EARNINGS MANAGEMENT AND DEBT FINANCING

A QUANTITATIVE STUDY IN A SWEDISH PRIVATE SETTING

JEAN-PIERRE SALIBA

JOHAN LEXNER

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Abstract

Private firms in Sweden used to have considerable leeway in their financial reporting. Moreover, debt from creditors remains one of the most important sources of financing for private firms, and therefore, the financial statements should be considered imperative in determining borrowing terms. Following the implementation of a mandatory nationally adapted version of IFRS for SMEs in 2014, also known as the K3 standard, we examine the relationship between earnings management and the cost of debt for Swedish private firms reporting under the K3 standard. Sweden remains one of few countries that has adopted a reporting standard of this kind, and therefore, generates an interesting environment for research. We find no evidence concerning an association between earnings management and the cost of debt, and the result remains insignificant after employing additional measures of earnings management. Plausible reasons for the insignificant results can be attributed to creditors obtaining relevant information from other sources than the financial statements, and the regulatory and institutional environment which is predicted to alter the relationship between earnings management and the cost of debt.

Keywords:

Earnings Management, Cost of debt, K3, Discretionary accruals, Information asymmetry

Authors:

Jean-Pierre Saliba (24738)
Johan Lexner (24732)

Tutor:

Antonio Vazquez, Assistant Professor, Department of Accounting

Master Thesis
Master Program in Accounting, Valuation and Financial Management
Stockholm School of Economics

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Jean-Pierre Saliba Johan Lexner

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1. Introduction

With the implementation of more stringent reporting standards, regulators and other stakeholders encourage firms to accurately and faithfully represent accounting numbers for outside users. The International Accounting Standards Board (IASB), which is the governing body of International Financial Reporting Standards (IFRS), states that:

"If financial information is to be useful, it must be relevant and faithfully represent what it purports to represent. The usefulness of financial information is enhanced if it is comparable, verifiable, timely and understandable" (IASB, 2018).

Hence, one important factor in explaining the development of new rules and reporting standards is to ensure that firms present financial information that adheres to the main principles of relevance and faithful representation. Over the last decades, numerous implementations and revisions have occurred to improve the usefulness of financial statements. Examples of reporting standards that aim to increase the harmonization between countries and among firms include but are not limited to, the implementation of IFRS in the European Union (EU) in 2005 and numerous other revisions pertaining to IFRS, such as IFRS 9 for financial instruments and IFRS 16 for leasing agreements.

A similar development to enhance the usefulness of financial statements is also noticeable in Sweden, where standard-setters aim to increase the transparency and accuracy of financial statement reports. For a considerable period, larger non-public Swedish firms were granted considerable leeway in their financial reporting which could enable managers to engage in, for instance, earnings management. In 2014, following a long-lived initiative, a new reporting standard by the Swedish Accounting Standards Board (SASB) came into mandatory effect. The new reporting standard, commonly known as "K3", is a nationally adopted reporting standard that targets private firms and is similar to the IFRS for SMEs (2009 version) (IASB, 2009). However, the adoption of IFRS for SMEs has remained scarce in Europe, and many countries have continued to report according to their respective Generally Accepted Accounting Principles (GAAP). Therefore, the evidence of an IFRS-like reporting standard for private firms remains relatively scarce as it only exists in a few countries in the EU. At the time of writing, the K3 standard has been in mandatory effect for 10 years and is subject to considerable interest from academia, standard-setters and other stakeholders.

When considering the usefulness of a reporting standard, one must consider the stakeholders who will use the financial statements. In the realm of private firms, previous literature shows that the debt capital markets are critical for the operations and financing of private firms (Cressy & Olofsson, 1997). Since creditors use financial statements as a basis for issuing loans, the quality of the financial information should be of great importance. Considering the significance of creditors for the operations and financing of private firms, and the creditors' dependence on financial statements, investigating the relationship between earnings

management and the cost of debt when a new reporting standard is implemented can yield important insights for future research.

In this paper, we investigate the relationship between earnings management and the cost of debt for Swedish private firms reporting under the K3 standard. In particular, our research question is: *What is the relationship between earnings management and the cost of debt for Swedish private firms?*

Using the implementation year 2014 as a starting point, we collect data that covers 322 unique firms until 2021. Using the K3 thresholds that firms must meet for two consecutive years, we limit our sample to firms that are independent legal entities and subject to mandatory K3 reporting. Furthermore, we use a model developed by Dechow et al. (1995), hereafter referred to as the "Modified Jones model" to measure earnings management, and we perform additional tests with other earnings management models for robustness sake. We employ multiple linear regression models to measure the relationship between earnings management and private firms' cost of debt.

Our findings show statistically insignificant results concerning the relationship between earnings management and the cost of debt for Swedish private firms reporting under the K3 standard. Hence, we do not find enough evidence to reject the null hypothesis that a relationship between earnings management and the cost of debt does not exist. Plausible reasons for the insignificant result can be attributed to creditors receiving valuable information from other sources than the financial statements, and using that information when determining, for instance, the interest rate for a firm. Moreover, the unique institutional and regulatory environment that exists in Sweden can also have implications for the relationship between earnings management and the cost of debt.

Our thesis contributes to extant literature in three significant ways. First, we examine a regulatory and institutional setting that differs considerably from previous literature. Sweden remains one of few countries in the EU that has adopted a reporting standard similar to the IFRS for SMEs (Gassen, 2017). Extant research on the topic has mostly examined a setting where the reporting requirements differ from the setting in Sweden (Gassen & Fülbier, 2015; Mafrolla & D'Amico, 2017; Vander Bauwhede et al., 2015). To the best of our knowledge, no paper has studied the relationship between earnings management and the cost of debt under a regulatory environment that involves an IFRS-like reporting standard for SMEs. Second, we expand the literature on earnings management in the realm of private firms and their relationship to creditors. Most empirical findings concerning earnings management are largely focused on public firms (Coppens & Peek, 2005), which is an environment that differs considerably from a private environment. This is especially interesting for a reporting standard (K3) that is similar to the regulatory requirements for public firms while keeping the institutional characteristics that are usually only found for private firms. Third and finally, we contribute to a topical research subject in Sweden, namely the K3 standard. The SASB has requested more input on the K3 standard, and we contribute to this topic by investigating whether a relationship exists between earnings management and the cost of debt for firms

reporting under the K3 standard. Moreover, we generate suggestions on topics for future research surrounding the relationship between earnings management and the cost of debt within the K3 standard that researchers can investigate further.

The structure for the remainder of our thesis is the following. Section 2 presents the literature review on the subject of earnings management and debt, and is followed by the hypothesis development. Section 3 presents the methodology. Section 4 includes descriptive statistics and the empirical analysis for the regressions. Section 5 presents robustness tests when using additional measures of earnings management. Section 6 concludes the thesis by presenting the conclusions, followed by limitations and suggested topics for future research.

2. Literature review

2.1.1 Earnings management

Earnings are indicators of firm performance and are used by several stakeholders when assessing the current health of a firm, as well as the future prospects of the firm (Dechow, 1994). Multiple valuation models are based on a firm's earnings, a part of a manager's compensation is usually tied to the earnings and earnings also serve as a basis in debt contracting. Considering the vital usage of earnings by multiple stakeholders, the topic of earnings quality is important. As illustrated by Yee (2006), earnings quality includes two attributes, the first one being the fundamental attribute and the second one corresponding to the financial reporting attribute. The fundamental attribute pertains to an accounting performance measure in assessing a firm's capacity to generate future cash flows, while the financial reporting attribute is the imperfect signal of fundamental earnings that the firm reports (Yee, 2006). Hence, earnings quality concerns the precision of the reported earnings in revealing fundamental earnings, that is, the future cash flow generating ability of the firm.

Management can either manage earnings through accruals in terms of accounting choices or engage in real earnings management in terms of changing the level of economic activities to obtain income objectives (Roychowdhury, 2006). The reason behind the reporting of accruals is to depict a more accurate presentation of a firm's performance and can thus act as a facilitator in adjusting cash flows to better showcase the firm performance (Dechow, 1994). Healy (1985) shows how one can divide accruals into non-discretionary accruals and discretionary accruals, with the non-discretionary accruals representing the accruals as a result of the accounting regulations and the discretionary accruals representing accruals as affected by managerial discretion.

$$Total\ Accruals = Nondiscretionary\ Accruals + Discretionary\ Accruals$$

There are multiple different models to estimate discretionary accruals (Jones, 1991; Dechow et al., 1995; Dechow & Dichev, 2002; Kothari et al., 2005). Real earnings management, however, is the extent to which managers engage in changing the real activities of the firm. Such activities include decreasing R&D expenses, overproduction of inventory, and temporary discounts to increase sales (Pappas et al., 2019).

This paper will utilize accrual-based earnings management, given that the primary objective is to explore the relationship between earnings management and debt characteristics (Alzoubi, 2018). More specifically, we use the well-established Modified Jones model (Dechow et al., 1995), which is an amended version of the Jones model (Jones, 1991). The original Jones model had a significant contribution to the academic field of earnings management as it took into account the economic environment of the firm (Jones, 1991). However, as we explain below, the Modified Jones model showcases higher explanatory power and remains one of the most used models in the research on earnings management

(Dechow et al., 1995; Christodoulou et al., 2018). Moreover, for our additional analysis, we investigate the differences between groups of firms when considering how different levels of intangible assets can impact the relationship between earnings management and the cost of debt.

