

Accruals represent the difference between net income and cash flows and are created for any revenues earned or expenses incurred without cash being exchanged (Li et al., 2009). This is often referred to as non-discretionary accruals. However, the interesting accruals in terms of EM are those described as discretionary. When engaging in EM, firms can reduce or increase revenues by creating accruals. In the accrual EM techniques, discretionary decisions about accrual accounting are the basis for manipulating changes in reported earnings. Such decisions can be about, e.g. depreciation rates, bad debt calculation, or methods for inventory valuation. Accrual EM affects only the presentation of a firm's financial performance, not the underlying economics (El Diri, 2017). Accruals are created on the assumption that cash will flow to or from the firm in the future. Therefore, all accruals will, at some point, be reversed. This implies that continuous use of accrual EM in one direction is increasingly difficult (Li et al., 2009).

The findings of Koh et al. (2008) suggest that U.S. firms are less likely to engage in accrual EM after the implementation of the SOX. These findings are supported by Cohen et al. (2008), who found a steady increase for accrual-based EM from 1987 to 2002, followed by a significant decline in the years after.

2.1.2.2 Real Earnings Management Techniques

In real EM, structuring and timing actual business activities are the basis for manipulation (Li et al., 2009). Examples of real EM include improved discounts and credit terms for customers to increase sales, timing sales of long-term assets and investments in low earning periods, overproduction to reduce unit cost and cost of sales and delaying expenses related to R&D, advertising, and administration (El Diri, 2017). Koh et al. (2008) and Cohen et al. (2008) also found an increase in the use of real EM after the implementation of the Sarbanes-Oxley Act.

2.1.3 Detection of Earnings Management

Several models aiming to detect EM have emerged since the 1980s (El Diri, 2017). The models are separated into accrual EM models and real EM models. This section will address the general traits and the positive and negative sides of the different models.

2.1.3.1 Accrual Earnings Management Models

A wide range of models that aim to detect accrual EM, including the Ronen and Sadan model (1981), the Healy model (1985), the DeAngelo model (1986), the Industry-Based model (Dechow & Sloan, 1991), the Jones model (1991), the Modified Jones model (Dechow et al., 1995), the Competing-Component model (the KS model) (Kang & Sivaramakrishnan, 1995), the Distributional approach (Thomas, 1989; Burgstahler & Dichev, 1997), the Cash-Flows model (Dechow and Dichev, 2002), the Forward-Looking model (Dechow et al., 2003), the Modified Jones with ROA (Kothari et al., 2005), the Performance Matching model (Kothari et al., 2005), the Business model (Ye, 2006), the Stubben model (2010), and a new approach based on the Modified Jones model (Dechow et al., 2012).

Models concerning accrual EM use discretionary accruals as a proxy for EM. The accrual-based models mainly define total accruals as the dependent variable and measure this through two different approaches, namely the balance sheet approach (as in e.g. Fama et al., 2016) or the cash flow approach (as in e.g. Cohen et al., 2008). The balance sheet approach is based on working capital items, while the cash flow approach is based on the difference between a firm's earnings and operating cash flow. Models that address aggregated discretionary accruals have been prefered in the literature concerning EM over models that measure an isolated component of accrual accounting due to the aggregated models being able to detect a broader range of manipulation conducted with different methods. On the other hand, it is hard to separate and isolate the influence of each item within total accruals. At the same time, this is clear when using a single accrual item as a dependent variable. (El Diri, 2017).

Several models control for firm performance by looking at different key figures to avoid misclassifying normal accruals as discretionary accruals. Some of the models are not controlled for firm performance, making them likely to include type 1 errors. This concerns the Jones model, the Modified Jones model, and the Stubben model. (El Diri, 2017). However, several studies have found that the Modified Jones Model is amongst the models that have the potential to provide the most reliable estimates of discretionary accruals, together with the Modified Jones with ROA model (Guay et al., 1996; Kothari et al., 2005).

Key figures in terms of firm performance include sales growth (used in the Forward-Looking model), cash flows (Cash-Flows model), abnormal sales (Ronen & Sadan model), working capital items (Competing-Component model and Business model), return on assets (Modified Jones with ROA and Business model), and matching performance to different benchmarks (The Performance Matching model) (El Diri, 2017). Several studies favour including return on assets in the model and apply the Modified Jones with ROA model (Guay et al., 1996; Kothari et al., 2005).

Models such as the Healy model, the DeAngelo model, the Industry-Based model, and the Distributional Approach do not involve any regressions. Therefore, the models are less capable of detecting EM since they do not consider the characteristics of manipulation and the influence of firm operations. (El Diri, 2017).

Further, Dechow et al. (2012) present a new approach to the detection of accrual-based EM. This new approach is the only of our mentioned models that take into account accrual reversals, meaning that "any accrual-based EM in one period must reverse in another period." (Dechow et al., 2012). However, this model is suitable only when the researcher is able to identify the period the accrual reversal takes place. Gerakos (2012) presents a response to Dechow et al. (2012), claiming that the model suffers from measurement errors since the model assumes that discretionary accruals always represent either EM or poor quality earnings.

2.1.3.2 Real Earnings Management Models

Compared to the vast amount of models defined for detection of accrual-based EM, there are few models to measure real EM, with the Roychowdhury model (2006) and the Gunny model (2010) being the only ones to our knowledge. Both models highlight decisions to manipulate discretionary expenses and production to improve earnings. However, the Gunny model focuses on managerial decisions that allow for manipulating the sale of assets and investments. In contrast, the Roychowdhury model focuses on managerial decisions related to manipulation of sales transactions. The Gunny model includes more variables than the Roychowdhury model, yet both models face problems of measurement error, omitted variables and simultaneity. This implies that ordinary least squares (OLS) regression is not an appropriate approach. (El Diri, 2017).

2.2 Debt Structure

2.2.1 Debt Heterogeneity

In the field of corporate finance research, debt heterogeneity and debt structure are relatively understudied concepts. As previous research has focused on capital

structure and why firms issue debt over equity, some recent studies focus on debt structure and why firms issue specific types of debt (Colla et al., 2013).

Rauh and Sufi (2010) studied debt structure in terms of debt types, sources and priorities for rated U.S. public firms. Their findings show that close to 25% of their sample firms have significant changes in year-to-year debt composition even though they have no change in debt level. Additionally, close to 70% of their observations utilize more than two different debt instruments. On the other hand, Colla et al. (2013) studied debt structure in a broader range of U.S. firms, including unrated firms. Their findings show that 85% of the firms in their sample utilize mainly one type of debt. They further find that the degree of debt homogeneity varies across subsamples and that large, rated firms tend to utilize several types of debt simultaneously. In addition, Nakamura and Póvoa (2012) found that heterogeneous and homogeneous debt both have patterns related to variables such as company size, credit rating, and the market to book value for firms in Brazil. This substantiates the importance of studying capital structure in light of debt heterogeneity in addition to the traditional approach of treating debt capital as homogenous.

The findings of Rauh and Sufi (2010), Nakamura and Póvoa (2012), and Colla et al. (2013) emphasizes the importance of recognising debt heterogeneity and debt structure as an element of capital structure.

2.2.2 Debt and Earnings Management

Existing literature on the relationship between debt ratio (total debt over total assets) and EM provides conflicting results. Some studies for U.S public firms, such as Chung et al. (2005), Lee et al. (2007), and Gribbin et al. (2017), found a negative relationship between debt ratio and income-increasing EM. This relationship is supported by the findings of Hemmen and Rodríguez (2010) for Spanish firms. These studies suggest that debt-holders perform some extent of control over the management of leveraged firms leaving less room for managers to engage in EM. In contrast, other studies such as DeFond and Jiambalvo (1994), Sweeney (1994), and Klein (2002) found a positive relationship between debt ratio and income-increasing

EM for U.S. public firms, supported by Othman and Zhegal (2006), studying Canadian and French firms. The studies that found a positive relation argue that firms manage earnings to get better terms and conditions when issuing debt and reduce the chance of breaching existing debt covenants.

Davidson III et al. (2010) studied whether U.S. public firms manage earnings prior to bond issuance to achieve a lower cost of borrowing. Their results show significant income-increasing EM prior to bond issuance and that the borrowing cost is lower for firms that engage in income-increasing EM. The authors argue that these results indicate that bondholders do not detect and adjust for managed earnings when pricing new debt.

Famá et al. (2016) studied EM surrounding issuances of debentures (debt securities) in Brazil. The authors argue that EM plays a particularly important role when issuing debentures as investors may pay an artificially high price for these securities if earnings are inflated. They found that issuing firms inflate their financial results in the quarter preceding the issuance to influence their investors positively. Further, they found that firms with higher debt, profitability and sales growth ratios have higher levels of EM. These findings were supported by Ater and Hansen (2020), who studied the presence of EM prior to private debt issuance for U.S. firms. Ater and Hansen (2020) indicate that firms engage in income-increasing EM in the period prior to new debt issuance.

2.2.3 Debt, Credit Rating and Earnings Management

Firms with high debt ratios generally have low credit ratings (Cornaggia & Demirtas, 2013; Nakamura & Póvoa, 2012). This, in combination with the findings of Chung et al. (2005), Lee et al. (2007), Hemmen and Rodríguez (2010), and Gribbin et al. (2017), which suggests a negative relationship between debt ratio and EM, suggests that firms with high credit ratings are related to high levels of EM. However, combined with the findings of DeFond and Jiambalvo (1994), Sweeney (1994), Klein (2002), and Othman and Zhegal (2006), which suggest a positive relationship

between debt ratio and EM, the suggestion would be that firms with low credit ratings are related to high levels of EM.

The argumentation for low credit quality firms having higher incentives to engage in EM can also be drawn from an agency cost perspective. Studies find that high agency costs are connected to higher levels of EM (Warfield et al., 1995; Leuz et al., 2003). Further, Fung & Goodwin (2013) state that higher agency costs are connected to low credit quality firms (BB or lower). This further strengthens the theory that low credit quality firms have higher incentives to engage in EM.

2.2.4 Debt Structure and Credit Rating Distribution

Rauh and Sufi (2010) studied capital and debt structure in firms of different levels of credit quality, and were the first to identify debt structure as an important dimension of the overall capital structure. They used Standard & Poor's (S&P) credit rating (appendix A) to identify the credit quality. Their data show interesting relations in terms of debt structure across credit quality distribution. Bank secured debt, subordinated bonds and convertible subordinated debt is negatively related to credit rating (appendix B1). Further, subordinated debt and secured debt is also negatively related to credit rating (appendix B2). The findings of Hackbarth and Mauer (2012) support this as they found that riskier firms with high financial distress tend to prioritize subordinated debt for their debt issuances.

Based on the findings of Rauh and Sufi (2010), Colla et al. (2013) continued to study the connection between debt structure and levels of credit quality based on the S&P credit rating scale. They found that commercial paper and other debt is positively related to credit rating (appendix C).

We draw from the findings suggesting a positive relationship between debt ratio and EM, resulting in the following hypotheses:

> *H_1: Earnings management in year t is more prominent to issuance in year t of subordinated debt and secured debt than unsecured debt.*

H_2: Earnings management in year t is more prominent to issuance in year t of convertible subordinated debt and subordinated bonds than unsecured debt.

H_3: Earnings management in year t is more prominent to issuance in year t of subordinated debt, term loans and drawn credit lines than commercial papers.

2.3 Market Reactions

2.3.1 Debt and Market Reactions

Fungacova et al. (2019) studied the effect of syndicated loans and bond announcements on the stock market reaction. The results show that announcements of debt, in general, tend to give a positive reaction in the stock market. The reaction is significantly stronger for loan issuance than for bond issuance. Dammen and Johansen (2020) found that the market reaction to loan issuance is positive while the reaction to bond issuance is negative. Hence, their findings contradict the findings of Fungacova et al. in terms of market reactions to bond issuances. Marshall et al. (2019) studied how the stock market responds to announcements of publicly, bank, and privately placed debt issuance among U.K. firms. Unlike Fungacova et al., they found no evidence of a significant market reaction to announcements of debt issuances in general. However, they found that prior to the financial crisis in 2008, stock prices responded positively to announcements of syndicated loan issuance. After the crisis, the response to the announcement of syndicated loans has declined but remains positive, both in absolute terms and in comparison to alternative sources for borrowing. Even though these studies have found somewhat contrasting results, there seems to be some agreement on issuance of loans resulting in a positive market reaction.

2.3.2 Earnings Management and Market Reactions

Gavious (2007) studied whether investors' ability to detect and interpret EM is influenced by analysts for 2001-2004. Their results show that investors rely on

reactions from analysts to be able to detect EM. During the ten first days after earnings announcements, investors are misled by the managed earnings prior to analysts presenting their recommendations. However, thirty days after the earnings announcements, recommendations from analysts are available, and investors, therefore, reassess the reliability of the earnings presented. Gavious (2007) also finds that when analysts present negative reactions to firms that engage in income-increasing EM (expressed through a decrease in target price), an even stronger negative reaction can be seen in the market.

Kwag and Stephens (2010) investigated investor reactions to EM over the period 1988-2002. They found a post-earnings announcement increase in cumulative abnormal returns (CAR) for firms engaging in income-decreasing EM and a decrease for firms engaging in income-increasings EM. Their findings support Gavious (2007), showing that investors are able to detect and interpret EM information presented by analysts.

Based on the findings of Gavious (2007), Kwag and Stephens (2010), Fungacova et al. (2019), Marshall et al. (2019), and Dammen and Johansen (2020), we construct the following hypotheses:

> *H_4: When firms engage in income-increasing (income-decreasing) EM in conjunction with issuance of loans, the market is initially not able to detect EM, resulting in an increase (decrease) in CAR.*
>
> *H_5: When firms engage in income-increasing (income-decreasing) EM in conjunction with issuance of loans, analysts detect EM after some time. This information is then detected and interpreted by the market, resulting in a decrease (increase) in CAR.*

The findings discussed in this literature review give us a basis for constructing hypotheses on loans such as in H_4 and H_5. However, we also find it interesting to investigate the relationship between EM, bond issuance and market reaction.

3.0 Methodology

3.1 Research Design

The research will be conducted with a deductive approach, particularly concerned with theory falsification or verification (Lewis et al., 2016). The collected data will evaluate our hypotheses through the deductive approach in light of the presented existing theory. The purpose of our research is to provide an explanatory study investigating the relationship between different forms of debt, EM and market reactions.

Our thesis will be purely numeric based on secondary quantitative data, examining relationships between variables, which will be analysed using statistical techniques explained further in this section. The analyses are conducted in the statistical software program Stata. The study will be based on repeated observations of the same variables over the period 1996-2020. The sampling is restricted to this period as 1996 was the year the SEC mandated electronic submission of all SEC filings (Green et al., 2006). Using secondary data makes it easier to obtain a longitudinal time horizon. A strength for collecting data over such a long time horizon is the strengthened capacity to study change and development.

3.2 Data Collection and Processing

To answer our research question and hypotheses, we will need information about the characteristics of debt issuance of U.S. public firms and characteristics of the associated financial statements of the firms issuing debt for the same period. This quantitative data will be extracted from the sources Refinitiv Eikon, Refinitiv Loan Connector, Wharton Research Data Services (WRDS) Compustat IQ (CO), and WRDS S&P Capital IQ (CIQ).

Financial statements for U.S. public firms are collected from Compustat IQ for 1996-2020 using Global Company Key (GVKEY) as firm identifier. The initial dataset contains 327.218 observations. Only U.S. firms traded on AMEX, NASDAQ,

and NYSE are included. Consistent with prior research, we remove all firm-year observations from utilities (SIC codes 4900-4949) and financial firms (SIC codes 6000- 6999) as these firms have unique reporting incentives. We then replace missing values for relevant variables with lagged values, or zeros if lagged values are missing. Further, we winsorize all key variables at the 1st and 99th percentiles. Last, we perform the cleaning procedure described in Colla et al. (2013). The final Compustat IQ dataset contains 82.629 observations for 7.962 distinct firms. This dataset will be used for DACC calculations using the Modified Jones with ROA model (section 3.3.1.1) and debt and capital structure regressions (section 3.3.1.2).

In order to have additional data on debt composition, we merge the Compustat IQ data with debt and capital structure information from Capital IQ for 2002-2010, containing 225.079 observations. We follow the same cleaning procedures as described for the Compustat IQ dataset. The final merged Compustat IQ and Capital IQ dataset contain 28.021 firm-year observations from 4.294 distinct firms. This dataset will also be used for debt and capital structure regressions (section 3.3.1.2). Appendix D provides a detailed description of all variables used in debt and capital structure regressions.

