

Mandatory CSR reporting and the effect on debt financing: A study on Swedish private firms

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ABSTRACT

The topic of CSR has become increasingly important in the last decades, however the empirical evidence on both the economic effects of CSR reporting on the cost of debt and on private firms are limited and inconclusive. In this thesis, we address the gap in this novel area of literature. We examine the economic effects of mandatory corporate social responsibility (CSR) reporting on private firms' cost of debt. The study follows a quantitative method using data from the Swedish database Serrano, studying Swedish private firms during the post-enforcement period 2017-2020. Exploiting discontinuous CSR reporting requirements assigned to otherwise similar private firms, a multivariate regression discontinuity design is applied to investigate the effects of adopting a CSR reporting mandate around the threshold. The main results do not show any statistically significant evidence for a relationship between the CSR reporting mandate and Swedish private firms' cost of debt. The results are robust both to a matched sample and a trimmed sample. However, we point out the possibility that similar tests could generate different results in a future different regulatory context.

Keywords:

Corporate social responsibility, CSR reporting, mandatory reporting, information asymmetry, regression discontinuity

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1. Introduction

For decades, worldwide companies and top executives have increasingly allocated more time, efforts and resources on corporate social responsibility (CSR) activities as a response to the mounting pressure of doing “good” while doing businesses (Christensen et al., 2021). Along with the growing interest in socially responsible investments, there is a steady growth in demand for firm disclosure of CSR information, which refers to non-financial information related to corporate practices and is summarized through three pillars: environmental aspects, social aspects and corporate governance aspects, respectively (Christensen et al., 2021). In Europe, the growing demand for relevant and faithfully presented non-financial disclosures resulted in the Non-Financial Reporting Directive in 2014, known as the NFRD (2014/56/EU). More recently, a new directive on corporate sustainability reporting (Corporate Sustainability Reporting Directive, CSRD) was approved and is expected to amend the NFRD for fiscal years starting from 2024 (European Parliament, 2022). The non-financial “CSR reporting” mandate aims to provide investors, consumers and various other stakeholders with useful information to make investment decisions, and at the same time drive changes in corporate behaviors, influencing companies to take a more environmentally and socially responsible business approach.

Despite the growing interest in CSR disclosure, the debate on mandatory CSR reporting (versus voluntary CSR disclosures) remains ongoing and controversial. For policy makers, mandatory CSR reporting might result in desirable or undesirable effects. On the one hand, it might increase the level and specificity of disclosed information, resulting in improved and harmonized reporting practices across firms and industries (Christensen et al., 2021), which would facilitate benchmarking. On the other hand, mandatory reporting might be a double-edged sword, causing firm resistance and unintended consequences (Christensen et al., 2021; Leuz & Wysocki, 2016). For enterprises, mandatory reporting is a trade-off between undesirable increased costs related to the reporting (Bushee & Leuz, 2005; Christensen et al., 2021; Daske et al., 2013) and reducing the information asymmetry issues between firms and capital providers, leading to a lower cost of capital (Healy & Palepu, 2001; Leuz & Wysocki, 2016). Thus, these contradictory effects and tradeoffs is of great importance for both executives and regulators so that CSR disclosures can drive changes as suggested by Christensen et al. (2021). In this thesis, we attempt to study the effects of a CSR reporting mandate on private firms’ risk profile, particularly, on the cost of debt.

Prior research on the topic of enhanced disclosure and cost of capital provides ambiguous results. On the one hand, several studies have documented a negative relationship between increased disclosure and the cost of capital (Core, 2001; Healy & Palepu, 2001; Verrecchia, 2001). Particularly, firms’ commitment to increased disclosure reduces both the agency and the information asymmetry problems, resulting in a lower cost of capital. Moreover, numerous studies find that enhanced disclosure lowers the information risk for investors, thus reducing the cost of capital (Botosan, 2006; Botosan & Plumlee, 2002; Diamond & Verrecchia, 1991; Lambert et al., 2007). Clark et al. (2015) also find that greater CSR performance results in lower cost of capital. Sengupta (1998) suggest that informative and timely disclosure results in a lower borrowing cost

for firms. More recently, Kleimeier and Viehs (2018) find a negative relationship between CSR performance and loan spreads, implying that better CSR performance lowers the cost of debt. On the other hand, Grewal et al. (2018) finds that equity market on average reacts negatively to events at the passage of the EU CSR reporting mandate, implying that equity investors perceive CSR disclosure as costly. This is consistent with Bushee and Leuz (2005) and Leuz and Wysocki (2016) who claim that mandatory disclosure can have undesirable consequences such as significant costs for firms. Moreover, Izzo and Magnanelli (2012) find a positive relation between CSR performance and the cost of debt, implying that CSR is not a value driver with a positive impact on firm's risk profile.

Thus, our interest in studying the economic effects of mandatory CSR reporting on private firms' cost of debt is motivated by the following reasons. The ongoing development of EU's CSR reporting mandate (NFRD), along with the stricter Swedish implementation of the EU directive may imply greater proprietary costs as well as more resources to be allocated to producing the CSR reporting for the subjected firms. Thus, improving our understanding of the key economic tradeoff and economic effects that the reporting mandate has could provide important implications not only for regulators but also for academia and practitioners. However, prior research has been more focused on analyzing the CSR activities themselves and less so on CSR reporting, since conducting empirical analysis on a CSR reporting mandate has proven difficult (Christensen et al., 2021). Secondly, contemporary research has paid little attention to private firms because they are exempted from the mandatory CSR reporting in the NFRD, and thus also in most countries. Private firms are also less studied in general since they per definition are not listed and therefore are of less interest to the public. Accordingly, there is little empirical knowledge about private firms in this area of research, despite the fact that they account for the majority of total firms in most countries. The unique setting in Sweden in this matter therefore has great potential for providing new insights on the economic implications of a CSR reporting mandate on the cost of debt for private firms, which according to prior research are often associated with public debt offerings and public traded debts (Christensen et al., 2021). Thirdly, extant literature focuses on the effect of stakeholder orientation on equity holders (Deng et al., 2013; Flammer & Kacperczyk, 2016; Jensen, 2001; Pagano & Volpin, 2005) whereas the effect of stakeholder orientation on debtholders is relatively understudied (Breuer et al., 2018).

In this paper, we examine the economic effects of adopting EU's mandatory CSR reporting directive (NFRD 2014/56/EU) for Swedish private firms. We have chosen the Swedish setting for two reasons. First, Swedish firms are in the forefront in CSR disclosure in comparison with other European countries. Second, Sweden has chosen to apply a stricter implementation and in a wider scope of the EU directive compared to other European countries. The Swedish regulation requires not only public but also private firms that fulfill the criteria in the Swedish Annual Accounts Act (Swe: Årsredovisningslagen, 1995:1554) to issue an annual CSR report. This unique private-firm setting allows us to investigate the causal link between CSR reporting on private firms' cost of debt, which has not been studied before.

Based on prior research about private firms, stakeholder orientation, CSR reporting, cost of capital and cost of debt, theory on information asymmetry, we restate our research question in a null hypothesis.

To conduct the research, we use a sample of Swedish private firms during the post-enforcement period 2017-2020. The sample comes from Serrano and consists of non-financial privately owned Swedish firms. Subsequently, we apply a multivariate regression discontinuity design as suggested by Breuer et al. (2018) and Reardon and Robinson (2012) to study the effect of the CSR reporting mandate around the thresholds. This research design allows us to exploit the variation between the treated firms (firms that are subjected to the mandate) and control firms (firms not subjected to the mandate). Thus, this design enables us to explore the impact of the Swedish CSR reporting mandate on private firms' cost of debt.

Particularly, we test our hypothesis applying a regression discontinuity design and perform regression analysis on four separate outcome variables based on external interest expenses and total financial expenses. The main results show no statistically significant evidence of effects of the Swedish CSR reporting mandate on the firms' cost of debt. The robustness of our main results is then tested in two separate ways. First, we run a regression analysis on an alternative matched sample based on the propensity score matching method. We find that the results from the matched sample are consistent with the main results, implying that our main results are relatively robust. Second, we conduct an identical regression as in the main tests, but on a sample where the extreme values are trimmed instead of winsorized. In this way, we also show that the results are robust for handling the extreme values (a significant portion) in different ways.

Our paper contributes to the literature in several ways. First, we take the first step to address and reduce the research gap in the empirical literature and open up avenues for further research, since the literature on the topics of economic effects of CSR reporting on the cost of debt is limited and inconclusive. Moreover, we provide results on private firms, which is also an understudied area in the accounting literature. As mentioned, an important intention of requiring companies to engage in CSR reporting is for it to result in real effects by driving corporate changes towards more sustainable business practices. Nevertheless, the traditional purpose of firms to generate financial returns for their shareholders is also still important. Therefore, our aim with this study is to contribute to the literature on the financial effects of non-financial (CSR) reporting, mandated via legislation. Furthermore, examining the link between mandatory CSR reporting and private firms' cost of debt can help firm managers, stakeholders and policy makers as well as academics to understand the economic effects of CSR reporting on firms' financing costs and hence show implications bring important insights for strategic planning.

The remainder of the paper is organized as follows: section 2 begins with a literature review in which existing research is presented, critically reviewed and discussed. Subsequently, the theoretical framework and hypothesis development is presented. Section 3 describes the data collection, research design as well as the definitions and statistics of outcome, explanatory and

control variables. In section 4, the empirical results are presented, followed by a synthesized discussion of the main results from a theoretical and methodological point of view. Section 5 presents some additional robustness tests of the results. Finally, section 6 concludes our findings, summarizes the limitations of the study as well as gives suggestions for future research.

2. Literature review

In this section, previous literature is discussed. First, the concepts of Corporate Social Responsibility (CSR) and CSR Reporting is introduced; followed by a discussion of voluntary versus mandatory disclosure. Second, we go through the regulation related to CSR reporting in EU and Sweden. Third, a literature review on information asymmetry and the implications on the effects of CSR disclosure on firms, banks and the cost of debt is done. After concluding the review, we present the theoretical framework for the study, followed by the development of our research hypothesis.

2.1 The concept of Corporate Social Responsibility (CSR) and CSR Reporting

The concept of CSR today has its roots in corporate philanthropy in the early 1900s, which associates CSR with corporates showing support for social causes through donation and community foundation (ACCP, 2021). After over a century of development, recent literature defines CSR as “corporate activities and policies that assess, manage and govern a firm’s responsibilities for and impacts on society and the environment” (Christensen et al., 2021, p. 6). With the goal of making businesses more sustainable for the environment and improving social welfare, CSR implies that firms are bound to pursue a broader objective than maximizing their financials and market value, namely meeting the needs and expectations of a wider set of stakeholders and community (Christensen et al., 2021).

The ongoing development of CSR over time has proven that traditional financial reports, which consist of financial statements and disclosures over a certain time period, are inadequate (Simnett et al., 2009). Since they do not reflect the multidimensional aspects of corporate businesses, new financial and non-financial metrics have been developed to address this issue (Simnett et al., 2009). As a result, firms started to disclose non-financial reports, today called CSR reports or sustainability reports, to meet the information needs of a broader set of stakeholders than just the investors (Simnett et al., 2009). In other words, CSR reports can be seen as the non-financial equivalent of financial reports (Simnett et al., 2009). Substantially, CSR reporting measures, disclose and communicate firms’ CSR efforts, risks and policies (Christensen et al., 2021). Subsequently, a CSR report is an internal and external-based document that companies disclose with the purpose of measuring, communicating and disclosing information about corporate CSR efforts (Christensen et al., 2021; Cote, 2021). Corporate CSR efforts can be summarized into four dimensions: namely environmental, ethical, philanthropic and economic (Christensen et al., 2021; Cote, 2021).

CSR reporting standards govern how CSR information should be disclosed and reported (Christensen et al., 2021; Cote, 2021). An important aspect of CSR reporting is the scope of the report, or in other words, to what extent the CSR information should be disclosed and for whom CSR information is intended. On the one hand, CSR information can be useful to the investors in forecasting future cash flows and assessing firm risks (Christensen et al., 2021; Dhaliwal et al., 2011, 2012). In other words, such information shows the effects of CSR on firms’ value and

performance (Dhaliwal et al., 2011, 2012). On the other hand, CSR information can also be associated with the impacts of firms' CSR actions on a wide range of stakeholders (Christensen et al., 2021). In other words, CSR information is not only financially material but also impact-based, which is referred to as double materiality, meaning that CSR information is intended not only for investors but a diverse set of audiences (Christensen et al., 2021).

