MANDATORY SUSTAINABILITY REPORTING IN UNLISTED FIRMS

A STUDY OF ITS ADOPTION AND EFFECT ON THE COST OF DEBT IN A SWEDISH SETTING

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Abstract:

Drawing on the EU Directive 2014/95 which imposes mandatory sustainability reporting for firms over a certain size since 2017 and the far-reaching Swedish application of this directive, this study explores (1) the existence and (2) the informational contents of the sustainability reports of 153 unlisted Swedish firms in the initial adoption year 2017, and (3) the impact of the regulation on the cost of debt of unlisted firms. We find firm size and state ownership to relate to both the existence and the content of these reports, which we interpret as legitimacy concerns influencing the sustainability reporting behavior of firms also in the mandatory setting. We also find a relationship between GRI adoption and the contents of the reports, as well as a relationship between the contents and the choice of auditor. On the other hand, we find no relationships to employed accounting quality or corporate governance variables. Finally, we find no effect on the cost of debt of firms using a regression discontinuity design. Applying signaling theory, we suggest that mandatory sustainability reporting in its current form performs poorly with regards to resolving information asymmetries for unlisted firms.

Keywords:

Mandatory sustainability reporting, Unlisted firms, Cost of debt

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Contents

1. Introduction

1.1. Problem area

Despite the coverage of previous studies on financial reporting in unlisted firms (Bernard, Burgstahler, & Kaya, 2016; Minnis & Shroff, 2017) and sustainability disclosures in the public setting (Clarkson, Fang, Li, & Richardson, 2013; Ioannou & Serafeim, 2017; Plumlee, Brown, Hayes, & Marshall, 2015), the understanding of mandatory sustainability reporting in unlisted firms remains rather unexplored. For public firms, sustainability disclosures have been found to have a negative impact on cost of equity (Dhaliwal, Li, Tsang, & Yang, 2011; Dhaliwal, Li, Tsang, & Yang, 2014; Ghoul, Guedhami, Kwok, & Dev, 2011) and a positive impact on access to finance (Cheng, Ioannis, & Serafeim, 2014). Furthermore, a link between sustainability performance and accounting quality has been found, (e.g. Kim, Park, & Wier, 2012), as well as a positive link between the level of sustainability disclosures and corporate governance (Chan, Watson, & Woodliff, 2014; Jizi, Salama, Dixon, & Stratling, 2014). To explore whether similar relationships exist in the mandatory reporting setting and for unlisted firms, this study exploits a recent regulatory change effective in the European Union on accounting years beginning after January 1, 2017 (European Union, 2014).

Sweden is a well-suited setting for investigating the implications of this regulation. Together with Denmark, Greece, and Iceland (EEA), Sweden included companies below the EU 500 employee threshold (CSR Europe, GRI, & Accountancy Europe, 2017). However, Greece also included more generous financial thresholds, and Denmark already had far-reaching sustainability reporting regulation with high compliance rates (Danish Commerce and Companies Agency, 2011). Since many of the affected entities in Sweden are unlisted, the Swedish setting presents a unique opportunity for studying sustainability reporting in unlisted firms, a subject on which literature is scarce. The topic gains further relevance as the adoption by Swedish firms has been found to be varying, with a report from PwC (2018) showing that a sustainability report was accessible for only 80 % of the firms required to produce one in the initial year of these reports, 2017. Moreover, the informational content of the reports was found to be varying (PwC, 2018). Indeed, the contents of these reports contain many peculiarities, as captured by the following quote; "[…] human rights among suppliers have not been considered material for Svea Ekonomi, since the proportion of risky suppliers, from the group's perspective and given its business, is limited." (Svea Ekonomi AB, n.d., p. 1). In summary, the Swedish setting allows for studying of mandatory sustainability reporting in unlisted firms, with variance in the adherence to the legal requirement and the informational content of these reports.

1.2.   Purpose

To the best of our knowledge, mandatory sustainability reporting in unlisted firms and the implications of such reports have not been studied by researchers before. To fill this gap, this study examines firstly the existence of such sustainability reports, and secondly their informational contents, for a sample of 153 unlisted Swedish entities. To accomplish this, we use a quantitative approach with qualitative inlays. In doing so, we also look for earlier established relations between sustainability disclosures and accounting quality and corporate governance. As cost of equity is unmeasurable due to the unlisted status, we instead estimate the impact of sustainability reporting on the cost of debt. These questions are relevant for three reasons. First, we aim to further investigate the variance in adherence and content indicated in the PwC (2018) study of initial adoption. Second, much of previous research on sustainability disclosures has been devoted to the idea that sustainability disclosures are mainly driven by shareholders' initiatives and abstained from investigating the impact of other stakeholders (Moser & Martin, 2012). The introduction of mandatory sustainability reporting introduces a new and important stakeholder, viz. the government. Third, previous studies have relied heavily on archival data, a method which should be complemented by studies with experimental design (Moser & Martin, 2012). The regulatory change can be viewed as a natural experiment, a viewpoint which will be further explored and studied through the thesis. In summary, we aim to provide further insights into the variation in adoption of the requirement, the contents of the sustainability reports, and the effect of the regulation on the cost of debt of firms. This leads us to our research questions.

1.2.1.   Research questions

The questions we are interested in studying in detail are the following:

What factors influenced the extent to which Swedish unlisted firms reported in accordance with the 2017 sustainability reporting requirement, taking into consideration the extent to which reports were issued, and their informational content?

What is the impact of mandatory sustainability reporting on the cost of debt in unlisted firms?

1.3.   Contribution

We contribute to previous research in several aspects. Firstly, by studying the far-reaching Swedish application of the regulatory change, we add to previous studies on sustainability reporting by showing the effects in a new context. Our sample firms conduct sustainability reporting in a situation which is different from what researchers have traditionally studied. In our setting, firms face pressure not only from shareholders,

but also from the government. Understanding sustainability reporting in these firms is of great interest to lawmakers, practitioners as well as the research community; lawmakers are able to evaluate the effect of the legislative change and practitioners can learn about the nature of this reporting. Secondly, through applying a regression discontinuity design, we are able to view the implementation of mandatory sustainability reporting as a natural experiment. This adds to the archival data methods traditionally used to research sustainability disclosures. This contributes to previous research and provides a possibility for lawmakers to evaluate the impact of the change.

1.4. Disposition

This thesis is divided into nine parts. In the second part, we give a background to the new sustainability reporting requirement. In part three, we review literature regarding sustainability reporting frameworks, reporting in unlisted firms, corporate governance, accounting quality and the impact of sustainability disclosures on the cost of capital. In the fourth part, we discuss our methodology. In part five, we provide results from our estimations. In the sixth part, we discuss our results. Part seven provides a conclusion, while parts eight and nine discuss limitations and suggestions for future research, respectively.

2. Background

2.1. EU Directive

Corresponding to an increased demand for corporate sustainability reporting from organizations such as the United Nations (2012), mandatory sustainability reporting was implemented in the European Union through EU Directive 2014/95. This directive imposed a requirement on large companies to report certain information in a sustainability report. More specifically, this information concerned the following areas: social responsibility, treatment of employees, protection of environment, anti-corruption, respect for human rights and the diversity of the board of directors. This reporting aimed at helping customers, investors, policy makers and other stakeholders to assess the non-financial performance of companies and to encourage these companies to establish a socially responsible approach to business. Another aim was to help in determining the sustainability risks and to strengthen the trust of investors and consumers (European Union, 2014). The legislation was effective for accounting years starting 2017 and onwards. Originally, the EU rules on sustainability reporting was designated to be applied only on large public-interest companies with more than 500 employees. Approximately 6,000 companies and groups across the EU were covered, including insurance companies, banks, listed companies, and other companies labelled as public-interest entities by governments (European Commission, n.d.). However, as earlier described, Sweden, Greece, Denmark and Iceland (EEA) went further in their adoption than the EU 500 employee threshold (CSR Europe, GRI, & Accountancy Europe, 2017).

2.2. Swedish adoption

The EU directive was implemented in the Swedish Annual Accounts Act (SFS 1995:1554) through an additional law (SFS 2016:947), which was in turn preceded by its legislative history (Prop. 2015/16:193). The Swedish adoption went further than the minimum levels required by the EU Directive, impacting a larger number of firms than initially estimated. This created some resistance among the consultation bodies. For instance, the Swedish Competition Authority proposed that Swedish companies may face a disadvantage compared to firms in other countries as they had to bear the cost of these reports. On the other hand, Amnesty Sweden and Swedwatch proposed that the requirements should cover more firms than the EU Directive prescribed (Prop. 2015/16:193). Further opposition to the Swedish implementation came from the Confederation of Swedish Enterprise[1] who opposed the size requirements on the basis of their cost, and the whole law on the basis that sustainability efforts should be

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[1] Swedish: Svenskt Näringsliv

voluntary, not mandatory (Alestig, 2015). However, the change was implemented and affects accounting years starting from December 31, 2016. The reporting requirement is formulated so that the management report in an annual report shall contain a sustainability report, or a reference to such a report if the company meets more than one of the following conditions (SFS 1995:1554):

- The average number of employees in the company has been more than 250 during each of the last two financial years.

- The company's reported total assets for each of the last two financial years amounted to more than SEK 175 million.

- The company's reported net sales for each of the last two financial years amounted to more than SEK 350 million.

The number of companies affected in Sweden alone was around 2,000 (Alestig, 2015), to be compared with the initially estimated 6,000 in the entire EU.

2.2.1. PwC report

In order to gain insight into the effects of this legislative change, PwC published a report on the adoption of the new sustainability reporting requirement in 2017 (PwC, 2018). The report was based on a sample of 105 Swedish firms affected by the reporting requirements. Results showed that 20% of the investigated firms a) did not publish a separate sustainability report, b) did not refer to one in their management review, or c) there was a reference to a website where the report could not be found. The PwC (2018) report also investigated the contents of the companies' sustainability reports, finding that sustainability risks were poorly described, and that information regarding human rights and anti-corruption was inadequate. A subsequent follow-up study revealed that the share of non-reporters had dropped to 5%, but that descriptions of human rights and anti-corruption remained insufficient (PwC, 2019). In other words, the adoption of the new legal requirement has been far from perfect.

3. Theoretical framework and hypotheses developement

This literature review will explore previous research in the following manner. First, we review sustainability reporting frameworks, with a focus on the Global Reporting Initiative (GRI). Then, we discuss financial reporting in the setting of unlisted firms. After that, we describe legitimacy and signaling theory, aiming to explain reporting and disclosures within firms. Subsequently, we develop hypotheses and relate sustainability reporting to corporate governance and financial reporting quality. Finally, we review studies about the impact of sustainability disclosures on the cost of capital.

3.1. Sustainability reporting frameworks

Many different frameworks for sustainability reporting exist. Although voluntary, the EU Directive (2014) gives several suggestions to companies, such as the United Nations' Global Compact-Initiative, OECD's Guidelines for Multinational Companies (ISO 26000) and the framework of the Global Reporting Initiative (GRI). Out of these, GRI is the most frequently used. For instance, of the world's largest 250 companies, 93% publish a sustainability report, and 82% of these apply the GRI standards (GRI, n.d.). Furthermore, Swedish companies often report according to the GRI standard (Prop. 2015/16:193). GRI is structured as a number of topic-specific standards grouped in three; economic, environmental and social standards (GRI, 2016). In applying GRI, a company must determine which topics are material, based on the reporting principles and the company's situation. The resulting sustainability report aims at aiding stakeholders in taking informed decisions on the company's sustainability efforts (GRI, 2016).

Sustainability disclosures have often been studied in relation to a reporting framework. Clarkson, Li, Richardson, & Vasvari (2008) studied the relation between the level of environmental disclosures and the level of environmental performance using an index developed from GRI, finding a positive relation between the two. The companies with high environmental performance had a higher level of discretionary disclosures, and firms with a low environmental performance issued more soft disclosures, likely explained by weak legitimacy (Clarkson et al., 2008). On a similar note, Plumlee et al. (2015) employed an informational index based on GRI, finding that the quality of sustainability disclosures was associated with firm value through the cost of equity. In the setting of mandatory sustainability reporting, Ioannou & Serafeim (2017) found a relationship between the introduction of mandatory sustainability reporting and increased use of GRI. The authors also found that increased disclosure in sustainability reports was associated with higher valuations, as reflected in Tobin's Q, suggesting that these disclosures tend to enhance value rather than destroy value (Ioannou & Serafeim, 2017).

However, some concern may be raised about the information provided in sustainability reports. Indeed, earlier research failed to provide evidence for a link between a firm's environmental disclosure and its actual environmental performance (see e.g. Wiseman, 1982). Michelon, Pilonato, & Ricceri (2015) suggested that sustainability disclosures lacked completeness and credibility. The authors found that the issue of stand-alone reports, use of reporting guidance and assurance did not on average lead to higher quality information. This was interpreted as symbolic use of the instruments. However, the authors found some evidence that performance-related disclosures provided in accordance with GRI were more likely to be comparable and balanced (Michelon et al., 2015). Furthermore, Milne & Gray (2013) criticized sustainability reporting in general and GRI in particular, for focusing on a triple bottom line and thereby sidelining the ecological issues that originally were the core of sustainability. In conclusion, although disputed, reporting frameworks and, in particular GRI, play an important role in practice and research.

3.2. Reporting in unlisted firms

Although studies on mandatory sustainability reporting in unlisted firms are scarce, several researchers have studied the financial reporting of these firms. For example, Minnis & Shroff (2017) investigated the benefits and costs of mandating the disclosure of unlisted firms' financial reports. The authors observed the vastly different financial reporting regulations for unlisted firms in different countries. In some countries, the US and Canada for example, unlisted firms faced a quite lax financial reporting regulation environment. In these settings, it was not mandatory for the firms to publish financial results publicly, nor to have their financial reports audited. In contrast, in Europe, many unlisted companies above certain thresholds were required to do so (Minnis & Shroff, 2017). On the one hand, unlisted companies were often managed by the majority owner, creating little separation of ownership and management, and hence agency problems were less pronounced compared to public companies. Therefore, one of the most important benefits for disclosing financial information publicly – that is, conveying information to outside investors – was less relevant for private firms. On the other hand, researches have argued for the benefits of mandatory reporting regulation, including creating positive externalities, providing more credibility to firms, saving costs or the economy as a whole, for instance by reducing social costs by limiting the controlling insiders' consumption of private interests (Leuz, 2010; Leuz & Wysocki, 2016). Overall, it is unclear whether there is a net benefit of financial reporting regulation in unlisted firms.

Building on this debate, Minnis & Shroff (2017) conducted surveys to investigate the arguments for and against regulation and auditing of financial reports in unlisted firms. They found that firms individually identified limited benefits from public disclosure of their reporting, and signs of proprietary costs. However, their results also revealed a

support for the benefits of public disclosures that unlisted firms enjoy. The companies revealed that they downloaded and checked the reports of their competitors, customers and suppliers, and believed that their competitors, customers and suppliers did the same. Furthermore, although most firms would not disclose their reports publicly if it not mandatory, the majority still believed that public disclosures should be required. This supported the view that public disclosures are collectively beneficial because of an improved information environment (Minnis & Shroff, 2017). This was consistent with the arguments that a mandatory regime can benefit the economy as a whole by cost savings (Leuz, 2010). However, it has been shown that the financial reporting quality (FRQ) is higher in voluntary reporting private firms than in mandatory reporting private firms (Chi, Dhaliwal, Li, & Lin, 2013). Similarly, Bernard et al. (2016) compared the FRQ of three groups of firms: private firms that voluntarily disclose financial information, private firms that do so only because of effective enforcement of mandatory disclosure requirements, and public firms that are all subject to mandatory disclosure requirements. Little or no evidence showed any difference of FRQ between private voluntary firms and public firms, while consistent evidence has been found that private mandatory firms have lower FRQ than both private voluntary firms and public firms. This suggested that the effect of the mandatory regulation on private firms' financial reporting was not substantial, as it entailed information of lower quality (Bernard et al., 2016). Although not the focus of this study, the understanding of financial reporting in unlisted firms is likely to enhance our understanding of sustainability reporting in these firms.