2.1.2 Debt financing

In contrast to public firms, private firms are more limited in regard to the sources of financing. Private firms typically do not have access to the public sources of financing, and are typically more reliant on debt financing, primarily private debt (Cressy & Olofsson, 1997; Hope & Vyas, 2017). Hence, in a non-public setting, creditors are expected to play an increasingly important role in the financing of private firms. This is also supported by Brav (2009) who examines public and private firms in the UK and finds that private firms to a much larger extent rely on debt financing. Brav (2009) argues that private firms exhibit more concentrated ownership and in comparison to public firms, rely less on equity financing. A reason for less dependence on equity financing could be that it would imply a higher loss of control and the ability to maintain significant ownership is one major advantage of being a private firm (Brav, 2009). Therefore, when considering the previous literature on private firms and debt, a relationship between private firms and creditors can be more multifaceted. Debt financing also plays an important role in agency theory, as it functions as a monitoring device for the creditors. Creditors use, for instance, covenants in order to influence the behavior of a firm.

2.1.3. Earnings management and debt financing

Creditors most likely use accounting information when assessing the creditworthiness of a potential borrower, thus, firms can be incentivized to report earnings that ameliorate borrowing terms. Previous literature has explored many aspects of the relationship between earnings management and debt contracting, as documented by Armstrong et al. (2010). Bharath et al. (2008), for instance, investigate the effects of earnings management in relation to debt contracting for public firms by investigating accruals quality and the choice of private versus public debt. Their findings highlight that firms with lower accruals quality prefer private debt, while firms with higher accruals quality on the other hand prefer public debt. The reason is that banks usually possess superior information, which implies that firms with low accruals quality will turn to private debt in order to not incur adverse selection costs (Bharath et al., 2008). In addition, the authors find that the firms with lower accruals quality have higher interest rates. Thus, firms that engage to a larger extent in earnings management have empirically shown to prefer private debt and are also faced with more adverse borrowing terms.

With regard to the previous literature on the relationship between earnings management and debt financing, some research has focused on public firms (Francis et al., 2005; Gray et al., 2009; Bharath et al., 2008). Francis et al. (2005) investigate the effect of earnings

management on the cost of debt and equity respectively. Using a sample of public firms in the United States, they find that firms that engage more in earnings management are associated with having a higher cost of debt. Investigating a sample of public Australian firms and following the research method of Francis et al. (2005), Gray et al. (2009) investigate the effect of earnings management on the cost of equity and cost of debt respectively, and do not find any effect of earnings management, as measured through total accruals quality and discretionary accruals quality, on the cost of debt. The different result that Gray et al. (2009) find can largely be attributed to the fact that Australian firms rely more on debt from private creditors, in comparison to public American firms (Gray et al., 2009). Therefore, creditors are more likely to possess private information about a firm, and hence, the impact of earnings management may not be as significant when determining the cost of debt for firms. Hence, the relationship between earnings management and cost of debt has empirically shown to vary between different institutional and regulatory environments. The abovementioned findings shed light on the relationship between earnings management and the cost of debt for public firms. However, in contrast to the above-mentioned articles, our paper will explore a sample consisting of private firms, implying little-to-no pressure from the financial markets and hence other mechanisms affecting the extent to which firms engage in earnings management (Healy & Wahlen, 1999). Examples of incentives for private firms to manage their earnings include minimizing tax expenses (Burgstahler et al., 2006), which is especially pervasive in countries with financial accounting similar to tax accounting (Alford et al., 1993; Ball et al., 2000).

Considering a setting with private firms, Burgstahler et al. (2006) examine firms in a European setting and find that private firms engage to a larger extent in earnings management in contrast to public firms. The authors attribute the result to the fact that actors investing in public firms have less private information about the particular firm, and therefore rely to a larger extent on public information, such as the financial statements. Therefore, for the abovementioned investors, public financial information becomes increasingly more important when, for instance, assessing the creditworthiness of a public firm. Thus, public firms have incentives to publish financial statements that fairly represent the economic environment. Following the same line of argument, any financial information that is of poor quality should be considered less attractive to invest in (Burgstahler et al., 2006). In contrast, private firms face different regulatory and institutional settings than public firms. As Burgstahler et al. (2006) note, private firms display more concentrated ownership and might be able to communicate private information to different stakeholders, such as creditors. This implies that the creditors can get access to relevant information through other sources than the financial statements. Cassar et al. (2015), for instance, showcase for a sample of private American firms, that the amount of years that a firm has been a client of the creditor decreases the cost of debt. Similarly, Bigus and Hillebrand (2017) reason that the relationship between a firm and a creditor can substitute the usefulness of financial statements because creditors have private channels of information. Hence, other information channels can supply creditors with the necessary information to determine the contract terms, such as the interest rate. This also implies that the implementation of a stringent reporting standard may not

impact the cost of debt to a larger extent, under the assumption that creditors can use other sources of information as well.

Considering the relationship between earnings management and the cost of debt for private firms only, some of the previous literature suggests that higher earnings management increases the cost of debt. Vander Bauwhede et al. (2015) investigate the effect of earnings management on the cost of debt for SMEs in Belgium and find that firms that engage more in earnings management, as measured through accruals quality, are associated with having a higher cost of debt. Ding et al. (2016) investigate a similar research question for private firms in China and find that firms engaging more in earnings management are also penalized by having a higher cost of debt. Mafrolla and D'Amico (2017) also find that more earnings management increased the cost of debt when examining the period following the implementation of Basel II for private firms in Italy, Portugal and Spain. In addition, the authors examine the relationship between earnings management and the loan amount and find a positive relationship. Hence firms that engage more in earnings management had more access to debt compared to the period before the implementation of Basel II. Mafrolla and D'Amico (2017) attribute this result by arguing that despite a stricter accounting regime, the private firms that engage more in earnings management manage to increase their borrowing capacities. An et al. (2016) also highlight the role of the institutional environment and they find that earnings management significantly and positively correlates with firm debt.

In contrast to the abovementioned literature on earnings management and the cost of debt, Gassen and Fülbier (2015) find that European private firms that engage in income smoothing (usually a form of earnings management) are associated with having lower costs of debt. This result differs from the findings of a positive relationship between earnings management and the cost of debt for firms in a private setting (Ding et al., 2016; Mafrolla & D'Amico, 2017; Vander Bauwhede et al., 2015). Gassen and Fülbier (2015) argue that creditors dislike high earnings volatility since the managers have limited downside risk, and managers will benefit from taking more risk. In addition, the volatility of net income can trigger bankruptcy events which creditors want to avoid in order to not incur negotiation costs. This problem is also likely to become more relevant in a private setting where creditors are the primary financiers of firms (Cressy & Olofsson, 1997). Therefore, according to Gassen and Fülbier (2015), private firms that engage more in earnings management to smooth their income, and consequently showing more stability, are associated with having lower costs of debt. Considering that we examine a Swedish private setting, the abovementioned finding could have important implications for our sample of firms. It is important to note, however, that we do not test for income smoothing in our thesis but we consider its potential implication for our research question.

Similarly to (Ding et al., 2016; Gassen & Fülbier, 2015; Mafrolla & D'Amico, 2017; Vander Bauwhede et al., 2015), we investigate the relationship between earnings management and the cost of debt in a private setting. In particular, we focus on a setting characterized by stricter reporting standards through the mandatory adoption of a nationally adapted IFRS for SMEs. Our paper provides new insights into a regulatory environment characterized by a

nationally adapted version of IFRS for SMEs, which according to Gassen (2017), is only adopted in the following countries: Estonia, Ireland, the United Kingdom and Sweden.

2.1.4 Regulatory environment

The Swedish Accounting Standards Board (SASB) implemented the K3 standard under the following standard: "Bokföringsnämndens allmänna råd BFNAR 2012:1 *Årsredovisning och koncernredovisning*", which came into mandatory effect in 2014. The launch of the K3 standard was the result of an initiative to implement a more stringent reporting standard that targeted larger private firms. In 2009, IFRS published a reporting standard called IFRS for SMEs, which also served as an inspiration for the development of the K3 standard (Hellman et al., 2022). Prior to the adoption, larger private firms in Sweden had more leeway and discretion in their financial reporting when applying the Swedish GAAP (Hellman et al., 2022). Hence, the usefulness of the financial statements may have been more questionable considering the significant discretion private firms had when preparing their financial statements.

In order to be subject to reporting to the K3 standard, a Swedish firm must fulfill at least two of the following three criteria for two consecutive years:

- The firm has more than 50 employees,
- an annual turnover of at least 80 million SEK and,
- a balance sheet size of at least 40 million SEK.

By adhering to the K3 standard, the firms are obligated to comply with stricter accounting rules. This includes, for instance, new capitalization requirements for items that usually were off-balance, such as pensions and leases (Hellman et al., 2022). A similar development can also be seen in the use of financial instruments, in which reporting properties became increasingly stringent following the adoption of the K3 standard. Hence, the K3 standard is likely to differ from other countries that have not adopted an IFRS-like reporting standard to the same extent as Sweden. Starting in 2023, the SASB requested advice and remarks about the K3 standard and whether revisions of the reporting standard would be necessary (SASB, 2023). Hence, the topic is still under discussion, and input from academia regarding the K3 standard has been warranted. Considering the unique research environment that has emerged upon the implementation of the K3 standard, researchers have generated new insights concerning the effects of the K3 adoption. Hellman et al. (2022), for instance, investigate the effects of the adoption of K3 in Sweden on groups' financial properties and the cost of debt and find that the introduction of the K3 standard led to lower costs of debt for groups reporting according to the K3 standard.