2.1.1 Implications for voluntary disclosure versus mandatory CSR disclosure

Firms' CSR reporting might be voluntary or mandatory. Extant literature on firms' disclosure shows that the topic of voluntary disclosure versus mandatory disclosure remains controversial. Numerous studies have looked into voluntary disclosure and revealed that firms' disclosure choices reflect their preferences for disclosure and how they perceive disclosures in terms of benefits and costs (Christensen et al., 2021; Daske et al., 2013). Specifically, firms that choose to disclose are more likely to find reporting beneficial (Christensen et al., 2021; Daske et al., 2013). On the contrary, firms that find reporting costly often postpone disclosing until a reporting mandate is in place (Christensen et al., 2021; Daske et al., 2013). This is also in line with Bushee and Leuz (2005) that claim firms refuse to comply with disclosure mandates when the costs of disclosure outweigh the benefits. Thus, voluntary disclosure often leads to a lack of harmonized reporting, which makes it more difficult to compare and benchmark between firms. Moreover, it is well documented that large firms and firms that operate in the regulated market are more likely to provide disclosure specificity and quantitative metrics, while smaller firms and firms that operate in unregulated markets do not (Bushee & Leuz, 2005; Christensen et al., 2021). Moreover, due to the agency problems, meaning that managers have incentives to make self-serving voluntary disclosures, investors tend to perceive voluntary disclosure as less credible (Healy & Palepu, 2001, 2001). Yet, it has been shown that the credibility issue of voluntary disclosure can be mitigated with the use of assurance provided by a third party (Minnis, 2011).

Mandatory CSR reporting refers to the adoption of formal CSR reporting standards that provide guidance on how firms disclose and structure their CSR information (Christensen et al., 2021). Consequently, reporting mandates and enforcements might alleviate the drawbacks of voluntary reporting in terms of reporting harmonization and increasing the level and specificity of disclosed information in the case of smaller firms and firms in less regulated sectors (Christensen et al., 2021). As the existence of a CSR reporting mandate means moving towards more standardized CSR reports, it would increase the comparability between firms in the same industry (Christensen et al., 2021). However, it is documented that reporting mandates can be politically expedient and thus brings unintended consequences (Christensen et al., 2021; Leuz & Wysocki, 2016). Christensen et al. (2021) suggest that the harmonization effects of financial reporting standards are limited, which can likely be the case for CSR reporting standards due to its multi-dimensional, long-term and non-monetary nature.

2.2 From NFRD to ÅRL – regulation developments on CSR reporting in Sweden

2.2.1 EU regulations on CSR reporting – Non-Financial Reporting Directive (NFRD)

For the purpose of this paper, we are going to look at the European regulations on CSR reporting as they direct the Swedish regulations. The European Commission (n.d.) defines CSR as “the responsibility of the enterprises for their impact on society”. This refers to the integration of social, environmental, ethical, consumer, and human rights concerns into the business strategy and operations of the firms. In 2014, the European Union (EU) introduced the Non-Financial Reporting Directive (NFRD 2014/56/EU), which applies the “double materiality” perspective on CSR reporting. This means that companies should not only report on how CSR issues materially affect investors’ decision making and firms’ long-term value creation, but also on externalities that are created due to their business activities, and thus affect various stakeholders around them (Christensen et al., 2021; European Commission, n.d.).

The reporting mandate came into effect for all EU member countries starting 2017, meaning that the first reports subjected to the mandate were published during 2018. It was then updated in 2022 and is now called the Corporate Sustainability Reporting Directive (CSRD). However, we will in this paper still refer to it as the NFRD since our study relies on data from the period before the update of the directive, and we therefore assume that the effects we study will primarily be related to the pre-update version. However, one should be mindful regarding the possibility that the updated version has had real implications even before it came into effect, since previous research has shown that companies adjusted to the first version of the NFRD several years before it went into force (Fiechter et al., 2022). Nevertheless, our purpose is not to study the content quality of the non-financial reports, so this is not a relevant issue for our analysis.

With the purpose of enhancing the transparency and comparability of non-financial information throughout the EU (NFRD 2014/56/EU) the NFRD applies to all large firms which are public-interest entities and have more than an average of 500 employees during the financial years. Public interest entities refer to companies that are publicly traded on a stock exchange, companies trading in securities, insurance companies, credit institutions and financial holding companies (Statutory Audit Directive 2014/56/EU). The firms which fulfill the criteria are required to include in the management report a non-financial statement containing information about the firm’s development, performance, position and impact of its activity relating to environmental, social and employee matters, respect for human rights, anti-corruption and bribery matters. The non-financial statement should include a brief description of the company’s business model, a description of the policies pursued in relation to those matters, including due diligence process, the outcome of those policies, the principal risks associated with those matters, and non-financial key performance indicators relevant to the business. To summarize, it is fairly obvious that there are clear elements of the stakeholder perspective in this regulation.

2.2.2 Swedish regulations on sustainability reporting – The Annual Reports Act

On December 1, 2016 Sweden adopted and implemented the NFRD (2014/95/EU) through the Annual Report Act (ÅRL 1995:1554, 6th chapter). Specifically, it applies to all firms that, during the two most recent financial years, exceed at least two of the following three criteria: having (i) a yearly average of 250 employees, (ii) a net turnover of SEK 350 million, (iii) a balance sheet total of SEK 175 million.

In terms of the reporting requirements, Sweden has chosen a slightly unique approach in comparison to other EU member countries. To a great extent, the Swedish reporting requirements exceed the minimum requirements stated in the NFRD in terms of the average number of employees and the type of companies. The non-financial disclosure is not limited to listed firms or certain financial institutions, but includes all companies, both publicly traded and privately owned. Moreover, it increases the scope of the reporting requirement to firms with an average number of 250 employees, instead of the double amount of 500 employees as in the NFRD. However, as stated in chapter 6, section 10 in the Swedish Annual Report Act, a firm does not need to draw up a sustainability report if it and its subsidiaries are covered by a group sustainability report that has been produced by the parent company. The subsidiaries must only enclose in a note with the information about the name, organization number and location of the parent company that produces the sustainability report for the group. This, however, does not apply to subsidiaries to a foreign group, meaning that they need to produce a CSR report.

In terms of the content of CSR reports, the Swedish Annual Reports Act strictly follows the guidance in the NFRD. The sustainability report can be published as a section in the annual report, under the management report (Swe: förvaltningsberättelse) section or be published as a separate stand-alone document (ÅRL 1995:1554, n.d.). In case of producing separate sustainability reports, the companies are required to mention them in their annual report. However, there is currently no regulation requirement for any specific CSR reporting standards in Sweden according to the Swedish institute for the accountancy profession, FAR (FAR, n.d.). There is neither any recommendation that states how a CSR report must comply with a certain set of standards (FAR, n.d.). Yet, there exists several CSR reporting standards and frameworks that companies can choose to comply with, namely the Global Reporting Initiative (GRI) and the Task Force on Climate-related Financial Disclosures (TCFD). The most widely accepted and used standards in Sweden are the GRI standards (FAR, n.d.; KPMG, 2022).

In terms of assurance on sustainability reports, companies in Sweden are not required by law to have their sustainability reports audited by a third party (FAR, n.d.). The auditors' responsibility is limited to giving a statement on whether or not a sustainability report has been drawn up in accordance with the Annual Reports Act (FAR, n.d.). However, the auditor is not obliged to review the contents of the CSR report or take a stand whether the areas that the companies have chosen to report are the most material aspects. Thus, the responsibility for the preparation of the sustainability report and the assessment of CSR information lies in the hands of the management

board. Nevertheless, third party assurance practices on sustainability reports have become increasingly common, to ensure the completeness and accuracy of CSR information that are presented to the stakeholders and society (KPMG, 2022).

As a result of the stricter implementation of the NFRD, approximately 1,500 independent companies in Sweden are covered by these stricter disclosure requirements, accounting for roughly three percent of the total private firms and more than half of the Swedish sectors in terms of fixed assets and emissions (Growth analysis, 2018). This unique setting with a vast data set of private firms' CSR reporting creates opportunities for researchers to study in a way that is currently impossible in most other countries. Moreover, statistics also display that Swedish firms on average report a higher quantity of non-financial information, and in a more coherent way than firms in the other Nordic countries (Growth analysis, 2018). Thus, it can be concluded that Sweden is in the forefront in terms of CSR reporting. As the disclosure regulations have taken effect for several years, we are able to use panel data to examine the potential effects of mandatory CSR reporting on private firms.

2.3 The information asymmetry problem and the role of disclosure

2.3.1 Market imperfections and the information asymmetry problem

The phenomenon of information asymmetry originated in the field of economics under the assumption that the market is not perfectly efficient, referring to the condition when one party in a transaction has more or better information than the other (Akerlof, 1970). Asymmetric information is conceptualized in different ways (Bergh et al., 2019). Firstly, it can be referred to as private information when one party has access to privileged or private information. Resulting information problems occur when those who possess the information are not willing to disclose and those whose decisions may potentially be better or different if they have that information (Bergh et al., 2019). Secondly, it can be perceived as different information when “different people know different things” as suggested by Schmidt and Keil (2013) and Stiglitz (2002), implying that relevant information is not accessible to everyone in the market. Thirdly, asymmetric information can also be hidden information, in which information about firms and their performance is not common knowledge and thus disclosed information by firm owners and managers might be opportunistically biased (Akerlof, 1970; Stiglitz, 2002). Moreover, asymmetric information may stem from the lack of perfect information as in Akerlof (1970) and Stigler (1961), implying that the sellers have informational advantages over the buyers. Akerlof (1970) refers to this situation as the “lemons problem”. Using the term “lemons” – an American expression for bad cars – Akerlof (1970) finds that the informational disadvantaged buyers who do not know the quality of the cars beforehand, price the car at the average expected value. This results in good cars being underpriced and bad cars being overpriced, leading to a market failure as sellers withdraw the good cars from the market, leaving only the “lemons” and successively decreasing the supply on the market.

The market for lemons' theory proposed by Akerlof can be applied to understand the mechanism of asymmetric information in the capital markets. Firms' managers often have more information about the firms' performance than the outside investors, making it difficult for the capital providers to assess the performance and value of the firms (Bergh et al., 2019; Healy & Palepu, 2001). As incentives differ between the firm managers and the capital providers, firm managers are often not willingly to disclose the relevant information to the investors, making it difficult for them to make an accurate assessment (Beyer et al., 2010; Healy & Palepu, 2001). Thus, when capital providers cannot make an assessment of the firm's value, they also tend to price the firm at the average of "good" and "bad" firms (Beyer et al., 2010; Healy & Palepu, 2001). Moreover, Verrecchia (2001) claims that market participants tend to interpret non-disclosure as unfavorable news and thus discount the value of the firm's assets to compensate for the information asymmetries. Consequently, "good" firms may be undervalued and "bad" firms may be overvalued (Beyer et al., 2010; Healy & Palepu, 2001; Verrecchia, 2001). This can impede the efficient allocation of resources, leading to a breakdown in the functioning of the market (Beyer et al., 2010; Healy & Palepu, 2001; Verrecchia, 2001).

2.3.2 The role of mandatory disclosure as a resolution to the asymmetry information problem

Demand for mandatory disclosure stems from imperfect markets and the information asymmetries as suggested by several studies (Beyer et al., 2010; Healy & Palepu, 2001; Verrecchia, 2001). This is because firms do not voluntarily disclose all private information due to a number of factors (Beyer et al., 2010). Specifically, firms do not voluntarily produce a sufficient level of relevant information because it can be costly for them to disclose "bad news" to investors. Thus, managers might choose to withhold bad news to achieve a higher payoff and avoid the costs associated with disclosure (Beyer et al., 2010; Healy & Palepu, 2001; Verrecchia, 2001). Moreover, firms are uncertain about the investors' reaction to the disclosed information as their reactions vary between investors' characteristics. Thus, their choice of disclosure or non-disclosure depends on their anticipation of the investor reactions (Beyer et al., 2010; Healy & Palepu, 2001; Verrecchia, 2001). Yet, investors can also be uncertain about firms' incentives for disclosure and the truthfulness of firm disclosure which is often difficult to verify (Beyer et al., 2010; Healy & Palepu, 2001; Verrecchia, 2001). Thus, disclosure requirements and enforcement acts as mechanisms that allow firms to commit to both a certain level of disclosure and certain desirable information for the market. This might as well improve the credibility of disclosed information and reduce the information asymmetry problems between firm managers and capital providers (Healy & Palepu, 2001; Leuz & Wysocki, 2016).

