



Mandatory CSR Reporting and Corporate Financial Performance

*The causal effects of §3-3c in the Accounting Act on the financial
performance of Norwegian companies*

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Abstract

Regression discontinuity design was employed to estimate the causal effects of mandatory CSR disclosure imposed by §3-3c in the Accounting Act on the corporate financial performance of companies in Norway. The analysis used data from 4 954 Norwegian firms. In this study, 15 financial ratios – that assess the profitability, efficiency, liquidity and leverage – were selected to examine the change in corporate financial performance. By using small and large businesses as treatment and control groups, respectively, this project estimated the causal effects of the legislation on the change in the ratios. The regression discontinuity design did not facilitate the causal estimation of §3-3c on liquidity. The analysis *did* reveal positive and negative short-term effects on profitability and firm leverage, respectively. However, the analysis yielded inconclusive results for financial efficiency. Nevertheless, all companies must incorporate CSR into their business strategies and actively report on their CSR activities to their stakeholders.

Keywords – Regression Discontinuity, Mandatory CSR Reporting, Corporate Financial Performance, Accounting Act, Norwegian Companies

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Dedicated to my grandfathers Dr. S. Balaraman and Dr. N. Viswanathan.

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1 Introduction

The world has come a long way from the poor working conditions and environmental degradation that prevailed in the industrial era. Milton Friedman's doctrines of corporate profit fixation (Friedman, 1962) have now been replaced by Gro Harlem Brundtland's principles that direct firms to focus on sustainable development (Figure 1.1). The World Commission on Environment and Development (1987) defined sustainable development as "development that meets the needs of the present generation without compromising the ability of future generations to meet their own needs". This ambition towards intergenerational equality has increased our environmental awareness and concerns for societal justice. Such insights into sustainability have helped improve living standards over the years: poverty rates and infant mortality have dramatically decreased, while literacy rates have increased significantly (Roser, 2017). Likewise, we have witnessed many green victories during the past decades: several environmental protection acts have been implemented (Glicksman et al., 2015), and more eco-friendly goods are sold now (Cone Communications, 2015). However, there is still a long way to go – child labourers are working under horrible conditions (CNN Freedom Project, 2017), the oceans contain plastics (Taylor and Laville, 2017), and some world leaders fail to acknowledge these problems (Banjo and Chen, 2019; Holden, 2019; Maru, 2019; Umair, 2018). Steps must be taken to eliminate similar negligence.

Companies can help the world move in the right direction by embracing the quest for social justice and environmental protection. Managers can safeguard the well-being of stakeholders through corporate social responsibility (CSR), which is a subtopic within corporate sustainability (CS). Several firms have delved into CSR in recent years – in fact, 80 percent of the CEOs regard CSR as a key component of the differentiation strategy, and 88 percent believe that CS is necessary for growth (Accenture, 2016). Why do these leaders revere CSR so highly? Do they perhaps believe that there is a causal impact of sustainability on corporate financial performance (CFP)?

Anecdotal evidence shows that there is a connection between profitability and CSR. The "Plan A" sustainability initiative has helped Marks & Spencer generate 185 million GBP in five years (Brokaw, 2012). Allowing labourers to volunteer for non-profit organisations

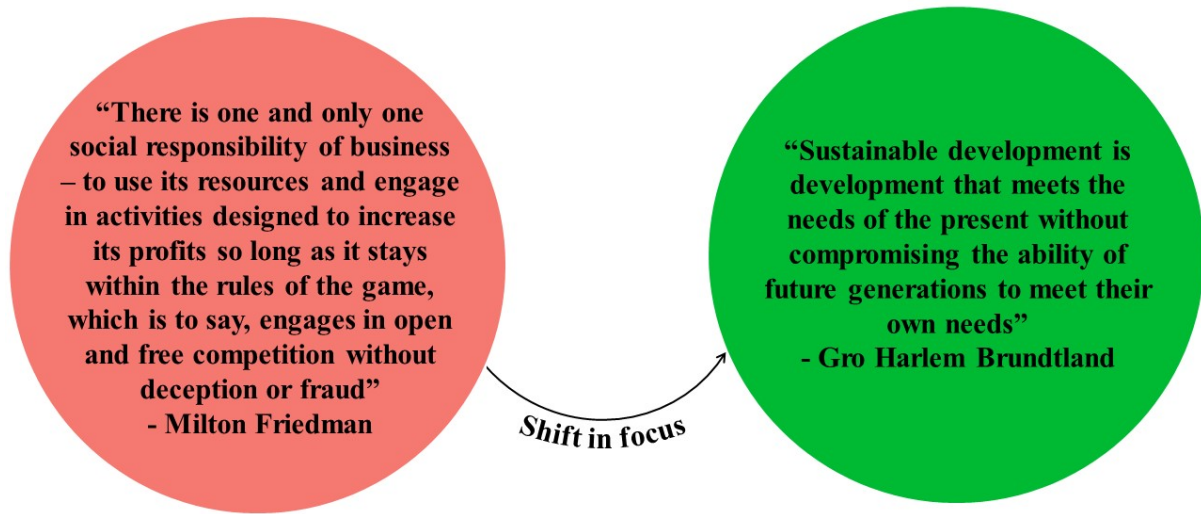


Figure 1.1: Shift in focus from mere economic prosperity to environmental, social and economic responsibility

increased employee productivity and loyalty at Xerox, enabling the firm to survive near-bankruptcy conditions in the early 2000s (Scott, 2012). Unilever’s Sustainable Living brands are growing faster than the group’s other ventures, signalling the superiority of a company that embraces CSR (SADC Correspondent, 2017). These examples demonstrate that there is a positive relationship between CSR and profitability.

Scholars, however, have not yet agreed about the connection between sustainability and CFP even though many articles describe this link (Alshehhi et al., 2018). Some authors show that there is a positive relationship between the two business-related aspects (Lo and Sheu, 2007; Rettab et al., 2009; Taib and Ameer, 2012; Weber, 2017), while others indicate that there is a negative correlation (Brammer et al., 2006; Hassel et al., 2005; Wright and Ferris, 1997). A few studies even claim that there is no connection at all between CSR and CFP (Aupperle et al., 1985; Deegan, 2004; Teoh et al., 1999). It must be mentioned that the aforementioned studies have used different methods to arrive at their respective conclusions. The contradictory findings are important because they are all pieces of the puzzle to understand the relationship between CSR and CFP. This thesis will be yet another piece to solve the above-mentioned conundrum, and the scientific society will hopefully be one step closer to finding the answer.