We will examine the relationship between earnings management and the cost of debt, solely focusing on firms that were obliged to adopt the K3 standard in Sweden. In contrast to Hellman et al. (2022), we study the K3 reporting standard in isolation and do not conduct a

treatment study to compare the effects of K3 vis-à-vis a control group. Hence, we investigate the relationship between earnings management and the cost of debt in an isolated environment. Moreover, Hellman et al. (2022) study K3 adoption for entities presenting group accounting in comparison to our paper focusing on accounting within the legal entity. As presented by Hellman et al. (2022), the K3 standard has some different rules for group accounting and independent legal entities related to tax considerations. Hence, we generate evidence and add to the literature by examining a unique institutional and regulatory setting that to the best of our knowledge is unexplored when considering the relationship between earnings management and the cost of debt.

2.2 Theoretical framework

Jensen and Meckling (1976) formalize the agency theory, implying potential conflicts of interest between the principal (creditor) and the agent (manager) assuming a setting with information asymmetry. For our setting of private firms in Sweden, information asymmetry can exist between the creditors and the private firms, which means that the parties will have different sets of information (Jensen & Meckling, 1976). In such a setting, creditors will have less information about the firm's future prospects and can anticipate that the manager can exploit resources and act in his or her own interest. Instances of managers acting at the expense of creditors include underinvestment wherein managers refrain from investing in positive NPV projects or when the firm acquires assets with higher risk, also known as asset substitution. Moreover, the managers can also seek to benefit themselves by using debt for their own purposes; this can include the concept of overinvestment, in which the manager seeks to expand its own influence within the firm by undertaking additional investments. With the abovementioned risks in mind, creditors will require a return to compensate for this information risk. In line with previous literature, for instance, Francis et al. (2005), the information risk is considered non-diversifiable and should therefore be taken into account by the creditors. Francis et al. (2005) define information risk as the probability of firm-specific information to investors being of poor quality. Therefore, firms that engage to a larger extent in earnings management will generate more opaqueness and uncertainty regarding future cash flows. Hence, all else equal, creditors should penalize firms that engage in earnings management by, for instance, charging higher interest rates.

An alternative theory for explaining the use of earnings management is to use it as income smoothing in order to display stability and signal this to the creditors. This is formally known as signaling theory, in which the more informative party (firm) aims to reduce agency costs by signaling information to the less informative party (creditor). Gassen and Fülbier (2015) show that increased earnings management, in the form of income smoothing, is associated with a lower cost of debt when investigating private firms in Europe. However, for this thesis, we do not consider income smoothing in our analysis but we note that different theories have generated different results when investigating the relationship between earnings management and the cost of debt.

Hence, numerous factors from a theoretical point of view indicate that the association between earnings management and the cost of debt is not clear. In addition, the Swedish setting will incorporate a reporting standard (K3) that shares some characteristics with IFRS for public firms, while still preserving the characteristics that are usually only present in a private setting.

2.3 Hypothesis testing

Considering the aforementioned literature, most of the literature indicates a positive relationship between earnings management and the cost of debt. Previous literature, on both public and private firms, finds a positive relationship between earnings management and the cost of debt (Bharath et al., 2008; Ding et al., 2016; Francis et al., 2005; Mafrolla & D'Amico, 2017; Vander Bauwhede et al., 2015). However, the setting that we explore is inherently complex as it contains the regulatory qualities of a public setting while preserving the qualities that are usually only present for private firms. As shown by Gray et al. (2009), the institutional and regulatory environment can yield different results between countries. Furthermore, for private firms, as shown by (Bigus & Hillebrand, 2017; Burgstahler et al., 2006; Cassar et al. 2015), there can be a multitude of factors, including other sources of information, that can influence how creditors determine the cost of debt for private firms. In such a setting, the impact of an IFRS-like reporting standard may be less than anticipated since creditors have access to other sources of information. Hence, the financial statements may not be as influential in determining the cost of debt for private firms, despite the implementation of a stricter reporting standard. In addition, Gassen and Fülbier (2015) find a negative effect of earnings management, in the form of income smoothing, on the cost of debt, which according to the authors is attributed to creditors preferring income smoothing. Therefore, considering the mixed evidence and the unique economic environment, we develop the following null hypothesis:

H_0: There does not exist a relationship between earnings management and the cost of debt

3. Methodology

The following section will introduce the data collection process alongside the research design and choice of models used to test our hypothesis.

3.1 Sample selection

In this study, we use data on Swedish private firms from the database Serrano. The database comprises data on all Swedish firms and includes financial statement information from 1997 and onwards. Serrano sources the data from the Swedish Companies Registration Office and obtains all relevant financial information per firm and per fiscal year. In our study, we limit our sample to independent firms and therefore use the "serrano.dta" dataset in comparison to the "bokslut.dta" dataset which contains data on group accounts. The "serrano.dta" dataset allows us to retrieve financial statement information for all our variables.

Since the implementation of the K3 standard came into mandatory effect in 2014, we hence limit our sample to firms obliged to report according to K3 and use a data sample that ranges between the years of 2014-2021 for our regression analysis. However, we also use data from the years 2012 and 2013 to measure whether firms met the criteria of the K3 standard since it is obligatory for firms applying the K3 standard to meet the criteria for two consecutive years. In addition, we apply conditional rules for firms that meet two of the three criteria, according to the K3 standard. The year 2021 contains the latest available data on the firms' financial statements and will therefore constitute the ending year for our sample.

We begin the sample selection process by only keeping active limited liability firms and removing public firms from the sample. We proceed with excluding firms active in the finance industry in line with previous literature (Gassen & Fülbier, 2015; Vander Bauwhede et al., 2015), with Table 2 showcasing the sectoral categorization for our final sample. Furthermore, we also exclude firms that are state or municipal-affiliated from the sample (Vander Bauwhede et al., 2015; Vermoesen et al., 2013), since governmental enterprises can be affected by government regulations, hence affecting investment decisions (Smith, 1986). Thereafter, we also remove firms that are not classified as independent legal entities. The reason for only including independent firms is that firms that report consolidated financial statements can choose to report under IFRS instead of K3. Hence, by excluding parent firms that can voluntarily report under IFRS, we limit ourselves to firms that solely report under K3. Thereafter, to limit the sample to firms obliged to report according to the K3 standard in 2014, we construct dummy variables equal to the value of 1 if the firm met the criteria in 2012 and 2013 respectively. In order to ensure the quality of the data, we also manually check whether the firms reported according to the K3 standard in 2014. As a last step, we drop observations containing missing values for our main dependent variable as well as all of our independent variables. As highlighted in Table 1, this leaves us with a sample of 322 firms and 1 670 firm-year observations.

Table 1: Sample selection process

	Number of firm-year observations
Total number of firm-year observations with only active non-public limited liability firms (2012-2021)[1]	3 991 797
- Eliminate firms belonging to the finance industry	-206 506
- Eliminate state and municipal affiliated firms	-18 299
- Eliminate non-independent firms	-1 144 540
- Eliminate firms not meeting the K3 thresholds	-2 620 255
- Limit the sample to 2014	-400
- Other missing values	-127
Final sample of firms	322
Total firm-year observations	1 670

There are some limitations with regard to our choice of data, one of them being that only individual firms are included. This implies that our sample includes a smaller number of distinct firms compared to if we were to include groups. Furthermore, another limitation with regards to the dataset "serrano.dta" is that it converts the fiscal years of firms reporting under broken years to the year in which the annual report was released. In our screening for firms meeting the K3 criteria, this, in turn, implies that a small number of firms started reporting under the K3 standard in 2015 instead of 2014.

[1] Adjustments are also made for missing values for total assets, sales and total employees.

Table 2: Sectoral categorization

SNI	Description	N
10-33	Manufacturing	64
35	Electricity, gas, steam and air conditioning supply	5
36-39	Water supply; sewerage, waste management and remediation activities	13
41-43	Construction	25
45-47	Wholesale and retail trade; repair of motor vehicles and motorcycles	121
49-53	Transportation and storage	34
55-56	Accommodation and food service activities	9
58-63	Information and communication	3
68	Real estate activities	5
69-75	Professional, scientific and technical activities	21
77-82	Administrative and support activities	3
85	Education	5
86-88	Human health and social work activities	9
90-93	Arts, entertainment and recreation	2
94-96	Other service activities	3

Table 2 reports the sectoral categorization of the firms included in our sample. *SNI* represents the distribution of the cluster of the two-digit sectoral categorization based on the Statistical Classification of Economic Activities in Sweden. The total number of firms (*N*) refers to the number of firms in each industry.

3.2 Measures of earnings management

In order to test our hypothesis for the relationship between earnings management and the cost of debt, we use the Modified Jones model, which constitutes one of the most used models in prior research and earnings management studies (Christodoulou et al., 2018). Furthermore, there are two common ways in which earnings management is estimated in previous literature, accruals-based models (Dechow et al., 1995; Kothari et al., 2005; McNichols, 2002), and real earnings management models focusing on the real economic activities (Roychowdhury, 2006). In this paper, we utilize accruals-based models, as those accruals-based models are the most prevalent in previous literature estimating the effects of earnings management on the cost of debt (Alzoubi, 2018; Ding et al., 2016; Mafrolla & D'Amico., 2017; Vander Bauwhede et al., 2015).