2.4 Disclosure regulations, cost of capital and firm banking

The research on the effects of disclosure regulations has documented contradictory results. Disclosure regulations refer to the mandatory reporting obligations that firms must comply with and the enforcement of these obligations (Bushee & Leuz, 2005). Some studies find that regulations and disclosure requirements can have undesirable consequences (Christensen et al.,

2021; Leuz & Wysocki, 2016). Specifically, Christensen et al. (2021) claim that a disclosure mandate can lead to proprietary costs and increased scrutiny by stakeholders. Bushee and Leuz (2005) examine the economic consequences of disclosure regulations on a number of US firms in the event of a regulatory change, the introduction of the SEC disclosure regulation. These firms that are quoted on the Over-The-Counter Bulletin Board (OTCBB) are forced to comply with the SEC disclosure or be removed from the OTCBB. For the majority of OTCBB firms that were not previously filing with the SEC, Bushee and Leuz (2005) find that mandatory SEC disclosure leads to significant costs that appear to outweigh the benefits of compliance.

Moreover, Leuz and Wysocki (2016) argue that disclosure regulation can have thorny and unintended real effects on firms' behavior. In the case of the OTCBB firms, the majority of these firms choose not to comply with the SEC disclosure and take the consequences of being removed from OTCBB. Other studies find that CSR is not always strategic. As firms face pressure of incorporating CSR into their business strategies and operations, they are forced to dress up CSR as business discipline and that every CSR initiative delivers business results (Rangan et al., 2015). This results in firm managers being distracted from the main goal of CSR, which is to align the company's ESG dimensions with its business purposes and values.

However, several studies document negative economic effects, or positive real effects of disclosure on the cost of capital. Verrecchia (2001) views information asymmetries as a component of the cost of capital, where firms' commitment to greater disclosure makes gathering of private information less beneficial for investors and reduces the information asymmetry component in the cost of capital (Core, 2001; Healy & Palepu, 2001; Verrecchia, 2001). Similarly, Healy and Palepu (2001) emphasize the importance of disclosure regulation as to reduce the information gap between the informationally advantaged firm managers and the disadvantaged investors. A minimum level of disclosure requirements reduces both agency and information problem, resulting in a more efficient market.

Extant literature has been mostly focused on the effects of disclosure on the cost of equity capital (Botosan, 2006; Botosan & Plumlee, 2002). Moreover, empirical evidence has been documented for public firms, in which greater levels of disclosure results in improved stock liquidity and reduced cost of capital (Diamond & Verrecchia, 1991; Healy & Palepu, 2001). Cost of capital could be understood as the compensation for risks that the investors have to bear while making the investments, which includes the information risk. Thus, a greater level of disclosure implies a lower information risk for investors, which results in a lower cost of capital. This is consistent with Lambert et al. (2007) who claim that more disclosure means less uncertainty and provides value-relevant information to investors. Specifically, higher quality of accounting information influences a firms' cost of capital both directly and indirectly. Directly, greater levels of accounting information affect the market participants' assessments of the distribution of future cash flows. Indirectly, it affects a firms' real decisions, which influences its expected value and covariances of firm cash flows. In other words, it reduces the conditional covariances that investors use to compute the factor betas, thus reducing the cost of capital.

Numerous studies have investigated the effects of CSR activities, however, a significantly smaller number of papers have focused their attention on the economic effects of CSR related disclosures (Christensen et al., 2021). Even so, this scarcer literature still has shed some light on the economic effects of CSR disclosure through both an empirical as well as a theoretical lens. In a literature review on the topic of sustainability, Clark et al. (2015) show that 90 percent of the studies prove the importance of sustainability performance on reducing the cost of capital. However, research on the links between firm disclosure and the cost of debt is scarce, despite the importance of this topic considering that debt financing is the predominant source of capital for firms. Prior literature that attempts to examine financial disclosure-cost of debt financing dates back to Sengupta (1998) that investigates the link between the quality of US firms' disclosure and the cost of debt capital. Based on the idea that banks and lenders take into account the firms' disclosure quality in their estimation of the default risk, Sengupta (1998) suggests that banks and financial analysts favor firms that provide informative and timely disclosure since they do not only disclose credible information but also unfavorable value-relevant information. Thus, these firms are charged with a lower risk premium, resulting in a lower borrowing cost. On the contrary, in their study of CSR performance on the cost of debt financing, in a sample including companies in different countries and industries, Izzo and Magnanelli (2012) find that CSR performance is positively correlated with the cost of debt, implying that firms with better CSR score receive a higher cost of debt. In other words, banks and capital providers do not recognize better CSR performance as a risk reducing factor that enhances the firm valuation. The authors explain further that banks and capital providers might still perceive CSR investments as costly and inefficient use of firm resources and thus increase the risk profile of the firms, consequently leading to a higher cost of borrowing. Moreover, Grewal et al. (2018) examine the equity market reaction (short-window returns) to events associated with the passage of NFRD for firms subjected to the mandate. The study finds an average negative market reaction across all firms. The results suggest that the equity market perceive CSR disclosure to be costly with regard to proprietary and political costs. Furthermore, the disclosure costs are high particularly for firms that are forced to disclose additional CSR information after the EU mandate came into effect.

Unlike publicly held companies, private firms possess distinguished characteristics. They do not have any access to the public equity markets, and thus the two main sources of financing for private firms are via debt capital and private equity capital. Within the scope of this thesis, we only focus on the debt component. Breuer et al. (2018) explain that banks are the primary source of capital provision for German private firms and firms' mandatory financial reports and disclosures provide firm-specific information to the public, which banks are active users of. They find that firms' regulated financial reporting is credible and provides value-relevant information to the lending banks. Moreover, financial reporting regulation also increases banks' reliance on firms' reports and fosters banking competition through the reduction of information asymmetries between banks and between firms. However, one should note that Breuer et al. are studying SMEs, which differ from large firms in several ways, for example that they usually do not have the same access to debt financing as do larger firms (de Guevara et al., 2022). Nevertheless, the findings of Breuer et al.

(2018) are consistent with the findings of Minnis (2011) which studies US private firms and finds that firms with audited financial reports on average have a lower cost of debt compared to firms with unaudited financial reports. Moreover, audited financial statements also seem to be more intensively used in the banks' debt pricing process (Minnis, 2011). Furthermore, Karjalainen (2011) studies private firms in Finland and the findings suggest that higher audit quality (proxied as audit done by a Big 4 auditor) negatively affects firms' cost of debt. In other words, the audit verification seems to be taken as a clear signal that the information is more useful, thus reducing the information asymmetry. In Sweden, most companies, except for very small ones, are required to have audited financial statements (Bolagsverket, 2018), but that does not apply for CSR disclosures since the NFRD states that it is optional for member states to implement such a mandate (Carungu et al., 2020). Therefore, since Sweden has not implemented such an audit mandate, the findings of for example Karjalainen (2011) and Minnis (2011) are relevant for CSR reporting as well.

Gao et al. (2021) investigate the adoption of constituency statutes that allow directors to take into account all stakeholders' interests in their decision-making. Though the study focuses on the causal effect of constituency statutes lowering the cost of debt, it has important implications on the topic of CSR. Specifically, the study shows that enhanced CSR incorporation into the business (associated with constituency statutes) helps lower the cost of debt. In summary, mandatory CSR reporting to make private companies' CSR issues more salient, resulting in greater pressure from outside stakeholders. Given that the companies adhere to the pressures and comply with stakeholder (CSR) demand to a higher extent, the companies might also receive better treatment from these actors. Such functions could also affect the relation with the bank and hence the debt financing, in addition to the function of the reporting as an information asymmetry reducer.

2.5 Theoretical background and hypothesis development

2.5.1 Theoretical background

To understand the mechanism of CSR reporting mandates, we revisit the market for lemons theory proposed by Akerlof (1970) and apply it into the capital market for private firms. The information asymmetry problems arise from the information and incentive differences between the firm managers and the capital providers and can cause inefficiency in the allocation of resources and can even lead to a breakdown in the functioning of the market (Healy & Palepu, 2001). As both the capital providers and firm managers as rational individual actors evaluate the investments based on their own information, a lack of relevant information is interpreted as unfavorable news (Healy & Palepu, 2001). To account for this asymmetric information, investors choose to value both firms at the average level, resulting in "good" firms being undervalued and "bad" firms being overvalued, impeding the efficient allocation of resources.

To resolve the information asymmetry problems and improve the efficiency of the market, it is argued that credible disclosure between firm managers and investors is necessary (Healy & Palepu, 2001; Leuz & Wysocki, 2016). Better disclosure and reporting reduce information asymmetries

since more value-relevant information is produced and provided to investors as well as outside parties (Leuz & Wysocki, 2016). The credibility of disclosure can be achieved through disclosure requirements and enforcement actions, as suggested by Beyer et al. (2010) and Healy and Palepu (2001). Mandatory CSR disclosure can be an effective mechanism that allows firms to commit to disclosing value-relevant information for banks and other creditors (Beyer et al., 2010; Breuer et al., 2018; Healy et al., 1999). In other words, mandatory disclosure acts as a “commitment device”, preventing firms’ self-serving incentives to withhold or manipulate information. It enforces them to disclose value-relevant information not only in good times but also during bad times (Bushee & Leuz, 2005). In short, regulations and institutions that facilitate uncovering of firms’ private information are important in resolving the information asymmetry problems, thus leading to more efficient markets. Moreover, it is documented that resolving the asymmetry problems through the increased level of disclosure and in a timely manner, specifically through a mechanism of reporting mandate and enforcement, also results in lower cost of capital, implying a lower cost of debt (Breuer et al., 2018). This is based on that the asymmetric information is viewed as a component of the cost of capital (Core, 2001; Healy & Palepu, 2001; Verrecchia, 2001), which can be reduced through firms’ sufficient production of relevant information to the investors. Prior literature observes that capital providers are active users of firm official disclosure and reports (Breuer et al., 2018). Moreover, they also show a positive reaction to firms that provide informative disclosure in a timely manner by charging them with a lower premium, resulting in a lower cost of borrowing (Breuer et al., 2018). Another important observation would be the role of auditing as enhancing the credibility of firm reports and disclosure, as suggested by Karjalainen (2011) and Minnis (2011). Explicitly, banks and capital providers tend to perceive audited reports as more credible and reliable, thus high level of audit quality results in lower cost of debt.

2.5.2 Hypothesis development

Prior literature on the topic of disclosure in relation to firm valuation and performance has certainly made efforts in establishing a relationship between the level of disclosure and firms’ cost of equity capital and cost of capital. Yet, the results remain inconclusive and ambiguous (Christensen et al., 2021). Some studies fail to establish economic effects of firm disclosure on the cost of capital, some find that CSR score is positively associated with the cost of debt while others come to the conclusion that greater disclosure helps reduce information asymmetries, which in turn reduces the cost of capital (Christensen et al., 2021; Izzo & Magnanelli, 2012). However, extant disclosure literature has mostly been focused on financial disclosures. The research on the economic effects of non-financial disclosures, explicitly CSR disclosures, on firms’ value and performance is limited and understudied (Christensen et al., 2021; Gao et al., 2021), despite the fact that the topic of CSR reporting has become increasingly important. Christensen et al. (2021) list several differences between CSR reporting and financial reporting, such as the fact that characteristics of CSR reporting are much more wide-ranging, multifaceted as well as long-term, non-monetary and intangible. Thus, it is important to revisit and take cautions when applying empirical relations established in the current literature on CSR reporting (Christensen et al., 2021).

Moreover, contemporary research has mostly established the relationship for voluntary disclosure and cost of capital in the sense of management incentives and choice of disclosure (Bushee & Leuz, 2005; Christensen et al., 2021; Daske et al., 2013), while fewer have focused on that relation for mandatory disclosure. This research gap can likely be explained by the lack of a CSR reporting mandate for most private firms, as discussed in section 2.2. Thus, there is a clear motivation for studying the relation between mandatory CSR reporting and cost of debt for private firms as a contribution to this relatively novel area of the literature. Specifically, we turn our focus towards the CSR reporting requirements in Swedish legislation, which are stated in the Annual Report Act.