In terms of bonds and loans for U.S. public firms, information about debt issuances is collected from Refinitiv Eikon and Refinitiv Loan Connector. We chose to focus on bonds and loans since bonds, notes, drawn credit lines, and term loans are the most employed debt types (Colla et al., 2013). The bonds data is collected for 1996-2020, and the initial dataset consists of 81.430 observations for active bonds, while the loans data is collected for 1996-2013 and consists of 43.429 observations. We include only observations where the U.S. is both domicile and country of issuance in the bonds data. For loan data, we include data where the borrower is a U.S. firm. Ticker is used as firm identifier for both bond and loan data. The samples concerning bonds and loans data are merged into our sample from Compustat IQ, resulting in a sample containing the information needed to conduct our event studies. The final merged Compustat IQ, Refinitiv Eikon and Refinitiv Loan Connector dataset contain 12.035 firm-year observations from 2.028 distinct firms.

3.3 Research Strategy

The chosen research strategy for our thesis is threefold, consisting of detection of EM, capital and debt structure regressions and event studies.

3.3.1 Baseline Empirical Specification

3.3.1.1 Proxies for Earnings Management

We start with identifying potential cases of EM in our data. Our literature review shows that utilization of accrual-based models is the most common approach for detection of EM. Additionally, a wide range of studies has examined the accuracy of the accrual-based models, providing more detailed insight into the accrual-based models' power, specification, and limitations than the less studied real EM models. Several studies have found that the Modified Jones Model and the Modified Jones Model with ROA are amongst the models that provide the most reliable estimates of discretionary accruals (Guay et al., 1996; Kothari et al., 2005). Including return on assets in the model controls for the effect of performance on measured discretionary accruals. Since these two models are similar and give similar results, we choose to use only the model that includes return on assets[1].

In the Modified Jones with ROA model, discretionary accruals are used as a proxy for EM. Total accruals (TACC) consists of discretionary accruals (DACC) and non-discretionary accruals (NDACC). High positive values for DACC imply high occurrence of income-increasing EM, while high negative values for DACC imply high occurrence of income-decreasing EM (Davidson III et al., 2010). Through regressions, TACC will function as the dependent variable, while the independent variables are factors that may explain TACC (Kothari et al., 2005). The TACC values are computed using both a balance sheet approach and a cash flow approach, to improve the credibility of our findings.

[1] Regressions were initially run on both the Modified Jones Model and the Modified Jones with ROA model. The regression results for the two models provided similar outcomes.

The first step in measuring EM with the Modified Jones Model with ROA is to calculate the total accruals as follows:

$$TACC\_BS_{i,t} = \Delta CA_{i,t} - \Delta Cash_{i,t} - \Delta CL_{i,t} + \Delta DLC_{i,t} - DEP_{i,t} \quad (1a)$$

and

$$TACC\_CF_{i,t} = IBC_{i,t} - (OANCF_{i,t} - XIDOC_{i,t}), \quad (1b)$$

where

$TACC\_BS_{i,t}$ = Total accruals in year t calculated with the Balance Sheet approach

$\Delta CA_{i,t}$ = Change in current assets for firm i in year t

$\Delta Cash_{i,t}$ = Change in cash and cash equivalents for firm i in year t

$\Delta CL_{i,t}$ = Change in current liabilities for firm i in year t

$\Delta DLC_{i,t}$ = Change in short term debt included in current liabilities for firm i in year t

$DEP_{i,t}$ = Depreciation and amortization expenses for firm i in year t

$TACC\_CF_{i,t}$ = Total accruals in year t calculated with the Cash Flow approach

$IBC_{i,t}$ = Income before extraordinary items for firm i in year t

$OANCF_{i,t}$ = Operating activities net cash flow for firm i in year t

$XIDOC_{i,t}$ = Extraordinary items and discontinued operations for firm i in year t

The next step is to calculate the Modified Jones Model with ROA as follows, using both TACC calculation approaches (balance sheet approach and cash flow approach):

$$\frac{TACC_{i,t}}{A_{i,t-1}} = \alpha_1 \frac{1}{A_{i,t-1}} + \alpha_2 \frac{(\Delta REV_{i,t} - \Delta REC_{i,t})}{A_{i,t-1}} + \alpha_3 \frac{PPE_{i,t}}{A_{i,t-1}} + \alpha_4 (ROA_{i,t}) + \varepsilon_{i,t} \quad (2a)$$

and

$$\frac{TACC_{i,t}}{A_{i,t-1}} = \gamma_t + \theta_i + \alpha_1 \frac{1}{A_{i,t-1}} + \alpha_2 \frac{(\Delta REV_{i,t} - \Delta REC_{i,t})}{A_{i,t-1}} + \alpha_3 \frac{PPE_{i,t}}{A_{i,t-1}} + \alpha_4 (ROA_{i,t}) + \varepsilon_{i,t}, \quad (2b)$$

where

$TACC_{i,t}$ = Total accruals for firm i in year t, using both TACC computations (1a & 1b)

θ_i = Vector containing dummies for each firms (firm fixed effects)

γ_t = Vector containing dummies for each year (year fixed effects)

$\Delta REV_{i,t}$ = Revenues in year t less revenues for firm i in year t-1

$\Delta REC_{i,t}$ = Net receivables in year t less net receivables for firm i in year t-1

$PPE_{i,t}$ = Gross property plant and equipment for firm i in year t

$A_{i,t-1}$ = Total assets for firm i in year t-1

α_1-α_4 = Parameters to be estimated

$\varepsilon_{i,t}$ = Residuals for firm i in year t

$ROA_{i,t}$ = Return on assets for firm i in year t

The variables are scaled by prior total assets in order to remove the firm size effect and reduce heteroskedasticity (Davidson III et al., 2010). The alpha coefficients are estimated by means of an ordinary least squares regression (OLS). Further, DACC is calculated as follows:

$$DACC_{i,t} = TACC_{i,t} - NDACC_{i,t}, \quad (3)$$

where

$DACC_{i,t}$ = Discretionary accruals for firm i in year t

$NDACC_{i,t}$ = Non-discretionary accruals for firm i in year t

and NDACC is calculated as follows:

$$\frac{NDACC_t}{A_{i,t-1}} = \hat{a}_1 \frac{1}{A_{i,t-1}} + \hat{a}_2 \frac{(\Delta REV_t - \Delta REC_t)}{A_{i,t-1}} + \hat{a}_3 \frac{PPE_t}{A_{i,t-1}} + \hat{\alpha}_4 (ROA_{i,t}), \quad (4)$$

where

$\hat{\alpha}_1$ - $\hat{\alpha}_3$ = Estimated parameters

In Stata, DACC is computed from the residuals in model (2).

Our DACC calculations include additional econometric specifications. To control for measures that are not included in the TACC definition but might actually be relevant, we use the Modified Jones Model with ROA in two versions. The first version includes firm and year fixed effects controlling for the impact of unobserved heterogeneity. To be able to run regressions with firm and year fixed effects, we construct dummy variables for each fiscal year, where one year variable is omitted to control for multicollinearity. In the second version, we group the observations by industry classification for each year using SIC codes, which is interesting to observe, as several studies use this approach (Cohen et al., 2008). This allows us to take the variation in industries and years into account in the DACC calculations. We require eight observations per industry-year grouping following Cohen et al. (2008).

Several studies have found that high absolute accruals should be seen as a “red flag” indicating engagement in EM (Dechow & Schrand, 2004). As our study is longitudinal and accruals reverse over time, the DACC values are also computed as absolute values. Based on the two different approaches to TACC calculation, the Modified Jones with ROA Model, fixed effects, regression by industry and year and

computation of absolute values, we get eight different sets of proxies of EM as presented in table 2.

Variable Name	***Variable Description***
dacc_fy_cf	EM Proxy, Firm and Year Fixed Effects, Cash Flow
dacc_fy_bs	EM Proxy, Firm and Year Fixed Effects, Balance Sheet
dacc_ind_cf	EM Proxy, Industry and Year, Cash Flow
dacc_ind_bs	EM Proxy, Industry and Year, Balance Sheet
abs_dacc_fy_cf	EM Proxy, Firm and Year Fixed Effects, Cash Flow, Absolute
abs_dacc_fy_bs	EM Proxy, Firm and Year Fixed Effects, Balance Sheet, Absolute
abs_dacc_ind_cf	EM Proxy, Industry and Year, Cash Flow, Absolute
abs_dacc_ind_bs	EM Proxy, Industry and Year, Balance Sheet, Absolute

Table 2: DACC variables

3.3.1.2 Debt and Capital Structure Regressions

Our three first hypotheses are based on the findings of DeFond and Jiambalvo (1994), Sweeney (1994), Klein (2002), and Othman and Zhegal (2006), which suggest a positive relationship between debt ratio and EM. However, as other studies find that this relation is negative, we will investigate this relation in our data using the following regression model:

$$DebtRatio = \gamma_t + \theta_i + \beta DACC_{i,t} + controls'_{i,t}\,\alpha + \epsilon_{it}, \quad (5)$$

where

$DACC_{i,t}$ = Discretionary accruals for firm i in year t using all 8 DACCs

θ_i = Vector containing dummies for each firm (firm fixed effects)

γ_t = Vector containing dummies for each year (year fixed effects)

β, α = Parameters to be estimated

$Controls'_{i,t}$ = Set of controls consisting of log size, tangibility, market to book value, profitability, R&D expense over sales, cash and short term investments over total assets, and capital expenditures over total assets.

ε_t = Residuals in year t

Variables that play an important role in the debt composition decision are included as controls. Firm and year fixed effects are included to control for unobserved heterogeneity across firms and over the business cycle. Errors are clustered at the source of variation; at a firm level as in Petersen (2009). To investigate H_1, H_2 and H_3 and potentially uncover other interesting relationships, we conduct regression analysis using the following regression model, based on the same procedure as above:

$$\frac{DebtType}{TotalDebt_{it}} = \gamma_t + \theta_i + \beta DACC_{i,t} + controls'_{i,t}\,\alpha + \epsilon_{it}. \quad (6)$$

3.3.2 Event Studies

An event study examines the impact of an event on the financial performance of a security (Hayes, 2019). For this study, we wish to examine the impact of the issuance of different types of debt and the engagement in EM on the market reactions for U.S. public firms. Therefore, event study analysis is considered an appropriate strategy. Our event studies will be conducted using the WRDS "U.S. Daily Event Study" tool ("U.S Daily Event Studies," 1993-2020), with CUSIP as security identifier. Further, risk models and estimation parameters for the event need to be determined. The output from the event study will provide observations of the development of CAR for the chosen debt instruments combined with different groupings of the EM proxy DACC.

To investigate H_4 and H_5, we will conduct event studies to examine the market reaction to issuance of all loan types for firms where the proxy for EM indicates income-increasing EM, income-decreasing EM, and absence of EM. Further, to examine other possible relations in market reactions, we conduct similar event studies for all bond types, security classifications, and seniority classifications of debt. The event studies are conducted using the Fama-French Plus Momentum model as presented by Carhart (1997). We choose this model as it is more restrictive than

the original Fama French model by including momentum, which explains much of the variation in returns observed in the cross-section.

$$R_{i,t} = Rf_{i,t} + \beta_{market}\,(Rm_{i,t} - Rf_{i,t}) + \beta_{SMB}\,(SMB_{i,t}) + \beta_{HML}\,(HML_{i,t}) + \beta_{MOM}\,(MOM_{i,t}) + \varepsilon_{i,t}, \quad (7)$$

where

$R_{i,t}$ = Total return on a stock or portfolio i at time t

$Rf_{i,t}$ = Risk free rate of return at time t

$(Rm_{i,t} - Rf_{i,t})$ = Equity market premium

$SMB_{i,t}$ = Size premium

$HML_{i,t}$ = Value premium

$MOM_{i,t}$ = Momentum in stock returns

$\varepsilon_{i,t}$ = Residuals in year t

The event study tool estimates expected returns based on a defined estimation window. Then, CAR, which reflects the market reaction, is calculated for a defined event window based on the following formula:

$$CAR_i = \sum_{t=T_k}^{T_l} AR_{i,t}, \quad (8)$$

where

CAR_i = Cumulative abnormal return for event *i*

$AR_{i,t}$ = Abnormal return for event *i* at time *t*

T_k,T_l indicates which part of the event window is investigated

The estimation window is set to 100 days followed by a 50-day gap prior to a 50-day event window (-10, 40) (figure 1).

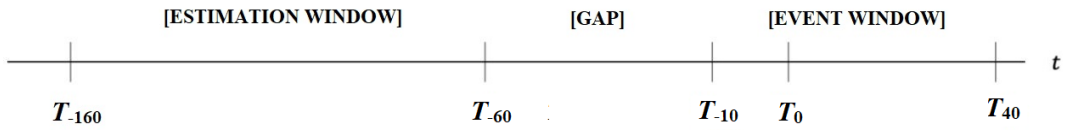

Figure 1: Estimation parameters for event studies

3.4 Quality of Research Methodology

The quality of the research design refers to the accuracy of the results and how generalizable the findings are (Lewis et al., 2016). A disadvantage of basing the research design on secondary data is that there is no real control over data quality (Lewis et al., 2016). Therefore, it is important to consider the quality of our sources. Nevertheless, WRDS is an extensive database that contains the industry's most detailed financial fundamentals for public firms (Hayes, 2020). Refinitiv delivers leading intelligence on finance, tax, accounting, etc. (Kolakowski, 2020). Further, Refinitiv is the world's most comprehensive financial historical database, allowing for research on the relationship between different sorts of data and market trends (Refinitiv, 2019). Since our sources are recognized as highly professional it is reasonable to assume that our sources provide credible information.

Quality of research design is commonly divided into validity and reliability. Validity refers to how accurately a method measures what it is intended to measure and reliability refers to how stable and consistent the results are (Lewis et al., 2016).

3.4.1 Validity

It is a common understanding in the field of EM that the models for detection of EM are imperfect. Dechow et al. (1995) point out that discretionary accruals models are misspecified when used on datasets that contain firms that experience extreme

performance. Our data is winzorised in several steps to account for extreme values. Further, Gerakos argues that models that measure EM from accruals, in general, suffer from correlated omitted variables and measurement error, leading to Type 1 and Type 2 errors (Gerakos, 2012). Additionally, these models do not take into account that earnings are best described with dynamic processes, and the models lack power and are often misspecified (Dechow et al., 2012). However, the model applied in this thesis has been applied to a vast amount of studies and is a result of improvements of previous models, from the Jones model (1991) to the Modified Jones model (Dechow et al., 1995) and eventually to the modified Jones with ROA model (Kothari et al., 2005). Nevertheless, the misspecification and power concerns of discretionary accrual models imply that our findings can only be interpreted as indications. The models are not able to provide exact estimations of EM, they only provide indications of the occurrence of EM.

3.4.2 Reliability

Our data is collected from credible secondary sources and no subjective data processing has taken place. Additionally, our methodology section is written in a detailed and transparent manner to make sure our methodological choices are sufficiently explained. The baseline econometric specifications and the data collection and processing described in this thesis can easily be replicated by others. Such replication would not necessarily give the exact same results, however, we believe potential differences would occur from natural market changes due to the longitudinal nature of the study, and not from reliability concerns. To account for natural market changes and fluctuations, the event studies are conducted using the Fama-French Plus Momentum model.

4.0 Analysis and Discussion of Findings

4.1 Proxies for Earnings Management

Table 3 shows the computations of TACC through the Modified Jones Model with ROA, including firm and year fixed effects, with the cash flow approach and the balance sheet approach. From these computations, the EM proxy DACC is computed through residuals. Our event study analysis (section 4.3) is based on the computations that include firm and year fixed effects with TACC values computed with the balance sheet approach, as these computations have far higher values for R-squared than the other outputs.[2]

Variables	***tacc_cf***	***tacc_bs***
inverse_lag_ta	0.0639	0.969***
	(0.0518)	(0.0444)
scaled_rev_rec	0.0169**	0.148***
	(0.00792)	(0.00715)
scaled_ppe	0.00832***	0.0134***
	(0.00119)	(0.000951)
roa	0.00179	-0.0295***
	(0.00753)	(0.00386)
Observations	82,629	82,629
R-squared	0.357	0.767
Clustered SE	Firm	Firm
Controls	No	No
Firm FE	Yes	Yes
Year FE	Yes	Yes
Robust standard errors in parentheses		
*** p<0.01, ** p<0.05, * p<0.1		

Table 3: TACC regressions using Modified Jones with ROA, firm and year fixed effects.

[2] The regressions by the industry-year approach is omitted for simplicity as it contains 1261 regressions for the balance sheet approach and 1261 regressions for the cash flow approach.

4.1.1 Descriptive Statistics

Creating descriptive statistics tables allows us to have a preliminary look at the characteristics of firms with high (low) appearance of EM, which is reflected in high (low) DACC values. First, we investigate the distribution of capital expenditures over total assets, market to book, log size, debt ratio, profitability, tangibility, and three financial constraints following Almeida and Campello (2004); dividend payout, size, and K&Z Index[3]. The three financial constraint variables are dummy variables indicating whether or not a firm can be ranked as financially constrained. The dividend payout and size variables take the value 1 if lower than or equal to the 25th percentile and 0 else. The K&Z Index variable takes the value 1 if higher than or equal to the 75th percentile and 0 else. In summary, the three financial constraint variables take the value 1 if the firm-year observation shows indications of being financially constrained. We allow firms to change their status over our sample period by ranking firms on an annual basis. Last, we investigate the distribution of credit ratings.