There exists a vast amount of accruals-based models to be used as a proxy for earnings management (Dechow et al., 2010). In addition to the Modified Jones model, there are other models that are common in the previous literature, for instance, the model developed by Dechow and Dichev (2002), and the extension of it (McNichols, 2002). The above-mentioned researchers develop a model that estimates earnings management by calculating the residuals from the regressions of changes in working capital on operating cash flows for three time periods. This model is also a viable way of estimating earnings management, however, considering the extensive use of the Modified Jones model in the earnings management literature (Christodoulou et al., 2018), we rely on the Modified Jones model to measure earnings management. However, as Dechow et al. (2010) explain, there are also some critical aspects to take into consideration with regard to using the Modified Jones model, which corresponds to that the model in some cases has low explanatory power. In order to test for our results and make sure that our results are robust, we also employ additional models in a later section, as robustness tests.

3.2.1 Discretionary accruals

The Modified Jones model is a further extension of the Jones model (1991), with the addition of the change in receivables. This implies that the changes in receivables are no longer considered to be non-discretionary accruals, but rather something that the management of a firm has full discretion over. The argument for including changes in receivables, according to Dechow et al. (1995), is that it should be easier for managers to have discretion over earnings when sales are made on credit, hence creating an account receivable. By including the changes in receivables, the model's estimates should no longer skew towards zero when earnings management is managed through revenue. The model has empirically shown to increase the explanatory power for detecting earnings management and is also closer to reality since methods for revenue recognition tend to be one of the most common ways of managing earnings (Stubben, 2010).

We start by estimating total accruals (TA) in line with previous literature (Healy, 1985; Jones, 1991):

$$TA_{it} = (\Delta CA_{it} - \Delta CL_{it} - \Delta Cash_{it} + \Delta STD_{it} - Dep_{it})/(A_{it-1}) \quad (1)$$

Where:

ΔCA_{it} = the change in current assets for firm *i* in year *t*,

ΔCL_{it} = the change in current liabilities for firm *i* in year *t,*

$\Delta Cash_{it}$ = the change in cash for firm *i* in year *t*,

ΔSTD_{it} = the change in current liabilities to credit institutions for firm *i* in year *t*,

Dep_{it} = depreciation and amortization expense for firm *i* in year *t*,

We scale all variables with lagged total assets (A_{it-1}).

As a second step, we run the following regression model using a cross-sectional approach for each industry-year group with a similar two-digit SNI code where at least 20 observations are available:

$$TA_{it} = \beta_0 + \beta_1 * (1/A_{it-1}) + \beta_2 * (\Delta Rev_{it} - \Delta Rec_{it}) + \beta_3 * (PPE_{it}) + \varepsilon_{it} \quad (2)$$

Where:

$1/A_{it-1}$ = the inverse of the lagged total assets,
ΔRev_{it} = the change in revenue in year *t* scaled by lagged total assets,
ΔRec_{it} = the change in account receivables for in year *t* scaled by lagged total assets,
PPE_{it} = the Property, Plant and Equipment in year *t* scaled by lagged total assets,
ε_{it} = the residuals from the regression model and also represents the discretionary accruals for firm *i* in year *t*.

Furthermore, before running the model as presented in equation 2, we also winsorize the variables TA_{it} and $(\Delta Rev_{it} - \Delta Rec_{it})$ at the 1st and 99th percentiles. However, we only winsorize $1/A_{it-1}$ and PPE_{it} at the 99th percentile since these values are bounded below zero (Veenman, 2023).

We decide to use a cross-sectional approach rather than a time-series approach for multiple reasons. Becker et al. (1998) show that the cross-sectional approach has improved specification and less demanding data requirements. In addition, the usage of a time-series model would require a longer data set with more years to mitigate the effect of survivorship bias (Subramanyam, 1996). Furthermore, the cross-sectional approach is also the approach utilized in previous studies on the relationship between earnings management and the cost of debt (Vander Bauwhede et al. 2015; Ding et al., 2016). Hence, we find the choice of cross-sectional approach to be the most appropriate.

After estimating the discretionary accruals, we calculate the absolute values of the discretionary accruals, representing the extent to which a firm engages in earnings management. There is also an alternative of using the signed values of the discretionary accruals, which indicate whether the earnings are managed with the objective of increasing or decreasing the income (Hribar & Nichols, 2007). We choose to use the absolute values of discretionary accruals because we are not examining the direction of earnings management, i.e. whether the earnings are managed upwards or downwards, but rather, the propensity of managers to engage in earnings management (Hribar & Nichols, 2007).

3.3 Regression model to test for the hypothesis

To test our hypothesis for the effect of earnings management on the cost of debt of Swedish private firms, we use the regression model as presented in equation 3. The proxy for earnings management is, as explained earlier, the Modified Jones model for estimating discretionary accruals, with the loan cost representing our dependent variable. We cluster all standard errors at firm level to obtain robust standard errors.

$$Loan\_cost_{it} = \beta_0 + \beta_1 * EM_{it} + \beta_2 * Debt\_ratio_{it} + \beta_3 * Growth_{it} + \beta_4 * Size_{it} + \beta_5 * Asset\_turnover_{it} + \beta_6 * Liquidity_{it} + \beta_7 * Asset\_tangibility_{it} + \varepsilon_{it} \quad (3)$$

Where:

$Loan\_cost_{it}$= natural logarithm of the absolute value of external interest expenses for firm i in year t,
EM_{it} = absolute value of the discretionary accruals for firm i in year t,
$Debt\_ratio_{it}$ = liabilities to credit institutions scaled by total assets for firm i in year t,
$Growth_{it}$= sales growth for firm i in year t,
$Size_{it}$ = natural logarithm of the total assets for firm i in year t,
$Asset\_turnover_{it}$ = total sales for firm i in year t scaled by lagged total assets,
$Liquidity_{it}$ = total liquid assets divided by total current liabilities for firm i in year t,
$Asset\_tangibility_{it}$ = total fixed tangible assets divided by total assets for firm i in year t,

3.3.2 Dependent variable

Our main dependent variable for our study is *Loan_cost* which we measure as the natural logarithm of the absolute value of external interest expenses. The choice of measuring the cost of debt as described above is largely attributable to our data. Information on debt in a private setting is considerably more scarce than in a public setting, where data on debt maturity, covenants and credit ratings can usually be retrieved. Moreover, our choice of taking the logarithm of external interest expenses addresses concerns of conditional heteroskedasticity. Our choice of not including the liabilities that pertain to the external interest expenses is largely attributed to data limitations since it would yield many missing values.

3.3.3 Control variables

In line with previous research (Vander Bauwhede et al. 2015; Mafrolla & D'Amico 2017; Hellman et al., 2022), we choose to include several control variables. Similar to Mafrolla and

D'Amico (2017), we use *Size*, which is the natural logarithm of total assets, to control for the variability in firms' asset size and its potential correlation with the cost of debt. Furthermore, we control for the growth prospects by calculating the year-on-year sales growth (Balsmeier & Vanhaverbeke, 2018). Controlling for growth is attributed to the fact that firms experiencing high growth prospects will most likely demand financing to take on additional projects (Bassemir, 2017). Similarly to Hellman et al. (2022), we use the control variable *Debt_ratio* to control for the relationship between the leverage ratio and the interest costs. Following Mafrolla and d'Amico (2017), we control for *Liquidity*, to control for differences in liquidity risk and its effect on the loan costs, which we define as total liquid assets scaled by total current liabilities. We control for the asset turnover (*Asset_Turnover)* for respective firms, which is measured as net sales over lagged total assets, in order to control for firm performance. Furthermore, we also control for asset tangibility (*Asset_tangibility)*, similar to Hellman et al. (2022) and Vander Bauwhede et al. (2015), which we calculate by taking the total fixed tangible assets over the total assets. Asset tangibility is a good indicator of the collateral value of the assets and could hence be associated with lower financial risk (Vander Bauwhede et al., 2015).

In addition, we use fixed-effects models, controlling for industry and year. By deploying fixed effects into our model, we can partly mitigate the effects of endogenous bias caused by omitted variables in our regressions. The structures of fixed effects that we deploy include industry fixed effects and year fixed effects.

3.4 Model for additional analysis

In addition to testing the relationship between earnings management and the cost of debt, we also conduct an additional analysis. The analysis attempts to estimate whether the effect of earnings management on the cost of debt varies between groups of firms, based on different levels of intangible assets.

3.4.2 Model for testing differences in intangible assets

Our additional analysis concerns the differences among firms with different levels of intangible assets and how it relates to earnings management and its correlation with the cost of debt. In order to do so, we construct a dummy variable representing information asymmetry. The total value of intangible assets can signal the complexity of operations or other information properties that are difficult for outsiders to obtain without incurring considerable costs. Hence, holding everything else constant, firms that have higher levels of intangible assets can be more difficult for creditors to assess, and hence, creditors may charge a higher interest rate to compensate for the additional information risk. This additional analysis can yield further insight on the differences between groups of firms, and whether creditors take into account the complexity of firms' operations.

In order to create our proxy for information asymmetry, we construct a dummy variable taking the value of 1 if a firm in the sample has total intangible assets exceeding the median of the sample, and 0 if not. This makes it possible to test for the differences among firms with a high respectively low amount of intangible assets and consider if intangible assets affect the extent of earnings management and its relationship with the cost of debt. The regression model used for this analysis corresponds to the one presented in equation 4.

$$Loan\_cost_{it} = \beta_0 + \beta_1 * EM_{it} + \beta_2 * EM_{it}\, x\, InfoAS_{it} + \beta_3 * infoAS_{it} + \beta_4 * Debt\_ratio_{it} + \beta_5 * Growth_{it} + \beta_6 * Size_{it} + \beta_7 * Asset\_turnover_{it} + \beta_8 * Liquidity_{it} + \beta_9 * Asset\_tangibility_{it} + \varepsilon_{it} \quad (4)$$

Where all the variables are the same as in equation (4), except for two new variables:

$InfoAS_{it}$ = an indicator variable taking the value of 1 if the firm has total intangible assets exceeding the median of the total intangible assets of our sample, and 0 otherwise,
$EM\, x\, InfoAS_{it}$ = an interaction variable between our main explanatory variable and the indicator variable $InfoAS_{it}$.