There are many ways to understand the link between CSR and CFP; for example, Teoh et al. (1999) studied the effects of the boycott of South Africa's apartheid on CFP, Kiessling et al. (2016) analysed the correlation between CSR and financials based on market orientation theory, and Beck et al. (2018) delved into the effects of CSR reporting on CFP. The present thesis uses regression discontinuity design (RDD) to understand the link between the financial performance indicators of Norwegian companies and §3-3c in the Accounting Act (1999), which states that large companies are required to include CSR-related issues in their financial reports. In other words, the current study will focus on the effects of mandatory CSR disclosure on the CFP of Norwegian companies. The project aims to shed light on the impact of CSR disclosure on CFP by centring on the following topic question:

What is the causal effect of a CSR-related legislation, namely §3-3c in the Accounting Act on the corporate financial performance of companies in Norway?

This thesis is organised in the following chapters: introduction, theoretical framework, methodology, results, discussion and conclusion. Since the topic has already been introduced, the theoretical framework will now be laid to provide an overview of CS, CSR reporting, financial performance and sustainability-related legislation. The methodology chapter will explain the methods used to conduct this study. Then, the results will be presented, followed by a discussion. Finally, the conclusion will be in the sixth chapter.

2 Theoretical Framework

In this chapter, I delve into CS to understand how companies incorporate sustainability and CSR into their business strategies, and I also investigate CSR reporting. Then, I study social legislations that are implemented by the Norwegian government to impose CSR on companies. Additionally, I explain CFP indicators, which can be affected by CSR reporting. Theory about these subjects will aid in the advancement of a hypothesis and lay the foundation for the study conducted in this master's project.

2.1 Corporate sustainability

Sustainability is about ensuring the well-being of the society and protecting natural resources while generating economic growth (Rothaermel, 2017). Furthermore, the World Commission on Environment and Development (1987) claimed that we need to aim for sustainable development to secure intergenerational equality. Therefore, the current generation must secure both intra- and intergenerational equity by appropriately utilising cultural and environmental assets, while preserving them for the next generation (Dyllick and Hockerts, 2002). This is easier said than done because we are living in a highly materialistic world in which people aim to project a lavish lifestyle (Monbiot, 2013). We must consume ecological and cultural capital to only cover our needs and not fulfil all our desires.

Based on the aforementioned explanation of sustainability, CS is about incorporating social justice, environmental protection and economic growth into business practices (Baumgartner and Ebner, 2010) – see Figure 2.1. First, firms must reduce their negative environmental impacts that arise from resource use, emissions and waste production (Baumgartner and Ebner, 2010). Only then can we spare enough natural resources to meet the needs of future generations. Companies must also engage in profitable activities to achieve economic growth and survive in a competitive world (Rothaermel, 2017), thus contributing to the national economy. Economically sustainable companies must generate a perpetual cash flow to both assure satisfactory liquidity levels and deliver solid shareholder returns (Dyllick and Hockerts, 2002). Furthermore, corporations should focus on societal issues through CSR. The most popular definition of CSR is that of Carroll

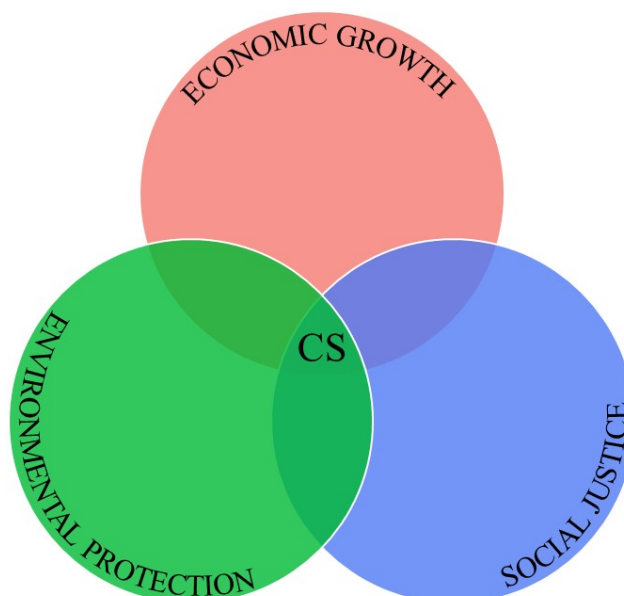


Figure 2.1: The three components of corporate sustainability, as described by Baumgartner and Ebner (2010)

(1979); “the social responsibility of business encompasses the economic, legal, ethical, and discretionary expectations that society has of organisations at a given point in time”. In other words, corporations must always ensure the well-being of all their stakeholders. This implies that companies should strengthen the human and social capital by, for example, training employees or supporting causes such as education and infrastructure (Dyllick and Hockerts, 2002). Due to the multifaceted nature of CS, an in-depth analysis of CS is an intricate process that requires a holistic approach. Companies must combine the knowledge obtained from different CS-related research to incorporate all three pillars of sustainability in their business practices.

Economic growth, namely one of the three aspects of CS, should be secured with caution. Costanza et al. (2014) highlight that economic growth should be generated through utilisation of resources that do not degrade the environment or exhaust the social capital. Furthermore, there is no fair monetary remuneration to compensate for negative externalities such as habitat loss due to pollution or deforestation, or health problems connected to poor working conditions. Worker compensations and environmental lawsuits may convey the wrong message that money can substitute losses inflicted on corporate stakeholders or surroundings. Instead of downplaying the severity of environmental

degradation and social negligence through financial settlements, companies must generate economic capital through responsible utilisation of natural and human resources, and make proactive investments to hone human, social and natural capital.