The descriptive statistics is viewed from two perspectives; the value distribution of relevant variables by different quartiles of DACC and the value distribution of relevant variables by a fixed threshold of DACC. Looking at the variables by quartiles of DACC allows us to identify characteristics of the type of firms located at the extremes of the distribution (Q1 and Q4) of the proxy for EM (DACC). The quartiles should be interpreted in the following way; Q1 functions as a proxy indicating income-decreasing EM, Q2 and Q3 functions as a proxy indicating absence of EM, and Q4 functions as a proxy indicating income-increasing EM. The second perspective is based on accounting being permissible with a deviation from GAAP for up to 5%. Therefore, we employ a 5% threshold (Katz, 1999). For the threshold perspective, the dataset is divided into three groups which should be interpreted in the following way; A (above) functions as a proxy indicating income-increasing EM based on DACC>0.05, B (below) functions as a proxy indicating income-decreasing EM based on DACC<-0.05, and I (in between)

[3] The Kaplan&Zingales Index (Kaplan & Zingales, 1997) is a measure of the reliance on external financing

functions as a proxy indicating absence of EM based on -0.05<DACC<0.05. We expect the following pairs to give somewhat similar outcomes; Q1 and B, Q2, Q3 and I, and Q4 and A.

4.1.1.1 Distribution of Financial Measures

Table 4 and 5 show the distribution of the financial measure variables by quartiles of DACC, and table 6 and 7 show the distribution of the financial measure variables by thresholds of DACC. The two approaches give the same outcome, increasing the reliability of our findings.

	dacc_ind_fc				***dacc_ind_bs***			
Variables	***Q1***	***Q2***	***Q3***	***Q4***	***Q1***	***Q2***	***Q3***	***Q4***
Capex, pct	0.066	0.060	0.075	0.060	0.066	0.065	0.074	0.057
Market to book	3.410	2.753	3.406	3.971	3.251	2.708	3.368	4.212
Log size	5.379	6.556	6.292	5.371	5.143	6.653	6.343	5.459
Debt ratio	0.232	0.263	0.271	0.234	0.219	0.281	0.279	0.219
Profitability	−0.099	0.070	0.096	0.004	−0.089	0.082	0.096	−0.019
Tangibility	0.233	0.277	0.296	0.224	0.244	0.298	0.293	0.194
FC: Dividend payout	0.604	0.403	0.397	0.475	0.584	0.388	0.394	0.513
FC: Size	0.301	0.153	0.212	0.344	0.364	0.150	0.199	0.297
FC: K&Z index	0.358	0.237	0.258	0.306	0.317	0.238	0.264	0.340

Table 4: Financial measures by quartiles of DACC, industry and year regression

	dacc_fy_fc				***dacc_fy_bs***			
Variables	***Q1***	***Q2***	***Q3***	***Q4***	***Q1***	***Q2***	***Q3***	***Q4***
Capex, pct	0.066	0.064	0.064	0.068	0.068	0.065	0.063	0.067
Market to book	3.484	2.626	2.900	4.529	4.025	2.472	2.407	4.635
Log size	5.399	6.621	6.352	5.225	5.204	6.562	6.433	5.398
Debt ratio	0.236	0.259	0.254	0.249	0.227	0.269	0.259	0.244
Profitability	−0.041	0.104	0.085	−0.077	−0.088	0.100	0.096	−0.037
Tangibility	0.235	0.293	0.275	0.226	0.224	0.295	0.288	0.223
FC:Dividend payout	0.547	0.371	0.407	0.554	0.565	0.389	0.376	0.548
FC: Size	0.313	0.146	0.180	0.371	0.356	0.152	0.168	0.334
FC: K&Z index	0.322	0.213	0.238	0.385	0.363	0.216	0.202	0.377

Table 5: Financial measures table by quartiles of DACC, firm and year fixed effects

	dacc_ind_fc			***dacc_ind_bs***		
Variables	***B***	***I***	***A***	***B***	***I***	***A***
Capex, pct	0.066	0.064	0.068	0.068	0.063	0.067
Market to book	3.605	2.701	4.365	3.924	2.388	4.462
Log size	5.259	6.514	5.341	5.309	6.532	5.466
Debt ratio	0.234	0.256	0.250	0.232	0.264	0.244
Profitability	−0.062	0.097	−0.056	−0.071	0.100	−0.027
Tangibility	0.226	0.286	0.232	0.230	0.293	0.227
FC: Dividend payout	0.564	0.386	0.540	0.554	0.377	0.536
FC: Size	0.332	0.160	0.349	0.340	0.155	0.323
FC: K&Z index	0.338	0.221	0.370	0.352	0.205	0.364

Table 6: Financial measures by 5% threshold of DACC, industry and year regression.

	dacc_fy_fc			*dacc_fy_bs*		
Variables	***B***	***I***	***A***	***B***	***I***	***A***
Capex, pct	0.065	0.068	0.061	0.065	0.070	0.057
Market to book	3.283	3.100	4.206	3.148	3.070	4.315
Log size	5.498	6.419	5.215	5.277	6.508	5.415
Debt ratio	0.234	0.266	0.233	0.223	0.281	0.218
Profitability	−0.079	0.085	−0.010	−0.071	0.091	−0.024
Tangibility	0.238	0.286	0.217	0.249	0.294	0.191
FC: Dividend payout	0.583	0.396	0.491	0.567	0.387	0.521
FC: Size	0.283	0.184	0.373	0.343	0.174	0.303
FC: K&Z index	0.341	0.245	0.325	0.306	0.252	0.348

Table 7: Financial measures by 5% threshold of DACC, firm and year fixed effects.

The tables show that the mean for the variables profitability, log size, debt ratio, and tangibility are lower for extreme values of DACC (Q1, Q4, B, and A), compared to the DACC values closer to zero (Q2, Q3, and I).

The extreme values for profitability have negative means for all DACC values when grouped by thresholds, negative means for Q1, and negative means for three out of four DACC values in Q4. Tangibility and profitability are highest for the groups where the EM proxy is lowest, indicating that firms not engaging in EM have the highest financial performance. Our findings regarding profitability contradict the findings of Famá et al. (2016), who found the highest values for profitability for firms engaging in EM. However, their study only includes debentures. Our dataset contains a low amount of observations on debentures, hence we would not necessarily expect our findings to provide the same results. In addition, their data is based on firms in Brazil, and the difference can occur as a result of country differences. The means of the variable log size indicates that bigger firms are less engaged in EM than smaller firms.

The debt ratio is highest for the firms where the proxies indicate absence of EM (Q2, Q3, and I), indicating that debt ratio is negatively related to EM. This supports the findings of Chung et al. (2005), Lee et al. (2007), Hemmen and Rodríguez (2010), and Gribbin et al. (2017), which suggests that debt ratio is negatively related to income-increasing EM. Our findings add to this by indicating that debt ratio is also negatively related to income-decreasing EM. This is in line with the argument of debt-holders performing some extent of control over the management of leveraged firms, leaving less room for managers to engage in EM. This indication that debt ratio is negatively related to EM, may imply that H_1, H_2 and H_3 are inappropriately specified as the hypotheses are based on this relationship being positive, as presented by DeFond and Jiambalvo (1994), Sweeney (1994), Warfield et al. (1995), Leuz et al. (2003), Othman and Zhegal (2006), Klein (2012), and Fung and Goodwin (2013). However, the differences in the means of the variable debt ratio are small. Hence, we are cautious with drawing inferences based on the indication that debt ratio is negatively related to EM.

The mean of the variable market to book is highest for the proxies for income-increasing EM (Q4 and A) for all DACC values, meaning the market value relative to book value is highest for firms with a proxy indicating income-increasing EM. These findings may indicate that the market is not able to detect EM. Rauh and Sufi (2010) found that firms with high market to book values have lower debt ratios. The findings of Rauh and Sufi (2010), in combination with the findings of Chung et al. (2005), Lee et al. (2007), Hemmen and Rodríguez (2010), and Gribbin et al. (2017) which suggests a negative relationship between debt ratio and EM, suggest that high market to book values are connected to high engagement in EM. Our findings support this. However, combined with the findings of DeFond and Jiambalvo (1994), Sweeney (1994), and Klein (2002), and Othman and Zhegal (2006) which suggest a positive relationship between debt ratio and EM, we would expect to find that high market to book values are connected to low engagement in EM. This is not supported by our findings.

Mean for the financial constraints; dividend payouts, size, and the K&Z index are higher for the extreme values of DACC (Q1, Q4, B, and A), compared to the DACC values closer to zero (Q2, Q3, and I). This suggests that firms with proxies indicating engagement in EM are more financially constrained than firms with proxies indicating absence of EM. There is no clear pattern for the mean of capital expenditures over total assets.

4.1.1.2 Percentage Distribution of Credit Rating by Quartiles of DACC

The distribution in table 8 and table 9 indicates a clear pattern in terms of credit ratings and EM. Q2, Q3, and I are highly represented in the higher credit ratings and less represented in the lower credit ratings. For Q1, Q4, B, and A we see the opposite pattern, with higher representation in the lower credit ratings than the higher credit ratings. As high debt ratio is known to be a trait of low credit quality firms, these findings support the findings of DeFond and Jiambalvo (1994), Sweeney (1994), Othman and Zhegal (2006), and Klein (2002), indicating a positive relationship between debt ratio and EM. In contrast to the findings in section 4.1.1.1, the findings in this section indicate that H_1, H_2 and H_3 are appropriately specified.

	dacc_fy_bs			***dacc_fy_cf***			***dacc_ind_bs***			***dacc_ind_cf***		
CR	***Q1***	***Q2&3***	***Q4***	***Q1***	***Q2&3***	***Q4***	***Q1***	***Q2&3***	***Q4***	***Q1***	***Q2&3***	***Q4***
A+	0.11	0.75	0.14	0.15	0.73	0.11	0.11	0.75	0.14	0.15	0.73	0.11
A	0.09	0.78	0.13	0.13	0.77	0.10	0.09	0.78	0.13	0.13	0.77	0.10
A-	0.10	0.74	0.16	0.16	0.70	0.14	0.10	0.74	0.16	0.16	0.70	0.14
B+	0.15	0.67	0.18	0.18	0.67	0.14	0.15	0.67	0.18	0.18	0.67	0.14
B	0.18	0.62	0.20	0.21	0.62	0.16	0.18	0.62	0.20	0.21	0.62	0.16
B-	0.22	0.56	0.22	0.25	0.54	0.22	0.22	0.56	0.22	0.25	0.54	0.22
C	0.29	0.42	0.28	0.27	0.40	0.33	0.29	0.42	0.28	0.27	0.40	0.33
D	0.18	0.53	0.28	0.27	0.47	0.25	0.18	0.53	0.28	0.27	0.47	0.25

Table 8: Credit rating distribution by quartiles of DACC where CR = credit rating.

	dacc_fy_bs			*dacc_fy_cf*			*dacc_ind_bs*			*dacc_ind_cf*		
CR	***B***	***I***	***A***	***B***	***I***	***A***	***B***	***I***	***A***	***B***	***I***	***A***
A+	0.17	0.68	0.16	0.14	0.75	0.11	0.17	0.66	0.17	0.15	0.73	0.12
A	0.16	0.73	0.11	0.13	0.77	0.10	0.14	0.73	0.13	0.11	0.77	0.12
A-	0.19	0.68	0.13	0.18	0.70	0.12	0.16	0.69	0.15	0.15	0.72	0.13
B+	0.21	0.61	0.18	0.19	0.67	0.14	0.19	0.61	0.20	0.17	0.64	0.19
B	0.23	0.57	0.21	0.21	0.62	0.17	0.19	0.57	0.25	0.17	0.60	0.23
B-	0.25	0.50	0.25	0.26	0.53	0.21	0.22	0.50	0.28	0.21	0.52	0.28
C	0.31	0.37	0.32	0.37	0.39	0.24	0.24	0.39	0.37	0.23	0.40	0.37
D	0.31	0.49	0.20	0.31	0.47	0.23	0.17	0.49	0.34	0.15	0.49	0.37

Table 9: Credit rating distribution by 5% threshold of DACC where CR = credit rating.

4.1.2 Time Series Evidence

Time-series evidence was built to identify potential (cyclical) patterns and reactions to specific events. The graphs (figure 2-5) show a large increase in the absolute value of the proxies for EM in the years up until 1999-2000. After this, the level decreased heavily and gave a less volatile curve, before the level again started to increase around 2018-2019. We find evidence that the DACC levels heavily decreased during 2001. The decrease can be a result of the passing of SOX, which came into force in 2002. This supports Koh et al. (2008) and Cohen et al. (2008) who found that firms are less likely to engage in accrual EM after SOX. It is also possible that another force affecting the decrease was the American recession following the dot-com bubble. The absolute values of the proxies remained untouched during the Great Recession in 2008, but increased heavily in the recession caused by Covid-19 in 2020. The increase surrounding Covid-19 can be caused by the financial distress the companies experienced. In such recessions, regulatory motivations (Healey & Wahlen, 1999) may be a prominent underlying reason for engagement in EM, as firms may alter their financial statements to seem less profitable to qualify for subsidy.

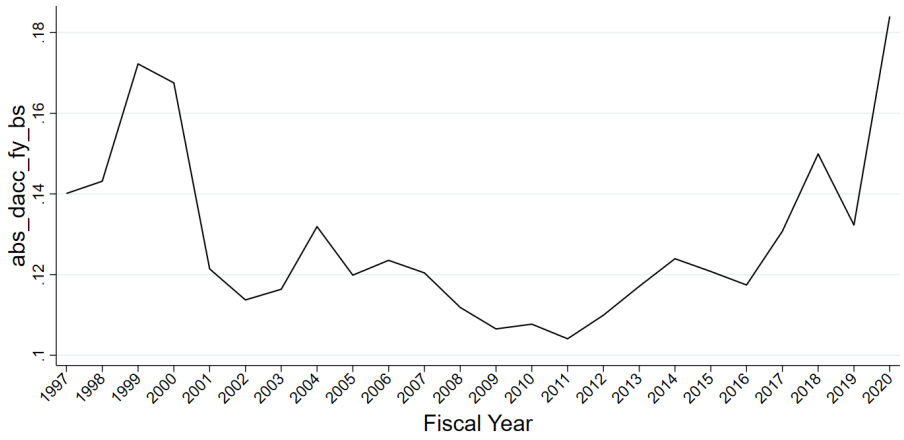

Figure 2: Time series evidence for absolute DACC values, firm and year fixed effects, balance sheet approach.

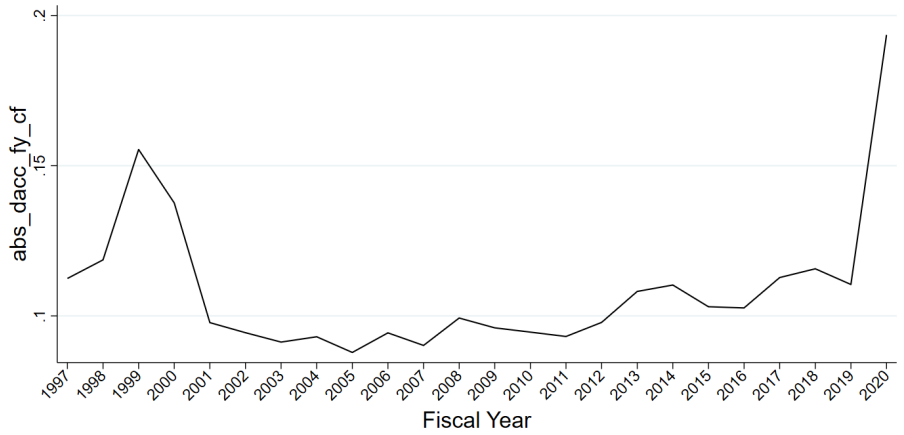

Figure 3: Time series evidence for absolute DACC values, firm and year fixed effects, cash flow approach.

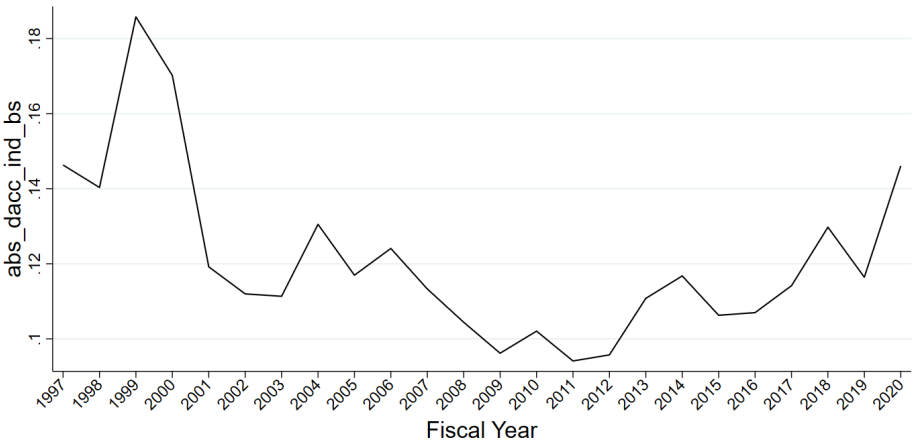

Figure 4: Time series evidence for absolute DACC values, industry and year regression, balance sheet approach.