Prior literature suggests that mandatory CSR reporting could also be relevant for private firms. A stakeholder-oriented firm is less likely to exploit fixed claimants, such as creditors and suppliers, for the benefit of the shareholders (Gao et al., 2021). The possibility that mandated non-financial disclosures might reveal material information that creditors might not otherwise have looked for, could be a factor that has a negative effect on the information asymmetry. Hence, this may lower the risk for the creditors, that in turn charges lower interest rates or less strict debt covenants. On the other hand, it might just as well reveal additional significant risks not yet incorporated into the interest models, and thus increase the required interest rate on loans. However, as mentioned before, CSR reporting is different in nature compared to financial reporting. Even though banks and capital providers are active users of financial reporting and disclosure as suggested by Breuer et al. (2018), it is uncertain whether banks and creditors perceive non-financial information in the same way as they do with financial information since it is more difficult to assess the quality of non-monetary and intangible CSR information. Given that the relevant regulation merely describes what kind of content the CSR reports should contain, but not specific quantitative measures or how the information should be assessed, it is uncertain if banks would respond to such disclosure and to what extent, since the comparability benefits of CSR disclosure is still relatively weak. Moreover, unlike financial reports, CSR reports are not required to undergo audit or any other third-party assurance. The only thing the financial statement auditor must do is confirm whether a CSR report has been filed or not. The lack of hard information and audit requirements for CSR reports raises the question whether banks and capital providers perceive the information in CSR reports as sufficiently credible and trustworthy for them to even react to it at all. Moreover, the extant literature on the economic effects of CSR reporting is scarce and provide inconclusive and contradictory results, which makes it difficult to predict the direction of the possible effect of a CSR reporting mandate on private firms' cost of debt. Based on the foregoing discussion, we restate our research question in the form of a null hypothesis:

H₀: Mandated CSR reporting for private firms does not affect their cost of debt.

3. Method

This section starts with a description of the data used for analysis, followed by a presentation of the research design. Finally, we include a definition and explain our variables used in the analyses.

3.1 Data

The purpose of this thesis is to study the effect of a CSR reporting mandate on private firms' cost of debt. Since the scope of this thesis is limited to Swedish private firms as explained in the previous section, the data from 2015-2020 is collected from the Swedish database Serrano. Serrano contains data based on financial statements from the Swedish Companies Registration Office (Swe: Bolagsverket). We only use the "serrano.dta" dataset, which has adjusted all financial data to calendar year. Based on the regulatory requirements, we obtain information on total assets, sales and average number of employees. We also obtain information necessary for the measure of the cost of debt and the control variables. Additionally, in order to exclude the publicly listed firms from the dataset, we use the database Orbis Europe to obtain organization numbers of all Swedish firms that were listed during the period.

The studied period is 2017-2020 and covers the post-enforcement period of the reporting mandate, since the purpose is to study the effects of the CSR reporting mandate which took effect for the first time for financial years starting from January 1, 2017. Consequently, the regulatory requirements for CSR reporting in our study are relevant only if it has been enforced. The post-enforcement period also allows us to observe both treated (subjected to the CSR reporting mandate) and untreated (not subjected) firms, independently of their voluntary disclosure incentives.

Table 1 below shows the sample selection process of firm-year observations. First, since the CSR reporting mandate does not apply for subsidiaries whose CSR reports are covered by the parent companies, we also omit all subsidiaries to a Swedish group. However, subsidiaries in a foreign group are kept in the sample because they are required to comply with the mandate if they meet the criteria. Second, since we restrict ourselves to a sample set close to the threshold, we drop all micro firms.¹ As can be seen in the table, the initial sample is heavily reduced when excluding micro firms since they account for the absolute majority of the total firms in Sweden.² Moreover, since the firms of interest to the study are private firms with active operations, we also eliminate that not fulfill these criteria. More specifically, observations of firms that are not classified as

¹ A micro firm is here defined as a firm whose average number of employees was lower than 10 during the studied period.

² During the studied period, firm-years related to micro firms accounted for almost 97 percent of initial sample gathered from Serrano.

active³ during a certain year are dropped. All firms with other legal forms than limited liability company (Swe: aktiebolag) are also removed. With private firms, we refer to unlisted companies acting in the private sector who are not owned by the state in some way, which means that firms that are either listed on a public stock exchange or state-owned are dropped from the sample. Firms that operate within the financial industry or real-estate industry or also removed for comparison reasons. The final sample consists of 66,967 firm-year observations, from 18,902 unique firms, of which 1,133 were subjected to the reporting mandate at least once during this period.

Table 1

| Sample selection (period 2017-2020) | Firm-years |
|--|-------------------|
| Initial sample | 2,890,291 |
| Eliminate domestic subsidiaries | -459,360 |
| Eliminate micro firms (< 10 employees) | -1,967,892 |
| Eliminate non-active firms | -142,341 |
| Eliminate non-LLC firms (AB) | -248,197 |
| Eliminate state owned firms | -127 |
| Eliminate financial and real estate firms | -2,205 |
| Eliminate publicly listed firms | -1,375 |
| Eliminate observations with missing data | -1,827 |
| Final sample | 66,967 |
| Firm-years subjected to mandate | 3,697 |
| Unique firms | 18,902 |
| Unique firms subjected to mandate | 1,133 |

Table 1 displays the process of selecting the relevant firm-year observations for the sample. Initially we had 2,890,291 firm-years for the period 2017-2020 from Serrano. A large portion of the initial sample is lost when micro firms are eliminated. These are firms whose average employees was lower than ten during the sample period. After removing other firms that will disturb the analysis and firm-years with missing values, we end up with 66,697 firm-years in the final sample. Since we winsorized the data on the 5th and 95th percentile, no extreme values are eliminated.

In the process of collecting and managing the data, some limitations of the dataset have come to our attention. The Serrano dataset has been adjusted for broken accounting periods, extra short and long accounting periods as well as omissions and gaps in a company's series of submitted financial statements, which means that there will be one data entry per calendar year for the respective field in the database for each firm-year. This makes it possible to follow groups of businesses and increase comparability between companies, which makes the dataset suitable for data analysis using statistical methods. Consequently, to be consistent with these adjustments, the classification of active firms in the Serrano dataset is different from that of the Statistics Sweden Office.

³ A limited liability firm is defined as active during a certain calendar year if it at least one of the following exceeds 10,000 SEK: net sales, other operating income, financial income, financial expenses, dividend amount, or if total assets exceed 500,000 SEK.

Moreover, we are aware of that these adjustments for the calendar years might cause some inconsistency to our setting since the regulatory requirement is set to take effect for financial years that began immediately after December 31, 2016. Nevertheless, this should be merely a technical issue which will not distort the results of our study, thus we will disregard it. Also, since we adjust the extreme values through winsorization, the sample will to a lesser extent reflect the actual population of private firms.

3.2 Research design

The hypothesis will be tested using a regression discontinuity design, comparing firms that are subjected to the CSR reporting mandate with firms that are not subjected to the mandate. As suggested by Reardon and Robinson (2012), regression discontinuity design is suitable for studying the treatment effect of policy or intervention. Thus, it might be suitable for studying the effect of a CSR reporting mandate on Swedish private firms' cost of debt. Just as the NFRD, the Swedish regulation on CSR reporting is based on size thresholds. This setting allows us to obtain data for both firms that are required (treated) and firms that are not required (control) to include a CSR report and then compare these treated and control firms around the cutoff point. However, due to the multiple assignment variables, namely total assets, sales and average number of employees, our setting will be slightly different from the standard regression discontinuity design. As a result, a limitation of our study is that we will not be able to provide a graphic presentation of the results due to the multiple dimensionalities. However, a regression discontinuity design including multiple assignment variables allows us to study heterogeneity of treatments effects (Breuer et al., 2018; Reardon & Robinson, 2012). Particularly, it enables us to simultaneously study and compare the treatment effects along multiple threshold dimensions (Breuer et al., 2018; Reardon & Robinson, 2012). Following Reardon and Robinson (2012) and Breuer et al. (2018), our empirical analysis model is presented below:

$$CoD_{i,t} = \beta Mandate_{i,t} + \varphi f(Size_{i,t}) + \gamma X + \delta_{j,t} + \varepsilon_{i,t} \quad (1)$$

This function resembles a parametric regression discontinuity design, where $CoD_{i,t}$ is a measure of the cost of debt on firm i in year t . $Mandate_{i,t}$ is an indicator variable taking the value of 1 if the firm is subjected to the CSR reporting mandate under the CSR reporting regulation; and 0 if it is not subjected to the CSR reporting mandate based on the assignment rule. In other words, $Mandate_{i,t}$ is a discontinuous function of the three firm-size dimensions, namely total assets (TA), sales (SA), and average number of employees (EM), based on whether they are required to release an annual CSR report. Specifically, Swedish firms have to provide a CSR report if they fulfill at least two out of three size criteria for two consecutive years. The assignment rule can be rewritten in the following formula:

$$Mandate_{i,t} = \begin{cases} 1 & \text{if } \min \left[\sum_{n=1}^3 \sum_{m \neq n} I_{i,t-1}^n I_{i,t-1}^m, \sum_{n=1}^3 \sum_{m \neq n} I_{i,t-2}^n I_{i,t-2}^m \right] > 0 \\ 0 & \text{if } \min \left[\sum_{n=1}^3 \sum_{m \neq n} I_{i,t-1}^n I_{i,t-1}^m, \sum_{n=1}^3 \sum_{m \neq n} I_{i,t-2}^n I_{i,t-2}^m \right] = 0 \end{cases} \quad (2)$$

where: $I_{i,t-1}^1$ is an indicator variable taking the value of 1 if the total assets of firm i in year $t-1$ ($Size_{i,t-1}^{TA}$) exceed the total assets threshold T_{TA} , or ($Size_{i,t-1}^{TA} > T_{TA}$). Similarly, $I_{i,t-1}^2 = 1$ ($Size_{i,t-1}^{SA} > T_{SA}$) is an indicator variable taking the value of 1 if the sales of firm i in year $t-1$ ($Size_{i,t-1}^{SA}$) exceed the sales threshold (T_{SA}). Subsequently, $I_{i,t-1}^3 = 1$ ($Size_{i,t-1}^{EM} > T_{EM}$) is an indicator variable equal to the value of 1 if the average number of employees of firm i in year $t-1$ ($Size_{i,t-1}^{EM}$) exceed the employee threshold. Similarly, $I_{i,t-2}^4$ is an indicator variable taking the value of 1 if the total assets of firm i in year $t-2$ ($Size_{i,t-2}^{TA}$) exceed the total assets threshold (T_{TA}). $I_{i,t-2}^5$ is an indicator variable equal to the value of 1 if the sales of firm i in year $t-2$ ($Size_{i,t-2}^{SA}$) exceed the sales threshold (T_{SA}). $I_{i,t-2}^6$ is an indicator variable taking the value of 1 if the average number of employees of firm i in year $t-2$ $Size_{i,t-2}^{EM}$ exceeds the employee threshold (T_{EM}).

Similar to Breuer et al. (2018), $f(Size_{i,t})$ is a function of size, in which we control for the regulatory size determinants: total assets, sales and average number of employees. Since treated firms and control firms are different in size based on the assignment rule of $Mandate_{i,t}$, the determinants of $Mandate_{i,t}$ can be observed. Any difference in firms' cost of debt right at the regulatory thresholds can be attributed to the causal effect of the CSR reporting requirements, conditioned on the continuity of the respective firm size criteria. In other words, it means that there are no sudden changes in the company's size dimensions (employees, total assets, sales) at the cutoff point or there is no manipulation of the eligibility criteria so that firm can avoid or join the treated group. The function of regulatory size control is specified as follows:

$$\varphi f(Size_{i,t}) = \sum_{n=1}^3 \varphi_n I_{i,t}^n + \sum_{n=1}^3 \varphi_{3+n} h(Size_{i,t}^n) + \sum_{n=1}^3 \varphi_{6+n} I_{i,t}^n h(Size_{i,t}^n) \quad (3)$$

where $h(Size_{i,t}^n)$ is the natural logarithm of $Size_{i,t}^n$ over $Threshold_t^n$. By including all the regulatory size determinants, we control for firm i 's relative distances to the respective thresholds. Moreover, $I_{i,t}^n$ is the indicator variable capturing the isolated effect of crossing each individual threshold. By including the individual indicators of the assignment rule, we can better isolate the regulatory discontinuity by comparing firms exceeding the same types of thresholds.

Subsequently, we also control for factors at the firm level by including a control vector, X . We include firm-level variables that are expected to have an impact on the cost of debt for firms. These variables include firm age, liquidity, profitability and financial risk (leverage), as suggested by prior research (Erragragui, 2018; Gigante & Manglaviti, 2022; Izzo & Magnanelli,

2012). Moreover, $\delta_{j,t}$ are fixed effects variables for industry (j) and year (t) combinations which is used to control for commonalities within industries and certain years, such as effects from macroeconomic shocks. $\varepsilon_{i,t}$ is the error term, for which the standard errors at the firm level are accounted for. Finally, to allow for autocorrelation within firms, we cluster the standard errors at the firm level.