4. Empirical Analysis

The following section will present the empirical results used to answer our research question alongside the empirical analyses.

4.1 Descriptive statistics

Table 3 presents the descriptive statistics for all the regression variables used for the main analysis, and Table A.1 in the appendix showcases the correlations between the variables included in the main analysis.

Table 3. Descriptive statistics of regression variables

	N	Mean	SD	p10	Median	p90
Loan_cost	1 670	4.878	2.285	1.609	5.366	7.391
EM	1 670	0.072	0.074	0.008	0.050	0.160
Debt_ratio	1 670	0.132	0.198	0	0	0.438
Growth	1 670	0.036	0.151	-0.110	0.032	0.192
Size	1 670	11.479	0.903	10.517	11.334	12.642
Asset_turnover	1 670	2.798	2.038	0.833	2.259	5.780
Liquidity	1 670	0.833	1.394	0.004	0.421	1.964
Asset_tangibility	1 670	0.274	0.261	0.003	0.203	0.691

Table 3 presents the summary statistics for all variables after winsorization. ***N*** represents the amount of firm-year observations available for the variables. The variable ***Loan_cost*** represents the natural logarithm of the absolute value of external interest expenses to credit institutions. ***EM*** is the absolute value of the discretionary accruals estimated using the Modified Jones model. ***Debt_ratio*** is the total loans to credit institutions scaled by total assets. ***Growth*** represents the year-over-year sales growth. ***Size*** is the natural logarithm of the total assets. ***Asset_turnover*** is the total sales divided by the lagged total assets. ***Liquidity*** is the total liquid assets divided by the total current liabilities. ***Asset_tangibility*** is the total fixed tangible assets divided by the total assets.

As illustrated in Table 3, the mean value of the earnings management variable as estimated using the Modified Jones model (Dechow et al., 1995) is approximately 0.072. Contrasting this value to the mean value of the sample of Vander Bauwhede et al. (2015) of 0.045 reveals that higher earnings management can be observed for Swedish private firms in comparison to Belgian SMEs. However, important to note is that different measures for earnings management have been utilized, as Vander Bauwhede et al. (2015) utilize the model proposed by Dechow and Dichev (2002). Therefore, the summary statistics for the earnings

management measure are not fully comparable to the statistics showcased by Vander Bauwhede et al. (2015).

Considering the other variables, one can see that the median value of the Debt_ratio is zero for our sample. This is because many firms have reported external interest expenses, without specifying the loans to credit institutions on their balance sheets[2]. Additionally, the cost of debt appears to be skewed to the left as the mean value is lower than the median. Conversely, the liquidity measure seems to be skewed to the right, as the mean is higher than the median. Table 3 further confirms that the asset turnover is high, with a mean of 2.798. The reason behind this can be attributed to the fact that a high number of the firms in our sample belong to the wholesale and retail trade sector, where a high asset turnover is typical. As wholesale firms typically have low operating margins, a higher asset turnover is necessary to achieve a higher return on invested capital, which is measured as a multiplication between the asset turnover and the operating margin.

Regarding the correlation table, as presented in Table A.1 in Appendix A, the analysis shows a significantly negative correlation between EM and the cost of debt at the 1% level. However, to further validate the potential relationship between earnings management and the cost of debt, we will proceed with multiple linear regression analyses in the upcoming section, using fixed effects for industry and year.

[2] We know that this can create a sampling issue, therefore we have provided an additional robustness test where we drop all the observations with reported external interest expenses above 0, but where the loans to credit institutions are not specified. The results can be seen in Table B.1 in the appendix. As illustrated, the results are statistically the same in terms of no statistical significant effect between our main explanatory variable (EM) and the dependent variable (Loan_cost) when introducing year and industry fixed effects.

4.2 Main analysis

Table 4 presents the regression results for equation 3 in order to test our hypothesis. The regression model includes clustered standard errors at firm level, and also controls for year fixed effects and industry fixed effects. All continuous variables across all the regressions are winsorized at the 1st and 99th percentiles.

Table 4. Effect of earnings management on the cost of debt

	Dependent variable: Loan_cost		
	(1)	(2)	(3)
EM	-0.599	-0.575	-0.532
	(0.768)	(0.595)	(0.596)
Debt_ratio	5.259***	4.651***	4.623***
	(0.546)	(0.617)	(0.618)
Growth	0.369	0.269	0.310
	(0.305)	(0.288)	(0.287)
Size	0.563***	0.552***	0.566***
	(0.095)	(0.112)	(0.116)
Asset_turnover	-0.149***	-0.108*	-0.110*
	(0.047)	(0.061)	(0.061)
Liquidity	-0.241**	-0.149	-0.146
	(0.093)	(0.095)	(0.096)
Asset_tangibility	0.614*	1.568***	1.556***
	(0.370)	(0.510)	(0.509)
Observations	1 670	1 669	1 669
Year FE	NO	NO	YES
Industry FE	NO	YES	YES
R^2	0.520	0.621	0.623
Adjusted R^2	0.518	0.608	0.608

Table 4 presents the regression results for equation 3. The dependent variable ***Loan_cost*** represents the natural logarithm of the absolute values of external interest expenses to credit institutions and is the dependent variable for all the regressions presented in each column. ***EM*** is the absolute value of the discretionary accruals estimated using the Modified Jones model. ***Debt_ratio*** is the total loans to credit institutions scaled by total assets. ***Growth*** represents the year-over-year sales growth. ***Size*** is the natural logarithm of the total assets. ***Asset_turnover*** is the total sales divided by the lagged total assets. ***Liquidity*** is the total liquid assets divided by the total current liabilities. ***Asset_tangibility*** is the total fixed tangible assets divided by the total assets. We cluster all standard errors at firm level. Robust standard errors are reported in parentheses under the coefficients.

***, **, * showcases the statistical significance at the 0.01, 0.05 and 0.1 levels. All continuous variables are winsorized at the 1st and 99th percentiles.

Considering the results presented in Table 4, we do not find any significant results related to the fact that earnings management has a significant association with the cost of debt for Swedish private firms reporting according to the K3 standard. Thus, we do not find enough evidence to reject the null hypothesis. Nevertheless, considering the control variable Debt_ratio, we see a significantly positive correlation at the 1% level between the debt ratio and the cost of debt, which is consistent with finance theory since more debt (a higher debt ratio) should lead to a higher cost of debt.

One reason behind the insignificant results between our main explanatory variable (EM) and the dependent variable (Loan_cost) can be attributed to the fact that our sample consists of private firms. Although most of the previous literature that has studied earnings management and its relationship with the cost of debt (Ding et al., 2016; Gassen & Fülbier, 2015; Mafrolla & D'Amico, 2017; Vander Bauwhede et al., 2015) have found significant results in a private setting, the case for private firms can still differ depending on the country and regulatory environment. Private firms usually have a closer relationship with capital providers as also highlighted by Burgstahler et al. (2006). This further implies that those stakeholders could already have private information surrounding the reporting quality of the private firms, hence not affecting the loan costs to a larger degree. Therefore, the agency costs that creditors would normally incur can be significantly less. This can imply that the predicted consequences from engaging in earnings management according to agency theory, i.e., being charged a higher interest rate to compensate for agency costs, diminishes as creditors have access to private information from other channels of information.

Another potential explanation behind the insignificant results could be attributed to the specific setting in which the hypothesis is tested. As Gassen (2017) highlights, Sweden is one of four countries that have implemented a mandatory nationally adapted IFRS for SMEs. This contrasts with the reference papers such as (Ding et al., 2016; Gassen & Fülbier, 2015; Mafrolla & D'Amico, 2017; Vander Bauwhede et al., 2015), where no such a specific reporting standard exists, such as in Belgium, for instance. Therefore, the unique institutional environment becomes important when interpreting the findings. Differences in accounting regulations also imply differences with regard to the accounting properties, that consequently can impact the estimations of the discretionary accruals, for instance. The impact of the regulatory environment is also concretized by the different findings in previous research, where some studies (Ding et al., 2016; Mafrolla & D'Amico, 2017; Vander Bauwhede et al., 2015) find a positive relationship between earnings management and the cost of debt, while others (Gassen & Fülbier, 2015) arrive at an opposing conclusion. Furthermore, some studies do not manage to find any evidence for such a relationship, as seen in Gray et al. (2009), when examining a sample of Australian public firms. The Swedish setting is specifically noteworthy, considering that it constitutes one of four countries that have implemented a nationally adapted IFRS for SMEs, which also has been proven to lead to a higher financial statement comparability following the implementation of the K3 standard (Hellman et al.,

2022). Therefore, the effects of the K3 standard have been shown to improve the accounting quality, as well as led to a higher financial statement comparability among firms reporting according to the K3 standard. Furthermore, Gassen (2017) also showcases that Sweden is the country with the highest private firm financial transparency, which in turn reinforces the prevalence of high financial statement comparability between firms in Sweden. Hence, the K3 standard alongside the institutional environment in Sweden, can have improved debt-contracting efficiency and help to explain why our results differ from previous studies.