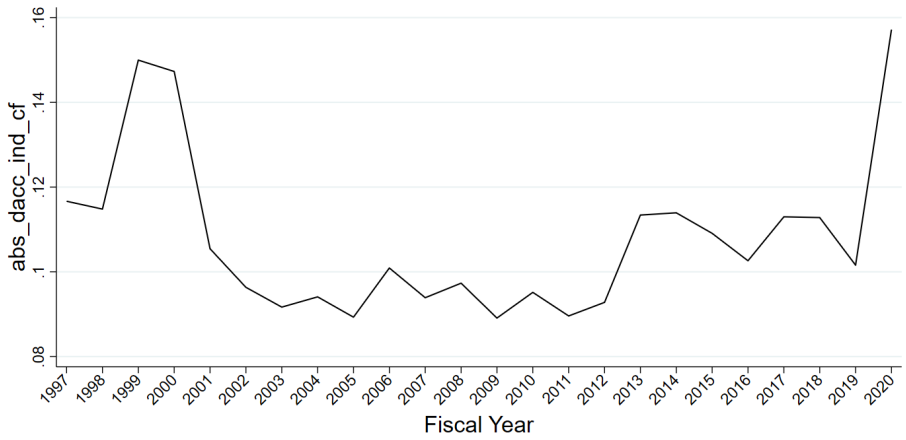

Figure 5: Time series evidence for absolute DACC values, industry and year regression, cash flow approach.

4.2 Debt and Capital Structure Regressions

Our debt ratio regression results (appendix E) show a significant negative relationship between debt ratio and EM for the balance sheet approach models and no significant relationship for the cash flow approach models. Hence, we can not claim that the relationship between debt ratio and EM in our data is positive, negative or even existent. These results may be due to the previously mentioned misspecification problems with the models for detecting the EM proxy DACC. This implies that we can not verify whether or not our three first hypotheses are properly specified. Given our conflicting results, our results for H_1, H_2, and H_3 will be viewed in the light of the existing literature suggesting a positive relation between debt ratio and earnings management and the existing literature suggesting a negative relation.

Regressions for debt and capital structure were run on both the Compustat IQ data and the Capital IQ data. Debt structure and capital structure variables were set as the dependent variable and the different DACC calculations (table 2) were set as independent variables. Further, issuance variables were generated to reflect the difference in the contemporaneous holding (year t) and lagged holding (year t-1) of debt. These were also set as dependent variables and were run on EM proxies in year t, t_{-1}, and t_{-2}. All regressions are run with and without controls for all EM proxies (table 2). We focus on the regression results for the regressions including controls

and further discuss the variables where we find a high amount of significant coefficients at a 10% level or lower.

4.2.1 Debt Structure

Debt structure regression results on Compustat IQ data indicate that there is no specific debt structure for firms engaging in EM. However, our findings indicate that EM in year t affects the subordinated debt share of total debt in year t. This can be connected to the findings by Hackbarth and Mauer (2012) stating that riskier firms with high financial distress choose larger amounts of subordinated debt and the findings of Watts and Zimmerman (1986) indicating that financial distress gives incentives to engage in EM. The regression results for debt issuance in the Compustat IQ data shows an overall strong relationship between debt issuance and EM, indicating that EM in year t has a significant effect on debt issuance in year t.

The Capital IQ regression results also indicate that there is no specific debt structure for firms engaging in EM. Nevertheless, in the Capital IQ data, we find significant relationships between EM and senior bonds and notes, and senior unsecured bonds and notes. In contrast to the Compustat IQ data, the subordinated debt variable shows few significant coefficients in the Capital IQ data. Hence, we can not claim that subordinated debt in terms of debt structure is significantly related to EM. In addition, the results for debt issuance do not show the same strong overall relationship between EM and debt issuance as found in the Compustat IQ regressions. In the Capital IQ data, we find indications that EM is related to issuance of bank debt, unsecured debt and unsecured debt less senior unsecured bonds and notes.

We also find that the issuance variables for bank debt, unsecured debt and convertible debt and preferred stock are strongest related to EM among all the issuance variables in both datasets. Further, we find few significant relationships for the lagged EM proxies t_{-1} and t_{-2} in both Capital IQ data and Compustat IQ data.

4.2.2 Capital Structure

In general, there is a high amount of significant coefficients for the relationships between EM and capital structure variables in the Compustat IQ data. Additionally, we see an even higher amount of significant coefficients for the relationship between EM and capital structure variables on issuance of debt.

For the Capital IQ data, the results are less clear. Several variables do not show significant coefficients for any of the DACC calculations. However, revolving credit lines seem to be related to EM. What is particularly interesting to point out is that all the capital structure variables on issuance of debt have significant coefficients on the 1% level for all DACC calculations.

We also find that the issuance variables for senior secured, secured and unsecured debt are strongest related to EM among all the issuance variables in both datasets. These categories capture all debt, since all debt issuance observations in our dataset are either secured or unsecured. Hence, this indicates that there may be some debt variables not included in our analysis that are stronger related to EM than the variables we have included.

Further, the lagged EM proxies t_{-1} provide conflicting results. The Compustat IQ data show high amounts of significant coefficients for all issuance variables, while the Capital IQ data show few significant relationships. For t_{-2}, both datasets show few significant relationships.

4.2.3 Findings from Debt and Capital Structure Regressions

The Compustat IQ and Capital IQ regressions show differing results in terms of debt and capital structure and the relationship to EM. Capital composition seems to be related to EM in the Compustat IQ data, while debt composition seems unrelated to EM in both datasets. However, the results show clear indications of significant relationships between EM in year t and capital structure in terms of debt issuances in year t in both datasets. The occurrence of significance for the variables that are not

related to issuance may come as a result of the variables capturing the issuance variables. This indicates that our model is not strict and sophisticated enough to capture the effects correctly.

Further, the regression results are viewed in connection to H_1, H_2 and H_3. As mentioned, the results show high amounts of significant coefficients for all issuance variables and DACC calculations for capital structure. Capital structure regressions results on issuance variables related to the three hypotheses will now be further addressed.

4.2.3.1 Hypothesis 1

The relevant variables for H_1; *earnings management in year t is more prominent to issuance in year t of subordinated debt and secured debt than unsecured debt,* are illustrated in table 10. For seven out of the eight regression models, we find that subordinated debt is less related to EM than secured and unsecured debt. This is the opposite of what we would expect based on the findings of Rauh and Sufi (2010) in addition to DeFond and Jiambalvo (1994), Sweeney (1994), Warfield et al. (1995), Leuz et al. (2003), Othman and Zhegal (2006), Klein (2012), and Fung and Goodwin (2013). Half of the models further indicate that unsecured debt is closer related to EM than secured debt, while the other half indicates the opposite. Hence, H_1 is rejected. Based on Hackbarth and Mauer (2012) who found that firms with high financial distress tend to prioritize subordinated debt for their debt issuances, and Watts and Zimmerman (1986) indicating that financial distress gives incentives to engage in EM, we would expect to find highest relationships for subordinated debt (table 10). However, this is where we find the weakest relationships. The rejection of hypothesis 1 is in line with existing literature indicating a negative relationship between debt ratio and EM and is consistent with our debt ratio regression results for the balance sheet approach DACC models (appendix E).

Variable name	*Subordinated (CO)*	*Subordinated Total (CIQ)*	*Secured (CO)*	*Secured (CIQ)*	*Unsecured (CIQ)*
dacc_fy_cf	0.00920***	0.0272***	0.0480***	0.0679***	0.0624***
	(0,000601)	(0,00272)	(0,00313)	(0,00631)	(0,00738)
dacc_ind_cf	0.0125***	0.0289***	0.0621***	0.0689***	0.0657***
	(0,000685)	(0,00308)	(0,00363)	(0,00707)	(0,00818)
dacc_fy_bs	0.00682***	0.0210***	0.0266***	0.0523***	0.0410***
	(0,00047)	(0,00194)	(0,00263)	(0,00498)	(0,0053)
dacc_ind_bs	0.00638***	0.0133***	0.0235***	0.0329***	0.0232***
	(0,000472)	(0,00192)	(0,00276)	(0,00473)	(0,00545)
abs_dacc_fy_cf	−0,000323	-0.0211***	-0.0161***	-0.0497***	-0.0646***
	(0,000939)	(0,00403)	(0,00523)	(0,00916)	(0,0107)
abs_dacc_ind_cf	-0.00635***	-0.0187***	-0.0397***	-0.0443***	-0.0574***
	(0,00084)	(0,00385)	(0,00452)	(0,00851)	(0,00985)
abs_dacc_fy_bs	-0.00438***	-0.00960***	-0.0198***	-0.0248***	-0.0379***
	(0,000753)	(0,00275)	(0,00416)	(0,00662)	(0,00708)
abs_dacc_ind_bs	-0.00962***	-0.0187***	-0.0447***	-0.0444***	-0.0559***
	(0,000665)	(0,00277)	(0,00376)	(0,00641)	(0,00693)
Constant	0.0676***	0.193***	0.279***	0.423***	0.392***
	(0,000661)	(0,00391)	(0,00379)	(0,00971)	(0,00899)
Observations	82 629	28 021	82 629	28 021	28 021
R-squared	0,6065	0,712	0,5035	0,681	0,640
Clustered SE	Firm	Firm	Firm	Firm	Firm
Controls	Yes	Yes	Yes	Yes	Yes

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 10: Capital Structure Issuance Variables used in H_1.

4.2.3.2 Hypothesis 2

The relevant variables for H_2; *earnings management in year t is more prominent to issuance in year t of convertible subordinated debt and subordinated bonds than unsecured debt,* are illustrated in table 11. All regression models indicate that unsecured debt is closer related to EM than subordinated bonds and convertible subordinated debt. This is the opposite of what we would expect based on the

findings of Rauh and Sufi (2010) in addition to DeFond and Jiambalvo (1994), Sweeney (1994), Warfield et al. (1995), Leuz et al. (2003), Othman and Zhegal (2006), Klein (2012), and Fung and Goodwin (2013). Hence, we reject our second hypothesis. The rejection of hypothesis 1 is in line with existing literature indicating a negative relationship between debt ratio and EM and is consistent with our debt ratio regression results for the balance sheet approach DACC models (appendix E).

Variable name	***Subordinated Bonds (CIQ)***	***Subordinated Convertibles (CO)***	***Unsecured (CIQ)***
dacc_fy_cf	0.0248***	0.00814***	0.0624***
	(0,00229)	(0,000536)	(0,00738)
dacc_ind_cf	0.0192***	0.00634***	0.0657***
	(0,00168)	(0,000421)	(0,00818)
dacc_fy_bs	0.0264***	0.0115***	0.0410***
	(0,00266)	(0,000607)	(0,0053)
dacc_ind_bs	0.0124***	0.00610***	0.0232***
	(0,00169)	(0,000438)	(0,00545)
abs_dacc_fy_cf	-0.00853***	-0.00280***	-0.0646***
	(0,0024)	(0,000681)	(0,0107)
abs_dacc_ind_cf	-0.0171***	-0.00754***	-0.0574***
	(0,00244)	(0,000585)	(0,00985)
abs_dacc_fy_bs	-0.0197***	−0,000809	-0.0379***
	(0,00333)	(0,000838)	(0,00708)
abs_dacc_ind_bs	-0.0177***	-0.00623***	-0.0559***
	(0,00335)	(0,000744)	(0,00693)
Constant	0.175***	0.0621***	0.392***
	(0,00349)	(0,00058)	(0,00899)
Observations	28 021	82 629	28 021
R-squared	0,714	0,639	0,640
Clustered SE	Firm	Firm	Firm
Controls	Yes	Yes	Yes

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 11: Capital Structure Issuance Variables used in H_2

4.2.3.3 Hypothesis 3

The relevant variables for H_3; *Earnings management in year t is more prominent to issuance in year t of subordinated debt, term loans and drawn credit lines than commercial papers,* are illustrated in table 12. For all regression models, the coefficient values for commercial papers are lower than the coefficient values for subordinated debt, term loans and drawn credit lines[4], indicating EM having a stronger relationship with subordinated debt, term loans, and drawn credit lines, than commercial papers. This is consistent with what we would expect based on the findings of Colla et al. (2013) in addition to DeFond and Jiambalvo (1994), Sweeney (1994), Warfield et al. (1995), Leuz et al. (2003), Othman and Zhegal (2006), Klein (2012), and Fung and Goodwin (2013). Hence, we accept our third hypothesis. The acceptance of hypothesis 3 is in line with existing literature indicating a positive relationship between debt ratio and EM. Our findings also suggest that out of the four debt types defined in H_3, term loans are closest related to EM.

[4] Colla et al. (2013) states that revolving credit facilities are equivalent to drawn credit lines. Hence, we use the variable for revolving credit facilities in our data to represent drawn credit lines.

Variable name	*Subordinated (CO)*	*Subordinated Total (CIQ)*	*Term Loan (CIQ)*	*Drawn Credit Lines (CIQ)*	*Commercial Paper (CIQ)*
dacc_fy_cf	0.0092***	0.0272***	0.0405***	0.0310***	0.0014***
	(0,0006)	(0,00272)	(0,00424)	(0,00287)	(9,56E−05)
dacc_ind_cf	0.0125***	0.0289***	0.0316***	0.0234***	0.00104***
	(0,000685)	(0,00308)	(0,00319)	(0,00225)	(7,80E−05)
dacc_fy_bs	0.00682***	0.0210***	0.0442***	0.0328***	0.00164***
	(0,00047)	(0,00194)	(0,00479)	(0,00312)	(0,0001)
dacc_ind_bs	0.00638***	0.0133***	0.0188***	0.0154***	0.00066***
	(0,00047)	(0,00192)	(0,00301)	(0,00225)	(7,18E−05)
abs_dacc_fy_cf	−0,000323	-0.0211***	-0.0208***	-0.0102***	-0.00048***
	(0,000939)	(0,00403)	(0,00432)	(0,00295)	(9,38E−05)
abs_dacc_ind_cf	-0.00635***	-0.0187***	-0.0341***	-0.0210***	-0.00096***
	(0,00084)	(0,00385)	(0,00415)	(0,00292)	(9,96E−05)
abs_dacc_fy_bs	-0.00438***	-0.0096***	-0.0198***	-0.0156***	-0.00072***
	(0,000753)	(0,00275)	(0,00562)	(0,00395)	(−0,00011)
abs_dacc_ind_bs	-0.00962***	-0.0187***	-0.0243***	-0.0137***	-0.00074***
	(0,000665)	(0,00277)	(0,0055)	(0,00379)	(0,000132)
Constant	0.0676***	0.193***	0.307***	0.192***	0.0106***
	(0,00066)	(0,00391)	(0,00632)	(0,004)	(0,000185)
Observations	82 629	28 021	28 021	28 021	28 021
R-squared	0,6065	0,712	0,718	0,637	0,691
Clustered SE	Firm	Firm	Firm	Firm	Firm
Controls	Yes	Yes	Yes	Yes	Yes

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 12: Capital Structure Issuance Variables used in H_3

4.3 Event Study

Event studies were conducted on different sortings within debt heterogeneity with the purpose of answering H_4; "*when firms engage in income-increasing (income-decreasing) EM in conjunction with issuance of loans, the market is initially not able to detect EM, resulting in an increase (decrease) in CAR"* and H_5; "*when firms engage in income-increasing (income-decreasing) EM in conjunction with issuance of loans, analysts detect EM after some time. This information is then detected and interpreted by the market, resulting in a decrease (increase) in CAR"* and potentially uncovering other interesting relations. All sortings are analysed by the different quartiles and thresholds of the EM proxy DACC. Single sortings of security and seniority of debt (figure 6-8) give a general starting point of the analysis.

4.3.1 Security

The results for event studies of secured debt (figure 6) show that when firms have proxies indicating income-decreasing EM (Q1 and B) in conjunction with issuance of secured debt, the market reaction is slightly positive and stable. This contradicts the findings of Kwag and Stephens (2010) who found negative market reactions for firms engaging in income-decreasing EM. However, the difference can be a result of Kwag and Stephens (2010) using data for a shorter period, namely 1988-2002. When firms have proxies indicating absence of EM (Q2, Q3, and I) the market initially reacts positively with a decrease after approximately 15 days, resulting in a negative market response. Here we observe a similar pattern as Gavious (2007) and Kwag and Stephens (2010) found for firms engaging in income-increasing EM, however, interestingly enough, here it is seen for firms that do not engage in EM. The difference can be a result of Gavious (2007) using data for a shorter period, namely 2001-2004. When firms have proxies indicating income-increasing EM (Q4 and A) the market reaction is positive. These results show that the market reacts stronger to income-increasing EM than income-decreasing EM. Hence, the findings for income-increasing EM support H_4 as the market initially is not able to detect EM, resulting in an increased CAR. This suggests that the relation exists for secured debt

in addition to loans.