It is vital that firms adopt a holistic approach to sustainability rather than focusing on just one or two of its aspects. Some scholars claim that a three-pronged approach to CS is incorrect because the importance of natural and social capital will be eclipsed by considering economic growth, and to them, it is inconceivable to achieve both environmental protection and social justice simultaneously (Kuhlman and Farrington, 2010). However, most scholars regard sustainability as the interplay between economic, social and environmental factors – see for instance Marshall and Toffel (2005), Dyllick and Hockerts (2002) and Baumgartner and Ebner (2010). Hence, companies must acknowledge the fact that human, natural and economic capital do not have a substitutable relationship, but a complimentary one (Costanza et al., 2014; Daly and Farley, 2011; Dyllick and Hockerts, 2002). Unfortunately, some managers ignore one or even two of the aspects of CS (Dyllick and Hockerts, 2002). Firms with an eco-efficiency strategy aim to consider only economic gains and environmental conservation, others focus solely on economic and social development and aspire for fair trade, and still others achieve environmental justice by protecting social and natural capital alone (Elkington, 1999). Even though it is not optimal to ignore any of the three aspects, an in-depth analysis of the entire topic is an intricate procedure. Therefore, this project delves into a subtopic within CS, namely CSR. However, companies must acknowledge that the three pillars are of equal importance.

Firms have different methods to implement CS into their business strategies – some of these are successful and others are not. Those companies that focus on the three aspects of CS do so at different magnitudes. Baumgartner and Ebner (2010) claim that there are six different profiles of CS strategies, ranging from the merely law-abiding introverted strategy to the devoted and fruitful systemic visionary strategy. Research has shown that businesses that adopt sustainability strategies with higher maturity levels are more lucrative in the long term (Eccles et al., 2014). Also, large companies with a systemic visionary strategy are more likely to be an industry leader than an average firm (Artiach et al., 2010). This means that smaller businesses do not have the aptitude to tackle sustainability issues. To mitigate this corporate lethargy, governments can implement

environmental and social policies and demand companies to contribute to the national sustainability goal. Such policy implementations will not only be effective in preserving our natural and human capital for future generations, but are also expected to have a positive effect on a firm's financial statements.

2.2 CSR reporting

CSR disclosure helps the companies to communicate their CSR-related business practices to their stakeholders (Moratis, 2017). Norway is one of the countries where the focus on CSR has grown in recent years (Norwegian Ministry of Foreign Affairs, 2009), and the Norwegian government has demanded increased transparency regarding business operations by mandating CSR disclosure through §3-3c in the Accounting Act (1999). The legislation has increased the quality of annual reports (Heldal and Arebø, 2019). In fact, Norwegian firms have always valued CSR and communicated their actions to their stakeholders, but the transparency and credibility of the disclosure increased after the implementation of §3-3c (Utgård, 2019). Nevertheless, there are claims that the paragraph is a weak legislation because it mandated only the disclosure of CSR and the government did not verify the actual CSR practices (Sjåfjell, 2013). In this regard, a question arises: did §3-3c in the Accounting Act actually affect the CSR practices of large Norwegian firms? This question is difficult to answer as CSR is a challenging aspect to assess (Márquez and Fombrun, 2005). Therefore, this report focuses only on the direct link between CSR reporting and CFP.

CSR reporting has received negative publicity in recent years. Certain companies disclose their CSR practices only as an obligation (Michelon et al., 2014), and some firms file CSR reports that lack credibility (Husillos et al., 2011). In fact, there are instances where businesses do not take the actions promised in the disclosure, thereby leading to greenwashing (Laufer, 2003). Some critics such as Gray and Milne (2002) claimed that there are no sustainable companies due to the profit-oriented nature of the business world, and that all CSR reports are only empty promises. Aras and Crowther (2008) even alleged that sustainability reporting is a way to trick investors into contributing to projects that are neither socially nor environmentally responsible. For example, BP marketed themselves as being “beyond petroleum”, thereby attracting investors through

greenwashing (Bannatyne, 2010). The company claimed that the investments were going to fund alternative energy products, but failed to mention that natural gas-fired power is classified as alternative energy (Pearce, 2008). However, Adams and Frost (2008) indicated that the key performance indicators developed for CSR reporting do, in fact, get incorporated into management practices. Other authors too reveal that CSR reports have a positive effect on corporate legitimacy (Bachmann and Ingenhoff, 2016). In the quest for positive CSR-related activities directed towards annual reports, companies increase their focus on CSR and improve their CFP. However, based on the reasons mentioned in the current and previous paragraphs, this project will analyse the link between CFP and CSR disclosure.

Academics have already studied the effects of CSR reporting on CFP. Several authors have obtained evidence of positive and negative effects of CSR disclosure on profitability and liquidity, respectively – see for instance Whetman (2018) and Matuszak and Rozanska (2017). Hence, it can be hypothesised that §3-3c may positively impact profitability and negatively affect liquidity. Unfortunately, there are not any articles that describe the effects of mandatory CSR reporting on firm leverage and efficiency. In summation, this thesis will be based on the following hypothesis:

The mandatory CSR disclosure imposed upon large Norwegian enterprises, through §3-3c in the Accounting Act, may have an effect on CFP.

2.3 Environmental and social legislation

The Norwegian Parliament has passed many laws concerning a variety of topics, ranging from construction to pension schemes (Holmøyvik and Gisle, 2019). According to the Rule of Law Index by the World Justice Project (2019), Norway has the second best rule of law in the world. With an overall score of 0.89 out of 1, the report lauds Norway for “the process by which the laws are enacted, administered and enforced” (World Justice Project, 2019). This implies that all Norwegian laws, including those concerning the nation’s sustainability, are fair and efficient. Ergo, the legislations in Norway are expected to have a greater impact on firms than those in low-ranking countries such as India, Russia or Nicaragua. Many Norwegian laws concerning the society directly or indirectly

affect business practices. For example, the Working Environment Act (2006) is the most important social legislation imposed upon Norwegian companies. The §10-2 (1) of the Working Environment Act (2006) states that “working hours shall be arranged in such a way that employees are not exposed to adverse physical or mental strain, and that they shall be able to observe safety considerations”. Furthermore, §13 of the Working Environment Act (2006) prohibits discrimination of employees based on political views, age etc. Thus, the Working Environment Act focuses on the social dimension of CS by persuading companies to take basic CSR measures to protect their employees. Likewise, §3-3c of the Accounting Act (1999) states that large enterprises must, in their financial reports, disclose their efforts to incorporate human rights, labour rights, corruption and other societal issues into their business practices. The paragraph came into effect in 2013, affecting financial statements from that year onwards. The rule is not applicable to small enterprises, but instead to firms that satisfy at least two of the following conditions: (i) a revenue of 70 million NOK or more, (ii) a balance sheet total of 35 million NOK or more and (iii) 50 or more full-time equivalents (FTEs) (Accounting Act, 1999). Even though the law does not change the CS profile of small companies, the separation facilitates the use of the RDD. By considering large and small enterprises as the treatment and control groups, respectively, the regression discontinuity analysis can delineate the causal effects of §3-3c on the changes in CFP from 2012 to 2013. The results will help us to understand if CSR-related business practices imposed through legislation indeed impacts firm financials.