4.3 Additional analysis

4.3.1 Information asymmetry

Table 5. Differences across groups with high intangible assets

	Dependent variable: Loan_cost		
	(1)	(2)	(3)
EM	-0.716	-0.889	-0.833
	(0.855)	(0.648)	(0.652)
EM*Info_as	0.606	1.927	1.843
	(1.647)	(1.335)	(1.331)
Info_as	0.213	0.143	0.153
	(0.188)	(0.199)	(0.200)
Debt_ratio	5.281***	4.669***	4.643***
	(0.545)	(0.617)	(0.618)
Growth	0.337	0.243	0.284
	(0.304)	(0.289)	(0.289)
Size	0.565***	0.538***	0.552***
	(0.094)	(0.113)	(0.118)
Asset_turnover	-0.152***	-0.109*	-0.111*
	(0.048)	(0.061)	(0.062)
Liquidity	-0.232**	-0.141	-0.138
	(0.093)	(0.095)	(0.096)
Asset_tangibility	0.584	1.599***	1.587***
	(0.375)	(0.509)	(0.508)
Observations	1 670	1 669	1 669
Year FE	NO	NO	YES
Industry FE	NO	YES	YES
R^2	0.522	0.623	0.625
Adjusted R^2	0.519	0.609	0.610

Table 5 presents the regression results for equation 4. The dependent variable ***Loan_cost*** represents the natural logarithm of the absolute values of external interest expenses to credit institutions and is the dependent variable for all the regressions presented in each column. ***EM*** is the absolute value of the discretionary accruals estimated using the Modified Jones model. ***EM*Info_as*** is an interaction term between ***EM*** and ***Info_as***. ***Info_as*** is a dummy variable taking the value 1 if a firm has total intangible assets exceeding the median of the

total sample and 0 otherwise. ***Debt_ratio*** is the total loans to credit institutions scaled by total assets. ***Growth*** represents the year-over-year sales growth. ***Size*** is the natural logarithm of the total assets. ***Asset_turnover*** is the total sales divided by the lagged total assets. ***Liquidity*** is the total liquid assets divided by the total current liabilities. ***Asset_tangibility*** is the total fixed tangible assets divided by the total assets. We cluster all standard errors at firm level. Robust standard errors are reported in parentheses under the coefficients. ***, **, * showcases the statistical significance at the 0.01, 0.05 and 0.1 levels. All continuous variables are winsorized at the 1st and 99th percentiles.

In Table 5, we showcase the results when including a dummy variable for information asymmetry as well as an interaction term for information asymmetry and earnings management. Consistent with the main results shown in Table 4, the earnings management proxy (EM) remains insignificant when introducing Info_as as a control variable. Furthermore, we do not find that firms with higher intangible assets, as measured by Info_As, have an additional significant effect on the relationship between earnings management and the cost of debt. Interestingly enough, although insignificant, when controlling for industry fixed effects and year fixed effects, the interaction term EM*Info_as is considerably higher. This result would imply that firms with higher intangible assets would incur a higher cost of debt. However, since the result remains insignificant, it is not possible to reject that the effect is different from zero.

When interpreting the above results, the findings from (Bigus & Hillebrand, 2017; Burgstahler et al., 2006; Cassar et al., 2015) can yield possible arguments for the insignificant results when including intangible assets as a proxy for information asymmetry. In comparison to public debt, it could be the case that multiple information channels are available for creditors. Since creditors and borrowers in this environment may have a closer relationship, it is reasonable to assume that creditors have a good understanding of the client's operations even if the client has high intangible assets.

Additional reasons for the result can also be attributed to our proxy for information asymmetry, which may not sufficiently reflect information asymmetry for our sample of firms. In addition, given the limited information available on private firms, it is difficult to construct a proxy that can accurately represent the information asymmetry. Finally, as showcased by Hellman et al. (2022), groups with high intangible assets exhibited lower income smoothing following the adoption of the K3 standard. Hence, the authors show that the relationship between income smoothing and higher intangible assets decreased following the K3 adoption, which is most likely attributed to stricter R&D capitalization requirements (Hellman et al., 2022).

5. Robustness tests

The following section includes the robustness tests conducted in this paper, where we utilize other accruals-based measures as well as other measures for the cost of debt.

5.1 Additional measures of earnings management

5.1.2 Kothari model

In order to ensure that our results are robust, we employ other measures for earnings management as well, such as the measure developed by Kothari et al. (2005). In the Kothari model, an additional variable is included in the estimation of the discretionary accruals, namely Return on Assets (ROA). The addition of the ROA variable implies a control for the effects of firm performance when estimating discretionary accruals, considering that previous research has found a relationship between performance and discretionary accruals (Dechow et al., 1998). However, we do not use the model of performance matching, instead we use the alternative one. The use of performance matching has a known tendency of assuming too much discretion over earnings, hence lowering the reliability of the test (Dechow et al., 2010). Instead, we use ROA in the Modified Jones model to control for performance, which has been shown to produce similar output as performance matching (Kothari et al., 2005) and is one of the most extensively used models in the literature (Jackson, 2018). Therefore, we estimate the discretionary accruals by running the following model cross-sectionally across each industry-year combination with a similar two-digit SNI code where at least 20 observations are available:

$$TA_{it} = \beta_0 + \beta_1(1/A_{it-1}) + \beta_2(\Delta Rev_{it} - \Delta Rec_{it}) + \beta_3(PPE_{it}) + \beta_4(ROA_{it}) + \varepsilon_{it} \quad (6)$$

Where all variables used in equation 6 are the same as in equation 2, but with the addition of ROA_{it} that is calculated by taking the net income in year t scaled by the total assets at t-1;
ε_{it} corresponds to the residuals from the regression model and also represents the discretionary accruals for firm i in year t.

5.1.3 Original Jones model

In addition to the Kothari model, we also test our hypothesis using another measure of earnings management, namely the Original Jones model (Jones, 1991). Both the Modified Jones model and the Kothari model are based on the Original Jones model, and including the Original Jones model in our analysis can showcase the results when dropping the assumptions used in the Modified Jones model and the Kothari model.

In order to calculate the discretionary accruals, we run the following regression model using a cross-sectional approach for each industry-year combination with a similar two-digit SNI code where at least 20 observations are available:

$$TA_{it} = \beta_0 + \beta_1(1/A_{it-1}) + \beta_2(\Delta Rev_{it}) + \beta_3(PPE_{it}) + \varepsilon_{it} \quad (7)$$

All of the variables in equation 7 are the same as in equation 2, except that the changes in receivables (ΔRec_{it}) are excluded;

ε_{it} corresponds to the residuals from the regression model and also represents the discretionary accruals for firm i in year t.

5.1.4 Total accruals

In addition to the Kothari model and the Original Jones model, we also conduct robustness tests using the absolute value of the total accruals scaled by lagged total assets as another measure for earnings management. Total accruals consist of both non-discretionary accruals and discretionary accruals and can hence be regarded as a proxy for earnings management given its incorporation of discretionary accruals. Furthermore, as outlined by Chen et al. (2018), studies that use the residuals as a proxy for earnings management are subject to different biases, through for instance biased coefficients that can lead to Type I or Type II errors. Hence, using a proxy for earnings management that is not based on residuals could be a way to overcome such potential biases.

5.1.5 Results

As illustrated from the tables reported in Appendix C, D and E, the results when using other accruals-based measures for earnings management are statistically the same as the results from our main analysis (Table 4) when considering the relationship between earnings management and the cost of debt. This showcases that using other measures of earnings management still yields insignificant results when using industry and year-fixed effects. This furthermore indicates that there is a consistency in failing to reject the null hypothesis when introducing other accruals-based measures for earnings management.

5.2 Additional measures of the cost of debt

Table 7. Additional measures of cost of debt

	CoD_1	CoD_2	CoD_3	CoD_1	CoD_2	CoD_3
EM	0.102	-0.151	0.154	0.095	-0.212	0.091
	(0.126)	(0.158)	(0.151)	(0.131)	(0.146)	(0.138)
Debt_ratio	-0.107**	-0.162***	-0.219***	-0.083**	-0.154***	-0.207***
	(0.044)	(0.062)	(0.059)	(0.037)	(0.049)	(0.057)
Growth	0.035	0.012	-0.042	0.035	0.014	-0.015
	(0.043)	(0.042)	(0.032)	(0.047)	(0.048)	(0.036)
Size	0.005	0.006	0.009	-0.003	-0.011	-0.006
	(0.007)	(0.009)	(0.008)	(0.103)	(0.012)	(0.010)
Asset_turnover	-0.001	0.002	-0.001	0.000	0.002	-0.001
	(0.004)	(0.005)	(0.004)	(0.005)	(0.006)	(0.004)
Liquidity	0.023	0.074	0.049	0.027	0.079	0.040
	(0.029)	(0.057)	(0.043)	(0.032)	(0.060)	(0.044)
Asset_tangibility	-0.052**	-0.069**	-0.028	-0.030	-0.054	-0.028
	(0.024)	(0.034)	(0.028)	(0.027)	(0.037)	(0.037)
Observations	844	893	832	839	888	829
Year FE	NO	NO	NO	YES	YES	YES
Industry FE	NO	NO	NO	YES	YES	YES
R^2	0.066	0.110	0.119	0.189	0.208	0.253
Adjusted R^2	0.058	0.103	0.112	0.138	0.161	0.205

Table 7 presents the regression results when using additional measures of the cost of debt. The dependent variable ***CoD_1*** represents the external interest expenses scaled by lagged loans to credit institutions; ***CoD_2*** is external interest expenses scaled by average loans to credit institutions at time t; ***CoD_3*** represents external interest expenses scaled by loans to credit institutions at time t. ***EM*** is the absolute value of the discretionary accruals estimated using the Modified Jones model. ***Debt_ratio*** is the total loans to credit institutions scaled by total assets. ***Growth*** represents the year-over-year sales growth. ***Size*** is the natural logarithm of the total assets. ***Asset_turnover*** is the total sales divided by the lagged total assets. ***Liquidity*** is the total liquid assets divided by the total current liabilities. ***Asset_tangibility*** is the total fixed tangible assets divided by the total assets. We cluster all standard errors at firm level. Robust standard errors are reported in parentheses under the coefficients. ***, **, * showcases the statistical significance at the 0.01, 0.05 and 0.1 levels. The data samples for all the regressions are winsorized at the 1st and 99th percentiles.