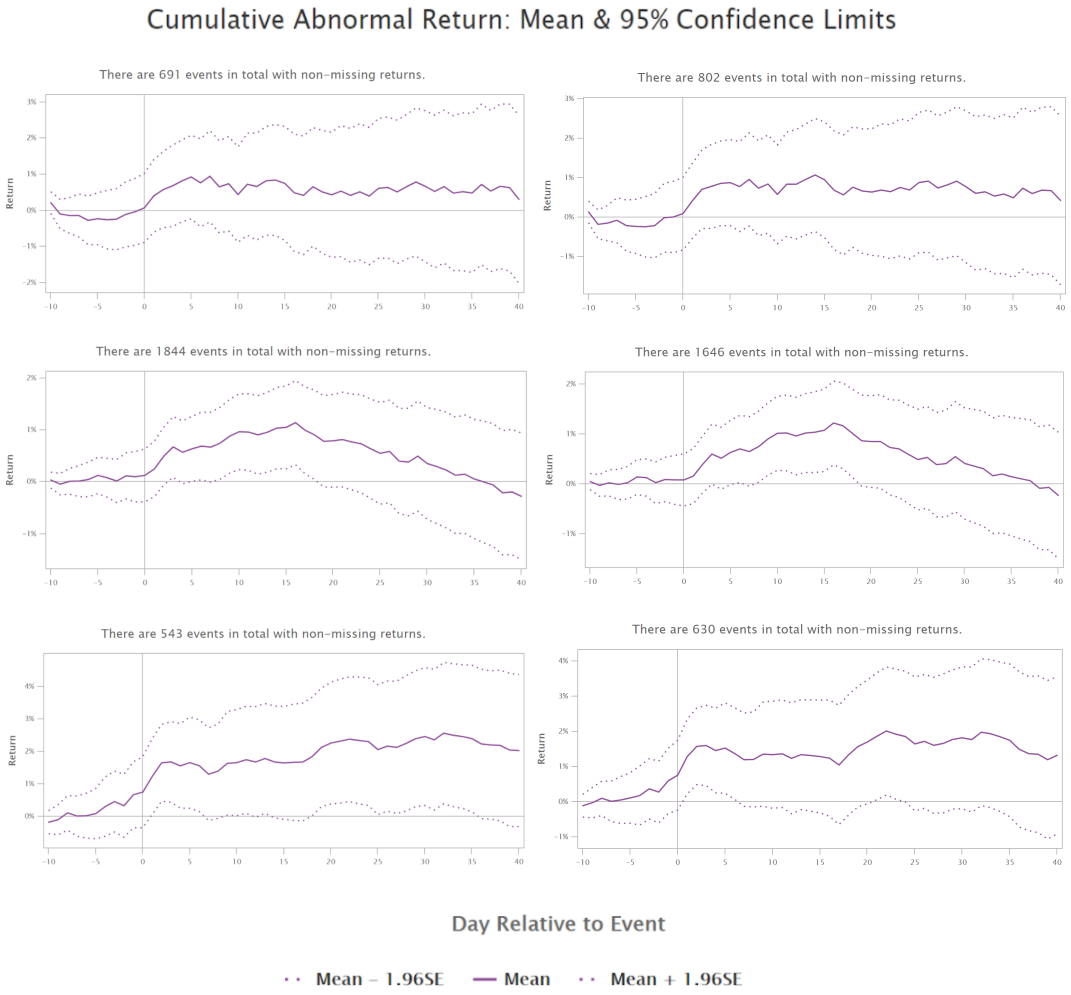

Figure 6: Event study results of issued secured debt 1996-2020. Top left: Q1. Top right: B. Middle left: Q2 & Q3. Middle right: I. Bottom left: Q4. Bottom right: A.

For issuance of unsecured debt (figure 7), the market reaction is negative and similar regardless of EM. The decreased CAR shown for Q1 and B, suggest that the pattern described in H_4 exists for unsecured debt in addition to loans. However, as the results are similar for all quartiles, this indicates that the response is not specific for income-decreasing EM. Hence, the market is not able to separate firms that engage and do not engage in EM in conjunction with issuance of unsecured debt. The results for neither secured or unsecured debt support H_5, suggesting that the pattern explained is not transferable to secured and unsecured debt.

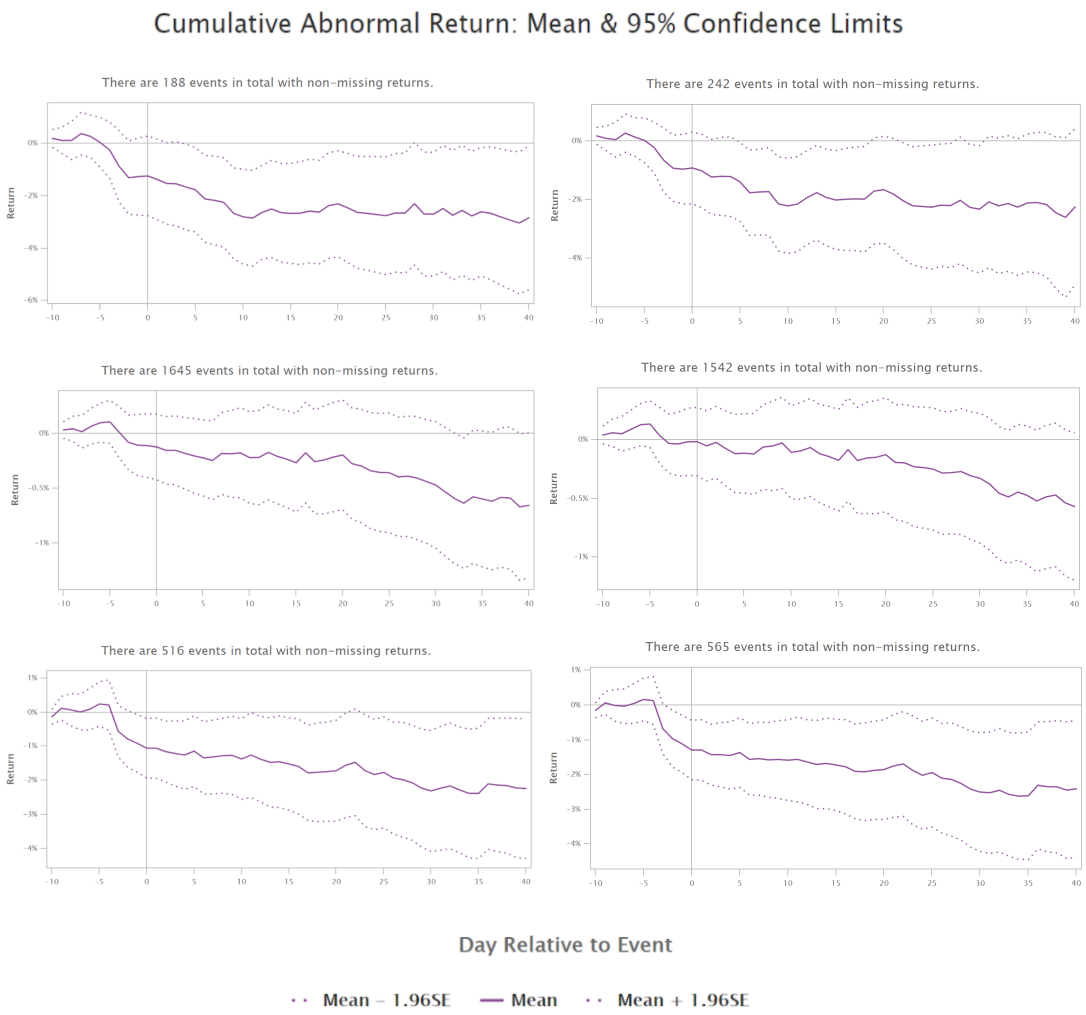

Figure 7: Event study results of issued unsecured debt 1996-2020. Top left: Q1. Top right: B. Middle left: Q2 & Q3. Middle right: I. Bottom left: Q4. Bottom right: A.

4.3.2 Seniority

The results for senior debt (figure 8) show that when firms have proxies that indicate income-decreasing EM (Q1 and B) in conjunction with issuance of senior debt, the market reaction is close to zero. For firms with proxies indicating absence of EM (Q2, Q3, and I) the market reaction is similar to the market reaction for the same quartiles for secured debt (figure 6). For firms with proxies indicating income-increasing EM (Q4 and A) the market reaction fluctuates more than for Q1 and B, but is still close to zero. Therefore, it does not appear that the market reacts significantly to EM. Our findings for senior debt do not support H_4 or H_5, suggesting that the patterns in H_4 and H_5 are not transferable to senior debt. The results for

subordinated debt are perceived as not reliable due to the low number of observations (appendix F1).

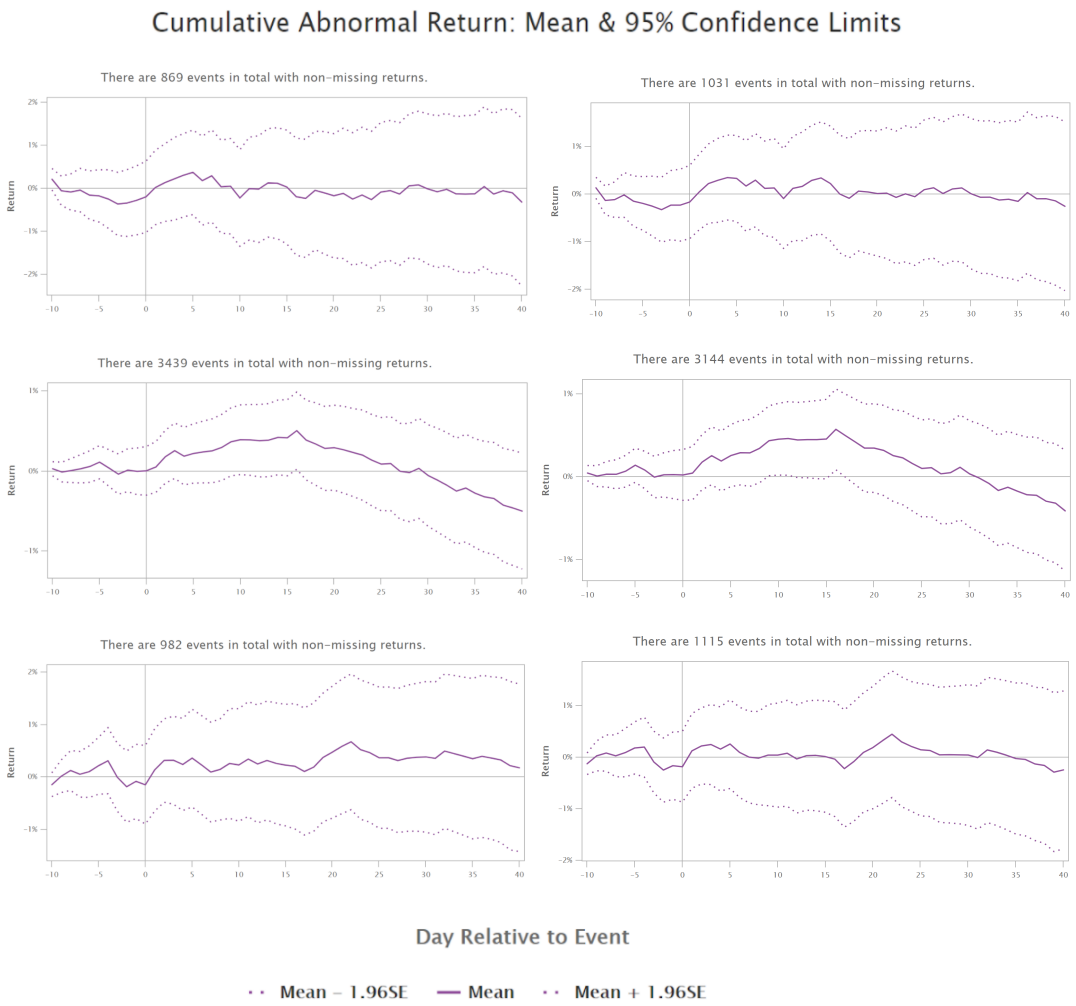

Figure 8: Event study results of issued senior debt 1996-2020. Top left: Q1. Top right: B. Middle left: Q2 & Q3. Middle right: I. Bottom left: Q4. Bottom right: A.

4.3.3 Loans

Event studies conducted on all loans data (appendix F2) show the same patterns as for secured debt (figure 6) since all observations in the loans data are secured. Our loans data contain most observations for the loan types term loan, drawn credit line, and 364-day-facility, and these will be analysed separately.

The results for term loans show that the market reaction for firms that have proxies indicating income-decreasing EM (Q1 and B) is initially positive after issuance, but shortly after decreases and leads to a slightly negative CAR. This contradicts the findings of Kwag and Stephens (2010) and does not support H_4. For firms with proxies indicating absence of EM (Q2, Q3, and I) the market reaction is positive but slightly decreasing over time. For firms with proxies indicating income-increasing EM (Q4 and A), the market reaction is positive, supporting H_4 but has no development such as described in H_5, suggesting that the market is not able to detect EM conducted in conjunction with issuance of term loans (figure 9).

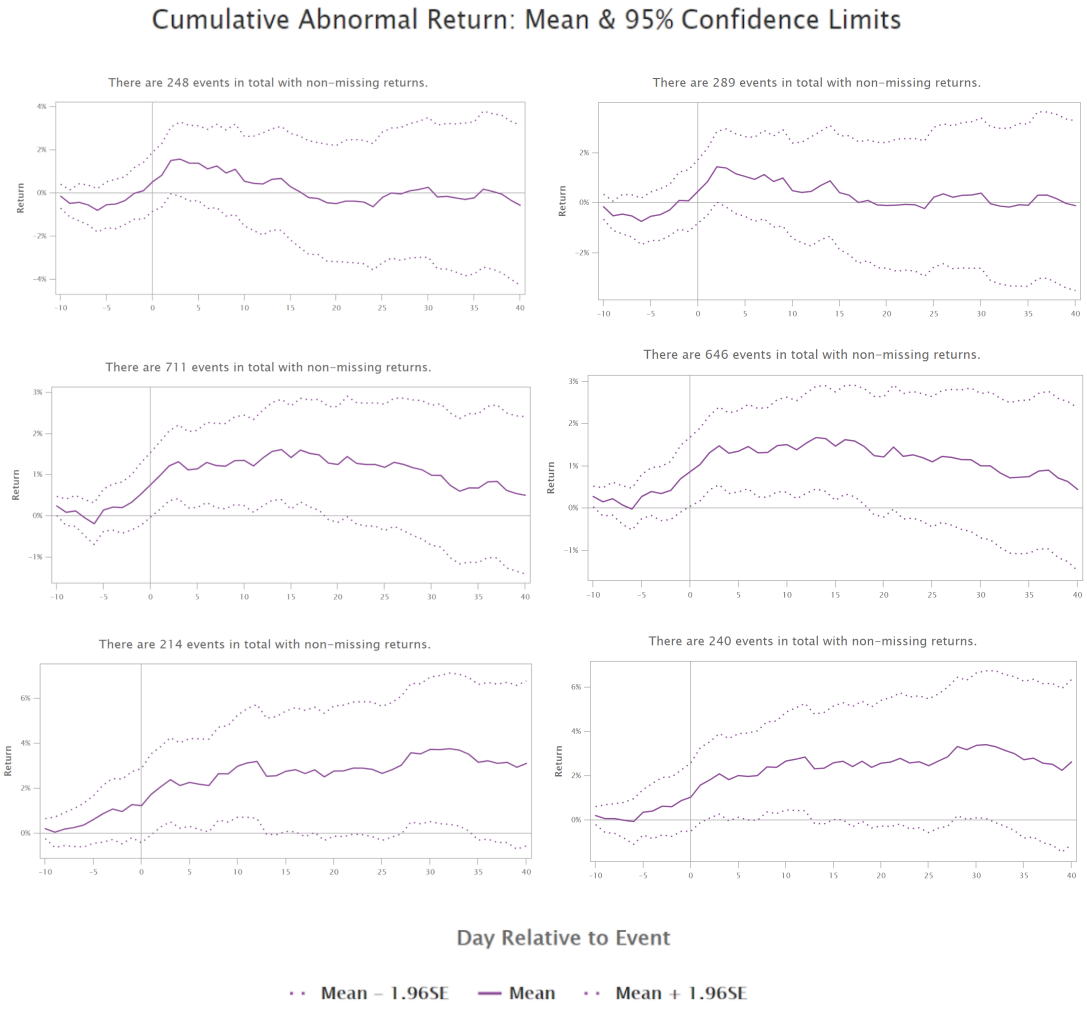

Figure 9: Event study results of issued term loans 1996-2013. Top left: Q1. Top right: B. Middle left: Q2 & Q3. Middle right: I. Bottom left: Q4. Bottom right: A.