3.3. Theories related to corporate reporting practices

3.3.1. Legitimacy theory

Legitimacy theory has been used as one of the more probable explanations of the motivation of some companies to provide information of higher quality than others. From an organization's perspective, legitimacy was defined by Lindblom (1994, p. 2) as "a condition or status which exists when an entity's value system is congruent with the value system of the larger social system of which the entity is a part". In other words, organizational legitimacy is believed to be one of the resources which an entity depends on for its survival and operation in a society. In order to gain legitimacy, companies should try to create congruence between how stakeholders perceive that the organization has acted and how the culture of a community believes organizations should act. Moreover, it should be noted that because legitimacy is based on public perceptions of an organization's actions, for an organization to gain legitimacy, it is not the actual activities conducted by the organization which is important. Rather, it is what the stakeholders accordingly know or perceive about the organization's conducts that improves its legitimacy. Thus, an organization can enhance the level of its legitimacy by using different disclosure practices (Hoque, 2018).

Several studies have suggested that sustainability disclosures are used by companies in order to gain legitimacy. By analyzing 128 firms, Patten (1991) found that social disclosures were related to public pressure variables, which included size and industry classification, while no significant association was found between profitability variables and the extent of social disclosures. The results provided evidence that social disclosures were used by companies as a method of managing the public environment which they faced (Patten, 1991). In addition, O'Donovan (2002) collected answers of open-ended questions by directly interviewing senior managers from three large Australian public companies about their disclosure choices. The findings from this study supported the legitimacy explanation for the motivations of companies' environmental disclosures in annual reports (O'Donovan, 2002). In the French context where a requirement to publish CSR reports was launched in 2001, an investigation of sustainability reporting quality among 81 publicly traded French firms showed that legitimacy concerns were continuously a major drive to different levels of disclosures in both 2004 and 2010 (Chauvey, Cho, & Giordano-Spring, 2015). Furthermore, legitimacy theory has been used as an explanation of the voluntary adoption of sustainability disclosures of companies. By responding to stakeholders' expectations of such disclosures, an organization can improve its legitimacy (La Torre, Sabelfeld, Blomkvist, Tarquinio, & Dumay, 2018).

3.3.2.   Signaling theory

Another theory which has been used to study reporting practices is signaling theory. Connelly, Certo, Ireland, & Reutzel (2011) provided a review of this theory. Its focus is the situation of asymmetric information, where the informed party must choose a signal, and the receiving party must choose how to interpret the signal. Quality is an important concept, referring to the underlying characteristic which the signal concerns. In a separating equilibrium, it is easy for the receiver to tell whether the sender is of good or bad quality. However, in a pooling equilibrium, both the good-quality sender and the bad-quality sender choose the same signal, making it impossible for the receiver to tell the senders' quality. Conclusively, the main pillars of signaling theory is the signaler, the signal and the receiver (Connelly et al., 2011). Relating to the area of sustainability reporting, signaling theory has been employed in order to understand the issuance of standalone sustainability reports (Mahoney, Thorne, Cecil, & LaGore, 2013). In this study, signaling theory was contrasted against greenwashing, that firms issuing a sustainability report did so even though having a weak environmental track record. However, through comparing the sustainability performance scores of reporters vs. non-reporters, signaling was found to be a stronger explanation (Mahoney et al., 2013). Signaling theory has been used in the study of overall disclosures as well. Pae (2002) studied the adverse selection problem in relation to productive activities and discretionary disclosures. Making the signal more informative lead to increased efficiency in the economy, as the receiver was able to distinguish the sender's quality

(Pae, 2002). Applying the same reasoning on mandatory sustainability reports would entail that, provided that the disclosures are informative enough, they should have a positive impact on reducing the information asymmetry.

3.4.   Corporate governance and sustainability reporting

In this section, we review literature on the relationship between sustainability disclosures and corporate governance. This marks the start of the hypotheses development. Since sustainability disclosures are largely influenced by the cultures, values and intentions of those who participate in the planning and decision-making of an organization, consideration of corporate governance mechanisms should be of importance (Gibbins, Richardson, & Waterhouse, 1990). Similarly, Chan et al. (2014) find that better corporate governance practices are strongly linked to increased sustainability disclosures in listed companies. One important gap in corporate governance and sustainability disclosure is the paucity of such research for unlisted small and medium companies under mandatory sustainability reporting regulation in the Swedish setting.

3.4.1.   Board size

Literature on the effects of the size of the board of directors points in several directions. Relatively smaller boards have been found to be more effective in attaining higher monitoring of a company's management. One proposed explanation is that smaller boards typically have more efficient communication and coordination and are thus more likely to be more organized in carrying out board functions compared to larger boards (Yermack, 1996). Higher levels of commitment and accountability of individual board members have also been found in smaller boards (Dey, 2008). However, considering the boards' advisory role, larger boards have a more diversified range of expertise, and can provide a higher quality of advice (Guest, 2009). Relating to sustainability disclosures, Jizi et al. (2014) examined large commercial banks in the US and found the sustainability disclosure level to be positively associated with a larger board size. Furthermore, de Villiers, Naiker, & van Staden (2011) found strong firm environmental performance to be related to board characteristics that relate to resource provision abilities, including board size. This suggests that firms with larger boards are more likely to benefit from diversity and richness of expertise, and therefore have better environmental performance. As the regulation of mandatory sustainability reporting was newly launched in Sweden, and the responsibility to produce such a report falls mainly on the board of directors (PwC, 2018), we expect that these considerations of expertise are of importance. According to Dey (2008, p. 1152), "board effectiveness declines as board size increases above a moderate number, an optimal number being about seven to nine directors". Hence, weighing the advantages of a smaller board against those of a larger board, we expect that boards with a certain board size will have a better

knowledge of the new legislation and direct management to present sustainability reports of higher quality. This leads to our first hypothesis:

H1: There is a positive association between an ideal board size and the extent of sustainability reporting.

3.4.2. CEO duality

Managements' private interests might have a strong influence on the extent to which they engage in sustainability activities and disclosures. By being both the chairman of the board of directors and the CEO of a company, a CEO could theoretically hide essential information from other board members, because of his or her ability to influence the information provided to others. In addition, they are also likely to use their power to appoint board members in their favor (Haniffa & Cooke, 2002). As a result, the board's monitoring and governance roles could be diminished by the concentration of decision-making power resulting from CEO duality (Forker, 1992; Li, Pike, & Haniffa, 2008). In addition, professional judgement of non-executive directors can be affected by managerial decisions because they might tend to avoid conflicts with powerful CEOs to maintain their positions on the board (Dey, 2008). Considering the importance of the board in adhering to the reporting requirement (PwC, 2018) and the arguments above, we state our second hypothesis:

H2: There is a negative association between CEO duality and the extent of sustainability reporting.

3.5. Accounting quality and sustainability reporting

There is no consensus on the relationship between accounting quality and the disclosure of sustainability information. On one hand, Chih, Shen, & Kang (2008) defined the multiple objectives hypothesis, by which sustainability activities are considered to aggravate agency problems, giving management more impetus to manipulate financial information in order to hide their rent-seeking activities from outsiders. This means that, within companies having multiple objectives, managements try to serve all stakeholders rather than pursuing the single objective of value maximization for shareholders. Therefore, a lack of clear measurement of their performance leads to a loss in accountability. In turn, this provides opportunities for management to pursue their own interests while sacrificing the interests of other stakeholders and society at large. The authors found evidence of companies with a higher sustainability performance being more prone to stating earnings aggressively, thereby finding support for the multiple objectives hypothesis (Chih et al., 2008). Similarly, Prior, Surroca, & Tribó (2008) obtained empirical evidence of the positive effect of sustainability practices on manipulative behavior, arguing that these social practices are carried out as a means of disguising earnings management. Salewski & Zülch (2014) also found a negative

association between companies' sustainability ratings and accounting quality, and stated that the relationship differs among countries. These arguments are similar to the opportunistic hypothesis, according to which managers act in their own interests, leading to manipulation of the accounting and sustainability reporting in order to attain private benefits (Hope, Thomas, & Vyas, 2013).

On the other hand, there are studies that are in contrast with these findings. The myopia avoidance hypothesis was defined by Chih et al. (2008), stating that companies with a higher sustainability performance tend to abstain from managing their earnings. More specifically, a sustainability-minded management should focus not only on increasing short-term profits, but also on developing relationships with all types of stakeholders. Accordingly, they should be less likely to hide unfavorable earnings realizations and to conduct earnings management (Chih et al., 2008). Furthermore, Shleifer (2004) argued that earnings manipulation, as an activity which society finds ethically objectionable, is less conducted by companies showing a higher level of social responsibility (Shleifer, 2004). Francis, Nanda, & Olsson (2008) found a complementary association between voluntary disclosure and earnings quality, showing that firms with a higher earnings quality had more voluntary disclosures, and vice versa. Similarly, the results of Gelb & Strawser (2001) indicated a positive relationship between financial disclosure quality and sustainability performance. The authors found that firms engaging in social responsibility activities provided more informative and extensive disclosures than the companies that were less engaged (Gelb & Strawser, 2001). More recently, Kim et al. (2012) showed evidence that more socially responsible firms are less likely to manage earnings through discretionary accruals and to manipulate real operating activities. Their findings suggested that honest and ethical concerns are likely to be incentives for managers to produce high-quality financial reports. Considering the arguments for both a positive and negative relation, we propose our third hypothesis:

H3: There is an association between accounting quality and the extent of sustainability reporting.

3.6.   The impact of sustainability reporting on the cost of capital

3.6.1.   The impact of sustainability disclosures on the cost of equity capital

A large number of researchers have investigated the relation between sustainability disclosures and the cost of equity capital. The impact of first-time sustainability disclosures on the cost of equity capital was studied Dhaliwal et al. (2011). The authors found that firms with a high sustainability performance achieved a reduction in the cost of equity capital following first-time disclosure of sustainability information. The reason given by Dhaliwal et al. (2011) was an increase in attention from institutional investors and analysts. Furthermore, these analysts could realize lower absolute forecast errors following such disclosure. This reasoning was further supported by Dhaliwal,

Radhakrishnan, Tsang, & Yang (2012), who similarly found that the production of a stand-alone sustainability report reduced the forecasting errors of analysts. Moreover, this relationship was found to be more pronounced in countries with stronger stakeholder orientation. The relationship was also impacted by the opaqueness of firms' and countries' financial disclosures. Thus, the authors provided evidence that sustainability disclosures play a complementary role to financial disclosures (Dhaliwal et al., 2012; Dhaliwal et al., 2014). Additionally, Plumlee et al. (2015) showed that the quality of voluntary environmental disclosures was linked to firm value through the cost of equity capital and future expected cash flows. The link between sustainability performance and the cost of equity capital was further explored by Ghoul et al. (2011). The authors found sustainability performance to be related to the cost of equity capital through employee relations, product strategies and environmental policies. These were found increase value and lower risk (Ghoul et al., 2011).

3.6.2. The impact of sustainability disclosures on the cost of debt

While the previous discussion showed that sustainability disclosures have been found to benefit companies' cost of equity, a similar influence of sustainability disclosures on cost of debt has also been established (Hoepner, Oikonomou, Scholtens, & Schröder, 2016; Jung, Herbohn, & Clarkson, 2018; Ye & Zhang, 2011). When assessing the credit risk of an organization, banks traditionally base their assessment on information that is fairly objective, quantitative, and financial in nature. Examples of such information include profitability, liquidity and credit ratings. This emphasis on "hard information" characterizes what is known as "transaction-based banking" (Liberti & Petersen, 2019). In contrast, "relationship banking" evaluates risks not only by the above, but also by "soft information" which is more subjective in nature, often collected manually, and difficult to verify by third parties (e.g., managerial competence, trustworthiness and innovative thinking) (Gropp & Guettler, 2018). Increasing research has shown that the incorporation of non-financial factors can lead to a more accurate prediction of corporate credit quality, compared to solely using financial information (Grunert, Norden, & Weber, 2005).

Considering the nature of sustainability activities, we postulate that information regarding these activities can be classified as "soft information". Studying the use of this type of information, Hoepner et al. (2016) investigated the relationship of country, corporate sustainability and the cost of bank loans across the world. Their findings showed that firms operating in countries which have better sustainability ratings can borrow at a lower interest rate compared to firms in countries with weaker sustainability ratings. However, no link was established between a firm's individual sustainability rating and the cost of debt. In contrast, Jung et al. (2018) found carbon-related risk to be associated with the cost of debt. Studying firms' responses to the Carbon Disclosure Project survey, they found a positive association between the cost of debt and carbon

risk for non-responders. When the carbon risk measure increased by one standard deviation for these firms, the cost of debt increased between 38 and 62 basis points (Jung et al., 2018). Further insights were provided by Ye & Zhang (2011) who investigated the relationship between sustainability performance and the cost of debt in a Chinese setting. The authors established a U-shaped relationship between sustainability performance and the cost of debt. For very high and very low levels of sustainability performance, the cost of debt was found to be higher. The authors noted that state-controlled banks in China place a large emphasis on the strategic direction on the government and may therefore favor sustainability information to a greater extent (Ye & Zhang, 2011). The same relationship was studied by Rosa, Liberatore, Mazzi, & Terzani (2018) in a European setting. By observing a sample of listed European non-financial firms over an eight-year period, they found a negative relationship between sustainability performance and interest rate, as well as a positive relationship between sustainability performance and debt rating. Moreover, firms with better sustainability were more attractive to lenders in terms of leverage allowance. Overall, their findings provided deeper insight into the reasons why companies should improve their sustainability performance (Rosa et al., 2018). In addition, it has been examined whether companies performing well in sustainability strategies have better access to finance. Cheng et al. (2014) found that firms with higher sustainability performance face significantly lower capital constraints. This result was found to be driven by both the environmental and social dimensions of sustainability (Cheng et al., 2014). In summary, the association between different dimensions of sustainability and the cost of capital suggests that sustainability information is important for the provider of finance with regards to determining risks within a firm. Thus, provided that sustainability reports are informative enough, they should have a positive effect in reducing the information asymmetry for unlisted firms. Based on these arguments, we raise our fourth hypothesis:

H4: Mandatory sustainability reporting leads to a reduction of the cost of debt in unlisted firms.