In addition to using different models for earnings management, we also employ additional measures for the cost of debt, where we scale the external interest expenses by loans to credit institutions, similar to Vander Bauwhede et al. (2015), excluding using the 1-year ahead

interest expense. We hence utilize three additional measures, where CoD_1 represents external interest expenses scaled by lagged loans to credit institutions, CoD_2 is total external interest expenses scaled by the average total loans to credit institutions and CoD_3 is the measure of the loan costs as used by Mafrolla and D'Amico (2017), where the interest expenses are scaled by the total loans to credit institutions in year t. The rationale for including the mentioned measures of the cost of debt is to showcase different outcomes when using additional measures of the cost of debt.

As highlighted in Table 7, the effects of earnings management on the cost of debt do not showcase any significance, which implies that there is a consistency in failing to reject the null hypothesis even when introducing additional measures of the dependent variable cost of debt. However, comparing the results from Table 7 with those from Table 4 has to be done taking into account that significantly fewer observations exist when using external interest expenses scaled by loans to credit institutions. The reason is that several firms in our dataset have external interest expenses reported, but do not specify the loans to credit institutions, therefore creating a large amount of missing values in our sample.

Furthermore, another interesting observation is the significantly negative correlation between the dependent variables representing the cost of debt and the control variable Debt_ratio. This contradicts finance theory and is the opposite of that shown in Table 4. However, the same results were also found by Minnis (2011), Francis et al. (2005), and Vander Bauwhede et al. (2015) who also utilize the effective interest rate as a proxy for the cost of debt. Following Minnis (2011) and Vander Bauwhede et al. (2015), their explanations imply that this unusual result can pertain to econometric issues and that economies of scale exist in lending. Vander Bauwhede et al. (2015) also explain this by the fact that larger firms tend to be highly leveraged and have a lower interest rate.

5.3 Trimming the dataset

In order to further test for the robustness of our main results, we also employ a robustness test as suggested by Vander Bauwhede et al. (2015), where one option instead of winsorizing is to trim or truncate the data. Therefore, we trim the dependent variable at the 5th and 95th percentiles, while also trimming all the continuous independent variables at the 1st and 99th percentiles. By doing so, we further control for potential outliers that might skew the results (Vander Bauwhede et al., 2015). As highlighted in Table 8, the results are still statistically the same in terms of the relation between our dependent variable and our main explanatory variable, as no significance is obtained between our main explanatory variable and the dependent variable when using industry and year-fixed effects. However, the results when excluding the fixed effects show a statistically significant correlation between our main explanatory variable (EM) and the dependent variable Loan_cost at the 10% level. Nevertheless, given that the significance however disappears when introducing industry and year-fixed effects, it showcases the potential existence of endogeneity and omitted variable bias.

Table 8. Effect of earnings management on the cost of debt when trimming the dataset

	Dependent variable: Loan_cost		
	(1)	(2)	(3)
EM	-1.397*	-0.982	-0.962
	(0.837)	(0.671)	(0.672)
Debt_ratio	5.517***	4.895***	4.884***
	(0.540)	(0.535)	(0.534)
Growth	0.594**	0.315	0.339
	(0.294)	(0.278)	(0.279)
Size	0.491***	0.443***	0.455***
	(0.109)	(0.131)	(0.137)
Asset_turnover	-0.142***	-0.112**	-0.112**
	(0.042)	(0.055)	(0.055)
Liquidity	-0.357***	-0.254***	-0.253***
	(0.085)	(0.086)	(0.086)
Asset_tangibility	0.177	1.073**	1.069**
	(0.312)	(0.435)	(0.437)
Observations	1 430	1 429	1 429
Year FE	NO	NO	YES
Industry FE	NO	YES	YES
R^2	0.474	0.599	0.600
Adjusted R^2	0.472	0.583	0.582

Table 8 presents the regression results for equation 3 when trimming rather than winsorizing the variables. The dependent variable ***Loan_cost*** represents the natural logarithm of the absolute values of external interest expenses to credit institutions and is the dependent variable for all the regressions presented in each column. ***EM*** is the absolute value of the discretionary accruals estimated using the Modified Jones model. ***Debt_ratio*** is the total loans to credit institutions scaled by total assets. ***Growth*** represents the year-over-year sales growth. ***Size*** is the natural logarithm of the total assets. ***Asset_turnover*** is the total sales divided by the lagged total assets. ***Liquidity*** is the total liquid assets divided by the total current liabilities. ***Asset_tangibility*** is the total fixed tangible assets divided by the total assets. We cluster all standard errors at firm level. Robust standard errors are reported in parentheses under the coefficients. ***, **, * showcases the statistical significance at the 0.01, 0.05 and 0.1 levels.

6. Conclusion

Following the increasing development of reporting standards, it is correspondingly important to consider the implications for stakeholders. For many stakeholders, including employees, firms and capital providers, the new reporting standards can have important effects. Private debt from creditors remains one of the most important sources of funding for private firms, and when considering the implementation of a more stringent reporting standard, the implications for firms and creditors can be impactful.

When testing the relationship between earnings management and the cost of debt for Swedish private firms reporting under the K3 standard, we find no evidence for rejecting the null hypothesis. We use multiple different measures of earnings management and we consistently fail to reject the null hypothesis. Plausible reasons for the insignificant results can largely be attributed to the environment in which the firms operate. Since it is a private environment, private firms may already have established relationships with the creditors, and can therefore supply the creditors with private information. Hence, the usage of financial statements can be complemented with other sources of information (Bigus & Hillebrand, 2017; Burgstahler et al., 2006; Cassar et al., 2015). In addition, the unique institutional and regulatory environment may also contribute to the insignificant results. As noted in previous literature, differences in institutional and regulatory environments have been shown to yield different results concerning the relationship between earnings management and the cost of debt. This case is also true for Sweden since it encompasses a unique regulatory environment with the implementation of an IFRS-like reporting standard for SMEs while preserving the institutional characteristics that are found in private firms. Moreover, we conduct an additional analysis to see whether an effect exists for firms' different levels of intangible assets on earnings management and its relationship with the cost of debt, and we find no statistical evidence implying that no such effect is present for our sample of firms. One potential explanation for the insignificant result could, for instance, be that creditors already possess sufficient knowledge about the firms' operations, even if some firms have higher intangible assets than others. This explanation is in line with the argument that private firms can provide information to creditors through other channels of information than financial statements.

We contribute to the literature and generate insights in several ways. First, we study and report the results on firms operating in a country that applies a nationally adapted IFRS for SMEs, which is relevant since Sweden remains one of the few countries which has enforced such a reporting standard. Second, we expand the literature on the relationship between earnings management and the cost of debt for private firms. Although earnings management remains a popular subject of study, extant literature in a private setting remains relatively scarce, and our findings help to expand this literature. Third and finally, we help to expand the literature on the K3 standard, which is a highly topical subject for standard-setters and where more insights have been called for.

6.1 Limitations

As is widely common among multiple linear regression models, there is always a risk of an omitted variable bias. That is, by not including relevant control variables in the regression models, the standard errors and coefficients may be biased, hence increasing the risk of causing a Type I or Type II error. This type of issue is especially pervasive in the realm of accounting since many unobservable variables can be correlated with the dependent variable (Roberts & Whited, 2013). We partly mitigate the issue of endogeneity by conducting our regression analyses using fixed effects for industry and year. The risk of having omitted variables is, however, always present in our sample, and our statistical inferences should be considered with care when assessing the validity of our results. Furthermore, we also employ multiple robustness tests to further increase the validity of our results.

In addition, our analysis can be subject to an attenuation bias. This implies that our proxy for earnings management, as measured by the Modified Jones model, alongside other earnings management models, suffers from measurement error. In such cases, the coefficient for earnings management is likely biased and is skewed towards zero, and hence, there is a higher risk of committing a Type II error. One way of mitigating the risk of committing a Type II error is increasing the sample size, and hence increasing the power of the test. However, as previously mentioned, if we were to include parent firms who report consolidated financial statements, it would not be directly comparable with single independent entities, and hence, the quality of the underlying data could deteriorate.

In addition, we do not make any conclusions regarding the causality of our results, but we instead investigate a potential association between earnings management and the cost of debt. As Armstrong et al. (2010) point out, we cannot determine whether earnings management has an impact on the cost of debt, or vice versa. Hence, reverse causality can be present in our sample of firms.

6.2 Future research

We consider numerous topics for future research. With regard to private firms, the relationship with creditors is likely significant in how debt contracts are constructed. Therefore, information on relationship-related characteristics, such as for how long that a firm has been a client of the bank or proximity to the client's location, could be useful in investigating how the relationship between private firms and creditors looks like in Sweden, and how this relationship looks within the K3 standard.