The results for the loan type drawn credit lines (figure 10) show similar results as for secured debt (figure 6), since all observations for drawn credit lines in our data are secured. We observe positive market reactions for the extreme values of the proxy for EM (Q1, Q4, B, and A), with Q4 and A as the strongest response. Q4 and A supports H_4 and the lack of corrected response over time as described in H_5 suggests that the market is not able to detect EM conducted in conjunction with issuance of drawn credit lines.

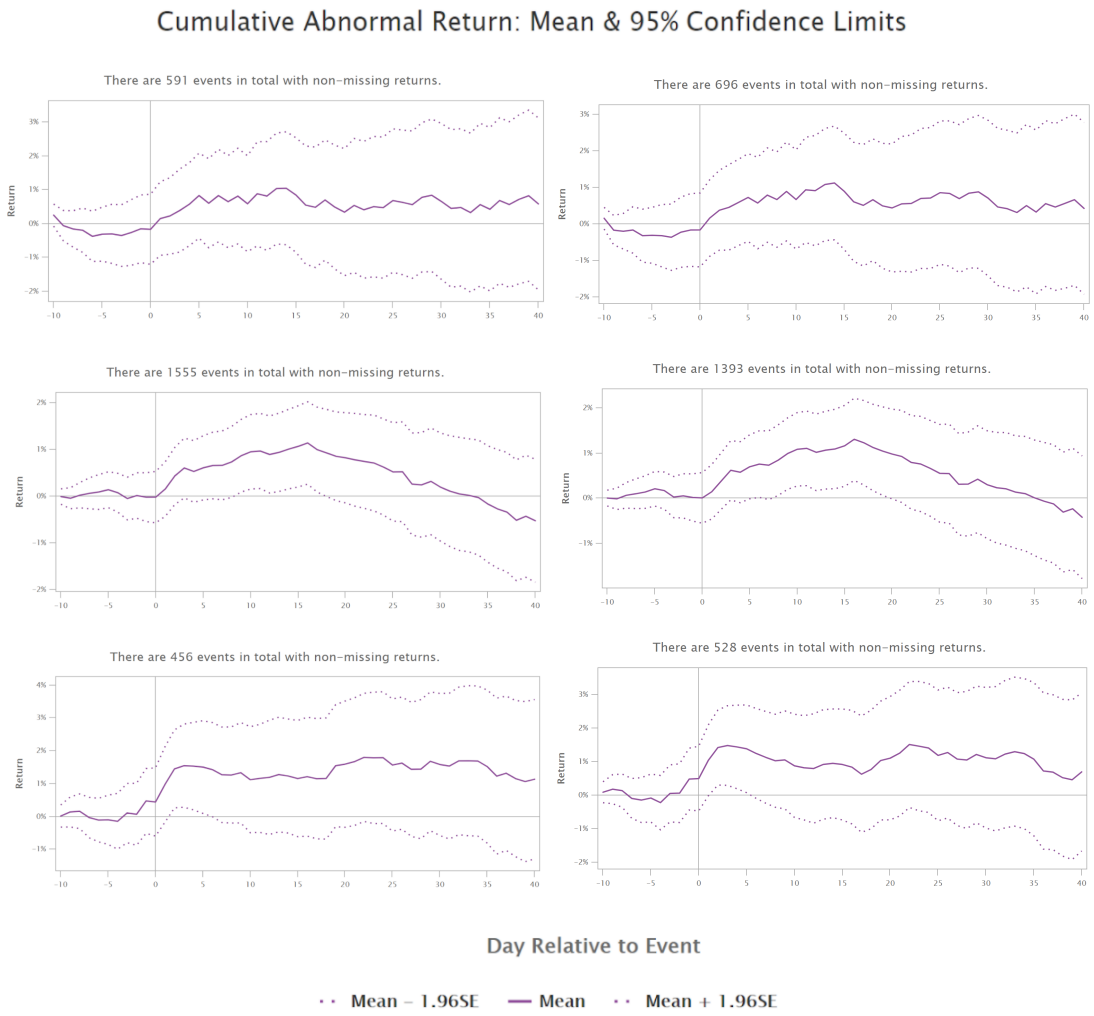

Figure 10: Event study results of issued drawn credit lines 1996-2013. Top left: Q1. Top right: B. Middle left: Q2 & Q3. Middle right: I. Bottom left: Q4. Bottom right: A.

The results for the loan type 364-day-facility do not contain reliable findings, due to the low number of observations (appendix F3).

Event studies conducted on the different types of loans show indications of an immediate positive market reaction after issuance, independent of engagement in EM, supporting the findings of Fungacova et al. (2019), Marshall et al. (2019), and Dammen and Johansen (2020). Therefore, H_4 stating that the market is not initially able to detect EM is accepted. The results show no indications of an adjusted negative market reaction after analysts release information regarding the issuance. Hence, H_5 is rejected.

4.3.4 Bonds

Event studies conducted on all bonds data (appendix F4) show the same patterns as for unsecured debt (figure 6) as most observations in the bonds data are unsecured. Our bond data contain most observations for the bond types bonds (subcategory), notes, commercial paper, and debentures (appendix F5-F8). The results show that the market reaction to firms issuing bonds (subcategory), notes, and commercial papers are negative, in all quartiles and thresholds of the EM proxy DACC. The results for debentures do not contain reliable findings, due to the low number of observations (appendix F5).

The results for bonds (subcategory), notes and commercial papers suggest that the market reacts negatively to bond issuance, supporting the findings of Dammen and Johansen (2020). Further, this suggests that the market is not able to detect EM conducted in conjunction with issuance of bonds, which supports the findings of Davidson III et al. (2010), and the patterns described in H_4 and H_5 are therefore not transferable to bonds.

5.0 Conclusion

Our findings contribute to the existing literature in three main areas; i) when examining the capital structure of firms, we find a significant relationship between debt issuance and EM, ii) we find that the market is not able to detect engagement in EM around debt issuance, and iii) the findings provide a better understanding of EM from a heterogeneous debt perspective.

In terms of debt and capital structure, we find that some debt types are strongly related to EM, emphasizing the need to treat debt as heterogeneous when assessing the relations between debt issuance and EM. Our findings suggest that issuance of bank debt, unsecured debt, and convertible debt and preferred stock are strongly related to EM in terms of debt structure. Further, our findings for capital structure indicate that there may be debt issuance variables that are stronger related to EM than the issuance variables we have included. We reject H_1 and H_2 as unsecured debt has a stronger relationship to the EM proxy DACC than subordinated debt, subordinated bonds and convertible subordinated debt. We accept H_3 as subordinated debt, term loans and drawn credit lines are stronger related to the EM proxy DACC than commercial papers.

We find clear differences in the market reactions to the different types of debt, suggesting that debt heterogeneity should be emphasized to a greater extent in future research. We find that the market is neither able to initially detect EM conducted in conjunction with issuance of debt in general nor in conjunction with loans specifically. Therefore, we accept H_4. We do not find the expected reaction in the market stated in H_5. Therefore, we reject the hypothesis. For issuance of unsecured debt and secured debt, there are clear patterns for the market reactions, independent of the existence of EM. The market reaction is negative for all quartiles and thresholds of unsecured debt, seen through a decrease in CAR. In contrast, for all quartiles and thresholds of secured debt, the market reaction is positive, seen through an increase in CAR.

The thesis contains several limitations that need to be addressed. First, measurement error is an established and critical limitation for models detecting EM. We mitigate this limitation through data trimming, the inclusion of control variables and utilization of several regression models for DACC calculation. However, we emphasize that our findings are only indicative. Second, we find indications that our debt and capital structure regressions models are not strict and sophisticated enough to capture the effects correctly. Third, our data consists exclusively of U.S. public firms traded on NYSE, AMEX, and NASDAQ hence, our findings may not be generalizable to non-U.S. firms and unlisted firms. Last, H_4 and H_5 are based on the assumption that engagement in EM in our sample is motivated by debt issuance, or in other words; contractual motivations. This would imply that earnings are managed prior to the issuance. However, capital market motivations and/or regulatory motivations may also be the underlying reason for our sample firms' engagement in EM. This implies that we can not verify if earnings are managed prior to issuance or after issuance. Using lagged variables for the EM proxy would ensure that the events occur in the desired order, but as this provides an extended time frame, it is likely to also include other aspects affecting CAR.

For future research, the most important aspect is to develop a model for EM detection that is more reliable than the existing ones. Further, we suggest obtaining financial statement information for shorter periods than per fiscal year, to be able to avoid the limitations we experience for H_4 and H_5. In addition, as our Compustat IQ data show high amounts of significant coefficients for the lagged EM proxies t_{-1}, we suggest that this is further addressed. Last, we suggest future research to further study the relationships between EM and debt and capital structure by including additional debt types.

6.0 Reference List

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7.0 Appendix

Appendix A - S&P Credit Rating

S&P	Moody's	Fitch	DBRS	Description
AAA	Aaa	AAA	AAA	Prime
AA+	Aa1	AA+	AA (high)	High grade
AA	Aa2	AA	AA	
AA-	Aa3	AA-	AA (low)	
A+	A1	A+	A (high)	Upper medium grade
A	A2	A	A	
A-	A3	A-	A (low)	
BBB+	Baa1	BBB+	BBB (high)	Lower medium grade
BBB	Baa2	BBB	BBB	
BBB-	Baa3	BBB-	BBB (low)	
BB+	Ba1	BB+	BB (high)	Non-investment grade speculative
BB	Ba2	BB	BB	
BB-	Ba3	BB-	BB (low)	
B+	B1	B+	B (high)	Highly speculative
B	B2	B	B	
B-	B3	B-	B (low)	
CCC+	Caa1	CCC	CCC (high)	Substantial risks
CCC	Caa2		CCC	Extremely speculative
CCC-	Caa3		CCC (low)	In default with little prospect for recovery
CC	Ca		CC	
C	C		C	
D	/	DDD		In default
	/	DD	D	
		D		

Figure 11: S&P Credit Ratings (Tradingeconomics, n.d.).

Appendix B - Credit Rating and Debt Structure, Rauh and Sufi (2010)

Appendix B1

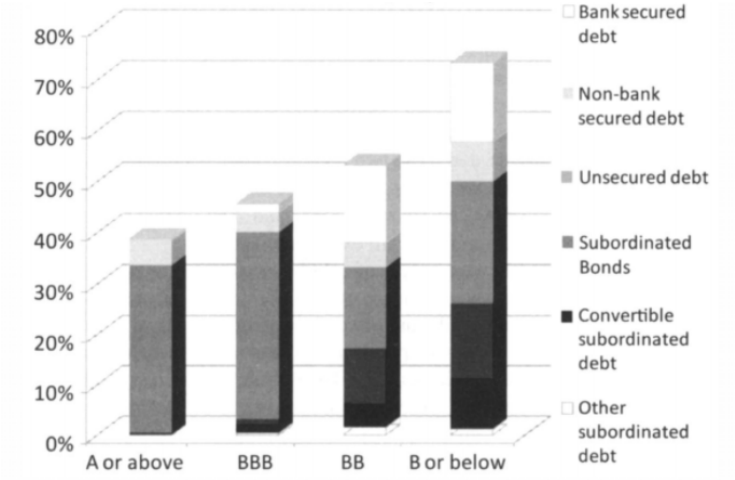

Figure 12: Debt structure across credit quality distribution (Rauh and Sufi, 2010)

Appendix B2

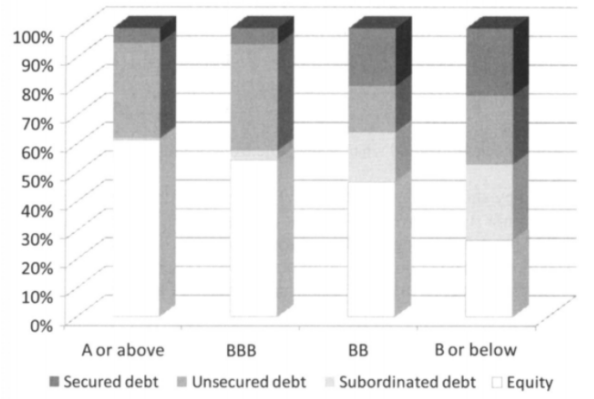

Figure 13: Capital structure priority across quality distribution (Rauh and Sufi, 2010)

Appendix C - Credit Rating and Debt Structure, Colla et al. (2013)

Appendix C1

Credit Ratings and Debt Structure

This table presents mean and median (in square brackets) values of debt specialization measures and mean and median (in square brackets) ratios of different debt types to total debt across different rating classes. Definitions of the variables are provided in Table A.I.

	AAA	AA	A	BBB	BB	B	≤CCC+	Unrated
HHI	0.409	0.568	0.693	0.686	0.604	0.647	0.712	0.735
	[0.371]	[0.522]	[0.721]	[0.700]	[0.532]	[0.595]	[0.734]	[0.809]
Excl90	0.018	0.176	0.427	0.397	0.314	0.381	0.456	0.513
Commercial paper	0.190	0.168	0.081	0.022	0.001	0.000	0.001	0.001
	[0.145]	[0.109]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
Drawn credit	0.000	0.011	0.036	0.115	0.118	0.074	0.115	0.297
Lines	[0.000]	[0.000]	[0.000]	[0.007]	[0.012]	[0.000]	[0.000]	[0.047]
Term loans	0.044	0.046	0.032	0.057	0.223	0.252	0.229	0.248
	[0.003]	[0.001]	[0.000]	[0.000]	[0.031]	[0.069]	[0.010]	[0.000]
Sen. bonds and notes	0.538	0.672	0.769	0.727	0.403	0.434	0.440	0.276
	[0.573]	[0.723]	[0.848]	[0.822]	[0.362]	[0.413]	[0.411]	[0.012]
Sub. bonds and notes	0.046	0.003	0.015	0.032	0.214	0.211	0.176	0.078
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
Capital leases	0.014	0.021	0.009	0.017	0.022	0.017	0.031	0.076
	[0.000]	[0.003]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
Other debt	0.169	0.079	0.058	0.031	0.019	0.013	0.009	0.023
	[0.113]	[0.027]	[0.006]	[0.001]	[0.000]	[0.000]	[0.000]	[0.000]

Figure 14: Credit Rating and Debt Structure (Colla et al., 2013)

Appendix C2

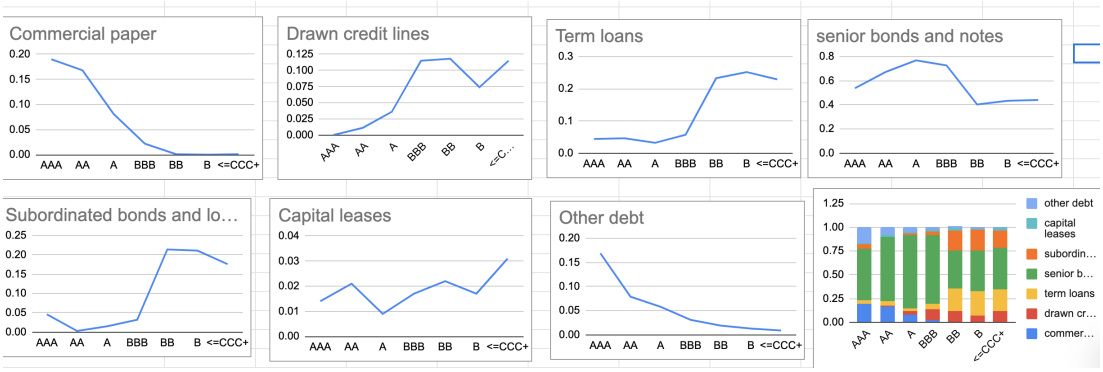

Figure 15: Credit Rating and Debt Structure graphs, based on Colla et al. (2013)

Appendix C3

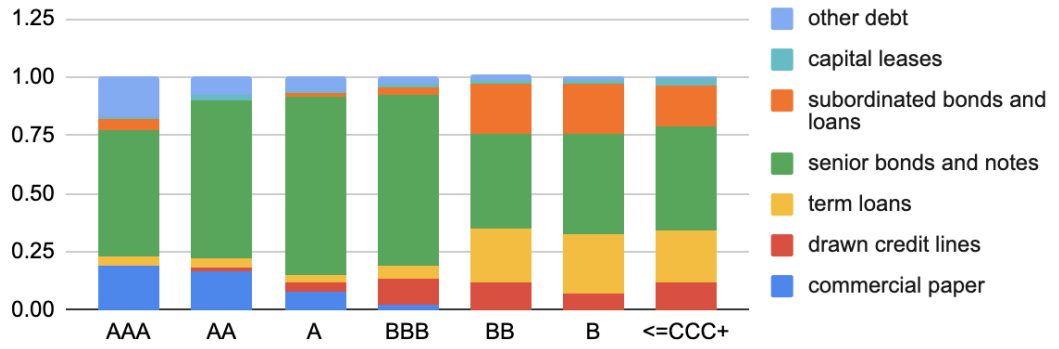

Figure 16: Credit Rating and Debt Structure bar chart, based on Colla et al. (2013)