4. Method

4.1. Research method

How we acquire knowledge has been the subject of debate since Antiquity. The positivistic foundations of natural science are in contrast to the hermeneutic ones of social science, where the first believes in absolute knowledge obtained from observation and logical derivation (Thurén, 1991), while the latter believes that research methods should be adapted to the subject, relying more heavily on interpretation of observations and their meaning (Kjørup, 1999). Furthermore, there are two main courses of how to derive a conclusion. One way is induction, where generalizable conclusions are made from empiric facts. The other is deduction, in which a conclusion is made through logical derivation (Thurén, 1991). Roughly seen, there are two main methods in research, viz. quantitative and qualitative (Muijs, 2011). Quantitative research is characterized by estimations of relationships between a number of scalable attributes (Hartman, 1998). Furthermore, quantitative methods can be considered inherently positivistic. In contrast, qualitative research methods are founded on a subjectivist view. The subjectivist view argues that human influence plays an important role in the research process. Accordingly, there is no pre-existing truth that can be uncovered by the researcher (Muijs, 2011). In this thesis, we adopt a quantitative method where we use deductive reasoning to arrive at testable hypotheses. However, we also partly rely on a qualitative method in our interpretation of the informational content of the sustainability reports, forming an inductive approach where we generalize on the basis of what we discover. This combination of methods has been employed to study the contents of disclosures before (e.g. Clarkson et al., 2013; Plumlee et al., 2015). Therefore, we consider it well-suited with regards to our research questions.

4.2. Data sources

For selecting our sample and retrieving financial data, we rely on the database Serrano (Swedish House of Finance, n.d.). Serrano includes detailed financial data at the company level for Swedish entities during the time period 1997 to 2017.[2] After our sample had been selected we proceeded to collecting the annual reports from 2017 for our sample companies using the database Retriever. In a third stage and when applicable, we collected the sustainability reports from each company's website. If we could not find the sustainability report there, we emailed the contact address. If a reference was provided to the Swedish Companies Registration Office[3], we contacted

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[2] By the time of the writing of this thesis.
[3] Swedish: Bolagsverket

them (this occurred in two cases).[4] A fifth source was a return series of entities listed on the Stockholm Stock Exchange, provided by the Swedish House of Finance through our tutor. This data was used in order to determine which entities were listed.

4.3. Sample selection

In determining our sample, we first considered the total number of observations available in Serrano. In order to determine which companies were mandated to produce a sustainability report in 2017, we looked at the years 2015 and 2016 in a first step, applying the legal requirements for book value of assets, net sales and the number of employees. In the second step, we focused on 2017, using the results from the first step to determine which entities fulfilling the requirement remained in 2017. As can be seen in the table 1, this number was 2,250. We then removed all observations with another legal form than limited liability company, excluding 317 observations. As our focus was unlisted firms, we removed the firms listed in Sweden or that had a parent company listed in Sweden, losing 339 observations. As we were unable to tell whether foreign companies were listed or not, we removed all observations having a foreign parent company, thus excluding 864 observations. Since the regulatory change affects companies from accounting years beginning after 31 December 2016, we removed those companies which did not have the calendar year as their accounting year, excluding 82 observations. We then excluded observations which were subsidiaries to other legal forms than limited liability companies, as we wanted to analyze the group accounts, thus ruling out 192 observations. The remaining observations consisted partly of doubles.[5] We removed these duplicates, so that only one observation per group, the parent company, or the company itself if independent, remained, thus excluding 110 observations. Out of the remaining 346 companies, a sample of 155 companies was randomly selected. However, the database was missing accounting data for two observations, which were excluded. Thus, the final sample consisted of 153 observations, of which 48 were independent, and 105 were subsidiaries of a Swedish group with a limited liability company as parent company. Table 1 provides a summary of this process. A list of the organizational identifiers and names of the sample firms is available upon request.

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[4] On an anecdotal note; the administrator we talked to had never heard of sustainability reports during the 20 years she had worked there and was surprised to know that companies had to publish such reports, although the legal requirement had been in effect during three years by the time we spoke.

[5] For example, Vattenfall AB had 11 subsidiaries fulfilling the requirement to produce a sustainability report, while Stena AB had 9 such subsidiaries and Albert Bonnier AB had 12. As a robustness check, we saw that in these cases, all subsidiaries referred to the sustainability report of the parent company, or to the one of Bonnier AB in the case of Albert Bonnier AB.

Table 1. Sampling procedure.

Total number of observations in 2017, in the Serrano "bokslutsfil.dta"	539,240
Of which fulfill the size requirements in 2015 and 2016, individual accounts	2,250
Of which are limited liability companies	1,933
Of which are not listed in Sweden	1,874
Of which do not belong to a Swedish listed group	1,594
Of which are not subsidiaries to foreign entities	730
Of which have the calendar year as accounting year	648
Of which are not owned by other legal forms than a limited liability company	456
Of which belong to unique parent companies or are independent	346
Initial sample	155
Final sample, for which the 2017 data in Serrano is complete	153
Of which are independent accounts	48
Of which are subsidiaries (group accounts used for analysis)	105

4.4.   Dependent variables

Issue of a sustainability report, $ISSUE_i$ measures the existence and accessibility of a sustainability report from the year 2017. An observation is assigned the value 1 if a sustainability report is referenced to in the management report of the annual report and accessible by us, and 0 otherwise. In total, we were able to find and access sustainability reports for 75% of our sample, bringing us fairly close to the 80% documented in the PwC study (PwC, 2018).

Disclosure score, $SCOR_i$ measures the information content provided in the sustainability report of the company. Previous researchers have employed various approaches to measuring the information content of a sustainability report. One example was constructing an index based on GRI with the aid of professional experts (Clarkson et al., 2013). Plumlee et al. (2015) criticize Clarkson et al. (2013) for applying the same weight to every disclosure item. Instead, they use a more sophisticated scale which assigns disclosure items to different subcategories such as hard and objective or soft/subjective. Other authors rely on data collected by companies such as Bloomberg (Ioannou & Serafeim, 2017).

Our research question calls for a slightly different approach. Previous research has been conducted on listed companies and has mostly focused on the setting where sustainability disclosure is done on a voluntary basis. The unlisted status of our sample makes a reliable second-hand source of sustainability data hard to find. Instead, we construct an index based on the five questions described in the Swedish Annual Accounts Act (SFS 1995:1554). These items are specified in the left column of table 2.

In order to score these items, we utilized Wiseman's (1982) scale for grading the degree of disclosure of a certain item. The rating is based on the existence and specificity of a

disclosure. The index assigns a score of three if an item is present and described in company-specific quantitative terms, e.g. monetary terms. A score of two is given if the disclosure is accompanied by a discussion in company-specific qualitative terms. A score of one is awarded if the disclosure exists and is mentioned only in general terms, while a zero is given if the disclosure is missing from the report (Wiseman, 1982). Applying this grading to the disclosure items derived from the law, we assigned scores in the range 0 to 1 for the existence of a description of the company's business model, and for each subquestion; 0 to 1 for a description of the policy, 0 to 2 for a description of the results of the policy, reasoning that a description can be either non-existing, company specific or company specific in quantitative terms. A score of 1 was awarded if the company did not have a policy but described the reasons why. A range of 0 to 2 was assigned to the existence of a description of a review mechanism in each question. For a description of material risks, a range of 0 to 3 was awarded, while a score between 0 and 1 was awarded for the handling of described risks. A score between 0 and 1 was awarded for the existence of KPIs. Thus, the subtotal ranged between 0 and 10 for each question, and the total score ranged between 0 and 51. Table 2 summarizes the index for the sample. In our estimations, non-reporters were assigned a score of 0. This assumption is tested in section 5.3.3.

Cost of liabilities, CL_i is computed as total interest expense over opening balance of total liabilities. We choose this metric primarily to be congruent with our other control variables, return on assets and leverage, which are all founded on the "total assets-concept" (Johansson & Runsten, 2013). Our regression discontinuity analysis (section 5.4) considers an alternative definition.

4.5. Independent variables

Accounting quality, $ACCQUAL_i$ measures the discretionary accruals according to the modified Jones (1991) model, specified by Dechow, Sloan, & Sweeney (1995) and described in Appendix A. Many different measures of accounting quality exist, for instance earnings persistence and abnormal accruals. A concern with discretionary accruals is that they may contain portions of true financial performance, thus not capturing the full picture of unnatural interference (Dechow, Ge, & Schrand, 2010). Nevertheless, the model has been used by researchers in examining similar relationships (see e.g. Dhaliwal et al., 2011). An alternative measure is considered in section 5.3.1. Since studies find different results in this regard, as we discussed in section 3.4, we expect no particular sign on in our estimations.

CEO duality, $CEODUAL_i$ measures the prevalence of the same person occupying the position of CEO and chairman of the board, equaling 1 where this is the case and 0 otherwise. Observations were manually collected from the annual reports, and values

were used for the parent company in the situations where the observation was a subsidiary. In line with our hypothesis, we expect a negative sign.

Board size, $BOARDS_i$ measures the size of the board of directors of a company. Following (Dey, 2008), the variable was coded as 1 if the company had between 4 and 9 members on the board of directors, and 0 otherwise. Data was manually collected from the annual report of a company and the value pertain to the parent company in the case it was a subsidiary. We expect this variable to take a positive sign.

Size, $SIZE_i$ measures the size of a company in terms of the natural logarithm of the book value of assets, closing balance. Since size has been found to impact the reporting practices and disclosure practices of firms (see e.g. Archambault & Archambault, 2003; Eng & Mak, 2003), we expect a positive sign.

Leverage, LEV_i measures the ratio of book value of total liabilities to book value of equity using opening balances. It has been observed that firms with higher leverage face higher agency costs, why such firms should disclose more information (see e.g. Chow & Wong-Boren, 1987). Therefore, we expect a positive sign.

Return on assets, ROA_i measures the profitability of a company through dividing the earnings before interest expenses with the opening balance of total assets. The metric was defined in accordance with Johansson & Runsten (2013). Since a positive relationship between corporate environmental and social disclosures and the profitability of a firm has been observed (see e.g. Qiu, Shaukat, & Tharyan, 2016), we expect a positive sign.

Industry, $INDUSTRY_i$ measures the profile of an observation's industry with regards to its two-digit SNI code. These codes were manually retrieved from the website Retriever. Following Chan et al. (2014), a value of 1 was assigned to firms within a low-profile industry, such as firms in the financial industry and real estate development and management. A value of 3 was assigned to firms within a high-profile industry, such as chemicals, containers and packaging, mining and metals and paper and forest products. All other firms were assigned a value of 2. Since firms in more exposed industries face larger legitimacy concerns (see e.g. Meek, Roberts, & Gray, 1995; Patten, 1991) we expect a positive sign.

State ownership, $STATEOWN_i$ takes the value 1 if the company is owned by the state and 0 otherwise. Data was manually collected from Retriever. Eng & Mak (2003) found a positive relationship between government ownership and disclosure, arguing that this is caused by increased agency problems following government ownership, and that disclosure is a tool of mitigating these problems. In the same line with this argument, we expect a positive relationship between state ownership and the extent of reporting.

Auditor choice, $BIG4_i$ takes the value 1 if the company has a Big 4 auditor and 0 otherwise. Data was manually collected from the annual reports of the companies and

the value of the parent company was used in the case it was a subsidiary. Auditor type has been found to be significantly associated with disclosure quality (Gallery, Cooper, & Sweeting, 2008). The quality of voluntary sustainability disclosures has also been found to be significantly higher for assured companies than for unassured companies (Moroney, Windsor, & Aw, 2012). Therefore, we expect a positive sign.

GRI adoption, *GRI$_i$* takes the value 1 if the company references to GRI in their sustainability report, and 0 otherwise. Data was manually collected from the sustainability reports. Since firms reporting in accordance with GRI has been found to produce more comparable sustainability information (Michelon et al., 2015), we expect a positive sign.

4.6. Model specifications

4.6.1. The issuing of a sustainability report

In order to investigate which factors influenced the issuing of a sustainability report, and to test our hypotheses regarding the extent of sustainability reporting, we employ the following specification:

$$ISSUE_i = \alpha_i + \beta_1 ACCQUAL_i + \beta_2 CEODUAL_i + \beta_3 BOARDS_i + \beta_4 SIZE_i + \beta_5 LEV_i + \beta_6 ROA_i + \beta_7 INDUSTRY_i + \beta_8 BIG4_i + \beta_9 STATEOWN_i + \varepsilon_i \qquad (1)$$

All variables are defined in the previous sections. Since the dependent variable can take either the value zero or one, the equation is estimated using logistic regression, with robust standard errors. Since we only have cross-sectional data, yearly fixed effects are excluded from our estimation.

4.6.2. The information contents of the sustainability reports

In order to estimate the relationships regarding the information content of a sustainability report, we use the following specification:

$$SCOR_i = \alpha_i + \beta_1 ACCQUAL_i + \beta_2 CEODUAL_i + \beta_3 BOARDS_i + \beta_4 SIZE_i + \beta_5 LEV_i + \beta_6 ROA_i + \beta_7 INDUSTRY_i + \beta_8 BIG4_i + \beta_9 STATEOWN_i + \beta_{10} GRI_i + \varepsilon_i \qquad (2)$$

Variable definitions are found in the previous sections. The specification is estimated using Ordinary Least Squares (OLS) with robust standard errors. Since we only have data from the year 2017, yearly fixed effects are excluded from the estimation.

4.6.3. Sustainability reporting and the cost of debt

In order to estimate the impact of mandatory sustainability reporting on the cost of debt, we will first estimate the following equations using OLS estimation. In section 5.4, we will employ a Regression Discontinuity design (RD) in order to obtain the causal impact

of sustainability reporting on the cost of debt. The OLS models are designed drawing inspiration from (Ye & Zhang, 2011) and are defined as follows,

$$CL_i = \alpha_i + \beta_1 SCOR_i + \beta_2 LEV_i + \beta_3 ROA_i + \beta_4 INDUSTRY_i + \beta_5 GRI_i + \varepsilon_i \qquad (3)$$

$$CL_i = \alpha_i + \beta_1 ISSUE_i + \beta_2 LEV_i + \beta_3 ROA_i + \beta_4 INDUSTRY_i + \beta_5 GRI_i + \varepsilon_i \qquad (4)$$

The variables correspond to their earlier definitions. The equations are estimated using OLS with robust standard errors.

4.7. Descriptive statistics

This section provides a descriptive summary of our different variables. First, we present the construction of our $SCOR_i$ variable in table 2, for the 114 reports we were able to find. The first column presents the reporting items retrieved from the law (SFS 1995:1554). The range column presents possible scores for each item, graded according to the Wiseman (1982) scale. As displayed in table 2, employees was the area in which the companies best reported, followed by environment, social conditions, anti-corruption and lastly human rights. As displayed by the percentile columns, the bottom levels were highest for environment and employees, while the bottom 10 percent failed to provide any information on social conditions, human rights and anti-corruption, respectively. Comparing the total number of observations for "Results" and "Explanation if not described" reveals how many companies reported their work in a certain question and how many did not. Reporting was most common for environment and employees, with only 4 observations abstaining from reporting information in these areas. Human rights was the area which the largest amount of non-reporters, with 30 companies abstaining from providing a description of their work on this question. Seen in total, the whole sample yields a mean $SCOR_i$ of 21.37 with a median of 21 out of the maximum 51. Another observation that could be made is that, in accordance with the PwC study, (PwC, 2018), we find risk descriptions to score low generally, with low means and medians compared to the maximum score of 3 per question. Thus, companies tend to be poor at describing sustainability risks, and often do this in vague terms, if done at all.