Instead of limiting the sample to firm-years with values in the vicinity of the regulatory thresholds, prior research suggests using the full sample in the case of multiple assignment variables (Breuer et al., 2018; Reardon & Robinson, 2012). However, most standard regression discontinuity designs still are restricted to a sample near the cutoff (Reardon & Robinson, 2012). In our study, we chose to exclude micro firms from our sample since they might not be comparable to the general firms that are close to the thresholds (note that they could still be near if the sales and total assets are large).

Several limitations have appeared while conducting the research design. One of the biggest limitations of this setting is that we do not have knowledge regarding the sample firms' actual compliance with the CSR reporting regulation. Thus, we are limited to a certain type of analysis, which restricts our ability to answer questions that might be valuable and important to our study. Particularly, we do not measure private firms' voluntary CSR disclosures which may have taken place before the mandate came into effect in 2017. Furthermore, several assumptions need to be made to be able to test the hypothesis or identify and estimate the effect of CSR reporting mandate on the cost of debt. First, we need to separate the effect of the CSR reporting mandate from the effect of other regulations or factors that may cluster at the same time, which could manipulate the results. Yet, to the best of our knowledge we are not aware of any such regulations or factors and we therefore assume that there are no other regulations and factors that occur at the same time as the adoption time of the CSR reporting mandate that might manipulate the results of our study. However, other such exogenous events on macro level should at least become partially absorbed by the industry-year fixed effects. Second, as suggested by Bernard et al. (2018), private European firms might manage their size to manipulate the fulfillment of thresholds and thus avoid disclosure costs. In our case, the size thresholds include the average number of employees, total assets and sales. The robustness of the hypothesis is contingent on the assumption that Swedish private firms do not manipulate these factors. We consider such manipulation unlikely since, there are no requirements for having the contents of the CSR report audited by a third party, the costs for disclosure should be smaller than in the case of obligatory auditing or assurance.

3.3 Definitions and statistics of variables

Here we present all variables used in the regression, along with their respective definitions. We begin with the four different outcome measures of cost of debt, followed by the explanatory regression discontinuity variable and then the various control variables.

3.3.1 Outcome variables

We generate four measures of cost of debt which are used as outcome variables in separate regressions. All of these measures are inferred from publicly reported accounting data. First, our main sample is based on the natural logarithm of interest expenses (first regression, from the left in Table 3), referred to as *log interest expenses*. Based on our research question and purpose of the thesis, we specifically chose the measure of the cost of debt based solely on external interest expenses to banks and credit institutions (cost of external debt). We did this since we focus on the borrowing costs from banks and credit institutions which are associated with private firms' main source of capital as suggested by extant literature (Breuer et al., 2018). Interest expenses is defined as the external interest expenses to credit institutions.

Second, we generate *scaled interest expenses*, which is calculated as external interest expenses to credit institutions over the opening balance of debt to credit institutions. Debt is the sum of current and non-current liabilities to credit institutions. In consistency with prior research (Erragragui, 2018; Izzo & Magnanelli, 2012), we use the accounting proxy to infer the cost of debt based explicitly on the numbers to banks and credit institutions. Hence, this measure is an indirect estimate of a firm's average interest rate they pay on the debt.

Moreover, to capture the aggregated cost of debt, including other interest expenses that were not accounted for using only the external interest expenses to banks and credit institutions, we also generate the third and fourth measure of cost of debt, which are *log financial expenses* and *scaled financial expenses*. Similar to log interest expenses, we use the natural logarithm of the total financial expenses to calculate log financial expenses. Finally, scaled financial expenses is calculated as the total financial expenses divided by the opening balance of total liabilities.

A problem with used log variables is that observations with the value zero are lost since the logarithm of zero cannot be done. In order to resolve this problem, we add a constant of one to the interest expenses and financial expenses before doing the logarithms. Otherwise, about ten percent of the sample would be lost, resulting in the descriptive statistics (see Table 2) being incorrect and a lower external validity. Mathematical expressions and definitions for the variables can be found in Appendix A.

3.3.2 Explanatory variable (Mandate)

The explanatory variable of interest is the binary *Mandate* variable, which takes the value of one for firms that fulfils the criteria for treatment (being subjected to the reporting mandate) a certain year. Otherwise, the firm-year is considered a control firm-year and the value will be zero.

To identify the firm-years that fall under the CSR reporting mandate, we use reported information on total assets, net sales, and average number of employees during the year. Note that the requirement for the mandate to take place is that the firm must have at least the same two of the three factors that exceed their respective thresholds for the last two consecutive years prior to the firm-year in question. For instance, if a firm's average employees and assets exceeds the employee

and asset thresholds respectively during year $t-1$ and $t-2$, the firm will have to file (or integrate) a CSR report during year t . However, if a firm's average employees and assets exceed their respective thresholds during year $t-2$, and then during year $t-1$ it is assets and employees that exceed their threshold, the firm will not be subjected to the reporting mandate in year t . Also note that this means that a firm needs to have complete data for three consecutive years in the sample to even have a chance of becoming a treated firm-year (i.e. being subjected to the mandate). A significant value for the parameter estimation of the explanatory mandate variable will constitute a basis for rejection of the null hypothesis.

3.3.3 Control variables and fixed effects

For firm-level control, we use a set of firm-specific control variables that might be correlated with the assignment of treatment and the cost of debt. The factors we that are controlled for are financial leverage, firm age, profitability and liquidity. First, financial leverage is expected to be positively correlated with the cost of debt (Erragragui, 2018; Izzo & Magnanelli, 2012), due to the increased risk associated with more financial debt (Baxter, 1967). Financial leverage is calculated as the liabilities to credit institutions over the book value of assets (see Appendix A). We use this measure for financial leverage since we get to keep more observations then, compared to if we would use the perhaps more common debt-to-equity measure. Second, firm age has been shown to be associated with the firm's perceived reputation from banks and capital providers (Breuer et al., 2018; Diamond, 1991), which might therefore be correlated with the cost of debt. Based on this, we expect that firm age is negatively related to the cost of debt. The variable we use to control firm age is the natural logarithm of years since registration over the sample average firm age (see Appendix A for the formula). Third, profitability is expected to be negatively related to the cost of debt (Erragragui, 2018; Gigante & Manglaviti, 2022; Izzo & Magnanelli, 2012). To measure and control for profitability, we use return on assets, which is calculated as the adjusted profit or loss after financial income divided by the total assets (see Appendix A for the formula). Finally, the quick ratio is applied as a measure for liquidity, used to indicate the firm's ability to pay its short-term liabilities. The quick ratio is calculated as the total current assets less the total inventories, divided by the total short-term liabilities. We expect the liquidity to be negatively related to the cost of debt.

4. Results

This section starts with statistical summary of the data, followed by a presentation of the four regression analyses that were performed with a regression discontinuity design. Finally, the results are discussed in relation to extant literature and theory.

4.1 Sample characteristics

Table 2 presents summary statistics for all variables used in the regressions, except for the size related control variables since they do not help understanding the data. The first four variables are the measures of our outcome variable cost of debt, which we analyze separately in four regressions. Three of them have got data for approximately 66,000 firm-years. Scaled interest expenses, on the other hand, has less than half as many observations (28,296 firm-years). The reason for this is that there are fewer data points for debt to credit institutions. If the debt to credit institutions is zero or missing, the scaled interest expense cannot be calculated and therefore become a missing value. We also note that the variations in the outcome variables are quite extensive, given the high standard deviations in relation to the means. The cost of debt also generally seems to be skewed to the right, which is displayed by the mean values exceeding the medians for the scaled expense variables. However, we also see that this issue is alleviated when using logarithms of the expenses, where the log variables have much smaller relative differences between their mean and median values.

Table 2

Descriptive statistics

| Variable | N | Mean | SD | Min | 25% | Median | 75% | Max |
|---------------------------|--------|--------|-------|--------|--------|--------|-------|-------|
| LN(Intrereast expenses) | 66,967 | 3.486 | 2.068 | 0 | 1.792 | 3.638 | 5.106 | 7.053 |
| Scaled interest expenses | 28,296 | 0.087 | 0.110 | 0 | 0.027 | 0.043 | 0.087 | 0.453 |
| LN(Financial expenses) | 66,967 | 3.910 | 2.261 | 0 | 2.197 | 4.025 | 5.525 | 8.110 |
| Scaled financial expenses | 65,502 | 0.013 | 0.015 | 0 | 0.001 | 0.008 | 0.018 | 0.057 |
| Mandate | 66,967 | 0.055 | 0.228 | 0 | 0 | 0 | 0 | 1 |
| Leverage (Debt-to-assets) | 66,967 | 0.088 | 0.144 | 0 | 0 | 0 | 0.134 | 0.469 |
| Return on Assets | 66,967 | 0.109 | 0.156 | -0.221 | 0.022 | 0.097 | 0.203 | 0.428 |
| Firm age | 66,967 | -0.318 | 0.882 | -3.072 | -0.875 | -0.239 | 0.295 | 1.997 |
| Liquidity (Quick ratio) | 66,967 | 1.493 | 0.886 | 0.380 | 0.871 | 1.279 | 1.863 | 3.841 |

Above, descriptive statistics are presented for all firm-years in the final sample from Table 1. The statistics for the control variables related to employees, assets, sales have been left out in this table since their interpretation is irrelevant. Note that these statistics are based on the values post winsorization.

The explanatory regression discontinuity variable Mandate has a mean of 0.055, which means that 5.5 percent of the firm-years are subjected to the CSR reporting mandate. The small portion is expected since the regulation only applies to the largest firms, and most private firms are relatively small. The table shows that the control variables leverage, return on assets and liquidity are a

somewhat skewed to the right. The opposite applies for firm age, which is logical since there are more young firms than old due to the natural selection bias in the market economy.⁴ However, do not forget to take into consideration here that the statistics for all variables in Table 2 were calculated after the variables had been winsorized on the 5th and 95th percentile, except for firm age which has not been winsorized. For this particular dataset, the effect of this is that the values of the average and distribution measures decrease since they are generally skewed to the right.

Since increased reporting also means increased disclosure costs (proprietary costs and costs for preparation), there could possibly be an incentive for firms to manage these variables in their reporting in order to avoid becoming subjected to the mandate. Would that be the case, it could be seen as a negative version of target beating⁵, and as a result also affect actual financial reporting (unless only the average employee factor is managed), thus also distorting regular financial analysis and increase information risk. Although we are not performing any statistical tests to examine this, we show the graphical distribution of firm-years based on the three size conditions upon which the CSR reporting mandate is based.

The distributions are displayed in figures 1a-1c by plotting histograms around the threshold for each factor. A gradual negative trend can be seen for all three variables, which is expected since there are more small firms than large ones. The firm-years around the threshold in Figure 1b indicates a possibility that some firms might have engaged in managing their total assets to avoid the threshold, although it could just as well be random looking at it from a purely graphical standpoint. Figures 1a and 1c displays no clear such tendencies. However, from this graphical analysis we can merely see that there are no large deviations from what one would expect, even though we do not perform any other more comprehensive statistical tests to prove such a conclusion.

⁴ Note that the firm age variable is a log variable (see section 3.3 for specification) and therefore takes on negative values from firms-years where the firm is younger than the average.

⁵ Target beating is proxy for earnings management, where firms report earnings just above certain thresholds (e.g., last year's earnings or analysts' earnings estimates) to avoid negative reactions on their share price. It first studied in the seminal papers by Hayn (1995) and Burgstahler and Dichev (1997) who found that there was an seemingly unreasonably high difference between the number of firm-years just below a certain earnings threshold in comparison with the number of firm-years with reporting earnings just above that threshold.