Appendix D - Variable overview

Variable Name	***Variable Description***
capx_pct	Capital expenditures over total assets (CO)
mkt_to_book	(Price close annual fiscal * common shares used to calculate EPS+ total debt + preferred stock liquidating value – deferred taxes and investment tax credit) over total assets (CO)
lsize	Log of total assets (CO)
debt ratio	Total debt over total assets (CO)
profitability	Operating income before depreciation over total assets (CO)
tangibility	Total net property, plant and equipment over total assets (CO)
fc_payout_ratio	Dummy variable, take the value 1 if lower than or equal to the 25th percentile and 0 else
fc_size	Dummy variable, take the value 1 if lower than or equal to the 25th percentile and 0 else
fc_kz_index	Dummy variable, takes the value 1 if higher than or equal to the 75th percentile and 0 else
dclo_debt *dclo_ at*	Capital lease obligations over total debt (CO) Capital lease obligations over total assets (CO)
dcvsr_debt *dcvsr_ at*	Senior convertibles over total debt (CO) Senior convertibles over total assets (CO)

dcvsub_debt	Subordinated convertibles over total debt (CO)
dcvsub_ at	Subordinated convertibles over total assets (CO)
dcvt_debt	Convertibles over total debt (CO)
dcvt_ at	Convertibles over total assets (CO)
dd_debt	Debentures over total debt (CO)
dd_ at	Debentures over total assets (CO)
dlto_debt	Other long-term debt over total debt (CO)
dlto_ at	Other long-term debt over total assets (CO)
dm_debt	Secured debt over total debt (CO)
dm_ at	Secured debt over total assets (CO)
dn_debt	Notes over total debt (CO)
dn_at	Notes over total assets (CO)
ds_debt	Subordinated debt over total debt (CO)
ds_at	Subordinated debt over total assets (CO)
ds_bank	Bank debt over total debt (CIQ)
dsat _bank	Bank debt over total assets (CIQ)
ds_clo	Total capital leases over total debt (CIQ)
dsat_clo	Total capital leases over total assets (CIQ)
ds_cp	Commercial papers over total debt (CIQ)
dsat_cp	Commercial papers over total assets (CIQ)
ds_ot	Other debt over total debt (CIQ)
dsat_ot	Other debt over total assets (CIQ)
ds_rc	Revolving credit over total debt (CIQ)
dsat_rc	Revolving credit over total assets (CIQ)
ds_seced	Securitized debt over total debt (CIQ)
dsat_seced	Securitized debt over total assets (CIQ)
ds_srb	Senior bonds and notes over total debt (CIQ)
dsat_srb	Senior bonds and notes over total assets (CIQ)
ds_srsecb	Senior secured bonds and notes over total debt (CIQ)
dsat_srsecb	Senior secured bonds and notes over total assets (CIQ)
ds_srsecl	Senior secured loans over total debt (CIQ)
dsat_srsecl	Senior secured loans over total assets (CIQ)
ds_srunsecb	Senior unsecured bonds and notes over total debt (CIQ)

dsat_srunsecb	Senior unsecured bonds and notes over total assets (CIQ)
ds_subb	Subordinated bonds and notes over total debt (CIQ)
dsat_subb	Subordinated bonds and notes over total assets (CIQ)
ds_subd	Subordinated debt over total debt (CIQ)
dsat_subd	Subordinated debt over total assets (CIQ)
ds_tl	Term loans over total debt (CIQ)
dsat_tl	Term loans over total assets (CIQ)
ds_srsec	Total senior secured debt over total debt (CIQ)
ds_srsec	Total senior secured debt over total assets (CIQ)
ds_totsubd	Total subordinated debt over total debt (CIQ)
dsat_totsubd	Total subordinated debt over total assets (CIQ)
ds_unseco	(Unsecured debt - senior unsecured bonds and notes) over total debt (CIQ)
dsat_unseco	(Unsecured debt - senior unsecured bonds and notes) over total assets (CIQ)
ds_seco	(Secured debt - senior secured bonds and notes - senior secured loans) over total debt (CIQ)
dsat_seco	(Secured debt - senior secured bonds and notes - senior secured loans) over total assets (CIQ)
ds_sec	Secured debt over total debt (CIQ)
dsat_sec	Secured debt over total assets (CIQ)
ds_unsec	Unsecured debt over total debt (CIQ)
dsat_unsec	Unsecured debt over total assets (CIQ)

Table 13: Variable overview where CO = WRDS Compustat IQ and CIQ = WRDS S&P Capital IQ. All debt variables are also constructed for issuance, reflecting the delta of the variable.

Appendix E - Debt ratio regression

Variables	*Debt ratio*
dacc_fy_cf	0.00438
	(0.00498)
dacc_fy_bs	-0.0147***
	(0.00421)
dacc_ind_cf	0.0148***
	(0.00551)
dacc_ind_bs	-0.0134***
	(0.00397)
abs_dacc_fy_cf	-0.00285
	(0.00711)
abs_dacc_fy_bs	-0.0109*
	(0.00591)
abs_dacc_ind_cf	0.00232
	(0.00675)
abs_dacc_ind_bs	-0.0232***
	(0.00573)
Constant	-0.168***
	(0.00872)
Observations	82,629
R-squared	0.699
Clustered SE	Firm
Controls	Yes
Firm FE	Yes
Year FE	Yes
Robust standard errors in parentheses	
*** p<0.01, ** p<0.05, * p<0.1	

Table 14: Debt ratio regression. Controls are omitted for presentation purposes.

Appendix F - Event Studies

Appendix F1 - Event Study Subordinated Debt

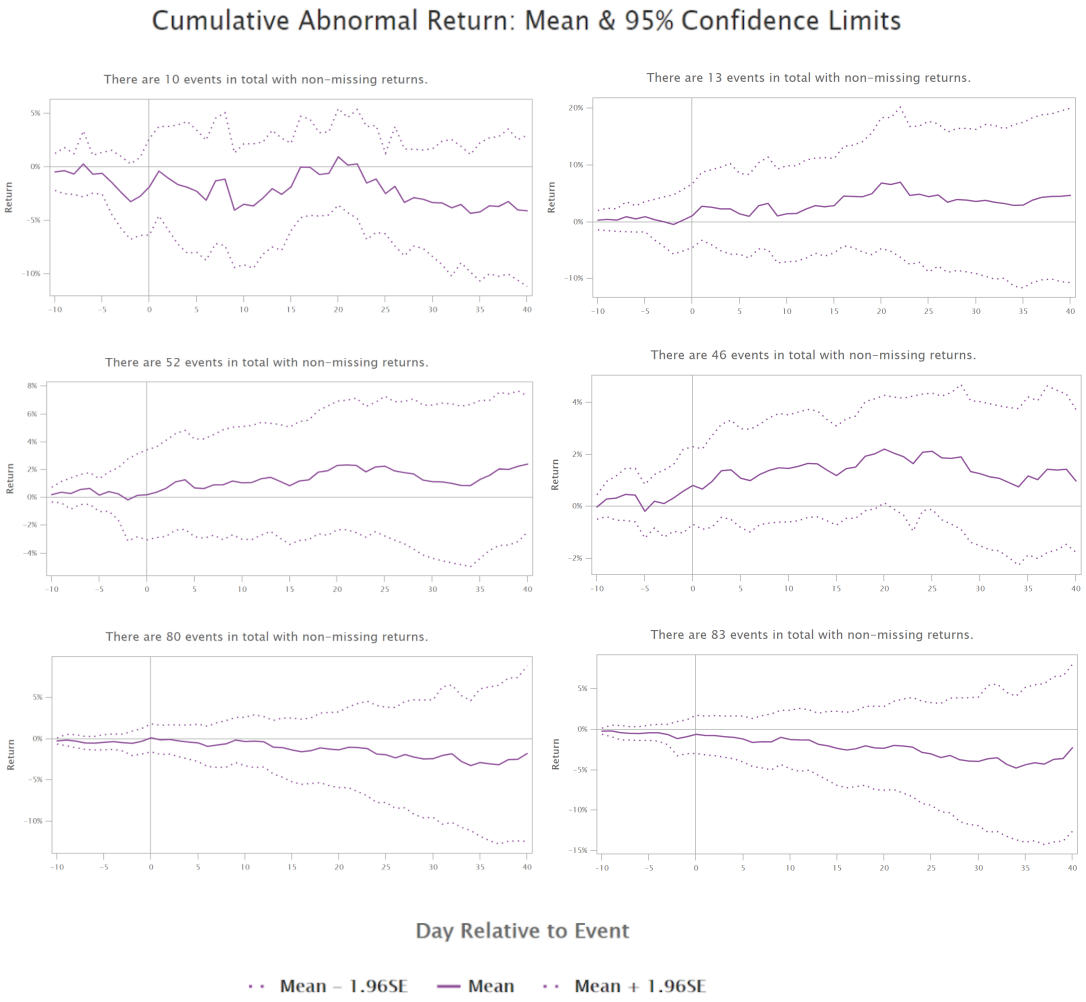

Figure 17: Event study results of issued subordinated debt 1996-2020. Top left: Q1. Top right: B. Middle left: Q2 & Q3. Middle right: I. Bottom left: Q4. Bottom right: A.

Appendix F2 - Event Study Loans

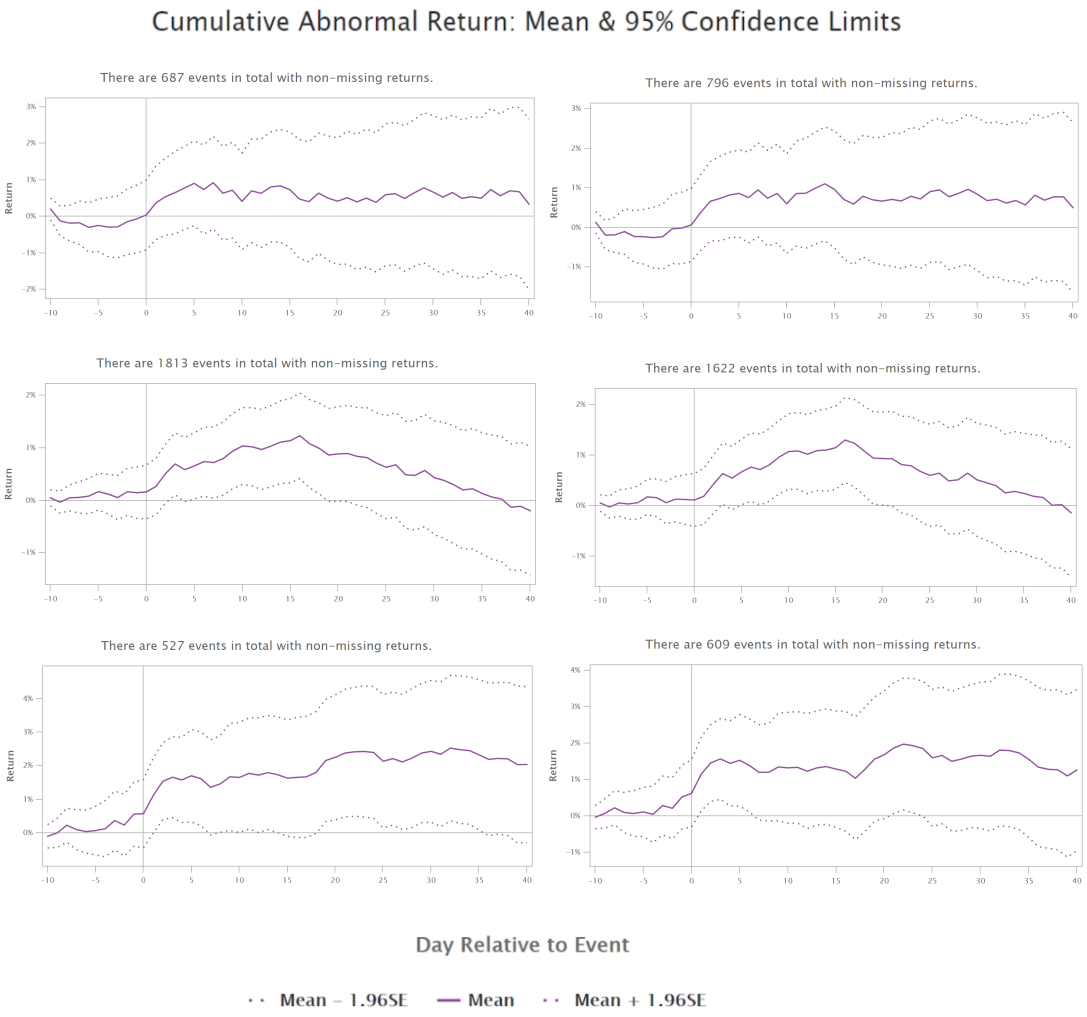

Figure 18: Event study results of issued loans 1996-2013. Top left: Q1. Top right: U. Middle left: Q2 & Q3. Middle right: B. Bottom left: Q4. Bottom right: A.

Appendix F3 - Event Study 364-days-facility

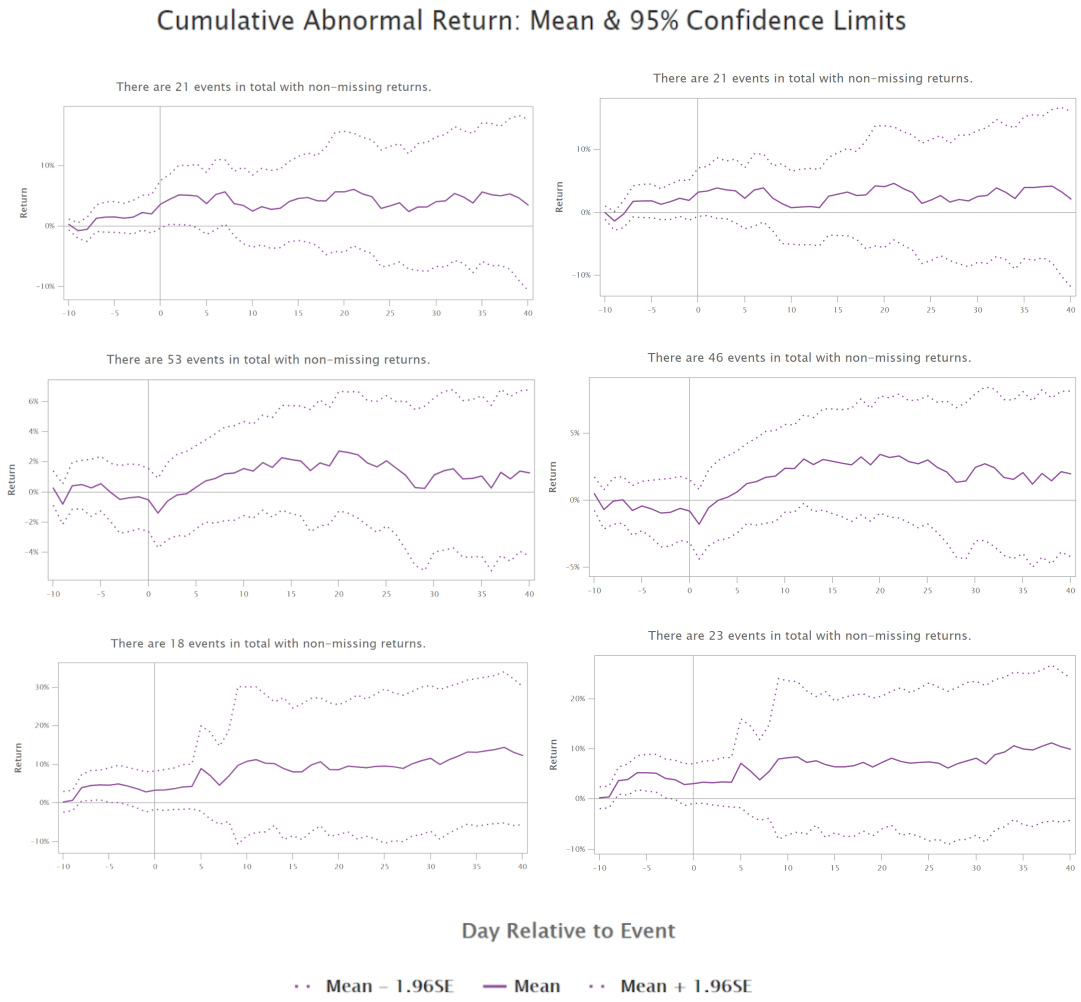

Figure 19: Event study results of issued 364-day-facilities 1996-2013. Top left: Q1. Top right: U. Middle left: Q2 & Q3. Middle right: B. Bottom left: Q4. Bottom right: A.