Norway’s pristine nature is protected by multiple laws and agreements. The most eminent environmental laws for Norwegians are the Pollution Control Act (1983) and the Climate Change Act (2018). The former one aims to protect the environment from pollution and wastes (Pollution Control Act, 1983), and the latter one was passed to “promote the implementation of Norway’s climate targets as part of its process of transformation to a low-emission society by 2050” (Climate Change Act, 2018). Unfortunately, these legislations were enforced in 1983 and 2018, i.e. outside the period for which I have data of Norwegian companies’ CFP figures. Therefore, this project cannot analyse the effects of the Pollution Control Act (1983) or the Climate Change Act (2018). In fact, we cannot study any Norwegian environment-related laws by conducting regression discontinuity analysis on large versus small enterprises. Ergo, this project does not examine the environmental aspect of sustainability and focuses solely on CSR.

2.4 Corporate financial performance

Corporate finance pertains to the financing and investment choices that a firm takes to reach its goals (Watson and Head, 2016). Based on this definition, CFP indicates the effectiveness with which the company achieves its goals through the said financing and investment decisions. This effectiveness can be measured using several indicators such as earnings before interests and taxes (EBIT) and gross profits (Kinserdal, 2016). These figures are of interest to stakeholders such as investors, managers and suppliers (Monea, 2009) because CFP is a key component of the values created by the firm. Financial ratios like return on equity and inventory turnover are crucial for analysts because they condense the vast information depicted in financial statements, and give a quick and effective insight into CFP (Beckham, 2014). Understanding CFP through financial ratios is pertinent to this study.

An analyst is placed in a crucial quandary when conducting financial analysis due to the myriad of financial ratios (Chen and Shimerda, 1981); which ones should be selected for our study? Calculating and analysing all ratios is not only time-consuming due to the number of available ratios, but also incorrect because of ratio overlapping (Jackendorff, 1962). Some ratios are even industry specific (Goel, 2016). This thesis delves into the “most commonly used financial ratios”. They are explained below, as defined by Beckham (2014).

Profitability ratios measure the effectiveness of a company’s cost-control and profit-generation (Beckham, 2014; Goel, 2016). The following profitability ratios were used in this project:

- The **net profit margin** reveals the degree to which a company has managed to retain its sales revenue
- **Return on sales** (ROS) gives information about the business’ profit margin without considering non-operating activities or expenses
- The **gross profit margin** discloses the percentage of the firm’s revenue after deducting the cost of production
- **Return on assets** (ROA) indicates the effectiveness of asset usage

- **Return on equity (ROE)** points out the effectiveness of stockholder capital utilisation

Note that Beckham (2014) also mentioned earnings per share – this ratio was not analysed in this project because the dataset used did not contain information about the number of outstanding shares for most companies.

Efficiency ratios measure the efficiency with which a company utilises its assets (Beckham, 2014; Goel, 2016). This thesis analysed these efficiency ratios:

- The **asset turnover** provides information about the firm's efficiency in creating revenue using its assets
- **Days of inventory** indicates the product's holding period in the inventory
- The **inventory turnover** points out the rate at which the business' inventory is replaced
- **Days sales outstanding (DSO)** reveals the average number of days that the company's customers use to make payments
- **Days payable outstanding (DPO)** tells the average number of days that the organisation takes to pay its suppliers
- **Working capital turnover** discloses the efficiency with which a business uses its working capital

Liquidity ratios measure a company's solvency, i.e. the capacity of a firm to repay its short-term debt (Beckham, 2014; Goel, 2016). This study analyses the **current ratio** which reveals the organisation's ability to swiftly pay off its short-term debts. Beckham (2014) also refers to the quick ratio, which has been omitted from this project due to its similarity with the current ratio.

Leverage ratios measure the depth of a company's debts (Beckham, 2014; Goel, 2016). The following leverage ratios were employed in this thesis:

- The **debt ratio** gives information about the money borrowed by businesses to finance their operations
- The **debt to equity ratio** compares the size of a firm's leverage with its equity

- The **coverage ratio** points out the capacity of a company to pay off its interest costs

Beckham (2014) also lists some market value ratios that quantify a company's stock market performance. Since some of the firms in our dataset were not stock listed, market value ratios were not studied. The formulas for calculating the above-mentioned financial ratios are given below. This project has used the formulas as defined by Beckham (2014).

$$\text{Net profit margin} = \frac{\text{Net profit after taxes}}{\text{Net sales}} \quad (2.1)$$

$$\text{ROS} = \frac{\text{Net sales} - \text{Operating expenses}}{\text{Net sales}} \quad (2.2)$$

$$\text{Gross profit margin} = \frac{\text{Net sales} - \text{Cost of goods sold}}{\text{Net sales}} \quad (2.3)$$

$$\text{ROA} = \frac{\text{Net profit after taxes}}{\text{Average total assets}} \quad (2.4)$$

$$\text{ROE} = \frac{\text{Net profit after taxes}}{\text{Average shareholders' equity}} \quad (2.5)$$

$$\text{Asset turnover} = \frac{\text{Net sales}}{\text{Average total assets}} \quad (2.6)$$

$$\text{Days of inventory} = \frac{\text{Average inventory}}{\text{Cost of goods sold} / 365} \quad (2.7)$$

$$\text{Inventory turnover} = \frac{\text{Cost of goods sold}}{\text{Average inventory}} \quad (2.8)$$

$$\text{DSO} = \frac{\text{Average accounts receivable}}{\text{Net sales} / 365} \quad (2.9)$$

$$DPO = \frac{\textit{Average accounts payable}}{\textit{Net sales} / 365} \quad (2.10)$$

$$\textit{Working capital turnover} = \frac{\textit{Net sales}}{\textit{Average working capital}} \quad (2.11)$$

$$\textit{Current ratio} = \frac{\textit{Current assets}}{\textit{Current liabilities}} \quad (2.12)$$

$$\textit{Debt ratio} = \frac{\textit{Total debt}}{\textit{Total assets}} \quad (2.13)$$

$$\textit{Debt to equity ratio} = \frac{\textit{Total debt}}{\textit{Total stockholders' equity}} \quad (2.14)$$

$$\textit{Coverage ratio} = \frac{\textit{EBIT}}{\textit{Interest expense}} \quad (2.15)$$

3 Methodology

This thesis aimed to study the effects of CSR disclosure on the financial performance of Norwegian companies. If it is mandated by law, all firms will consider sustainability in their decision-making process, irrespective of their sustainability profile. The present project examines the impact of social legislation on CFP by performing regression discontinuity analysis. This chapter explains the data, design and methods used in the analysis.