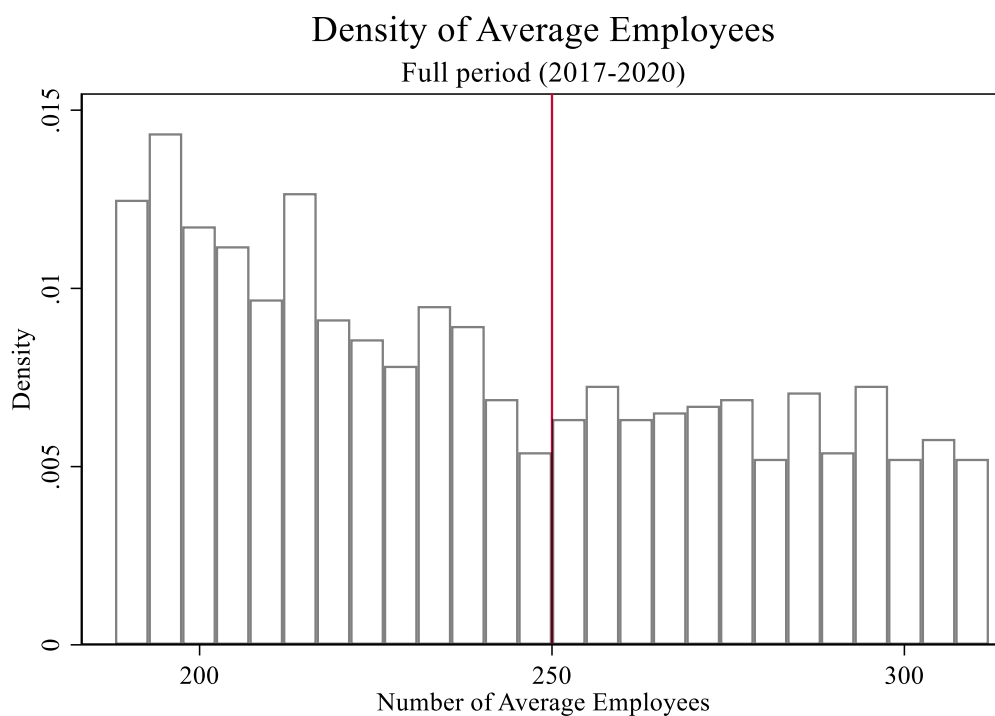


Figure 1a

The figure displays a histogram with the distribution of the average employees for all firm-years that has values which deviates less than 25 percent from the regulatory threshold of 250. The threshold is marked by the red line.

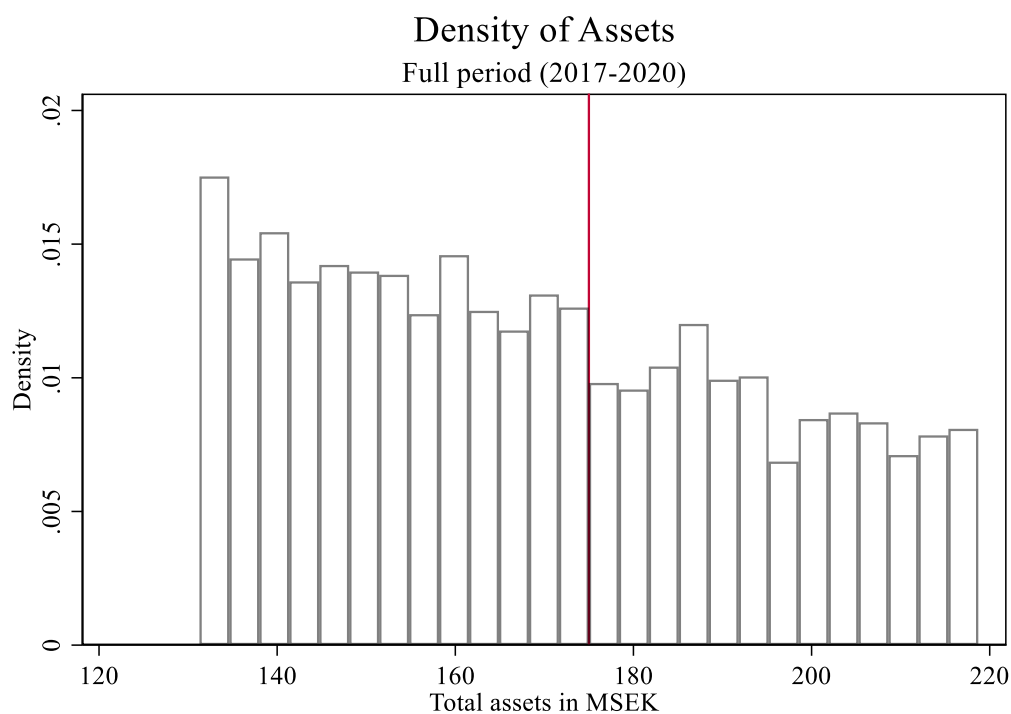


Figure 1b

The figure displays a histogram with the distribution of the total assets for all firm-years that has values which deviates less than 25 percent from the regulatory threshold of 175 million SEK. The threshold is marked by the red line.

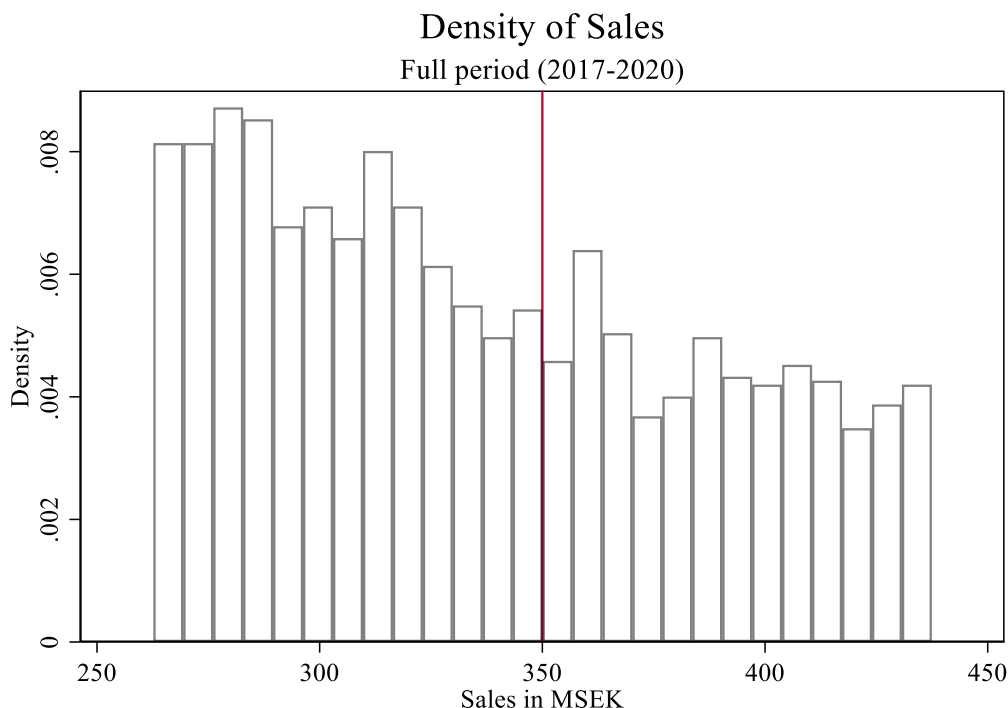


Figure 1c

The figure displays a histogram with the distribution of the sales for all firm-years that has values which deviates less than 25 percent from the regulatory threshold of 350 million SEK. The threshold is marked by the red line.

4.2 Empirical results from regression analysis

The results from the regressions of private firms' cost of debt on their obligation to engage in CSR reporting are displayed in Table 3 with controls for firm size (on which the CSR reporting requirement depends) and other factors expected to affect the cost of debt. As already mentioned in section 4.1, all values in debt to credit institutions that are either zero or missing, will lead to a missing value when scaling the expenses, which is the reason that there are a significantly lower number of observations in the regression on scaled interest expenses.

As shown in the table, we find no statistically significant relation between the Swedish CSR reporting mandate and firms' cost of debt in any of the four regressions. However, what is not shown in the table is that the p-value for the mandate variable in the first regression (from the left, i.e., log interest expenses), which is based solely on debt to credit institutions, is 0.114 and in other words close to beating the 10 percent significance level. The same thing applies for the second regression (scaled interest expenses, also only from debt to credit institutions), where the mandate variable has a p-value of 0.113. These results could be viewed as an indication that the variables based on interest expenses solely related to debt to credit institutions might be more accurate measures of the cost of debt in this case, thus suggesting that the outcome variables based on total financial expenses, which are based on all liabilities, bring in too much noise into the measure and hence distorts the analysis. In that case, there a weak indication that there could be a causal relation

between the mandate and the cost of debt, but nevertheless, we still do not find any convincing evidence on which we can base a rejection of the null hypothesis.

Table 3
Effect of CSR reporting mandate on private firms' cost of debt

| | RD-OLS | RD-OLS | RD-OLS | RD-OLS |
|------------------------------------|-----------------------|--------------------------|------------------------|---------------------------|
| | LN(interest expenses) | Scaled interest expenses | LN(financial expenses) | Scaled financial expenses |
| <i>Mandate</i> | 0.227 (0.144) | 0.026 (0.016) | 0.023 (0.135) | 0.000 (0.001) |
| Controls | | | | |
| I_{EM} (Employees > T_{EM}) | Yes | Yes | Yes | Yes |
| I_A (Total assets > T_{TA}) | Yes | Yes | Yes | Yes |
| I_{SA} (Sales > T_{SA}) | Yes | Yes | Yes | Yes |
| Relative T_{EM} | Yes | Yes | Yes | Yes |
| Relative T_{TA} | Yes | Yes | Yes | Yes |
| Relative T_{SA} | Yes | Yes | Yes | Yes |
| $I_{EM} * \text{Relative } T_{EM}$ | Yes | Yes | Yes | Yes |
| $I_{TA} * \text{Relative } T_{TA}$ | Yes | Yes | Yes | Yes |
| $I_{SA} * \text{Relative } T_{SA}$ | Yes | Yes | Yes | Yes |
| Leverage (Debt-to-assets) | Yes | Yes | Yes | Yes |
| Return on Assets | Yes | Yes | Yes | Yes |
| Firm age | Yes | Yes | Yes | Yes |
| Liquidity (Quick ratio) | Yes | Yes | Yes | Yes |
| Functional form | Linear | Linear | Linear | Linear |
| Fixed effects | Industry-year | Industry-year | Industry-year | Industry-year |
| Observations | 66,966 | 28,296 | 66,966 | 65,501 |
| Number of clusters (firms) | 18,901 | 9,461 | 18,901 | 18,641 |
| Adjusted R-squared | 0.4989 | 0.1595 | 0.5493 | 0.1689 |

In this table four regression discontinuity ordinary-least-square (OLS) regressions are presented, which have been performed in order to test whether the Swedish CSR reporting mandate has any effect on privately owned firms' cost of debt in Sweden. Natural log of interest expenses, scaled (on debt to credit institutions) interest expenses, natural log of financial expenses and scaled (on total liabilities) financial expenses are the regressed outcome variables used as different measures of cost of debt. The binary regression discontinuity variable *Mandate* is the explanatory variable of interest, which is determined by the firm size factors employees, assets and sales during the two foregoing years. The control variables are six firm size factors (based on employees, assets and sales, in relation to their respective regulatory thresholds) and the interactions of them, financial leverage, profitability (return on assets), firm age (natural log of firm age over average firm age) and liquidity. We also control for industry-year fixed effects and cluster standard errors (in parenthesis) on firm level. *, ** and *** denote the two-tailed statistical significance levels of 10 percent, 5 percent, and 1 percent, respectively. The datasets for each of the regressions are winsorized on the 5th and 95th percentile. See section 3.3 for more precise definitions of the variables.

4.3 Discussion of the results

Numerous studies on the impact of financial reporting and disclosure on firms' cost of capital show that financial disclosure reduces the information asymmetry problems between capital providers and firm managers, resulting in a lower cost of equity capital and cost of capital for firms (Botosan, 2006; Botosan & Plumlee, 2002; Core, 2001; Diamond, 1991; Healy & Palepu, 2001; Lambert et al., 2007; Leuz & Wysocki, 2016; Verrecchia, 2001). However, the research on CSR reporting is both limited and focused mainly on publicly listed firms. Moreover, they also provide inconclusive results. Some find that both voluntary and mandatory CSR reporting (based on a measure of CSR score) are associated with lower cost of capital (Clark et al., 2015). On the contrary, others find that firms with better CSR performance receive a higher cost of debt financing (Izzo & Magnanelli, 2012). This implies that CSR investments are not recognized as a risk reducing factor by capital providers. Furthermore, equity market reacts negatively to events at the passage of a CSR reporting mandate (Grewal et al., 2018). However, applying a multivariate regression discontinuity method, we do not find significant evidence to reject the null hypothesis. Statistically, our main result suggests that such causal link between the Swedish reporting mandate and private firms' cost of debt does not exist or is unlikely to exist.