Appendix F4 - Event Study Bonds

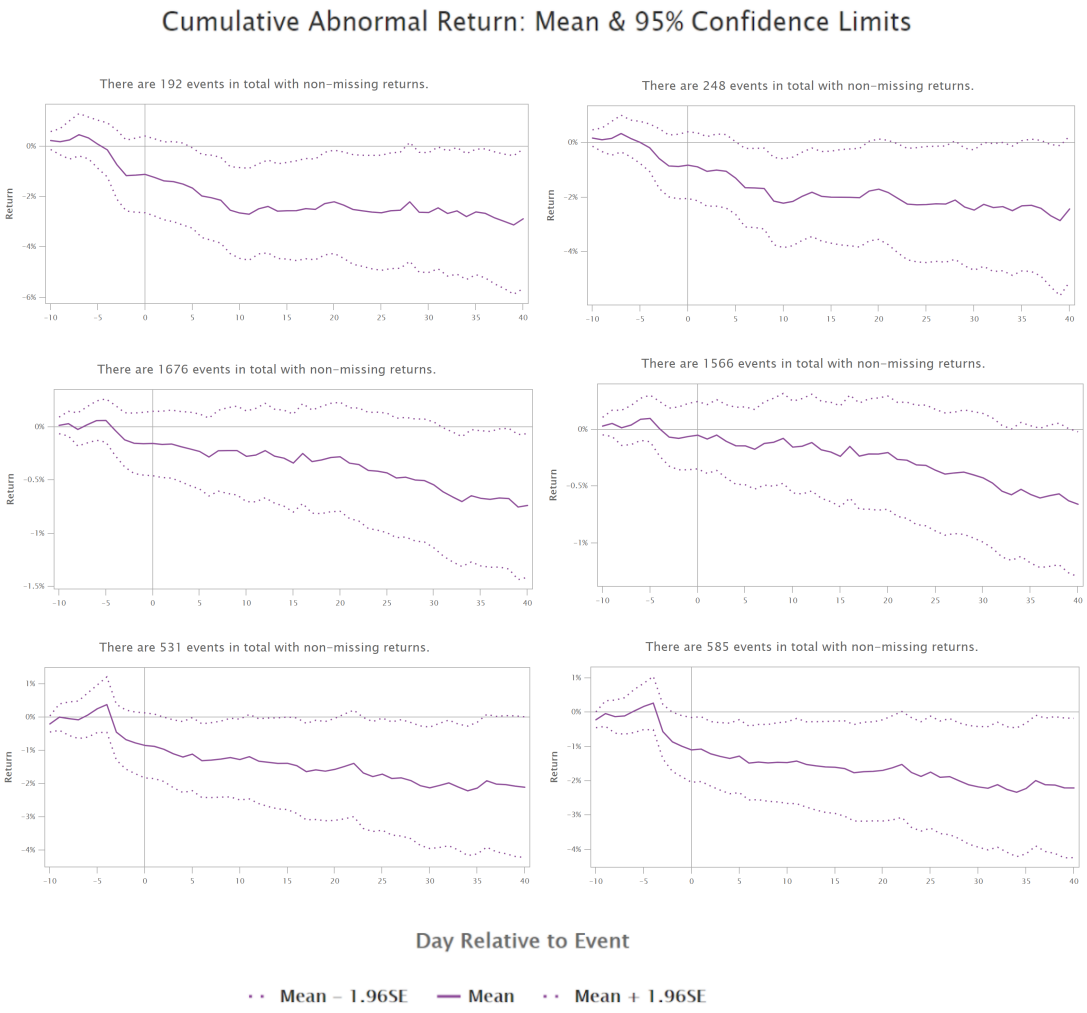

Figure 20: Event study results of issued bonds 1996-2020. Top left: Q1. Top right: U. Middle left: Q2 & Q3. Middle right: B. Bottom left: Q4. Bottom right: A.

Appendix F5 - Event Study Debentures

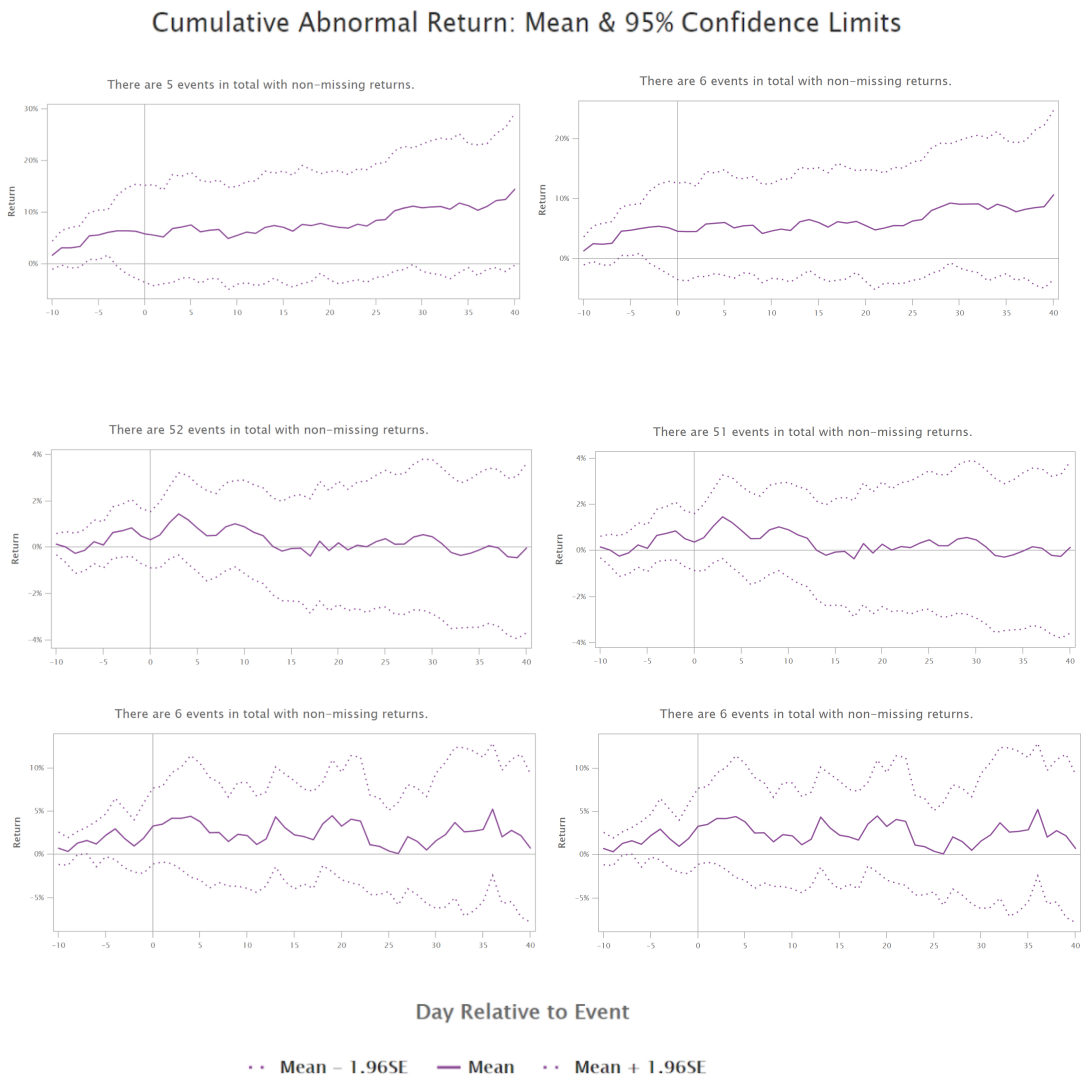

Figure 21: Event study results of issued debentures 1996-2020. Top left: Q1. Top right: U. Middle left: Q2 & Q3. Middle right: B. Bottom left: Q4. Bottom right: A.

Appendix F6 - Event Study Bonds (Subcategory)

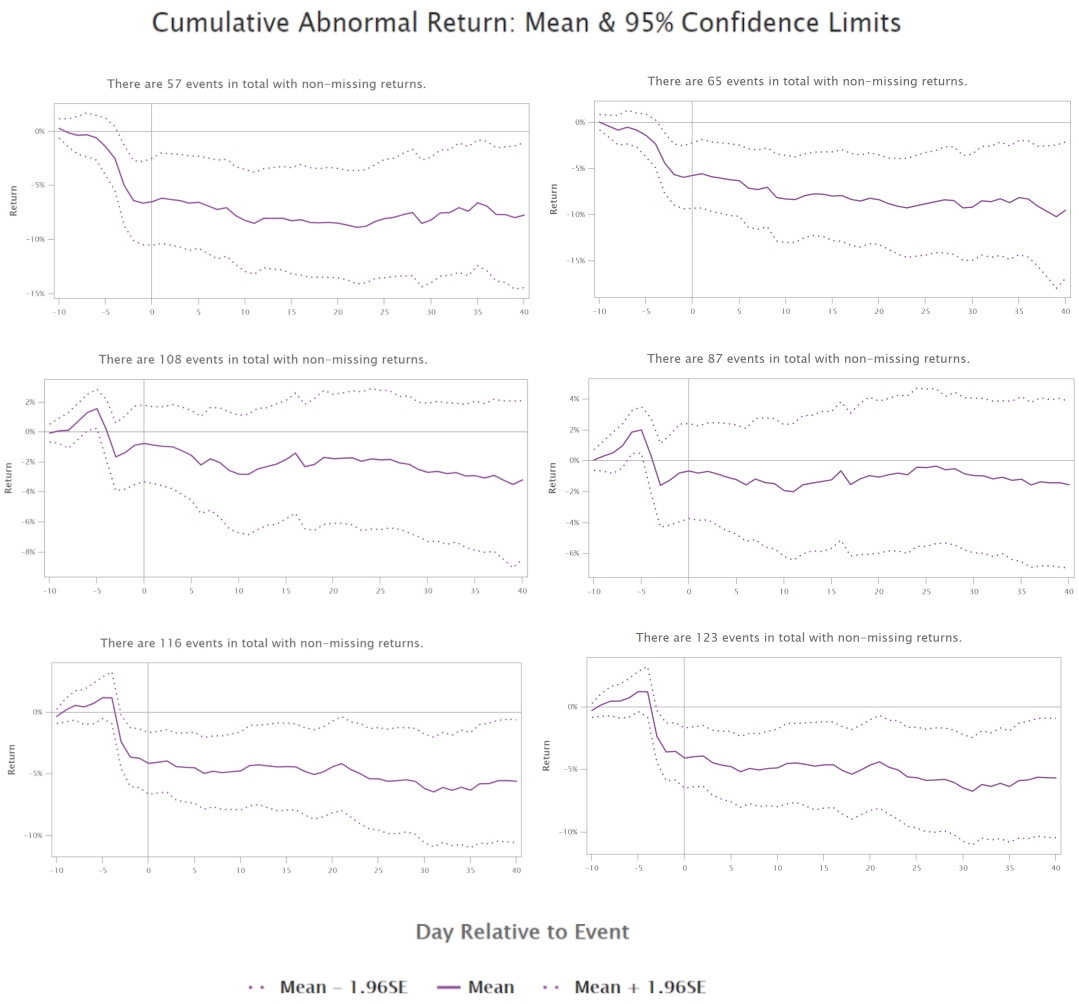

Figure 22: Event study results of issued bonds (subcategory) 1996-2020. Top left: Q1. Top right: U. Middle left: Q2 & Q3. Middle right: B. Bottom left: Q4. Bottom right: A.

Appendix F7 - Event Study Notes

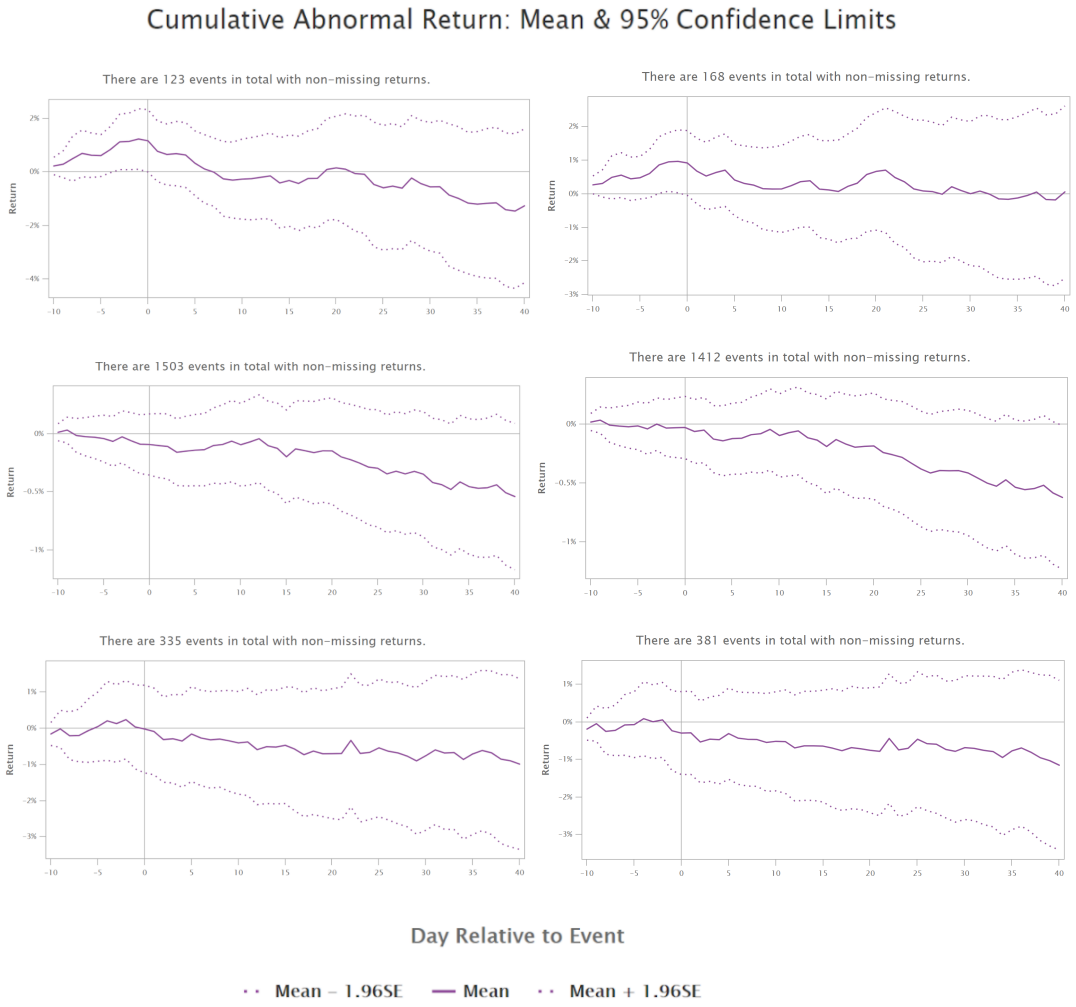

Figure 23: Event study results of issued notes 1996-2020. Top left: Q1. Top right: U. Middle left: Q2 & Q3. Middle right: B. Bottom left: Q4. Bottom right: A.

Appendix F8 - Event Study Commercial Papers

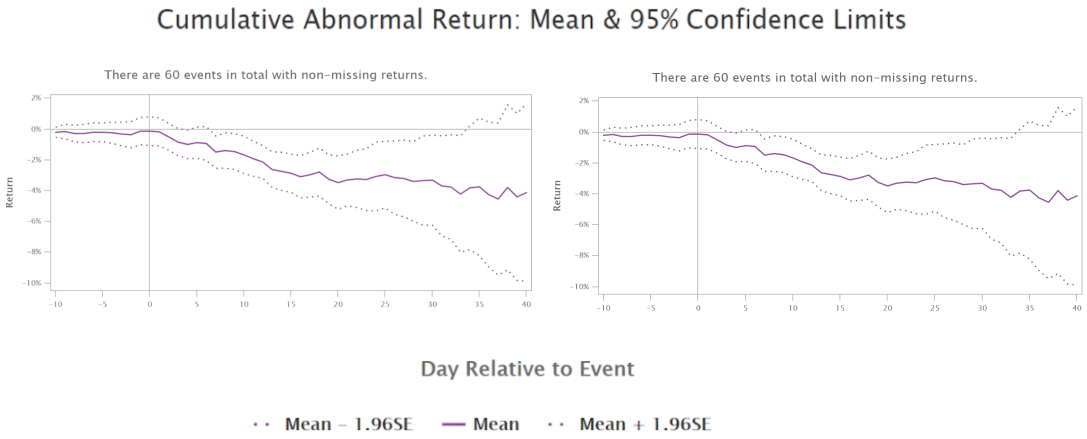

Figure 24: Event study results of issued commercial papers 1996-2020. Left: Q4. Right: A. Our data only contains observations for Q4 and A.