3.1 Theoretical overview of regression discontinuity design

Several studies as those of Brammer et al. (2006) and Blacconiere and Northcut (1997) have found a positive relationship between CS and CFP, but such research fail to acknowledge the fact that some businesses are more likely to have a systemic visionary strategy than those that do not have one (Flammer, 2015). To obtain the most accurate results when studying the effects of sustainability on financial performance, we must compare the CFP of companies with and without sustainable business practices, irrespective of the differences in firm attributes. In such cases, we can use a causal research design such as difference in differences, which uses both treatment and control groups, as employed by several researchers such as Zhou et al. (2016) and Beatty and Shimshack (2011). Here, some companies are given the right to embrace sustainability and others are denied the right to do so. However, this approach is difficult to implement and not ethically justifiable.

First applied by Thistlethwaite and Campbell (1960) to analyse the effects of public recognition on scholarship results and career ambitions, the RDD solves the ethical issue by eliminating the need for a conventional control group and allowing the use of observational data. Originally, there was a lack of interest for the design, but seminal publications such as those of McCrary (2008), Angrist and Pischke (2009), Lemieux and Lee (2010) and Imbens and Kalyanaraman (2011) have given it a reputation as “one of the strongest non-randomised designs” (Thoemmes et al., 2017). RDD facilitates the estimation of causal effects of a treatment T_i on an outcome y_i by assigning a cut-off point x_0 in a running variable x_i (Beckham, 2017; Thoemmes et al., 2017) – see Figure

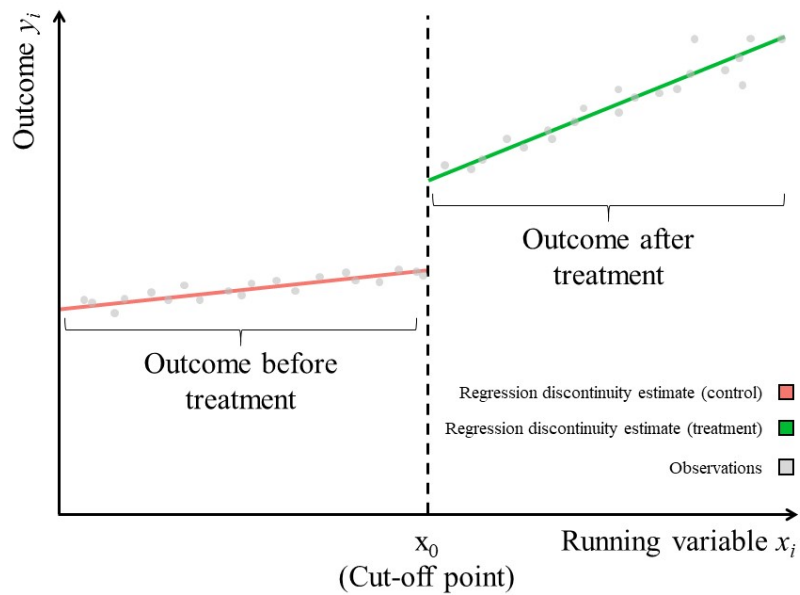


Figure 3.1: Visual representation of regression discontinuity with outcome in the y-axis and running variable in the x-axis

3.1 for a visual representation of regression discontinuity. By comparing observations that are close to the cut-off, RDD enables the analysis of treatment effects among units with otherwise similar average values (White and Raitzer, 2017). The cut-off is not determined by researchers but by policymakers and other such decision-makers, enabling the development of a quasi-experiment with a treatment assignment mechanism similar to that of the randomised control trial (RCT) (Smith et al., 2016). RDD gives unbiased and more credible inferences with milder assumptions than its counterparts, i.e. difference in differences and instrumental variables (Lemieux and Lee, 2010; Moss et al., 2014; Beckham, 2017; Shadish et al., 2008). The main assumptions can be verified to strengthen the internal validity of the design (Imbens and Lemieux, 2008). In RDD strategy, the graphical presentations increase the transparency of the research design (Lemieux and Lee, 2010). The Achilles' heel of the RDD is its external validity (Imbens and Lemieux, 2008); in the present project, the design looks at the CFP of companies only close to cut-off point, i.e. almost and barely large enterprises. All in all, RDD is a powerful quasi-experimental design to estimate causal relationships.

There are two subcategories within RDD, namely sharp and fuzzy RDD. Sharp RDD should be used when assignment variables exclusively determine the treatment (Imbens

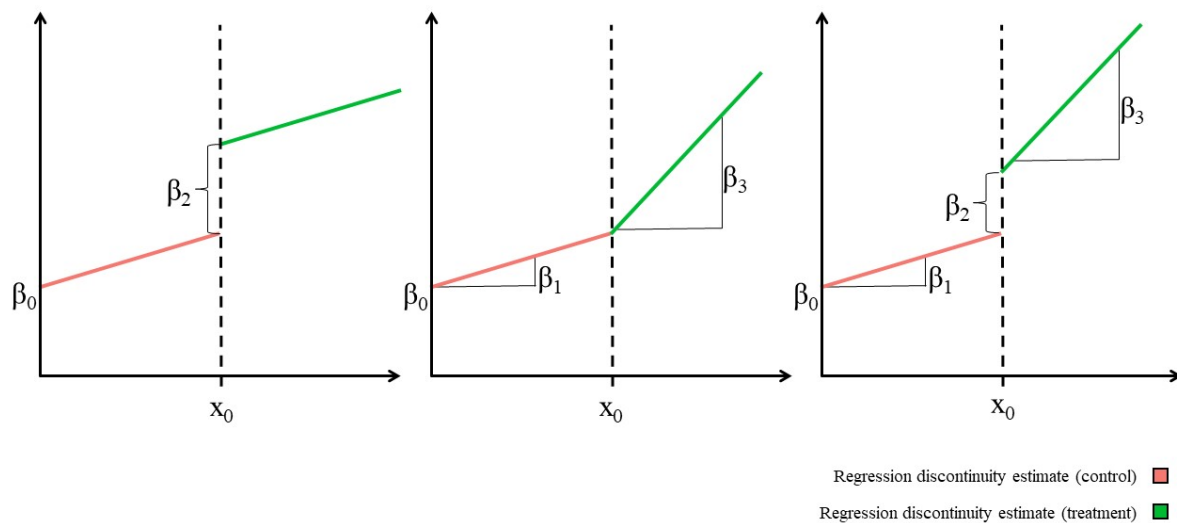


Figure 3.2: The main, interaction, and main and interaction effects that can be revealed through a regression discontinuity analysis