Table 3 provides descriptive statistics for our sample. $ISSUE_i$ captures the publication of an accessible sustainability report, and takes the mean of 0.75, implying that 75% of the companies in our sample produce the mandatory sustainability report. $SCOR_i$ measures the information content of the sustainability reports with non-reporters assigned the value 0, and ranges from a minimum of 0 to a maximum of 40. Furthermore, 29% of our sample companies mention GRI in their sustainability report, as captured by the mean of GRI_i. Another observation is that some variables exhibit variation, which motivates the use of robust standard errors to mitigate heteroscedasticity.

Table 2. Summary of disclosure index.

Disclosure item	Range	Mean	Median	90 Perc.	10 Perc.	N
Description of business model	0 - 1	0.88	1	1	0	114
Environment						
Existence of policy	0 - 1	0.96	1	1	1	114
Results	0 - 2	1.36	1	2	1	110
Explanation if no policy	0 - 1	0.75	1	1	0.3	4
Description of review/control mechanism	0 - 2	1.13	1	2	1	110
Description of material risks	0 - 3	0.91	1	2	0	110
Description of how risks are handled	0 - 1	0.51	1	1	0	110
Existence of KPIs	0 - 1	0.65	1	1	0	110
Subtotal	**0 – 10**	**5.39**	**5**	**9**	**3**	**114**
Social conditions / other stakeholders						
Existence of policy	0 - 1	0.88	1	1	0	114
Results	0 - 2	1.02	1	2	0	100
Explanation if no policy	0 - 1	0.07	0	0	0	14
Description of review/control mechanism	0 - 2	0.73	1	2	0	100
Description of material risks	0 - 3	0.65	0	2	0	100
Description of how risks are handled	0 - 1	0.39	0	1	0	100
Existence of KPIs	0 - 1	0.19	0	1	0	100
Subtotal	**0 – 10**	**3.50**	**3**	**7**	**0**	**114**
Employees						
Existence of policy	0 - 1	0.96	1	1	1	114
Results	0 - 2	1.25	1	2	1	110
Explanation if no policy	0 - 1	0.25	0	0,7	0	4
Description of review/control mechanism	0 - 2	1.13	1	2	0	110
Description of material risks	0 - 3	1.05	1	2	0	110
Description of how risks are handled	0 - 1	0.61	1	1	0	110
Existence of KPIs	0 - 1	0.69	1	1	0	110
Subtotal	**0 - 10**	**5.54**	**6**	**8**	**2**	**114**
Human rights						
Existence of policy	0 - 1	0.74	1	1	0	114
Results	0 - 2	0.61	1	1	0	84
Explanation if no policy	0 - 1	0.23	0	1	0	30
Description of review/control mechanism	0 - 2	0.82	1	1	0	84
Description of material risks	0 - 3	0.69	0	2	0	84
Description of how risks are handled	0 - 1	0.40	0	1	0	84
Existence of KPIs	0 - 1	0.05	0	0	0	84
Subtotal	**0 - 10**	**2.69**	**3**	**6**	**0**	**114**
Anti-corruption						
Existence of policy	0 - 1	0.82	1	1	0	114
Results	0 - 2	0.64	1	1	0	94
Explanation if no policy	0 - 1	0.35	0	1	0	20
Description of review/control mechanism	0 - 2	0.95	1	2	0	94
Description of material risks	0 - 3	0.82	1	2	0	94
Description of how risks are handled	0 - 1	0.52	1	1	0	94
Existence of KPIs	0 - 1	0.10	0	0	0	94
Subtotal	**0 - 10**	**3.38**	**3**	**6**	**0**	**114**
Total score	**0 - 51**	**21.37**	**21**	**33**	**10.3**	**114**

Table 3. Descriptive statistics.

	N	Mean	Std. Dev.	Min	Max
$SIZE_i$	153	21.09	1.52	19.01	26.88
LEV_i	153	3.54	5.35	0.02	45.28
CL_i	153	0.02	0.03	0.00	0.26
$CEODUAL_i$	153	0.05	0.22	0.00	1.00
$BOARDS_i$	153	0.59	0.49	0.00	1.00
ROA_i	153	0.09	0.14	-0.25	0.89
$SCOR_i$	153	15.92	12.16	0.00	40.00
$ISSUE_i$	153	0.75	0.44	0.00	1.00
$ACCQUAL_i$	153	0.00	0.11	-0.50	0.56
$INDUSTRY_i$	153	1.92	0.49	1.00	3.00
$STATEOWN_i$	153	0.07	0.26	0.00	1.00
$BIG4_i$	153	0.73	0.44	0.00	1.00
GRI_i	153	0.29	0.46	0.00	1.00

$SIZE_i$ measures the natural logarithm of the closing balance of total assets,
LEV_i is the ratio of total liabilities to equity, calculated using opening book values,
CL_i is the ratio of total interest expense to opening book value of total liabilities,
$CEODUAL_i$ takes the value one if the company CEO is also the chairman of the board of directors, and zero otherwise,
$BOARDS_i$ takes the value one if the company has between four and nine members on the board of directors, and zero otherwise,
ROA_i is the ratio of earnings before interest expense to opening book value of total assets,
$SCOR_i$ is the informational content score of the company's sustainability report,
$ISSUE_i$ takes the value one if the company has published an accessible sustainability report in 2017, and zero otherwise,
$ACCQUAL_i$ measures the discretionary accruals of the company according to the modified Jones model (Dechow et al., 1995),
$INDUSTRY_i$ measures the profile of the company's industry, taking the value one for low-profile industries, three for high-profile industries and two otherwise,
$STATEOWN_i$ takes the value one if the company is owned by the government, and zero otherwise,
$BIG4_i$ takes the value one if the company has a Big 4 auditor, and zero otherwise,
GRI_i takes the value one if the company refers to the GRI framework in their sustainability report, and zero otherwise.

Table 4 displays the Spearman correlations of our sample. Spearman correlations are preferable in our setting since they are not sensitive to the influence of extreme values, and do not rely on an assumed distribution (Newbold, Carlson, & Thorne, 2013). This is appropriate with regards to our relatively limited sample size. We note significant correlations between our $SCOR_i$ variable and $SIZE_i$, $BIG4_i$, $STATEOWN_i$ and GRI_i. Furthermore, we observe that $ISSUE_i$ tends to correlate positively with $SIZE_i$ and $STATEOWN_i$, while it correlates negatively with LEV_i. We also note that some of our control variables exhibit significant correlations with one another, for instance $SIZE_i$ and GRI_i. Therefore, we include multicollinearity checks in section 5.3.6 and Appendix C to ensure that our results are not blurred by this phenomenon.

26

Table 4. Spearman correlations.

	$ISSUE_i$	$SCOR_i$	$SIZE_i$	LEV_i	CL_i	$CEODUAL_i$	$BOARDS_i$	ROA_i	$INDUSTRY_i$	$ACCQUAL_i$	$STATEOWN_i$	$BIG4_i$	GRI_i
$ISSUE_i$	1	0.76*	0.20*	-0.20*	-0.10	-0.06	-0.02	0.11	-0.09	-0.05	0.16*	0.12	0.38*
$SCOR_i$	0.76*	1	0.37*	-0.10	-0.08	-0.06	-0.03	0.01	-0.03	0.07	0.37*	0.27*	0.63*
$SIZE_i$	0.20*	0.37*	1	-0.08	0.31*	0.09	0.10	-0.10	-0.16*	0.13	0.27*	0.26*	0.37*
LEV_i	-0.20*	-0.10	-0.08	1	-0.02	0.03	0.09	-0.45*	-0.13	0.05	0.00	-0.14	-0.06
CL_i	-0.10	-0.08	0.31*	-0.02	1	0.14	0.12	-0.16*	0.14	-0.09	-0.07	0.16*	-0.13
$CEODUAL_i$	-0.06	-0.06	0.09	0.03	0.14	1	0.07	-0.02	-0.02	0.07	0.05	0.08	-0.02
$BOARDS_i$	-0.02	-0.03	0.10	0.09	0.12	0.07	1	-0.03	-0.03	-0.19*	-0.18*	0.31*	0.04
ROA_i	0.11	0.01	-0.10	-0.45*	-0.16*	-0.02	-0.03	1	0.09	0.06	-0.10	-0.04	-0.04
$INDUSTRY_i$	-0.09	-0.03	-0.16*	-0.13	0.14	-0.02	-0.03	0.09	1	0.05	-0.01	0.08	-0.07
$ACCQUAL_i$	-0.05	0.07	0.13	0.05	-0.09	0.07	-0.19*	0.06	0.05	1	0.20*	-0.03	0.17*
$STATEOWN_i$	0.16*	0.37*	0.27*	0.00	-0.07	0.05	-0.18*	-0.10	-0.01	0.20*	1	0.17*	0.43*
$BIG4_i$	0.12	0.27*	0.26*	-0.14	0.16*	0.08	0.31*	-0.04	0.08	-0.03	0.17*	1	0.23*
GRI_i	0.38*	0.63*	0.37*	-0.06	-0.13	-0.02	0.04	-0.04	-0.07	0.17*	0.43*	0.23*	1

$ISSUE_i$ takes the value one if the company has published an accessible sustainability report in 2017, and zero otherwise,

$SCOR_i$ is the informational content score of the company's sustainability report,

$SIZE_i$ measures the natural logarithm of the closing balance of total assets,

LEV_i is the ratio of total liabilities to equity, calculated using opening book values,

CL_i is the ratio of total interest expense to opening book value of total liabilities,

$CEODUAL_i$ takes the value one if the company CEO is also the chairman of the board of directors, and zero otherwise,

$BOARDS_i$ takes the value one if the company has between four and nine members on the board of directors, and zero otherwise,

ROA_i is the ratio of earnings before interest expense to opening book value of total assets,

$INDUSTRY_i$ measures the profile of the company's industry, taking the value one for low-profile industries, three for high-profile industries and two otherwise,

$ACCQUAL_i$ measures the discretionary accruals of the company according to the modified Jones model (Dechow et al., 1995),

$STATEOWN_i$ takes the value one if the company is owned by the government, and zero otherwise,

$BIG4_i$ takes the value one if the company has a Big 4 auditor, and zero otherwise,

GRI_i takes the value one if the company refers to the GRI framework in their sustainability report, and zero otherwise,

* indicates significance on the 0.05 level.

5. Results

5.1. Univariate analysis

As an early analysis of our first research question relating to the issuing of a sustainability report, table 5 presents the results from t-tests for differences in means and the Wilcoxon rank sum test for the groups $ISSUE_i$ one and zero, i.e. for the group publishing a sustainability report and the one abstaining from doing so. As displayed in table 5, we observe a statistically significant difference in $SIZE_i$, indicating that the firms that abstain from publishing a sustainability report are smaller in terms of total assets compared to the firms that follow the requirement. We also note a statistically significant difference in state ownership, as captured by our $STATEOWN_i$ variable. We also observe an indication of a difference in LEV_i in the Wilcoxon test, although the t-statistic is weaker.

Table 5. Univariate analysis of means.

	ISSUE = 1	ISSUE = 0	t - stat	Wilcoxon
	N = 114	N = 39		z - stat
$SIZE_i$	21.27	20.55	-2.60**	-2.48**
LEV_i	3.17	4.65	1.50	2.49**
CL_i	0.02	0.02	0.03	1.25
$CEODUAL_i$	0.04	0.08	0.80	0.80
$BOARDS_i$	0.59	0.62	0.30	0.30
ROA_i	0.10	0.07	-1.46	-1.31
$INDUSTRY_i$	1.89	2.00	1.15	1.16
$ACCQUAL_i$	-0.01	0.01	1.02	0.62
$STATEOWN_i$	0.10	0.00	-2.03**	-2.01**
$BIG4_i$	0.76	0.64	-1.49	-1.48

$SIZE_i$ measures the natural logarithm of the closing balance of total assets,

LEV_i is the ratio of total liabilities to equity, calculated using opening book values,

CL_i is the ratio of total interest expense to opening book value of total liabilities,

$CEODUAL_i$ takes the value one if the company CEO is also the chairman of the board of directors, and zero otherwise,

$BOARDS_i$ takes the value one if the company has between four and nine members on the board of directors, and zero otherwise,

ROA_i is the ratio of earnings before interest expense to opening book value of total assets,

$INDUSTRY_i$ measures the profile of the company's industry, taking the value one for low-profile industries, three for high-profile industries and two otherwise,

$ACCQUAL_i$ measures the discretionary accruals of the company according to the modified Jones model (Dechow et al., 1995),

$STATEOWN_i$ takes the value one if the company is state-owned, and zero otherwise,

$BIG4_i$ takes the value one if the company has a Big 4 auditor, and zero otherwise,

***, **, * indicate significance at 0.01, 0.05, 0.1 levels respectively.

5.2. Multivariate analysis

5.2.1. The issuing of a sustainability report

Table 6 presents the results of our estimation of equation 1, using logistic regression with robust standard errors. Due to its perfect predicting power, the $STATEOWN_i$ variable was omitted, since all 11 state-owned companies in our sample published a sustainability report. Two variables emerge with a level of statistical significance, $SIZE_i$ capturing the natural logarithm of assets, and ROA_i capturing profitability. This suggests that the size and profitability of a company positively impacts its adherence to the reporting requirement.

Table 6. Estimation of equation 1, using logistic regression with robust standard errors.

Dependent variable: $ISSUE_i$				
Variable	Prediction	Coefficient	Std. Err.	z
$INDUSTRY_i$	+	-0.48	0.41	-1.16
$BOARDS_i$	+	-0.32	0.45	-0.71
$CEODUAL_i$	-	-0.74	0.88	-0.85
$ACCQUAL_i$	+/-	-2.56	2.04	-1.25
$SIZE_i$	+	0.39**	0.17	2.31
LEV_i	+	-0.02	0.04	-0.54
ROA_i	+	4.07*	2.21	1.84
$BIG4_i$	+	0.45	0.48	0.94
$STATEOWN_i$	+	0.00	(omitted)	
Constant		-6.44	3.72	-1.73
Number:	142			

$ISSUE_i$ takes the value one if the company has published an accessible sustainability report in 2017, and zero otherwise,

$INDUSTRY_i$ measures the profile of the company's industry, taking the value one for low-profile industries, three for high-profile industries and two otherwise,

$BOARDS_i$ takes the value one if the company has between four and nine members on the board of directors, and zero otherwise,

$CEODUAL_i$ takes the value one if the company CEO is also the chairman of the board of directors, and zero otherwise,

$ACCQUAL_i$ measures the discretionary accruals of the company according to the modified Jones model (Dechow et al., 1995),

$SIZE_i$ measures the natural logarithm of the closing balance of total assets,

LEV_i is the ratio of total liabilities to equity, calculated using opening book values,

ROA_i is the ratio of earnings before interest expense to opening book value of total assets,

$BIG4_i$ takes the value one if the company has a Big 4 auditor, and zero otherwise,

$STATEOWN_i$ takes the value one if the company is state-owned, and zero otherwise,

***, **, * indicate significance at 0.01, 0.05, 0.1 levels respectively.

5.2.2. The information contents of the sustainability reports

Table 7 presents the results from our estimation of equation 2 using OLS with robust standard errors. As can be noted from the t-statistics, $SIZE_i$, $BIG4_i$, $STATEOWN_i$ and

GRI$_i$ emerge with statistical significance. In words, our results show that companies with a Big 4 auditor on average scores 3.51 points higher on our scale, while state ownership on average scores 3.59 points higher. Furthermore, companies referencing to GRI achieve 13.25 more points on our scale, a result which is of high statistical significance.