Prior research has proven it to be difficult studying the economic effects of a policy change, and particularly even more challenging for CSR reporting (Christensen et al., 2021). CSR information are often of multifaceted, long term, non-monetary and intangible characteristics, thus, it is more difficult to measure its effects. In our research, we applied a multivariate regression discontinuity research design based on several assumptions, which has not been statistically tested. Particularly, we assume that the Swedish firms comply with the mandate. However, there are reasons for why that might not be the case. Firstly, as prior research on this topic is limited, the documented benefits from CSR reporting are unclear and inconclusive. It is suggested that investors find mandatory CSR disclosures to be costly, particularly for firms that already disclosed some CSR information prior to the mandate, and now (from 2017 and onwards) would be forced to disclose additional information on the subject that is no of visible financial value to the investors (Daske et al., 2013; Grewal et al., 2018). Furthermore, enforcement of the current CSR mandate is relatively weak. Particularly, there are no requirements for CSR reports to be audited or assured by a third party as well as no legal pressures such as penalties for failing to report required CSR information. Based on the above-mentioned reasons, Swedish firms seemingly have both incentives and a clear opportunity of resisting to comply with the mandate without any legal repercussions. If outside pressures from other stakeholders are not strong enough, it would be rational for some firms to avoid producing a CSR report. In addition, prior literature has found banks and credit institutions to be active users of financial disclosure and reporting (Breuer et al., 2018). The disclosed financial information is value relevant and reduces the information asymmetry problems between capital providers, resulting in a lower cost of capital (Healy & Palepu, 2001; Leuz & Wysocki, 2016). However, as we mentioned before that CSR reporting is different compared to financial reporting in numerous ways, banks and credit institutions might not use or perceive the CSR information in the same way as they do with the financial reporting and disclosure. This is because firms have

incentives to manipulate the CSR mandate and CSR disclosure and reporting are not audited or assured by a third party, questioning the credibility and value-relevant quality of the disclosed CSR information. Based on these above reasons, banks and credit institutions might not react to CSR disclosure, consequently leading to no effect on the cost of debt, which in the current context could be viewed as a likely explanation for the consistently insignificant results we got in the regressions.

Moreover, as suggested by prior literature, there is also a possibility that firms already have voluntarily disclosed all now currently required CSR information prior to the mandate (Kleimeier & Viehs, 2018). In that case, a CSR reporting mandate would not lead to reduction of the information asymmetry problems and there would be no impact the cost of debt. In our research design, we did not measure and account for the level of voluntary CSR disclosure that might have occurred years before the mandate, which could also possibly be another explanation for our inconclusive results.

However, our main results only means that we do not have enough evidence to reject the null hypothesis and does not mean that we can accept it, which implies that there is a possibility that there still might be causal link. In our research, we examine the effects of the Swedish implementation of EU's Non-Financial Reporting Directive (NFRD 2014/95/EU). This mandate consists of multiple and dimensional regulatory thresholds, which makes it difficult to find a research design to effectively measure the effect of the CSR reporting mandate on the cost of debt. First of all, the control function in the research design, which only control for relative distances to the thresholds and whether a firm crosses the individual thresholds, is not sufficient to demonstrate the complexity of the Swedish CSR reporting mandate and thus might explain why our research design does not result in any clear conclusions.

Moreover, in our research design, we exploit the discontinuous CSR reporting mandate assigned to otherwise similar private firms and examine its effects for a sample consisting of both treated and control firms. These firms differ from each other in terms of size dimensions (total assets, sales and employees). By doing that, we only account for the size differences between the treated and control firms, which might not be sufficient. In fact, these firms also differ from one another in terms of other factors, for instance, leverage, profitability, age and liquidity, which can be observed from the data collected from Serrano. This suggests our sample might not be optimal since it does not fully account for the pre-treatment differences between treated firms and control firms, leading to inconclusive results. Therefore, in the following section, we proceed with a slightly different approach by performing propensity score matching to create a matched sample. Thereafter, we run the same regression analysis on the matched sample to test the robustness of our main results.

5. Robustness checks

In this section, we present our two additional empirical tests for robustness. Section 5.1 presents the methodology and result for a regression analysis based on a matched sample. Section 5.2 describes the methodology and result for a regression model based on a trimmed sample.

Since we already perform a robustness check by doing regressions for four separate outcome variables in the main results, we will not make additional tests by performing similar regression but with other variables. Instead, we check the robustness of our main result in two different ways. First, we test our hypothesis by performing a propensity score matching to create a matched sample, and thereafter run a regression analysis on the matched sample. The reason we generate a sample with more similar firms than in the main sample is to diminish the potential pre-treatment differences between treated and control firms that are beyond the three size dimensions (total assets, sales and average employees). Second, conducting a study on privately held firms, Minnis (2011) uses an alternative approach to handle outliers in the data, by trimming (also known as truncating) the data instead of winsorizing it. Thus, we perform a regression analysis on a trimmed sample and compare it to the results from the main tests.

5.1 Regression analysis on a matched sample

Based on the Swedish CSR reporting regulation, firms that are assigned to the treatment group (subjected to the CSR reporting mandate) and firms that are assigned to the control group (not subjected) are different in terms of size dimensions (total assets, sales and average employees). However, these firms also vary in term of other factors such as leverage, profitability, liquidity, firm age and industry, as well as other factors we have not observed. These observable different firm characteristics, which can be viewed in Appendix B, suggest that the decision to disclose CSR information is not random and may result in endogeneity problems (Larcker & Rusticus, 2007). Therefore, it might not be sufficient to only control for the size differences (total assets, sales, average employees). To be able to tackle the other pre-treatment differences between the treated firms and control firms, we proceed to create a matched sample that consists of firms with pretreatment similarities.

We generate this matched sample as follows. First, we use firm-year observations from 2016 which we call the donor pool. We then identify all firms that are assigned to the treatment group and the control group, respectively. Thereafter, based on the firm-level control variables (financial leverage, return on assets, liquidity and firm age), we perform the propensity score matching using one-to-one matching without replacement to find suitable matched control firms from the donor pool. One-to-one matching implies that one treated firm is matched to one control firm, and no replacement matching means that each control firm can be matched only once, even if the control firm might be a good match for several treated firms (Shipman et al., 2017). We perform the one-to-one matching without replacement in order to create the best matches, which means that the treated firm is matched with the most similar control firm. However, one-to-one and without replacement matching may also result in a smaller sample size (Shipman et al., 2017), which we

experience in our case. Once the matching is done, only the matched firms are kept. In the last step, this list of matched treated firms and control firms are merged with our main sample (which is the sample of firms over the 2017-2020 period) in order to generate the matched sample.

Table 4 summarizes the results for the regression analysis using the matched sample. Our main results hold for all four measures of cost of debt in the matched sample. It is observed that the magnitude of the coefficient is reduced compared to the results provided by the main sample. However, we still find no statistically significant evidence for the cost of debt.

Table 4
Effect of CSR reporting mandate on private firms' cost of debt (matched sample)

| | RD-OLS | RD-OLS | RD-OLS | RD-OLS |
|--|-----------------------|--------------------------|------------------------|---------------------------|
| | LN(interest expenses) | Scaled interest expenses | LN(financial expenses) | Scaled financial expenses |
| <i>Mandate</i> | 0.104 (0.329) | 0.023 (0.033) | -0.288 (0.323) | -0.003 (0.002) |
| Controls | | | | |
| I _{EM} (Employees > T _{EM}) | Yes | Yes | Yes | Yes |
| I _A (Total assets > T _{TA}) | Yes | Yes | Yes | Yes |
| I _{SA} (Sales > T _{SA}) | Yes | Yes | Yes | Yes |
| Relative T _{EM} | Yes | Yes | Yes | Yes |
| Relative T _{TA} | Yes | Yes | Yes | Yes |
| Relative T _{SA} | Yes | Yes | Yes | Yes |
| I _{EM} * Relative T _{EM} | Yes | Yes | Yes | Yes |
| I _{TA} * Relative T _{TA} | Yes | Yes | Yes | Yes |
| I _{SA} * Relative T _{SA} | Yes | Yes | Yes | Yes |
| Leverage (Debt-to-assets) | Yes | Yes | Yes | Yes |
| Return on Assets | Yes | Yes | Yes | Yes |
| Firm age | Yes | Yes | Yes | Yes |
| Liquidity (Quick ratio) | Yes | Yes | Yes | Yes |
| Functional form | Linear | Linear | Linear | Linear |
| Fixed effects | Industry-year | Industry-year | Industry-year | Industry-year |
| Observations | 5,906 | 1,325 | 5,906 | 5,893 |
| Number of clusters (firms) | 1,564 | 471 | 1,564 | 1,564 |
| Adjusted R-squared | 0.3623 | 0.1589 | 0.5720 | 0.1158 |

This table provides results for the effect of mandatory CSR reporting on Swedish private firms' cost of debt. We regress natural log of interest expenses, scaled interest expenses, natural log of financial expenses and scaled financial expenses over Mandate, the treatment indicator, that takes the value of 1 for firm-year observations that meet the requirement for mandatory CSR reporting. The control variables are six firm size factors (based on employees, assets and sales, in relation to their respective regulatory thresholds) and the interactions of them, financial leverage, profitability (return on assets), firm age (natural log of firm age over average firm age) and liquidity. We also control

for industry-year fixed effects and cluster standard errors (in parenthesis) on firm level. *, ** and *** denote the two-tailed statistical significance levels of 10 percent, 5 percent, and 1 percent, respectively. The datasets for each of the regressions are winsorized on the 5th and 95th percentile. See section 3.3 for more precise definitions of the variables.

5.2 Trimming instead of winsorization

Here, we examine what happens with the regression coefficients if we trim the extreme values instead of winsorizing them. This means that have the same dataset as in Table 1 (see section 3.1), but we then also eliminate all extreme values instead of winsorizing them. The results from the regressions on the alternative dataset is presented in Table 5 below.

Table 5
Effect of CSR reporting mandate on private firms' cost of debt

| | RD-OLS | RD-OLS | RD-OLS | RD-OLS |
|--|-----------------------|--------------------------|------------------------|---------------------------|
| | LN(interest expenses) | Scaled interest expenses | LN(financial expenses) | Scaled financial expenses |
| <i>Mandate</i> | 0.207 (0.169) | 0.019** (0.009) | 0.172 (0.168) | 0.000 (0.001) |
| Controls | | | | |
| I _{EM} (Employees > T _{EM}) | Yes | Yes | Yes | Yes |
| I _A (Total assets > T _{TA}) | Yes | Yes | Yes | Yes |
| I _{SA} (Sales > T _{SA}) | Yes | Yes | Yes | Yes |
| Relative T _{EM} | Yes | Yes | Yes | Yes |
| Relative T _{TA} | Yes | Yes | Yes | Yes |
| Relative T _{SA} | Yes | Yes | Yes | Yes |
| I _{EM} * Relative T _{EM} | Yes | Yes | Yes | Yes |
| I _{TA} * Relative T _{TA} | Yes | Yes | Yes | Yes |
| I _{SA} * Relative T _{SA} | Yes | Yes | Yes | Yes |
| Leverage (Debt-to-assets) | Yes | Yes | Yes | Yes |
| Return on Assets | Yes | Yes | Yes | Yes |
| Firm age | Yes | Yes | Yes | Yes |
| Liquidity (Quick ratio) | Yes | Yes | Yes | Yes |
| Functional form | Linear | Linear | Linear | Linear |
| Fixed effects | Industry-year | Industry-year | Industry-year | Industry-year |
| Observations | 49,903 | 20,440 | 49,506 | 48,835 |
| Number of clusters (firms) | 16,256 | 7,892 | 16,225 | 16,193 |
| Adjusted R-squared | 0.4472 | 0.1220 | 0.4903 | 0.2253 |

In this table four regression discontinuity ordinary-least-square (OLS) regressions are presented, which have been performed in order to test whether the Swedish CSR reporting mandate has any effect on privately owned firms' cost of debt in Sweden. Natural log of interest expenses, scaled (on debt to credit institutions) interest expenses, natural log of financial expenses and scaled (on total liabilities) financial expenses are the regressed outcome variables used as different measures of cost of debt. The binary regression discontinuity variable *Mandate* is the explanatory variable

of interest, which is determined by the firm size factors employees, assets and sales during the two foregoing years. The control variables are six firm size factors (based on employees, assets and sales, in relation to their respective regulatory thresholds) and the interactions of them, financial leverage, profitability (return on assets), firm age (natural log of firm age over average firm age) and liquidity. We also control for industry-year fixed effects and cluster standard errors (in parenthesis) on firm level. *, ** and *** denote the two-tailed statistical significance levels of 10 percent, 5 percent, and 1 percent, respectively. The datasets for each of the regressions are trimmed on the 5th and 95th percentile. See section 3.3 for more precise definitions of the variables.