and Lemieux, 2008; Imbens and Kalyanaraman, 2011; Thoemmes et al., 2017). In this case, the treatment is a dummy variable T_i , where $T_i = 1$ if $x_i \geq x_0$ and $T_i = 0$ if $x_i < x_0$ (Beckham, 2017). On the other hand, fuzzy RDD allows a non-deterministic partial effect of the assignment variable on the treatment (Imbens and Lemieux, 2008; Imbens and Kalyanaraman, 2011; Thoemmes et al., 2017). Only large Norwegian firms are subject to §3-3c of the Accounting Act (1999), meaning that companies with a sales revenue below 70 million NOK, a balance sheet total less than 35 million NOK or fewer than 50 FTEs were not required to report on social issues. Ergo, the probability of treatment assignment is dichotomised in our case. This point proves that a sharp RDD is suitable to estimate causal effects of social governmental decisions on CFP.

Estimation of causal impacts using RDD can show three treatment effects. These alternatives can be understood with the help of a formal model. With a sharp RDD, the causal effects of a treatment T_i on an outcome y_i as a linear function of a running variable x_i would be:

$$y_i = \beta_0 + \beta_1 x_i + \beta_2 T_i + \beta_3 x_i T_i + \varepsilon_i, \quad (3.1)$$

where β_0 and β_1 are the control's intercept and slope, respectively, $\beta_0 + \beta_2$ and β_3 are the treatment's intercept and slope, respectively, and ε_i is the error term (Beckham, 2017; Thoemmes et al., 2017). A main effect is reflected through a difference between the intercepts of the treatment and the control while the slopes of the treatment and control are similar. An interaction effect is shown through different slopes for the control and treatment groups. Main and interaction effects are mirrored through a difference between the intercepts of the treatment and control, and through their different slopes. These three effects are simplified in the graphical model in Figure 3.2. In some cases, there can be some probability of no treatment effect. Regression discontinuity analysis is effective to understand if a policy or any other treatment has evoked intended effects.

3.2 Data description and introduction of variables

To study the effects of sustainability on CFP, I decided to look at the financial information of Norwegian companies. Norway is a world leader of green policies (Young-Powell, 2016), and the welfare state ensures the happiness of its inhabitants through generous policies (Skreiberg, 2018). Furthermore, Norway's aforementioned exemplary rule of law makes it easy to study the effects of legislative changes. Moreover, since Norwegian firms are obliged to report their financial statements on a yearly basis, corporate data is easily available for academic use. These reasons justify the use of the financial data of Norwegian companies for this project.

Norwegian corporate accounts from the database of SNF and NHH that contains accounting and company information of Norwegian companies was used in this study. The dataset contained corporate accounts of all Norwegian firms from 1992 to 2016. The number of companies varied from year to year, and the variables gave corporate information such as organisation number, cost of goods sold and EBIT. Since this project aimed to analyse the causal effects of §3-3c of the Accounting Act, corporate information only from the year of the law's implementation, i.e. 2013, was studied. In other words, cross-sectional data was used to conduct the regression discontinuity analysis. The analysed dataset contained 4 954 observations and 72 variables. Some of the variables were from the original dataset from SNF, while others were calculated for this study. Not all of these variables were used – only 16 of the 72 variables were relevant for the regression discontinuity analysis.

One of the 16 variables that were used for the regression discontinuity analysis was the independent variable. To quantify the size of the firms in the dataset, I define the measure company size index based on the following three aspects explained in the Accounting Act (1999):

- (i) The sales revenue should be at or above 70 million NOK
 - (ii) The balance sheet total must be at least 35 million NOK
 - (iii) The number of FTEs in the company should be more than 49
- If the observation satisfied all three criteria, company size index was calculated as the sum of the difference between the corresponding values and their minimum requirement
 - If the observation satisfied only two criteria, company size index was calculated as the sum of the difference between the corresponding values – that satisfied the criteria – and their minimum requirement
 - If the observation satisfied only one criterion, company size index was calculated as the sum of the difference between the corresponding values – that did not satisfy the criteria – and their minimum requirement
 - If the observation did not satisfy even one criterion, company size index was calculated as the sum of the difference between the corresponding values and their minimum requirement

The codes for calculating company size index is given in Appendix A1. By employing this calculation method, small firms received a negative company size index and large enterprises were given a positive index. For a further explanation of company size index, see Appendix A2. The values of company size index were used as the running variable in the regression discontinuity analysis as it assigned the observations to treatment or control groups.

Fifteen dependent variables were used for the regression discontinuity analysis. These were the change from 2012 to 2013 of the financial ratios, namely net profit margin, ROS, gross profit margin, ROA, ROE, asset turnover, days of inventory, inventory turnover, DSO, DPO, working capital turnover, current ratio, debt ratio, debt to equity ratio and

coverage ratio. To find the change from 2012 to 2013, the ratio at 2013 was subtracted from the ratio at 2012. These figures were used as the outcome variables in the regression discontinuity analysis to understand if §3-3c in the Accounting Act (1999) had an effect on the ratios.

Table 3.1 depicts the summary statistics of the dependent and independent variables used in the regression discontinuity analysis. The first and third quartiles of company size index were -147.81 and 224.18, respectively, indicating that the dataset contained both small and large firms. However, the median value was -5.98, showing that the dataset contained more small than large companies – this is expected as there are more small than large companies registered in Norway. Table 3.1 also demonstrates that the fifteen dependent variables too had variation in the data, giving hints to the interesting results that were to be proven through the regression discontinuity analysis.

Table 3.1: Summary statistics of the variables used in the analysis.