Table 7. Estimation of equation 2 using OLS with robust standard errors.

Dependent variable: *SCOR$_i$*				
Variable	Prediction	Coefficient	Std. Err.	t
INDUSTRY$_i$	+	0.42	1.40	0.30
BOARDS$_i$	+	-2.12	1.57	-1.35
CEODUAL$_i$	-	-2.85	3.48	-0.82
ACCQUAL$_i$	+/-	-7.54	6.40	-1.18
SIZE$_i$	+	1.36***	0.51	2.65
LEV$_i$	+	-0.06	0.16	-0.36
ROA$_i$	+	3.66	5.00	0.73
BIG4$_i$	+	3.51**	1.77	1.98
STATEOWN$_i$	+	3.59*	1.95	1.84
GRI$_i$	+	13.25***	1.79	7.42
Constant		-19.03	11.63	-1.64
Number:	153			
Adj R2	0.41			

SCOR$_i$ is the informational content score of the company's sustainability report,
INDUSTRY$_i$ measures the profile of the company's industry, taking the value one for low-profile industries, three for high-profile industries and two otherwise,
BOARDS$_i$ takes the value one if the company has between four and nine members on the board of directors, and zero otherwise,
CEODUAL$_i$ takes the value one if the company CEO is also the chairman of the board of directors, and zero otherwise,
ACCQUAL$_i$ measures the discretionary accruals of the company according to the modified Jones model (Dechow et al., 1995),
SIZE$_i$ measures the natural logarithm of the closing balance of total assets,
LEV$_i$ is the ratio of total liabilities to equity, calculated using opening book values,
ROA$_i$ is the ratio of earnings before interest expense to opening book value of total assets,
BIG4$_i$ takes the value one if the company has a Big 4 auditor, and zero otherwise,
STATEOWN$_i$ takes the value one if the company is state-owned, and zero otherwise,
GRI$_i$ takes the value one if the company refers to the GRI framework in their sustainability report, and zero otherwise,
***, **, * indicate significance at 0.01, 0.05, 0.1 levels respectively.

5.2.3.   Sustainability reporting and the cost of debt

Tables 8 and 9 provide results from our equations 3 and 4, respectively. Here, we aim at providing initial estimations before we estimate the causal effect of the regulatory change in section 5.4, using Regression Discontinuity design. First, table 8 presents the results from estimating equation three, in order to explore the relationship between the information content of the sustainability reports, *SCOR$_i$,* and the cost of liabilities of a

company. As can be noted from the small t-statistic, we find no evidence of a relationship between the two variables. Neither do we note a statistically significant relationship between the cost of total liabilities and the referencing to GRI, or to any of the three control variables, as all have small t-statistics. This is also reflected in the small value of R squared in the regression, suggesting that a straight line would be a better fit than our model.

Table 8. OLS estimation of equation 3.

Dependent variable: CL_i				
Variable	Prediction	Coefficient	Std. Err.	t
$SCOR_i$	-	0.000	0.00	0.68
LEV_i	+	0.000	0.00	0.82
ROA_i	-	-0.019	0.01	-1.36
$INDUSTRY_i$	+	0.004	0.00	1.31
GRI_i	-	-0.003	0.01	-0.56
Constant		0.014	0.01	1.95
Number:	153			
Adj R sq	-0.01			

CL_i is the ratio of total interest expense to opening book value of total liabilities,
$SCOR_i$ is the informational content score of the company's sustainability report,
LEV_i is the ratio of total liabilities to equity, calculated using opening book values,
ROA_i is the ratio of earnings before interest expense to opening book value of total assets,
$INDUSTRY_i$ measures the profile of the company's industry, taking the value one for low-profile industries, three for high-profile industries and two otherwise,
GRI_i takes the value one if the company refers to the GRI framework in their sustainability report, and zero otherwise,
***, **, * indicate significance at 0.01, 0.05, 0.1 levels respectively.

Table 9 displays the results from the OLS estimation of equation four, using the $ISSUE_i$ variable as to investigating the relationship between the issuing of a sustainability report and the cost of liabilities. Again, we note small t-statistics and a low value of R-squared. We do not find evidence of a link between the issuing of a sustainability report and the cost of total liabilities of a company.

Table 9. OLS estimation of equation 4.

Dependent variable: CL_i				
Variable	Prediction	Coefficient	Std. Err.	t
$ISSUE_i$	-	0.003	0.00	0.55
LEV_i	+	0.000	0.00	0.8
ROA_i	-	-0.019	0.01	-1.39
$INDUSTRY_i$	+	0.004	0.00	1.4
GRI_i	-	-0.002	0.01	-0.34
Constant		0.014	0.01	2.09
Number:	153			
Adj R sq	-0.01			

CL_i is the ratio of total interest expense to opening book value of total liabilities,

$ISSUE_i$ takes the value one if the company has published an accessible sustainability report in 2017, and zero otherwise,

LEV_i is the ratio of total liabilities to equity, calculated using opening book values,

ROA_i is the ratio of earnings before interest expense to opening book value of total assets,

$INDUSTRY_i$ measures the profile of the company's industry, taking the value one for low-profile industries, three for high-profile industries and two otherwise,

GRI_i takes the value one if the company refers to the GRI framework in their sustainability report, and zero otherwise,

***, **, * indicate significance at 0.01, 0.05, 0.1 levels respectively.

5.3.   Robustness checks

In this section we provide robustness checks for our earlier estimates, aiming at providing more rigor to our results.

5.3.1.   Alternative measure of accounting quality

In order to test whether our model specifications are sensitive to the choice of accounting quality metric, we estimate equations 1 and 2 using the performance adjusted Jones model, as specified by Kothari, Leone, & Wasley (2005). Untabulated results do not show any significant changes, which provides some assurance to our derived results using the modified Jones model (Dechow et al., 1995).

5.3.2.   Alternative measure of industry affiliation

Another suitable test subject is the measure of industry affiliation, which we previously defined in accordance with Chan et al. (2014). In alternative estimations of equations 1 and 2, we instead used industry dummies for the companies' one-digit SNI-code, resulting in ten such dummies. For equation 1 regarding the issue of a sustainability report, we noted a drop in significance for our ROA_i variable, so that ROA_i was no longer significant at the 10% level. We interpret this as that the coefficient of the ROA_i variable should be interpreted with caution. Regarding equation 2, we noted strengthened t-statistics on our $STATEOWN_i$ and $SIZE_i$ variables, so that $STATEOWN_i$

was significant on the 5% level. Meanwhile, $BIG4_i$ was estimated to be significant on the 10% level, and not the 5% level as before. This drop in significance regarding the $BIG4_i$ variable suggests that some caution could be applied in its interpretation.

5.3.3. Exclusion of non-reporters

In our earlier estimations, we assigned non-reporters a zero value of $SCOR_i$. However, this might distort the estimations. We therefore re-estimated equations 2 and 4, only including values of $SCOR_i$ of the reporters, thereby testing only the 114 companies publishing a sustainability report. This did not materially change our results, in neither estimation, which we interpret as additional robustness regarding our $SCOR_i$ variable.

5.3.4. Analysis of outliers

There is a possibility that our results from previous estimations are influenced by outliers. To address this potential issue, we use a 1% Winsorization of our data, meaning that the values in the 1st and 99th percentile are assigned values of the closest observations not considered to be outliers. This method is useful for handling outliers in situations where sample size is limited (Reifman & Keyton, 2012). We therefore employ this method instead of changing the outliers to missing values. We apply 1% Winsorization on the variables $SIZE_i$, ROA_i, $ACCQUAL_i$ and LEV_i. The adjustments are done first one by one, with estimations of each equation being done for each separate adjustment. Then, a pooled estimation of all Winsorized variables is performed. We observe a drop in significance on our $BIG4_i$ variable in equation 2, from the 5% to the 10% level, but no other significant changes are noted. We interpret as our results being relatively robust to the influence of outliers.

5.3.5. Tests of subsections of the disclosure index

Some researchers have suggested that different types of disclosures have differing importance (e.g. Plumlee et al., 2015). Thus, different types of the sustainability reporting information may be differently important to the providers of finance. We thus estimated equation 3 again, but replacing the $SCOR_i$ variable with each observations' subtotal, for each of the five areas environment, social conditions, employees, human rights and anti-corruption. These estimations did not significantly change the results, which we interpret as support that our estimation of equation 3 is not sensitive to the type of sustainability reporting information.

5.3.6. Tests regarding multicollinearity

In our estimations of equations 2 to 4, we rely on OLS estimation. As indicated in our correlation matrix, some explanatory variables exhibit significant correlations. We therefore examine whether is a violation of the assumption on no multicollinearity

through a VIF-test. In the case of multicollinearity, two or more explanatory variables are highly correlated. A VIF-level that typically should raise concern is 10 (Mitra, 2011). However, as displayed in Appendix C, all our variables across all three estimations have levels far below 10. Thus, multicollinearity is not considered a problem in our estimations of equations 2 to 4.

5.4. Additional analysis – Regression Discontinuity

5.4.1. Regression Discontinuity and its application

In order to further investigate our fourth hypothesis regarding the impact of sustainability reporting on the cost of debt, we conduct estimations using Regression Discontinuity (RD) design. The introduction of mandatory sustainability reporting for firms over a certain size can be seen as a natural experiment where the firms above the legal threshold receive the treatment and the firms below do not. A research design that focuses on the evaluation of treatment effects in these settings is RD. Through studying a smaller number of observations close to the threshold, one can derive the average treatment effect of a program (Khandker, Koolwal, & Samad, 2010). This method accounts for both observed and unobserved heterogeneity, as the observations just above and just below the cutoff value share many common features. Thus, the estimate of the average treatment effect bypasses issues surrounding model specification (Hahn, Todd, & Van der Klaauw, 2001). However, the local treatment effects may not be valid for the population as a whole, sample sizes might become an issue as the method explicitly focuses on the observations closest to the cutoff, and the method exhibits potential sensitivity to functional form, e.g. nonlinear relationships (Khandker et al., 2010). Nonetheless, the method has been applied for instance in studying the effects of institutional ownership on tax avoidance (Khan, Srinivasan, & Tan, 2017) and the effects of debt covenant violations on CEO compensation (Balsam, Gu, & Mao, 2018).

5.4.2. Regression Discontinuity sample

Challenges in applying RD in our setting include sample selection and the definition of the running variable surrounding the cutoff value. Since our sample used for our earlier estimations was randomly composed of firms above the legal requirement across all sizes, we needed to select an additional sample for the purpose of RD estimation, focusing on the firms closest to the requirement. We again sampled unlisted Swedish limited liability companies owned by Swedish owners with the calendar year as accounting year, to ensure that our sample firms were affected by the changed legislation. As before, we applied the legal requirements stated in the Swedish Annual Accounts Act (SFS 1995:1554). However, this time, we wanted to form two groups of companies. One group above the legal threshold, and one below. Our approach to handling this issue, and thus for creating the two groups, is by lowering the requirement

by 20% in order to form the lower group and increasing the requirement by 30% in order to form the higher group. The reason for this was to have roughly the same number of companies on both sides of the cutoff. The ranges that resulted for the net turnover requirement are between 280 to 350 MSEK for the lower group and 350 to 455 MSEK for the higher group. For total assets, the ranges are 140 to 175 MSEK for the lower group and 175 to 227.5 MSEK for the higher group. For the employee requirement, the ranges are 200 to 250 for the lower group and 250 to 325 for the higher group. As can be seen in figure 1, this formed two groups, with 206 companies in the lower group and 178 companies in the higher group. A company was assigned to a group if it fulfilled the requirement at the previous boundary but not the next boundary. $TREAT_i$ is a dummy variable taking the value 1 if the company is required by law to produce a mandatory sustainability report, and 0 otherwise.

Figure 1. Illustration of RD sample formation.

Lower boundary, 80% of legal requirement	Legal requirement	Higher boundary, 130% of legal requirement
$TREAT_i = 0$	$TREAT_i = 1$	
N = 206	N = 178	

As earlier observed, some companies that are legally required to produce a sustainability report fail to do so. On the other hand, it might be the case that companies below the threshold produce sustainability reports despite being not legally required. Accordingly, the situation is characterized as a fuzzy discontinuity, as opposed to a sharp discontinuity where participation is deterministic above the threshold (Khandker et al., 2010). Running the estimation on the entire sample might produce clouded results. Therefore, to filter away those companies who violated the cutoff, i.e. those $TREAT_i = 1$ companies that did not produce a sustainability report, and those $TREAT_i = 0$ companies that did produce a sustainability report although not required to do so, we collected the annual reports from the year 2017 for each company using the website Retriever. We used the existence of a sustainability report or the reference to such a report as proxy for the publishing of a report, we did not look as thoroughly for them as in our previous data collection. As shown in table 10, out of the 178 companies forming our $TREAT_i = 1$ group, 36 did not include a sustainability report although being legally required to do so. On the other hand, out of our $TREAT_i = 0$ group, 54 companies included sustainability reports although not required to do so.

Table 10. From fuzzy RD-sample to sharp RD-sample.

|	$TREAT_i = 1$	$TREAT_i = 0$
Total sample, fuzzy	178	206
Less observations violating $TREAT_i$	36	54
Second sample, sharp	142	152

5.4.3. Running variable

In order to run the RD estimations, we needed to approximate the distance to the legal requirements for each company. Since research on this topic is scarce, we applied a modified version of Balsam et al.'s (2018) approach. We first calculated the distance for each requirement (net sales, total assets and employees) for each year (2015 and 2016). However, instead of dividing with the standard deviation of the financial measure as Balsam et al. (2018) did, we divided with the legal requirement. We then selected those observations that determined a company's assignment, i.e. those observations that fall short of the following boundary but not the previous one. We then took the mean of these observations resulting in our running variable $TOTMEAN_i$ which measures the average distance to the legal requirement, reaching from 0.8 to 1 for the lower group and 1 to 1.3 for the higher group. Accordingly, the cutoff value used in the RD estimations was $TOTMEAN_i = 1$ (see Appendix B for examples of our $TOTMEAN_i$ variable).

A potential concern is whether assignment of sustainability reporting is random, or if companies may manipulate their financial statements in order to avoid sustainability reporting. Research into this subject is again scarce, but a similar effect of companies avoiding thresholds is found for private European firms regarding financial reporting (Bernard, Burgstahler, & Kaya, 2018). Figure 2 displays the distribution of our total RD sample across the legal requirement. Rather interestingly, we note an uneven distribution around the threshold, with a smaller number just above compared to just below. To check the significance of this observation, we apply the density test developed by Cattaneo, Jansson, & Ma (2019). This yields a t-statistic of -1.60, indicating that manipulation of the running variable is insignificant at the 10% level. Thus, we do not find evidence of a manipulation surrounding the legal threshold.[6]

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[6] However, there is a possibility that significance would rise if sample size is increased, e.g. over time. We leave it to future research to investigate this possibility.