As Table 5 shows, about 25 percent of the remaining sample is removed when the extreme values are eliminated, going from around 66,000 firm-years in the winsorized dataset to just under 50,000 in the trimmed equivalent (with the exception of scaled interest expenses that goes from 28,296 firm-year observations to 20,440). The regressions of log interest expenses, log financial expenses, and scaled financial expenses result in insignificant parameter estimates for the *mandate* variable, consistent with both the main results and the regressions done on the matched sample using propensity score matching. On the contrary, the regression of scaled interest expenses results in a parameter estimate of 0.019 which is significant on the five percent level, suggesting firms subjected to the CSR reporting mandate generally experience a cost of debt that is 1.9 percent higher than if they would not be subjected to the mandate.

Table 6

| | Reported value | | Missing value | | Difference (Reported – Missing) | |
|---------------------------|----------------|--------|---------------|--------|------------------------------------|-----------|
| | Mean | Median | Mean | Median | Mean | Median |
| Leverage (Debt-to-assets) | 0.168 | 0.146 | 0.008 | 0.000 | 0.160*** | 0.146*** |
| Return on Assets | 0.099 | 0.089 | 0.130 | 0.121 | -0.031*** | -0.032*** |
| Firm age | -0.248 | -0.128 | -0.298 | -0.182 | 0.050*** | 0.054*** |
| Liquidity (Quick ratio) | 1.238 | 1.133 | 1.578 | 1.424 | -0.340*** | -0.291*** |
| Firm-years | 20,440 | | 30,408 | | | |

Table 6 presents descriptive statistics (mean and median) for firm-year observations conditioned on whether there is a reported value (i.e., reported values for interest and debt, from which the variable is calculated) scaled interest expenses (based on debt solely to credit institutions) or not. The differences between those two groups are also calculated and tested for whether these are significant or not. The variables are financial leverage, profitability (return on assets), firm age (natural log of firm age over average firm age) and liquidity. *, ** and *** denote the two-tailed statistical significance levels of 10 percent, 5 percent, and 1 percent, respectively. See section 3.3 and Appendix A for more precise definitions of the variables.

However, the regression for scaled interest expenses cannot simply become interpreted on the same conditions as the other three regressions. Since there are such a vast amount of many missing values (60 percent, or 30,408 firm-years) for the scaled interest expenses variable, there is a chance the dataset might be biased compared to the other regressed datasets. In Table 6, firm-years are grouped based on whether there is a value for scaled interest expenses or not. As can be seen, the firm-years' characteristics of these two groups vary significantly with regards to the control variables used in the regressions. The firm-years with sufficient reported data to calculate the

scaled interest expense (i.e., reported value-observations) on average are more mature, have higher leverage, lower profitability, and lower liquidity. This means that the dataset on which regression for scaled interest expenses is biased and should be given less weight in the analysis due to the lower external validity.

6. Conclusions

This section presents a summary of the main aspects of this thesis. We summarize our results and provide implications based on current theoretical and methodological background. Thereafter, we present our contributions to the area of literature. We then summarize the limitations of our research, which have been presented in detail in the previous sections. The section ends with our suggestions for future research.

6.1 Conclusion

The primary purpose of this thesis is to study the economic effects of the Swedish implementation of EU's NFRD on the cost of debt for Swedish private firms. A quantitative research design has been chosen to investigate the research question. The null hypothesis was developed after reviewing prior research on the topic. Private firms possess different characteristics compared to publicly listed firms and CSR reporting is characteristically different compared to financial reporting. The prior research on the topic of economic effects of CSR reporting is limited and the empirical evidence on private firms is scarce. In this paper, we take a first step towards uncovering this novel area of literature and attempt to answer the research question: What are the economic effects of adopting a CSR reporting mandate for the cost of debt for private firms? To examine the effect of CSR disclosure regulation on private firms' cost of debt, our empirical approach compares the cost of debt outcomes of firms treated with differing disclosure requirements near the regulatory thresholds as suggested by Breuer et al. (2018). Exploiting this comparison of otherwise similar firms, we investigate how CSR reporting requirements affect Swedish private firms' cost of debt. We did not find any statistically significant evidence for the cost of debt based on our main regression analysis. Furthermore, on a matched sample in which we control for other pre-treatment differences between firms in the treatment and control groups, our findings are also consistent with our main results. The equivalent regressions performed on the trimmed datasets support the main results as well. These consistent results suggest that our main statistical results therefore can be considered fairly robust.

This paper extends the literature by shedding light onto the effects of adopting a CSR reporting mandate on the cost of debt for private firms. The results from our research could also be of interest to regulators who have made efforts in establishing a CSR reporting mandate that may drive changes in corporate behaviors towards a more socially responsible business approach. Furthermore, we discussed potential reasons for why our research design has not succeeded in establishing statistically significant evidence, based on the limitations of the research design and theoretical background of prior literature. Our paper leaves several questions unanswered (including the research question) and opens up avenues for future research on this area, which seems to have been overlooked by prior research.

6.2 Limitations and future research

The main limitations of our research design are also the main limitations of this study (discussed in more detail in section 3.2), with strong assumptions made regarding private firms' compliance with the CSR mandate. If these assumptions are not met, it might distort the results of our empirical research design. Subsequently, the control function in the empirical model is not sufficient to fully reflect the complexity of the Swedish CSR reporting mandate. Furthermore, our research design does not take into account the voluntary disclosure level prior to the mandate, which might also affect the results of our study. In addition to the voluntary CSR information disclosed prior to the mandate, we do not account for the pre-treatment differences beyond the size factors (total assets, sales, employees), which might lead to the endogeneity problems. However, by performing the regression analysis on a matched sample, we partly tackle this endogeneity issue.

Moreover, there are also limitations with regards to our data (section 3.1). The data we use is adjusted for broken, short and long accounting periods as well as omissions and gaps in the financial statements. Fiscal years are altered and converted to calendar years, which might generate some inconsistency in our research since the mandate applies to all firm fiscal years starting immediately after 31 December 2016. However, we were able to partly check for how this would affect our sample. This is done by comparing the number of firms assigned to the treated group with the number of firms expected to be affected by the mandate according to an analysis by Growth analysis (2018), which is approximately 1,500. We got a sample of 1,133 firms subjected to the mandate, which can be considered fair for our study given that we exclude public and state-owned firms.

As mentioned earlier, our paper opens up new avenues for research on the topic of CSR reporting in a number of ways. Firstly, the knowledge and data on CSR reporting is constantly increasing and so are the regulations for CSR reporting. For instance, EU's new CSR mandate – CSRD (which has been accepted by the Council in 2022) – amending NFRD (2014/95/EU) is expected to come into effect for firms' fiscal years starting in 2024. The CSRD extends the scope of firms being subjected and also requires third-party assurance of the CSR reporting (European Council, 2022). Furthermore, a similar mandate is being developed by the U.S. Securities and Exchange Commission. Hence, future replications of our research design could provide different predictions and results when performed on data coming from a different regulatory context after the new regulations have come into enforcement. Secondly, we suggest using a different research design for this, for instance, the difference-in-differences method. The reason for this is that a difference-in-differences design allow within-firm comparisons by taking both before and after difference in the treatment group's cost of debt outcomes and capturing all time-varying factors before and after in the control group, which may provide more robust results for our original setting. Moreover, the control function in the empirical model could be improved and a non-linear regression model might be used in future research. Thirdly, an alternative matched sample can be generated using the panel data for several years prior to the mandate, instead of merely using the data for 2016 to create the matched sample, as we did in our robustness test. This can be done by, for example,

calculating the average pre-treatment values of the covariates to generate a cross-sectional dataset to create a matched sample, which thereafter can be extended over the 2017-2020 period. Last, but not least, in our research we excluded micro firms from the original sample. However, Breuer et al. (2018) and Reardon and Robinson (2012) suggest using the full sample for a multivariate regression discontinuity design. Thus, future studies may replicate our research design using the full sample (with the micro firms).

7. References

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8. Appendices

Appendix A

Variable definitions

| Outcome variables | Mathematical definition | Definition |
|-------------------------------------|--|---|
| Log interest expenses | $\text{LN}(\text{interest expenses} + 1)$ | Natural logarithm of interest expenses based on external interest expenses to credit institutions |
| Scaled interest expenses | $\text{Interest expenses} / \text{Debt}$ | Interest expenses to credit institutions over the opening balance of debt to credit institutions |
| Log financial expenses | $\text{LN}(\text{financial expenses} + 1)$ | Natural logarithm of total financial expenses, including other interest expenses |
| Scaled financial expenses | $\text{Financial expenses} / \text{Liabilities}$ | Total financial expenses over the opening balance of total liabilities |
| Control variables | | |
| <i>Size control variables</i> | | |
| I_{TA} | See formula in section 3.3 | Indicator variable equal to the value of one if total assets exceed the total assets threshold and zero otherwise |
| I_{SA} | See formula in section 3.3 | Indicator variable equal to the value of one if sales exceed the sales threshold and zero otherwise |
| I_{EM} | See formula in section 3.3 | Indicator variable equal to the value of one if employees exceed employees threshold and zero otherwise |
| $h(\text{Size}_{TA})$ | See formula in section 3.3 | Relative total assets. Natural logarithm of total assets over total assets threshold |
| $h(\text{Size}_{SA})$ | See formula in section 3.3 | Relative sales. Natural logarithm of sales over sales threshold |
| $h(\text{Size}_{EM})$ | See formula in section 3.3 | Relative employees. Natural logarithm of employees over the employees threshold |
| <i>Firm-level control variables</i> | | |
| Financial leverage | $\text{Debt} / \text{Assets}$ | Liabilities to credit institutions over the book value of assets |
| Liquidity (quick ratio) | $(\text{Current assets} - \text{Inventory}) / \text{Short-term liabilities}$ | Total current assets less the total inventories, divided by the total short-term liabilities |
| Return on assets | $(\text{Adj. profit after fin. income}) / \text{Assets}_{t-1}$ | Adjusted profit or loss after financial income divided by the total assets |
| Relative firm age | $\text{LN}(\text{firm age} - \text{avg. firm age})$ | Natural logarithm of firm age over sample average firm age |

Appendix B

| | Treated firm-years (mandate = 1) | | Control firm-years (mandate = 0) | | Difference (Treated – Control) | |
|---------------------------|-------------------------------------|--------|-------------------------------------|--------|-----------------------------------|-----------|
| | Mean | Median | Mean | Median | Mean | Median |
| LN(interest expenses) | 5.430 | 6.256 | 3.372 | 3.497 | 2.058*** | 2.759*** |
| Scaled interest expenses | 0.110 | 0.039 | 0.086 | 0.043 | 0.024*** | -0.004*** |
| LN(financial expenses) | 6.989 | 7.885 | 3.730 | 3.871 | 3.259*** | 4.014*** |
| Scaled financial expenses | 0.016 | 0.009 | 0.013 | 0.008 | 0.003*** | 0.001*** |
| Leverage (Debt-to-assets) | 0.026 | 0.000 | 0.092 | 0.000 | -0.066*** | 0.000*** |
| Return on Assets | 0.085 | 0.073 | 0.111 | 0.099 | -0.026*** | -0.026*** |
| Firm age | 0.422 | 0.424 | -0.361 | -0.239 | 0.783*** | 0.663*** |
| Liquidity (Quick ratio) | 1.344 | 1.138 | 1.502 | 1.288 | -0.158*** | -0.150*** |

This table presents descriptive statistics (mean and median) for firm-year observations conditioned on whether the firm-year is subjected to the CSR reporting mandate (i.e., the *mandate* variable is equal to 1) or not (*mandate* = 0). The differences between those two groups are also calculated and tested for whether these are significant or not. The variables are the four measures of cost of debt (log interest expenses, scaled interest expenses, log financial expenses, scaled financial expenses, financial leverage), and the control variables profitability (return on assets), firm age (natural log of firm age over average firm age) and liquidity. *, ** and *** denote the two-tailed statistical significance levels of 10 percent, 5 percent, and 1 percent, respectively. See section 3.3 and Appendix A for more precise definitions of the variables.