Variable	First quartile	Median	Third quartile
Company Size Index	-147.81	-5.98	224.18
Net Profit Margin	-0.08	0.00	0.09
ROS	-1.43	-0.09	1.24
Gross Profit Margin	-0.35	0.00	0.44
ROA	-0.11	0.02	0.18
ROE	-0.35	0.09	0.68
Asset Turnover	-0.07	0.59	3.05
Days of Inventory	0.00	0.00	14.32
Inventory Turnover	0.00	0.00	9.47
DSO	-19.91	0.19	25.39
DPO	-11.54	0.69	13.12
Working Capital Turnover	-4.83	0.61	15.14
Current Ratio	-1.57	-0.03	1.07
Debt ratio	-0.30	0.04	0.40
Debt to Equity Ratio	-2.20	0.68	4.27
Coverage Ratio	-4.82	0.00	19.53

3.3 Explanation of the regression discontinuity analysis

The regression discontinuity analysis started with the validation of design assumptions. The first assumption is that there is a discontinuity in the probability of the treatment assignment at the cut-off (Smith et al., 2016). Intuition was used to validate this assumption (see the explanation in Section 4.1). The second assumption is that there are

no discontinuities in the treatment assignment variable (Beckham, 2017; Thoemmes et al., 2017). If the treatment assignment is manipulated, there would be fewer observations just below the cut-off, and more at the cut-off (Smith et al., 2016). In other words, we require the density of the observations to be continuous. This assumption was tested using McCrary's (2008) hypothesis test. The third assumption is that the observations close to the cut-off should be similar in all aspects except for the presence or absence of the treatment (Smith et al., 2016). The third assumption was validated through reasoning. The fourth assumption states that the treatment occurs only at the specified cut-off point (Beckham, 2017; Thoemmes et al., 2017), meaning that any difference between the treatment and control groups is solely due to the treatment (Smith et al., 2016). Visual placebo test was employed to check the fourth assumption. These four assumptions were verified, as described in Section 4.1.

After the assumptions were verified, the causal effects were estimated. Here, the change in the financial ratios in 2013 over 2012 was used as the dependent variable (y). In other words, the change from 2012 to 2013 of the various financial ratios were analysed to check if §3-3c in the Accounting Act (T_i) had any affect on the ratios. The variable company size index was set as the running variable (x), and zero as the cut-off point (x_0). By using zero as the cut-off point, small companies were located to the left of the cut-off, and large ones to the right. A non-parametric estimation method was employed in the regression discontinuity analysis, wherein the Imbens Kalyanaraman bandwidth selection algorithm was used. The selection method is a data-dependent one that finds the optimal bandwidth to give precise estimates with low bias (Imbens and Kalyanaraman, 2011; Jacob et al., 2012).

Finally the sensitivity check was conducted. A sensitivity check is a method to test the robustness of a model (Jacob et al., 2012). For the purpose of this thesis, the sensitivity check was done by analysing the change in the dependent variables at various bandwidths, as described in Thoemmes et al. (2017) – see Section 4.3. By conducting both assumption and sensitivity checks, the RDD's estimation process was proved to be internally valid.

4 Results

The regression discontinuity analysis employed in this study included assumption testing, effect estimation and sensitivity checks. Four assumption checks to confirm the internal validity and one sensitivity check to ensure the robustness of the analysis were conducted. Further details are given in the following sections.

4.1 Assumption tests

The first RDD assumption is that there is a discontinuity in the probability of the treatment assignment at the cut-off, as mentioned in Section 3.3. This assumption was validated by intuition; §3-3c of the Accounting Act (1999) clearly stated that only large enterprises are subject to the reporting requirement – indicating the dichotomy in the probability of the treatment assignment. In other words, the paragraph applied only to companies that satisfied at least two of the criteria mentioned in Section 3.2.

The second assumption about continuity of the treatment assignment variable was tested using McCrary's (2008) hypothesis test. The results of the hypothesis test is presented in Table 4.1. Since the p- and z-values were 0.23 and 1.19, respectively, the null hypothesis that there is a discontinuity in the company size index was rejected. Figure 4.1 illustrates the density of the company size index – McCrary's test gave insignificant results in our case because the confidence intervals on both sides of the cut-off point overlap. Furthermore, business-related intuition tells us that barely-large enterprises would not attempt to evade the mandatory reporting since controlling the balance sheet total and sales revenue down to the penny is a tedious task. Due to these points, we can conclude that the treatment assignment variable is continuous.

The third assumption is that the non-outcome variables are similar, and this was validated through reasoning. The companies used in the regression discontinuity analysis were selected at random using R programming. Therefore, any similarities in firm characteristics between treatment and control groups are solely due to random chance.

The fourth assumption that the treatment occurs only at the specified cut-off point was checked by conducting placebo tests – see Appendix A3. If the assumption holds true,