Figure 2. Histogram of distance to legal threshold.
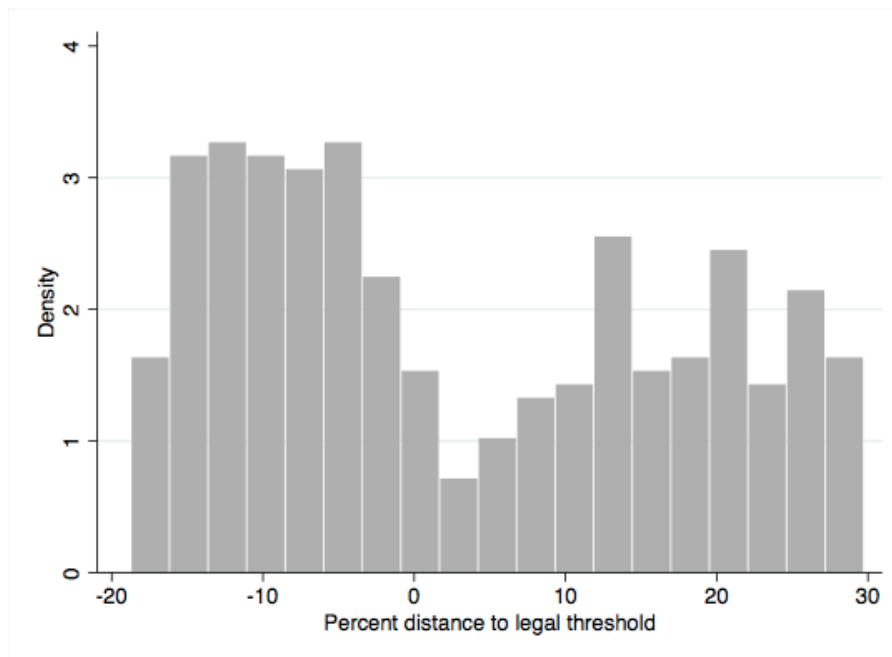
5.4.4. Descriptive statistics and univariate analysis

Table 11 provides summary statistics for our total RD sample. The great variance in our leverage measure can be attributed to that the analysis is done on individual accounts level, and not on group accounts as before. We motivate this choice through our research design, which accounts for endogeneity concerns that would otherwise raise questions about this approach. However, we test the underlying assumption through estimating the discontinuities surrounding ROA_i, $LNSALES_i$, $LNASSETS_i$ and LEV_i, the results of which are presented in table 13.

Table 11. Descriptive statistics, RD-sample.

	N	Mean	Std. Dev.	Min	Max
$TOTMEAN_i$	384	1.03	0.14	0.81	1.30
ROA_i	384	0.09	0.14	-0.58	0.84
$LNASSETS_i$	384	19.66	1.05	15.22	23.25
$LNSALES_i$	384	19.93	0.42	18.13	21.73
CL_i	384	0.01	0.02	0.00	0.37
$CDEBT_i$	384	0.05	0.33	0.00	5.48
LEV_i	384	11.48	46.80	0.00	588.67

$TOTMEAN_i$ is the distance to the legal requirement, as previously defined,
ROA_i is the ratio of earnings before interest expense to opening book value of total assets,
$LNASSETS_i$ is the natural logarithm of the closing book value of total assets,
$LNSALES_i$ is the natural logarithm of net sales,
CL_i is the ratio of total interest expense to opening book value of total liabilities,
$CDEBT_i$ is the ratio of total interest expense to opening book value of interest-bearing liabilities,
LEV_i is the ratio of total liabilities to equity, calculated using opening book values.

To further illustrate our sample, we performed t-tests of means, the results of which are displayed in table 12. As defined, the $TOTMEAN_i$ is significantly different across the two groups of companies. However, some concern is raised by the presence of significant differences in the means of $LNASSETS_i$ and $LNSALES_i$. Although fairly expected, that the larger group should have a greater mean, we also estimate the discontinuity across these two variables close to the cutoff as a robustness check.

Table 12. Univariate analysis of the RD-sample.

	TREAT = 1	TREAT = 0		Wilcoxon
	N = 178	N = 206	t-stat	z-stat
$TOTMEAN_i$	1.17	0.91	-39.98***	-16.90***
ROA_i	0.09	0.09	0.27	0.16
$LNASSETS_i$	19.81	19.54	-2.62**	-4.52***
$LNSALES_i$	20.03	19.85	-4.20***	-6.76***
CL_i	0.01	0.01	-1.36	-1.64
$CDEBT_i$	0.07	0.04	-1.01	-1.68
LEV_i	10.71	12.14	0.30	-0.75

$TOTMEAN_i$ is the distance to the legal requirement, as previously defined,
ROA_i is the ratio of earnings before interest expense to opening book value of total assets,
$LNASSETS_i$ is the natural logarithm of the closing book value of total assets,
$LNSALES_i$ is the natural logarithm of net sales,
CL_i is the ratio of total interest expense to opening book value of total liabilities,
$CDEBT_i$ is the ratio of total interest expense to opening book value of interest-bearing liabilities,
LEV_i is the ratio of total liabilities to equity, calculated using opening book values,
***, **, * indicate significance at 0.01, 0.05, 0.1 levels respectively.

5.4.5. Regression Discontinuity results

In this section, we present the results from our RD estimations. On either side of the cutoff, local non-parametric linear regressions were estimated, the results of which are displayed in tables 13 to 15. Following Khan et al. (2017), we employ the optimal bandwidth selection algorithm developed by Calonico, Cattaneo, & Titiunik (2014) to account for potential bias of significance levels arising from the employed bandwidth. A triangular kernel function was used in estimating the local polynomial estimators. As can be observed in the table below, we observe no significant discontinuities in the variables $LNASSETS_i$, LEV_i, ROA_i and $LNSALES_i$, as indicated by the weak z-statistics. In particular, the weak z-statistics of $LNASSETS_i$ and $LNSALES_i$ provide some assurance to the potential problem indicated by the univariate analysis.

Table 13. RD results from overall sample, fuzzy.

	LNASSETS$_i$	LEV$_i$	ROA$_i$	LNSALES$_i$
TREAT$_i$	-0.03	-32.3	0.07	-0.24
Z-stat.	-0.04	-1.11	1.33	-0.62
Optimal bandwidth	Yes	Yes	Yes	Yes
Number	384	384	384	384

TREAT$_i$ refers to the company being mandated to produce a sustainability report. The treatment effect is derived using non-parametric regression models on both sides of the cutoff, using the optimal bandwidth selection algorithm developed by Calonico et al. (2014),

LNASSETS$_i$ is the natural logarithm of the closing book value of total assets,

LEV$_i$ is the ratio of total liabilities to equity, calculated using opening book values,

ROA$_i$ is the ratio of earnings before interest expense to opening book value of total assets,

LNSALES$_i$ is the natural logarithm of net sales,

***, **, * indicate significance at 0.01, 0.05, 0.1 levels respectively.

The tables and graphs below display the results from our estimation of the regression discontinuities of the cost of total liabilities and the cost of interest-bearing liabilities. As displayed in table 14, the average treatment effect is -0.004 for cost of total liabilities, and -0.038 for cost of interest-bearing debt in the fuzzy estimation (where all observations were included). For our refined sharp sample, we observe an average treatment effect of -0.008 for cost of total liabilities and -0.068 for the cost of interest-bearing debt, as can be seen in table 15. However, as indicated by the small z-statistics, these effects are not statistically significant. Thus, we do not find support for a discontinuity around the statutory requirement. It can be noted from the graphical illustration in figure 3, as well as the z-statistics in table 15, that the effect is somewhat more pronounced in the case of sharp discontinuity. However, due to the small significance levels, this effect is far from certain and should be interpreted with caution.

Table 14. Results from fuzzy RD-estimation.

	CL$_i$	CDEBT$_i$
TREAT$_i$	-0.004	-0.038
Z-stat.	-0.67	-1.06
Optimal bandwidth	Yes	Yes
Number	384	384

TREAT$_i$ refers to the company being mandated to produce a sustainability report. The treatment effect is derived using non-parametric regression models on both sides of the cutoff, using the optimal bandwidth selection algorithm developed by Calonico et al. (2014),

CL$_i$ is the ratio of total interest expense to opening book value of total liabilities,

CDEBT$_i$ is the ratio of total interest expense to opening book value of interest-bearing liabilities,

***, **, * indicate significance at 0.01, 0.05, 0.1 levels respectively.

Table 15. Results from sharp RD-estimation.

	CL_i	$CDEBT_i$
$TREAT_i$	-0.008	-0.068
Z-stat.	-1.15	-1.16
Optimal bandwidth	Yes	Yes
Number	294	294

$TREAT_i$ refers to the company being mandated to produce a sustainability report. The treatment effect is derived using non-parametric regression models on both sides of the cutoff, using the optimal bandwidth selection algorithm developed by Calonico et al. (2014),
CL_i is the ratio of total interest expense to opening book value of total liabilities,
$CDEBT_i$ is the ratio of total interest expense to opening book value of interest-bearing liabilities,
***, **, * indicate significance at 0.01, 0.05, 0.1 levels respectively.

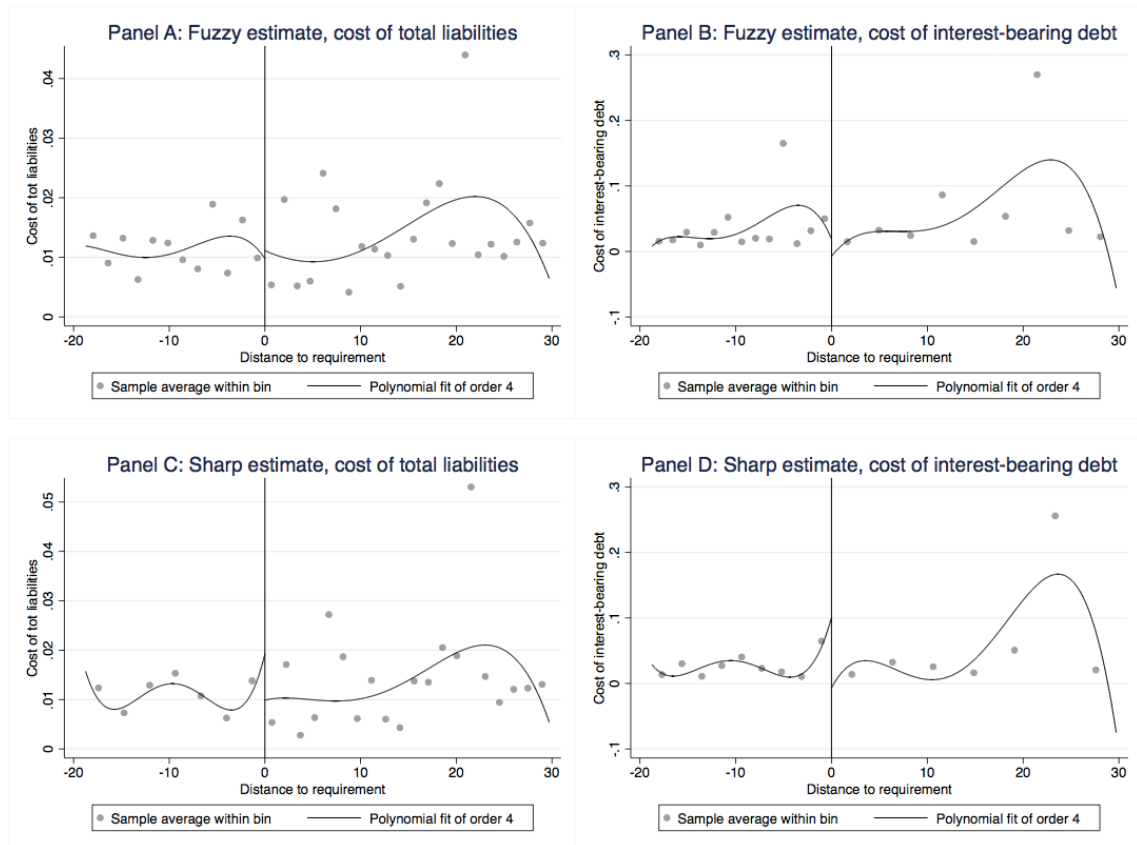**Figure 3.** Estimation of treatment effects using RD estimation.

Figure 3 provides a graphical illustration of the discontinuities surrounding the legal threshold. In panels A and B, where our fuzzy estimations are displayed, all observations are included. In panels C and D, the observations are filtered, so that all companies above the cutoff adhere to the requirement and no observation under the requirement produces a sustainability report although not required to do so. This is the sharp discontinuity.

6.   Discussion

6.1.   The issuing of a sustainability report

We acknowledge our observation that a sustainability report is only available for 75% of our sample companies. Although in line with the PwC (2018) study, where a sustainability report is found in 80% of cases, this raises some concern regarding the adoption of regulatory change.

Aiming to understand this variation, we find support for the influence of size and state ownership on the adoption of mandatory sustainability reporting. These findings are in line with what could be expected from legitimacy theory. Larger companies attract a higher level of stakeholder attention, and it should therefore be more important for them to embrace legislative reporting requirements in order to uphold their legitimacy. Adhering to statutory requirements is especially important for state-owned enterprises, since these companies are close to the government, and would presumably face a considerable loss in legitimacy if they did not abide to the requirement. Thus, our study adds to previous literature (e.g. Clarkson et al., 2008) by showing the explanatory power of legitimacy theory also for unlisted firms in the mandatory setting. This shows that, even though legitimacy concerns could be expected to be replaced by the coercive force of the law as sustainability reporting is made mandatory (La Torre et al., 2018), they are so strongly founded among businesses, that a transition takes time. The follow-up study by PwC (2019) indicates that the compliance rate is increasing, indicating that this shift is underway. Nevertheless, this finding raises questions regarding how effective legislative change is with respect to changing the reporting practices of firms.

Furthermore, we find an association between profitability and adherence to the new requirement, which is unlikely to be explained by legitimacy theory. Rather, this suggests that sustainability reporting is a costly activity, and that companies with smaller economic resources are more prone to abstaining from issuing such a report. Thus, this finding lends support to the critique of the Confederation of Swedish Enterprise, that the Swedish implementation of the directive is a costly process for companies (Alestig, 2015). However, it is still possible that mandatory sustainability reporting in private firms benefits the economy as a whole, in line with the similar effect of financial reporting suggested by Leuz (2010) and Leuz & Wysocki (2016). The information environment in the overall economy is likely to be improved, in line with Minnis & Shroff (2017). On the other hand, our experience how hard it could be just to find these sustainability reports raises some doubt about the extent of this effect.

Concerning corporate governance, our results do not support the influence of board size or CEO duality on the issue of a sustainability report. These findings are not in line with our hypotheses. The positive effects of a board size, as indicated by Chan et al. (2014),

Gibbins et al. (1990) and Guest (2009) are not found. It could be the case that the explanatory effect of board size is weak after controlling for firm size. Regarding CEO duality, we note that the Swedish law regulating limited liability companies does not require unlisted firms to have a CEO. Accordingly, this variable might not be suited to studying corporate governance in unlisted Swedish firms.

We did not find any statistically significant relationship between the adoption of mandatory sustainability reporting and accounting quality. Thus, our results do not support that firms that fail to comply with mandatory sustainability reporting requirements have a significant difference in accounting quality overall, neither in a negative direction (as suggested by Prior et al., 2008; Salewski & Zülch, 2014) or in a positive direction (as suggested by Chih et al., 2008).

6.2. The information contents of the sustainability reports

Considering the informational contents of the sustainability reports, we found substantial differences in total scores and subtotals across the different reporting areas, again confirming the findings of the PwC (2018) study of initial adoption.

As under the previous section, support is found for the influence of size and state ownership on the level of reporting. This can be seen as further evidence of the explanatory power of legitimacy theory in this setting, and that this theory can be used to explain not only the existence of these reports, but also their contents. According to this interpretation, stakeholders also care about the contents of these reports.