Furthermore, we also consider real earnings management models to be an interesting suggestion for future research. As mentioned by Hellman et al. (2022), following the adoption of a stricter reporting standard, firms may engage more in real earnings management rather than accruals-based earnings management since the opportunity to manage accruals

may be reduced. Moreover, similarly to Gassen and Fülbier (2015), researchers can also consider income smoothing when investigating a similar reporting standard, and whether private firms signal stability through income smoothing. Since the use of income smoothing, a form of earnings management, constitutes a significant part of the literature on earnings management and debt-related characteristics, conducting such tests for an IFRS-like reporting standard can further contribute to the extant literature.

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Appendix

Appendix A

Table A.1. Correlation table

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
(1) Loan_cost	1.000							
(2) EM	-0.079***	1.000						
(3) Debt_ratio	0.651***	-0.063**	1.000					
(4) Growth	0.075***	-0.014	-0.008	1.000				
(5) Size	0.435***	-0.071***	0.296***	0.193***	1.000			
(6) Asset_turnover	-0.366***	-0.001	-0.318***	0.119***	-0.410***	1.000		
(7) Liqudity	-0.272***	0.035	-0.278***	-0.156***	0.014	-0.132***	1.000	
(8) Asset_tangibility	0.493***	-0.137***	0.643***	0.046*	0.270***	-0.270***	-0.209***	1.000

***, **, * showcases the statistical significance at the 0.01, 0.05 and 0.1 levels.

Appendix B

Table B.1. Effect of earnings management on the cost of debt when excluding observations with reported external interest expenses, but no specified loans to credit institutions

	Dependent variable: Loan_cost		
	(1)	(2)	(3)
EM	-1.105*	-0.751	-0.730
	(0.631)	(0.625)	(0.598)
Debt_ratio	2.892***	3.058***	2.982***
	(0.372)	(0.444)	(0.437)
Growth	0.136	0.086	0.183
	(0.195)	(0.186)	(0.186)
Size	0.759***	0.804***	0.823***
	(0.062)	(0.069)	(0.069)
Asset_turnover	-0.067**	-0.059	-0.062
	(0.033)	(0.042)	(0.042)
Liquidity	-0.421***	-0.313***	-0.310***
	(0.126)	(0.114)	(0.116)
Asset_tangibility	0.181	0.442	0.439
	(0.236)	(0.336)	(0.333)
Observations	832	829	829
Year FE	NO	NO	YES
Industry FE	NO	YES	YES
R^2	0.714	0.756	0.769
Adjusted R^2	0.711	0.743	0.755

Table B.1 presents the regression results for equation 3 when excluding firms with reported external interest expenses, but with no specified debt. The dependent variable ***Loan_cost*** represents the natural logarithm of the absolute values of external interest expenses to credit institutions and is the dependent variable for all the regressions presented in each column. ***EM*** is the absolute value of the discretionary accruals estimated using the Modified Jones model. ***Debt_ratio*** is the total loans to credit institutions scaled by total assets. ***Growth*** represents the year-over-year sales growth. ***Size*** is the natural logarithm of the total assets. ***Asset_turnover*** is the total sales divided by the lagged total assets. ***Liquidity*** is the total liquid assets divided by the total current liabilities. ***Asset_tangibility*** is the total fixed tangible assets divided by the total assets. We cluster all standard errors at firm level. Robust standard errors are reported in parentheses under the coefficients. ***, **, * showcases the statistical significance at the 0.01, 0.05 and 0.1 levels. All continuous variables are winsorized at the 1st and 99th percentiles.

Appendix C. Kothari Model

Table C.1 . Effect of earnings management on the cost of debt using the Kothari model

	Dependent variable: Loan_cost		
	(1)	(2)	(3)
EM_KM	-0.928	-0.819	-0.775
	(0.769)	(0.614)	(0.614)
Debt_ratio	5.265***	4.649***	4.621***
	(0.546)	(0.619)	(0.620)
Growth	0.368	0.269	0.311
	(0.305)	(0.287)	(0.287)
Size	0.563***	0.549***	0.563***
	(0.095)	(0.112)	(0.117)
Asset_turnover	-0.147***	-0.105*	-0.107*
	(0.048)	(0.061)	(0.061)
Liquidity	-0.241**	-0.148	-0.145
	(0.093)	(0.095)	(0.096)
Asset_tangibility	0.598	1.560***	1.548***
	(0.370)	(0.511)	(0.510)
Observations	1 668	1 667	1 667
Year FE	NO	NO	YES
Industry FE	NO	YES	YES
R^2	0.521	0.621	0.623
Adjusted R^2	0.518	0.608	0.608

Table C.1 presents the regression results when using the Kothari model to estimate the discretionary accruals. The dependent variable ***Loan_cost*** represents the natural logarithm of the absolute values of external interest expenses to credit institutions and is the dependent variable for all the regressions presented in each column. ***EM_KM*** is the absolute value of the discretionary accruals as measured using the Kothari model. ***Debt_ratio*** is the total loans to credit institutions scaled by total assets. ***Growth*** represents the year-over-year sales growth. ***Size*** is the natural logarithm of the total assets. ***Asset_turnover*** is the total sales divided by the lagged total assets. ***Liquidity*** is the total liquid assets divided by the total current liabilities. ***Asset_tangibility*** is the total fixed tangible assets divided by the total assets. We cluster all standard errors at firm level. Robust standard errors are reported in parentheses under the coefficients. ***, **, * showcases the statistical significance at the 0.01, 0.05 and 0.1 levels. All continuous variables are winsorized at the 1st and 99th percentiles.

Appendix D. Original Jones Model

Table D.1. Effect of earnings management on the cost of debt using Original Jones model

	Dependent variable: Loan_cost		
	(1)	(2)	(3)
EM_OJ	-0.574	-0.556	-0.511
	(0.765)	(0.592)	(0.593)
Debt_ratio	5.257***	4.650***	4.622***
	(0.546)	(0.617)	(0.618)
Growth	0.368	0.267	0.309
	(0.305)	(0.288)	(0.287)
Size	0.564***	0.553***	0.566***
	(0.095)	(0.112)	(0.116)
Asset_turnover	-0.149***	-0.108*	-0.110*
	(0.047)	(0.061)	(0.061)
Liquidity	-0.241**	-0.149	-0.146
	(0.093)	(0.095)	(0.096)
Asset_tangibility	0.616*	1.570***	1.557***
	(0.370)	(0.510)	(0.509)
Observations	1 670	1 669	1 669
Year FE	NO	NO	YES
Industry FE	NO	YES	YES
R^2	0.520	0.621	0.623
Adjusted R^2	0.518	0.608	0.608

Table D.1 presents the regression results when using the Original Jones model to estimate the discretionary accruals. The dependent variable ***Loan_cost*** represents the natural logarithm of the absolute values of external interest expenses to credit institutions and is the dependent variable for all the regressions presented in each column. ***EM_OJ*** is the absolute value of the discretionary accruals as measured using the original Jones model. ***Debt_ratio*** is the total loans to credit institutions scaled by total assets. ***Growth*** represents the year-over-year sales growth. ***Size*** is the natural logarithm of the total assets. ***Asset_turnover*** is the total sales divided by the lagged total assets. ***Liquidity*** is the total liquid assets divided by the total current liabilities. ***Asset_tangibility*** is the total fixed tangible assets divided by the total assets. We cluster all standard errors at firm level. Robust standard errors are reported in parentheses under the coefficients. ***, **, * showcases the statistical significance at the 0.01, 0.05 and 0.1 levels. All continuous variables are winsorized at the 1st and 99th percentiles.

Appendix E. Total Accruals

Table E.1. Effect of earnings management on the cost of debt using total accruals

	Dependent variable: Loan_cost		
	(1)	(2)	(3)
EM_TA	-0.388	-0.568	-0.539
	(0.666)	(0.534)	(0.536)
Debt_ratio	5.253***	4.641***	4.614***
	(0.546)	(0.616)	(0.617)
Growth	0.368	0.267	0.310
	(0.305)	(0.287)	(0.287)
Size	0.562***	0.551***	0.565***
	(0.095)	(0.112)	(0.117)
Asset_turnover	-0.148***	-0.107*	-0.109*
	(0.048)	(0.061)	(0.061)
Liquidity	-0.241***	-0.149	-0.146
	(0.093)	(0.095)	(0.096)
Asset_tangibility	0.647*	1.587***	1.573***
	(0.375)	(0.512)	(0.511)
Observations	1 670	1 669	1 669
Year FE	NO	NO	YES
Industry FE	NO	YES	YES
R^2	0.520	0.621	0.623
Adjusted R^2	0.518	0.608	0.608

Table E.1 presents the regression results when using the total accruals as a measure of earnings management. The dependent variable ***Loan_cost*** represents the natural logarithm of the absolute values of external interest expenses to credit institutions and is the dependent variable for all the regressions presented in each column. ***EM_TA*** is the absolute value of the total accruals scaled by lagged total assets. ***Debt_ratio*** is the total loans to credit institutions scaled by total assets. ***Growth*** represents the year-over-year sales growth. ***Size*** is the natural logarithm of the total assets. ***Asset_turnover*** is the total sales divided by the lagged total assets. ***Liquidity*** is the total liquid assets divided by the total current liabilities. ***Asset_tangibility*** is the total fixed tangible assets divided by the total assets. We cluster all standard errors at firm level. Robust standard errors are reported in parentheses under the coefficients. ***, **, * showcases the statistical significance at the 0.01, 0.05 and 0.1 levels. All continuous variables are winsorized at the 1st and 99th percentiles.