We note a significant positive relationship between GRI adoption and the extent of sustainability reporting. Even if this result is likely to be driven by a selection bias, that companies with a generally ambitious approach to sustainability reporting choose to apply GRI, it can also be interpreted as support for the use of frameworks and reporting guidance in order to achieve more elaborate reporting. This supports that disclosures provided in accordance with GRI are more likely to be balanced (Michelon et al., 2015). Although GRI has been criticized for not capturing the ecological dimension of sustainability (Milne & Gray, 2013), we propose that its use helps companies in complying with the reporting requirement, a finding which should attract interest from practitioners and policymakers.

On an additional note, we note the statistically significant relationship found between our reporting index score and the choice of auditor. This association can be interpreted as the auditor having influenced the extent of disclosure, possibly providing advice on the application of the law, or that firms with more ambitious reporting choose an auditor from a larger auditing firm. Nevertheless, this finding contributes to previous research (Gallery et al., 2008; Moroney et al. 2012) by showing the existence of this relationship in the setting of sustainability reporting in unlisted firms.

It can be questioned whether the information provided in these reports represent a fair picture of the companies' actual sustainability performance. Since we were unable to localize a source with quantitative data in this regard, we are not able to test the signaling versus greenwashing explanation, as tested by Mahoney et al. (2013). In other words, we are unable to test whether the signal truly captures the performance of the sender. Additionally, as discussed in our limitations section, our reporting index has not been tested and is subject to a degree of arbitrariness.

We do not find any evidence for a link between the informational content of the sustainability reports and corporate governance, nor to the accounting quality of the company. This result may be driven by the large concentration of family firms among Swedish unlisted firms (Andersson, Johansson, Karlsson, Lodefalk, & Poldahl, 2018). These firms are known to have concentrated ownership, and corporate governance problems are less pronounced for them than for large listed firms (Anderson & Reeb, 2003; Demsetz & Lehn, 1985). Regarding accounting quality, we are not able to find support for either the hypothesized self-interest pursuing behaviors of managements, nor that the myopia activities of managements have an impact on the extent of sustainability reporting. However, as we studied sustainability reporting in its infancy, it might be the case that an eventual relationship needs time to crystallize.

6.3. The impact of mandatory sustainability reporting on the cost of debt

Our results show no impact of sustainability reporting on the cost of debt of firms. This result was consistent across all OLS specifications as well as our RD design. This result enhances our understanding of sustainability reports as it differs from earlier results found in other settings.

For larger listed firms, sustainability disclosures reduced the forecasting errors of analysts thus providing a complementary role to financial disclosures (Dhaliwal et al., 2012; Dhaliwal et al., 2014), which indicates that the publishing of a sustainability report leads to lower risk for a provider of finance. This should be true also for the cost of debt of an unlisted firm, since determination of sustainability risks was one of the goals of the EU Directive (European Union, 2014).

To understand this difference, we apply signaling theory. Here, the sustainability report is seen as a signal containing information on the senders' sustainability risks and efforts. From this perspective, the quality of the signal and the receivers' interest in the signal can be discussed.

Regarding the quality of the signal, it might be the case that sustainability reporting done on a mandatory basis results in information of lower quality than if done on voluntary basis, following similar relationships for financial reporting quality for

unlisted firms (Bernard et al., 2016; Chi et al., 2013). Again, as we are unable to test the actual sustainability performance of a company, this question is best investigated by future researchers. Second, it has been suggested that sustainability information is more comparable and balanced when it is provided in accordance with GRI (Michelon et al., 2015). This entails that the quality of the signal should rise when GRI is applied. However, our estimations do not provide evidence that GRI referencing leads to lower cost of debt, as measured by cost of liabilities. Thirdly, there is a possibility that voluntary assurance raises the quality of the signal. Our discussion in the previous section indicates that a company's reporting score is positively associated with larger auditing firms, which opens for a possibility that there is indeed a relation between assurance and increased signal quality. However, this is not the focus of our study and is best investigated by future research.

Regarding the interest of the receiver, it might be discussed how interested the debtholders really are in the sustainability activities of the sender. First, we note that in the US, funds under management of Sustainable and Impact (SRI) investing has increased from $2 trillion dollars in 2003 to $12 trillion by the end of 2017 (US SIF Foundation, 2018). This rise is likely to have affected the focus on sustainability disclosures in the US and thus to have influenced the results of previous research in this setting (e.g. Dhaliwal el al., 2011; Plumlee et al., 2015). It is uncertain how wide-spread this effect is among debt-providers to Swedish unlisted firms. Our results would suggest that these finance providers lag behind. Second, in an international comparison, companies in Sweden and the other Scandinavian countries are deeply involved with their stakeholders and well-represented in the Dow Jones Sustainability Index (Strand & Freeman, 2015). Accordingly, sustainability performance is more likely to lead to improved financial performance, and sustainability information should be even more important as a complement to financial reporting (Dhaliwal et al., 2012). It might be the case that banks are still caught up with old-style transaction banking and have not fully incorporated sustainability risks into their overall risk assessments. This topic could be studied further by future researchers.

On a final note, our application of signaling theory on mandatory sustainability reporting does not lead to the discovery of a separating equilibrium. Thus, it would appear that the informational asymmetry remains (Connelly et al., 2011), and that the intended benefits of sustainability reporting fail to materialize. However, there is a case to be made that it creates a more positive information environment, and that it increases the focus on sustainability, thus contributing to the global strive towards a sustainable society.

7. Conclusion

Our study sheds light on some aspects of the new mandatory sustainability reporting requirement in Swedish unlisted firms. We show that legitimacy concerns are presumable drivers of both the adherence to the new reporting requirement, and the informational content of these reports. Regarding the publication of these reports, we also find indications of a relationship to profitability, suggesting that mandatory sustainability reporting is a costly process for firms. Regarding the informational content of the sustainability reports, we suggest a way of measuring the extent of information in these reports, showing that this score is impacted by size, application of GRI, choice of auditor and state ownership. Furthermore, we do not find support for an impact of mandatory sustainability reporting on the cost of debt in unlisted firms, to which there are multiple interpretations. On the one hand, mandatory sustainability reporting in its current form and usage may not spur the firms that perform well to disclose their performance. One the other hand, debtholders may not yet incorporate sustainability risks in their overall risk assessments. Together, both of these explanations suggest that sustainability reporting in its current form, and in its first year of adoption, might cost companies more than it provides benefits. However, we do not rule out that mandatory sustainability reporting increases the overall focus on sustainability in the economy, leading to long-term benefits for society at large.

8. Limitations

Our study has a number of limitations. First, the time frame is limited to one sole year. The relationships we find may change over time, why further research is needed in this respect. Second, our estimations are limited by the sample size. Ideally, an even larger number of companies could have been examined. Third, the study has an explicit focus on Swedish data, limiting the applicability of its results in other geographical settings. Fourth, our information content index is limited since it has not been verified. The reliability of our computed $SCOR_i$ values could have been further assured should both of us have read the included reports, although this was not possible due to language limitations.

9. Suggestions for future research

Our study indicates a number of directions for future research. One is to investigate companies close to the sustainability reporting threshold to see whether they manipulate their accounting to avoid reporting. Such relationships have been indicated for financial reporting in unlisted firms (Bernard et al., 2018), and our histogram displaying the distance to the legal requirement (figure 2 in section 5.4.3) indicates that searching for such a relationship might be fruitful. Furthermore, there are other areas that could be examined in relation to mandatory sustainability reporting in unlisted firms. One such area could be taxation. It could also be interesting to expand the geographical scope of the study and include observations from other countries. Also, it could be interesting to qualitatively study the production of a sustainability report within smaller unlisted firm. It would provide additional insights if the sample size was extended to include more years, so that it could be studied how sustainability reporting patterns change over time. Another topic which might be subject to further research is the voluntary assurance undertaken by some companies and whether that leads to the reporting being perceived as more reliable.

10. References

Alestig, P. (2015, April 28). *Svenska Dagbladet.* Retrieved April 20, 2020, from https://www.svd.se/svenskt-naringsliv-rasar-mot-regeringens-hallbarhetslag

Andersen, M. L., Hong, Y., & Olsen, L. (2012). Accruals quality and corporate social responsibility: The role of industry. *Journal of Accounting and Finance, 12*(2), 65-79.

Anderson, R. C., & Reeb, D. M. (2003). Founding-Family Ownership and Firm Performance: Evidence from the S&P 500. *The Journal of Finance, 58*(3), 1301-1328.

Andersson, F. W., Johansson, D., Karlsson, J., Lodefalk, M., & Poldahl, A. (2018). The characteristics of family firms: exploiting information on ownership, kinship, and governance using total population data. *Small Business Economics, 51*, 539–556.

Archambault, J. J., & Archambault, M. E. (2003). A multinational test of determinants of corporate disclosure. *The International Journal of Accounting, 38*(2), 173-194.

Balsam, S., Gu, Y., & Mao, C. X. (2018). Creditor Influence and CEO Compensation: Evidence from Debt Covenant Violations. *The Accounting Review, 93*(5), 23-50.

Bernard, D., Burgstahler, D., & Kaya, D. (2016). Disclosure Incentives and Data Availability for Private Firms: Implications for Comparisons of Public and Private Firm Financial Reporting Quality. Retrieved February 19, 2020, from SSRN: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2749747

Bernard, D., Burgstahler, D., & Kaya, D. (2018). Size management by European private firms to minimize proprietary costs of disclosure. *Journal of Accounting and Economics, 66*(1), 94-122.

Calonico, S., Cattaneo, M. D., & Titiunik, R. (2014). Robust nonparametric confidence intervals for regression-discontinuity designs. *Econometrica, 82*(6), 2295-2326.

Cattaneo, M. D., Jansson, M., & Ma, X. (2019). Simple Local Polynomial Density Estimators. *Journal of the American Statistical Association*, forthcoming.

Chan, M., Watson, J., & Woodliff, D. (2014). Corporate Governance Quality and CSR Disclosures. *Journal of Business Ethics, 125*, 59–73.

Chauvey, J., Cho, C., & Giordano-Spring, S. (2015). The Normativity and Legitimacy of CSR Disclosure: Evidence from France. *Journal of Business Ethics, 130*, 789–803.

Cheng, B., Ioannis, I., & Serafeim, G. (2014). Corporate Social Responsibility and Access to Finance. *Strategic Management Journal, 35*, 1-23.

Chi, W., Dhaliwal, D., Li, O. Z., & Lin, T.-H. (2013). Voluntary Reporting Incentives and Reporting Quality: Evidence from A Reporting Regime Change for Private Firms in Taiwan. *Contemporary Accounting Research, 30*(4), 1462-1489.

Chih, H.-L., Shen, C.-H., & Kang, F.-C. (2008). Corporate Social Responsibility, Investor Protection, and Earnings Management: Some International Evidence. *Journal of Business Ethics, 79*(1), 179–198.

Chow, C. W., & Wong-Boren, A. (1987). Voluntary Financial Disclosure by Mexican Corporations. *The Accounting Review, 62*(3), 533-541.

Clarkson, P. M., Fang, X., Li, Y., & Richardson, G. (2013). The relevance of environmental disclosures: Are such disclosures incrementally informative? *Journal of Accounting and Public Policy, 32*, 410-431.

Clarkson, P. M., Li, Y., Richardson, G. D., & Vasvari, F. P. (2008). Revisiting the relation between environmental performance and environmental disclosure: An empirical analysis. *Accounting, Organizations and Society, 33*(4-5), 303-327.

Connelly, B. L., Certo, S., Ireland, R., & Reutzel, C. R. (2011). Signaling Theory: A Review and Assessment. *Journal of Management, 37*(1), 39-67.

CSR Europe, GRI and Accountancy Europe. (2017). *Member State Implementation of Directive 2014/95/EU.* CSR Europe and GRI.

Danish Commerce and Companies Agency. (2011). *Corporate Social Responsibility and Reporting in Denmark.*

de Villiers, C., Naiker, V., & van Staden, C. J. (2011). The Effect of Board Characteristics on Firm Environmental Performance. *Journal of Management*, 1636–1663.

Dechow, P. M., Sloan, R. G., & Sweeney, A. P. (1995). Detecting Earnings Management. *The Accounting Review, 70*(2), 193-225.

Dechow, P., Ge, W., & Schrand, C. (2010). Understanding earnings quality: A review of the proxies, their determinants and their consequences. *Journal of Accounting and Economics, 50*, 344-401.

Demsetz, H., & Lehn, K. (1985). The Structure of Corporate Ownership: Causes and Consequences. *Journal of Political Economy, 93*(6), 1155-1177.

Dey, A. (2008). Corporate Governanceand Agency Conflicts. *Journal of Accounting Research, 46*(5), 1143-1181.

Dhaliwal, D. S., Li, O. Z., Tsang, A., & Yang, Y. G. (2011). Voluntary Nonfinancial Disclosure and the Cost of Equity Capital: The Initiation of Corporate Social Responsibility Reporting. *The Accounting Review, 86*(1), 59-100.

Dhaliwal, D. S., Radhakrishnan, S., Tsang, A., & Yang, Y. G. (2012). Nonfinancial Disclosure and Analyst Forecast Accuracy: International Evidence on Corporate Social Responsibility Disclosure. *The Accounting Review, 87*(3), 723-759.

Dhaliwal, D., Li, O. Z., Tsang, A., & Yang, Y. G. (2014). Corporate social responsibility disclosure and the cost of equity capital: The roles of stakeholder orientation and financial transparency. *Journal of Accounting and Public Policy, 33*(4), 328-355.

Eng, L., & Mak, Y. (2003). Corporate governance and voluntary disclosure. *Journal of Accounting and Public Policy, 22*(4), 325-345.

European Commission. (n.d.). *European Commission*. Retrieved May 2, 2020, from https://ec.europa.eu/info/business-economy-euro/company-reporting-and-auditing/company-reporting/non-financial-reporting_en

European Union. (2014). Directive as regards disclosure of non-financial and diveristy information by certain large undertakings and groups, 2014/95/EU.

Forker, J. J. (1992). Corporate Governance and Disclosure Quality. *Accounting and Business Research, 22*(86), 111-124.

Francis, J., Nanda, D., & Olsson, P. (2008). Voluntary disclosure, earnings quality, and cost of capital. *Journal of Accounting Research, 46*(1), 53-99.

Gallery, G., Cooper, E., & Sweeting, J. (2008). Corporate Disclosure Quality: Lessons from Australian Companies on the Impact of Adopting International Financial Reporting Standards. *Australian Accounting Review, 18*(3), 257-273.

Gelb, D. S., & Strawser , J. A. (2001). Corporate Social Responsibility and Financial Disclosures: An Alternative Explanation for Increased Disclosure. *Journal of Business Ethics, 33*, 1-13.

Ghoul, S. E., Guedhami, O., Kwok, C. C., & Dev, M. R. (2011). Does corporate social responsibility affect the cost of capital? *Journal of Banking & Finance, 35*(9), 2388-2406.

Gibbins, M., Richardson, A., & Waterhouse, J. (1990). The Management of Corporate Financial Disclosure: Opportunism, Ritualism, Policies, and Processes. *Journal of Accounting Research, 28*(1), 121-143.

GRI. (n.d.). Retrieved May 9, 2020, from https://www.globalreporting.org/information/news-and-press-center/press-resources/Pages/default.aspx

GRI. (2016). GRI 101: Foundation.

Gropp, R., & Guettler, A. (2018). Hidden gems and borrowers with dirty little secrets: Investment in soft information, borrower self-selection and competition. *Journal of Banking & Finance, 87*, 26-39.

Grunert, J., Norden, L., & Weber, M. (2005). The role of non-financial factors in internal credit ratings. *Journal of Banking and Finance, 29*(2), 509-531.

Guest, P. M. (2009). The impact of board size on firm performance: evidence from the UK. *The European Journal of Finance, 15*(4), 385-404.

Hahn, J., Todd, P., & Van der Klaauw, W. (2001). Indentification and estimation of treatment effects with a Regression-discontinuity design. *Econometrica, 69*(1), 201-209.

Haniffa, R., & Cooke, T. (2002). Culture, Corporate Governance and Disclosure in Malaysian Corporations. *Abacus, 38*(3), 317-349.

Hartman, J. (1998). *Vetenskapligt tänkande: Från kunskapsteori till metodteori.* Lund: Studentlitteratur.

Hoepner, A., Oikonomou, I., Scholtens, B., & Schröder, M. (2016). The Effects of Corporate and Country Sustainability Characteristics on The Cost of Debt: An International Investigation. *Journal of Business Finance and Accounting, 43*(1-2), 158-190.

Hope, O.-K., Thomas, W. B., & Vyas, D. (2013). Financial Reporting Quality of U.S. Private and Public Firms. *The Accounting Review, 88*(5), 1715-1742.

Hoque, Z. (2018). *Methodological issues in accounting research* (2nd Edition ed.). London: Spiramus Press.

Ioannou, I., & Serafeim, G. (2017). The Consequences of Mandatory Corporate Sustainability Reporting. *Working Paper 11-100*. Harvard Business School.

Jizi, M. I., Salama, A., Dixon, R., & Stratling, R. (2014). Corporate Governance and Corporate Social Responsibility Disclosure: Evidence from the US Banking Sector. *Journal of Business Ethics, 125*, 601–615.

Johansson, S.-E., & Runsten, M. (2013). *Företagets lönsamhet, finansiering och tillväxt* (3:8 ed.). Lund: Studentlitteratur AB.

Jones, J. J. (1991). Earnings Management During Import Relief Investigations. *Journal of Accounting Research, 29*(2), 193-228.

Jung, J., Herbohn, K., & Clarkson, P. (2018). Carbon Risk, Carbon Risk Awareness and the Cost of Debt Financing. *Jounal of Business Ethics, 150*, 1151–1171.

Khan, M., Srinivasan, S., & Tan, L. (2017). Institutional Ownership and Corporate Tax Avoidance: New Evidence. *The Accounting Review, 92*(2), 101-122.

Khandker, S. R., Koolwal, G. B., & Samad, H. A. (2010). *Handbook on impact evaluation: Quantitative methods and practices.* Washington DC: The World Bank.

Kim, Y., Park, M. S., & Wier, B. (2012). Is Earnings Quality Associated with Corporate Social Responsibility? *The Accounting Review, 87*(3), 761-796.

Kjørup, S. (1999). *Människovetenskaperna: Problem och traditioner i humanioras vetenskapsteori.* Lund: Studentlitteratur AB.

Kothari, S. P., Leone, A. J., & Wasley, C. E. (2005). Performance mathced discretionary accrual measures. *Journal of Accounting and Economics, 39*, 163-197.

La Torre, M., Sabelfeld, S., Blomkvist, M., Tarquinio, L., & Dumay, J. (2018). Harmonising non-financial reporting regulation in Europe: Practical forces and projections for future research. *Meditari Accountancy Research, 26*(4), 598-621.

Leuz, C. (2010). Different approaches to corporate reporting regulation: How jurisdictions differ and why. *Accounting and Business Research, 40*(3), 229-256.

Leuz, C., & Wysocki, P. D. (2016). The Economics of Disclosure and Financial Reporting Regulation: Evidence and Suggestions for Future Research. *Journal of Accounting Research, 54*(2), 525-622.

Li, J., Pike, R., & Haniffa, R. (2008). Intellectual capital disclosure and corporate governance structure in UK firm. *Accounting and Business Research, 38*(2), 137-159.

Liberti, J. M., & Petersen, M. A. (2019). Information: Hard and Soft. *The Review of Corporate Finance Studies, 8*(1), 1–41.

Lindblom, C. K. (1994). The implications of organizational legitimacy for corporate social performance and disclosure. *Critical Perspectives on Accounting Conference.*

Mahoney, L. S., Thorne, L., Cecil, L., & LaGore, W. (2013). A research note on standalone corporate social responsibility reports: Signaling or greenwashing? *Critical Perspectives on Accounting, 24*, 350-359.

Meek, G. K., Roberts, C. B., & Gray, S. J. (1995). Factors Influencing Voluntary Annual Report Disclosures by U.S, U.K. and Continental Multinational Corporations. *Journal of International Business Studies, 26*(3), 555-572.

Michelon, G., Pilonato, S., & Ricceri, F. (2015). CSR reporting practices and the quality of disclosure: An empirical analysis. *Critical Perspectives on Accounting, 33*, 59-78.

Milne, M. J., & Gray, R. (2013). W(h)ither Ecology? The Triple Bottom Line, the Global Reporting Initiative, and Corporate Sustainability Reporting. *Journal of Business Ethics, 118*, 13-29.

Minnis, M., & Shroff, N. (2017). Why regulate private firm disclosure and auditing? *Accounting and Business Research, 47*(5), 473-502.

Mitra, A. (2011). Multicollinearity. In *Encyclopedia of Measurement and Statistics* (639-640). Thousand Oaks: Sage Publications, Inc.

Moroney, R., Windsor , C., & Aw, Y. (2012). Evidence of assurance enhancing the quality of voluntary environmental disclosures: an empirical analysis. *Accounting and Finance, 52*(3), 903-939.

Moser, D. V., & Martin, P. R. (2012). A Broader Perspective on Corporate Social Responsibility Research in Accounting. *The Accounting Review, 87*(3), 797-806.

Muijs, D. (2011). Introduction to Quantitative Research. In *Doing Quantitative Research in Education with SPSS* (1-12). London: SAGE Publications, Ltd.

Newbold, P., Carlson, W. L., & Thorne, B. M. (2013). *Statistics for Business and Economics.* Essex: Pearson Education Limited.

O'Donovan, G. (2002). Environmental disclosures in the annual report: Extending the applicability and predictive power of legitimacy theory. *Accounting, Auditing & Accountability Journal, 15*(3).

Pae, S. (2002). Discretionary disclosure, efficiency, and signal informativeness. *Journal of Accounting and Economics, 33*, 279-311.

Patten, D. M. (1991). Exposure, legitimacy, and social disclosure. *Journal of Accounting and Public Policy, 10*(4), 297-308.

Plumlee, M., Brown, D., Hayes, R. M., & Marshall, R. (2015). Voluntary environmental disclosure quality and firm value: Further evidence. *Journal of Accounting and Public Policy, 34*, 336-361.

Prior, D., Surroca, J., & Tribó, J. A. (2008). Are Socially Responsible Managers Really Ethical? Exploring the Relationship Between Earnings Management and Corporate Social Responsibility. *Corporate Governance: An International Review, 16*(3), 160-177.

Prop. 2015/16:193 (2016). *Företagens rapportering om hållbarhet och mångfaldspolicy.*

PwC. (2018). *Stora brister i lagstadgade hållbarhetsrapporter.* PricewaterhouseCoopers i Sverige AB.

PwC. (2019). *En lägesrapport 2019: Oroväckande brister i rapporteringen av företagens hållbarhetsarbete.* PricewaterhouseCoopers i Sverige AB.

Qiu, Y., Shaukat, A., & Tharyan, R. (2016). Environmental and Social Disclosures: Link with Corporate Financial Performance. *The British Accounting Review, 48*(1), 102-116.

Reifman, A., & Keyton, K. (2012). Winsorize. In *Encyclopedia of Research Design* (1637-1638). Thousand Oaks: SAGE Publications, Inc.

Rosa, F. L., Liberatore, G., Mazzi, F., & Terzani, S. (2018). The impact of corporate social performance on the cost of debt and access to debt financing for listed European non-financial firms. *European Management Journal, 36*(4), 519-529.

Salewski, M., & Zülch, H. (2014, February 17). *The Association between Corporate Social Responsibility (CSR) and Earnings Quality – Evidence from European Blue Chips.* Retrieved February 26, 2020, from https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2141768

SFS 1995:1554. Årsredovisningslag.

SFS 2016:947. Lag om ändring i årsredovisningslagen (1995:1554).

Shleifer, A. (2004). Does Competition Destroy Ethical Behavior? *American Economic Review, 94*(2), 414-418.

Strand, R., & Freeman, R. E. (2015). Scandinavian Cooperative Advantage: The Theory and Practice of Stakeholder Engagament in Scandinavia. *Journal of Business Ethics, 127*, 65-85.

Svea Ekonomi AB. (n.d.). Hållbarhetsrapport 2017.

Swedish House of Finance. (n.d.). Retrieved February 1, 2020, from Download the Serrano dataset for Stata or SAS: https://data.houseoffinance.se/serrano/index

Thurén, T. (1991). *Vetenskapsteori för nybörjare* (1st edition ed.). Malmö: Liber AB.

United Nations. (2012, September 11). A/RES/66/288. The future we want.

US SIF Foundation. (2018). *Sustainable and Impact Investing - Overview.* US SIF Foundation.

Wiseman, J. (1982). An Evaluation of Environmental Disclosures made in Corporate Annual Reports. *Accounting, Organizations and Society, 7*(1), 53-63.

Ye, K., & Zhang, R. (2011). Do Lenders Value Corporate Social Responsibility? Evidence from China. *Journal of Business Ethics, 104*(2), 197-206.

Yermack, D. (1996). Higher market valuation of companies with a small board of directors. *Journal of Financial Economics, 40*(2), 185-211.

11. Appendix

Appendix A.

The Modified Jones Model used to estimate the discretionary accruals for each observation is specified in the following manner by Dechow et al. (1995):

$$\frac{TA_{it}}{A_{it-1}} = \alpha_i [\frac{1}{A_{it-1}}] + \beta_{1i} \left[\frac{(\Delta REV_{it} - \Delta REC_{it})}{A_{it-1}} \right] + \beta_{2i} \left[\frac{PPE_{it}}{A_{it-1}} \right] + \varepsilon_{it}$$

Where:

TA_{it} equals total accruals of firm i in the year t. TA_{it} is given by [*ΔCurrent assets - ΔCash*] *– ΔCurrent liabilities – Depreciation and amortization expense,*

A_{it-1} equals total assets at time t-1,

ΔREV_{it} equals the change in net sales from time t-1 to time t,

ΔREC_{it} equals the change in receivables from time t-1 to time t,

PPE_{it} equals gross property, plant and equipment at time t,

ε_{it} is an error term.

Appendix B.

The running variable in our regression discontinuity analysis is calculated as follows:

$$TOTMEAN_i = \frac{\sum Diff_i}{\sum Ndiff_i}$$

Where $TOTMEAN_i$ is the mean distance from the legal requirements, $Diff_i$ is an observation of a requirement variable, fulfilled at the lower boundary but not the higher, and $Ndiff_i$ is the number of $Diff_i$ observations for an individual firm. Recall that the legal threshold that needed to be fulfilled was to meet more than one of the following conditions (SFS 1995:1554):

- The average number of employees in the company has been more than 250 during each of the last two financial years,

- The company's reported total assets for each of the last two financial years amounted to more than SEK 175 million;

- The company's reported net sales for each of the last two financial years amounted to more than SEK 350 million.

Thus, a company with the following values would meet the requirements to produce a sustainability report and belong to the $TREAT_i = 1$ group:

Table 16. Example of $TOTMEAN_i$ calculation.

	2015	2016
Net sales (million SEK)	500	525
Total assets (million SEK)	185	250
Employees	50	60

Recall also that our higher boundary was 130% of the legal requirement, i.e. employees of 325, total assets of 227.5 MSEK, and net sales of 455 MSEK. Our example company above fulfills the net sales and total assets requirement at the legal boundary, but not at the higher boundary, since total assets in 2015 were too low. Thus, the $TOTMEAN_i$ value of this company would be:

$$TOTMEAN_i = \frac{\frac{185}{175}}{1} = 1.06$$

Appendix C.

Table 17. VIF-tests equation 2.

	VIF	Tolerance
$CEODUAL_i$	1.05	0.95
GRI_i	1.05	0.95
$SIZE_i$	1.10	0.91
$BIG4_i$	1.11	0.90
$BOARDS_i$	1.17	0.86
LEV_i	1.24	0.81
ROA_i	1.25	0.8
$INDUSTRY_i$	1.36	0.74
$ACCQUAL_i$	1.40	0.71
$STATEOWN_i$	1.40	0.71
Mean VIF	1.21	

$CEODUAL_i$ takes the value one if the company CEO is also the chairman of the board of directors, and zero otherwise,

GRI_i takes the value one if the company refers to the GRI framework in their sustainability report, and zero otherwise,

$SIZE_i$ measures the natural logarithm of the closing balance of total assets,

$BIG4_i$ takes the value one if the company has a Big 4 auditor, and zero otherwise,

$BOARDS_i$ takes the value one if the company has between four and nine members on the board of directors, and zero otherwise,

LEV_i is the ratio of total liabilities to equity, calculated using opening book values,

ROA_i is the ratio of earnings before interest expense to opening book value of total assets,

$INDUSTRY_i$ measures the profile of the company's industry, taking the value one for low-profile industries, three for high-profile industries and two otherwise,

$ACCQUAL_i$ measures the discretionary accruals of the company according to the modified Jones model (Dechow et al., 1995),

$STATEOWN_i$ takes the value one if the company is state-owned, and zero otherwise.

Table 18. VIF-test equation 3.

	VIF	Tolerance
ROA_i	1.04	0.96
$INDUSTRY_i$	1.04	0.96
LEV_i	1.10	0.91
GRI_i	1.64	0.61
$SCOR_i$	1.64	0.61
Mean VIF	1.29	

ROA_i is the ratio of earnings before interest expense to opening book value of total assets,

$INDUSTRY_i$ measures the profile of the company's industry, taking the value one for low-profile industries, three for high-profile industries and two otherwise,

LEV_i is the ratio of total liabilities to equity, calculated using opening book values,

GRI_i takes the value one if the company refers to the GRI framework in their sustainability report, and zero otherwise,

$SCOR_i$ is the informational content score of the company's sustainability report.

Table 19. VIF-test equation 4.

	VIF	Tolerance
INDUSTRY$_i$	1.05	0.95
ROA$_i$	1.06	0.95
LEV$_i$	1.10	0.91
GRI$_i$	1.17	0.85
ISSUE$_i$	1.20	0.83
Mean VIF	1.12	

INDUSTRY$_i$ measures the profile of the company's industry, taking the value one for low-profile industries, three for high-profile industries and two otherwise,
ROA$_i$ is the ratio of earnings before interest expense to opening book value of total assets,
LEV$_i$ is the ratio of total liabilities to equity, calculated using opening book values,
GRI$_i$ takes the value one if the company refers to the GRI framework in their sustainability report, and zero otherwise,
ISSUE$_i$ takes the value one if the company has published an accessible sustainability report in 2017, and zero otherwise.