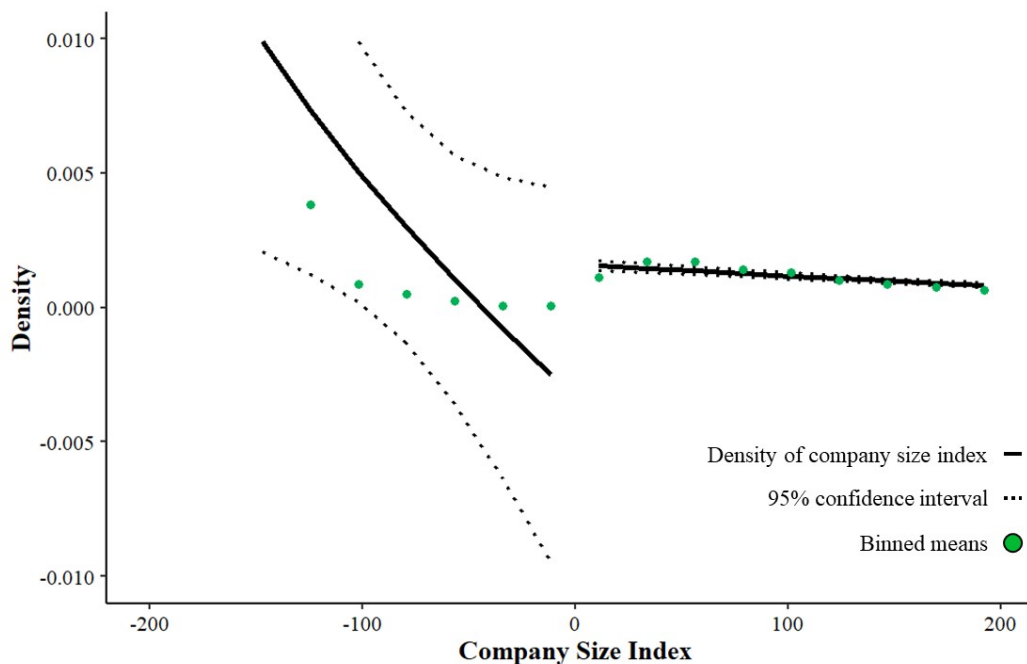


Figure 4.1: Density plot of the running variable, i.e. company size index

local average treatment effects (LATE) at other placebo cut-off points should be different from that observed at the actual cut-off point. In our case, the assumption is satisfied for gross profit margin, asset turnover, inventory turnover, working capital turnover and coverage ratio. Unfortunately, this is not the case for net profit margin, ROS, ROA, ROE, days of inventory, DSO, DPO, current ratio, debt ratio and debt to equity ratio. Therefore, these ratios will not be analysed in this project, thereby ensuring that the fourth assumption was not violated. Ten of the 15 financial ratios were eliminated from further analysis, and since the assumption was violated in the case of the current ratio, I was not able to analyse liquidity in this thesis. However, the remaining ratios allowed the regression discontinuity estimation of profitability, efficiency and leverage.

Table 4.1: Results of McCrary's hypothesis test

Hypothesis test indicators	Values
z-value	1.19
p-value	0.23
Discontinuity	0.07

4.2 Regression discontinuity estimation

The effects of §3-3c in the Accounting Act (1999) on CFP of Norwegian companies were identified employing an RDD. The analysis yielded significant results on all financial ratios that passed all the assumptions, namely gross profit margin, asset turnover, inventory turnover, working capital turnover and coverage ratio. Table 4.2 lists these ratios and their estimands, standard errors, statistical significance, bandwidth and effective number of observations for both treatment and control groups. The estimands estimate the direction and degree to which the mandatory CSR disclosure has affected the CFP ratios of interest. The standard errors and statistical significance give the accuracy of the estimands. The bandwidths were calculated using the Imbens Kalyanaraman bandwidth selection algorithm. The effective number of observations revealed the number of observations that are within the bandwidth from the cut-off point (Cattaneo et al., 2018).

The §3-3c in the Accounting Act (1999) significantly affected the five ratios that were analysed. The profitability ratio, gross profit margin was significantly increased by 0.26 in the presence of mandatory CSR reporting. The estimand had a standard error of 0.08, signalling high precision. The Imbens Kalyanaraman algorithm selected a bandwidth of 120.99, resulting in 370 effective number of observations in the control group and 864 in the treatment group. The three efficiency ratios were also significantly impacted by the legislation. Asset turnover, inventory turnover and working capital turnover received regression discontinuity estimands of -3.80, -660.29 and 219.32, respectively. Asset turnover had a standard error of 0.27, a bandwidth of 248.82, 2 477 effective observations in the control group and 1 301 effective observations in the treatment group. The corresponding values were 279.15, 134.31, 590 and 922 for inventory turnover and 68.19, 643.66, 2 477 and 1 840 for working capital turnover. Since two of the efficiency ratios were reduced and another one was increased after the implementation of §3-3c, we understand that the regression discontinuity analysis yielded inconclusive results for financial efficiency. The leverage ratio, namely coverage ratio, was significantly reduced by -946.28 in the presence of §3-3c in the Accounting Act (1999). The estimand had a standard error of 186.33, and was calculated with a bandwidth of 140.67 that analysed 781 and 944 effective observations in the control and treatment groups, respectively. The overall effects of §3-3c

Table 4.2: The effects of §3-3c on profitability, efficiency and leverage ratios

Dependent variable	Regression discontinuity components	Values
Profitability		
Gross profit margin	Regression discontinuity estimate	0.26 ***
	Standard error	0.08
	Bandwidth	120.99
	Effective number of observations (control)	370
	Effective number of observations (treatment)	864
Efficiency		
Asset turnover	Regression discontinuity estimate	-3.80 ***
	Standard error	0.27
	Bandwidth	248.82
	Effective number of observations (control)	2 477
	Effective number of observations (treatment)	1 301
Inventory turnover	Regression discontinuity estimate	-660.29 *
	Standard error	279.15
	Bandwidth	134.31
	Effective number of observations (control)	590
	Effective number of observations (treatment)	922
Working capital turnover	Regression discontinuity estimate	219.32 **
	Standard error	68.19
	Bandwidth	643.66
	Effective number of observations (control)	2 477
	Effective number of observations (treatment)	1 840
Leverage		
Coverage ratio	Regression discontinuity estimate	-946.28 ***
	Standard error	186.33
	Bandwidth	140.67
	Effective number of observations (control)	781
	Effective number of observations (treatment)	944

*** indicates $p < 0.001$ ** indicates $p < 0.01$ * indicates $p < 0.05$

in the Accounting Act (1999) will be further discussed in the next chapter.

4.3 Sensitivity check

A plot-based sensitivity check was conducted to assess the sensitivity of the analysis to various bandwidths – see Appendix A4. The sensitivity check revealed that the treatment effect remained stable across different bandwidths for the five financial ratios that were used in the regression discontinuity analysis. Note that the effect becomes more stable as the bandwidth gets larger – this is due to a larger sample size and thereby smaller standard error. In conclusion, the sensitivity check proves that the treatment estimate is

robust.

5 Discussion

Corporate sustainability is not only a necessity to create a socially just and environmentally safe world but also a requirement that stakeholders expect from the business world. Therefore, companies must protect the environment and human rights while generating a steady cash flow to contribute to the national economy. Ergo, CSR is important in the business world, and researchers must conduct studies to understand both the subject as a whole and its subtopics such as the genuineness of CSR practices, legitimacy of CSR reports and linkage between CSR and CFP. The latter one is of utmost interest to companies as it encourages them to embrace CSR. Even though several articles about the effects of CSR on CFP have already been published (see for instance Lee and Park (2010), Byus et al. (2010) or Brammer et al. (2006)), the true connection is still unknown. Therefore, academics must continue to study the relationship, as conducted in this thesis.

Some nations legally require enterprises to incorporate sustainability into their business practices – thus persuading firms to create an intra- and intergenerationally equitable status. Norway is one such country that has imposed several sustainability-related legislations on organisations. This thesis analyses the causal effects on financial performance by §3-3 c in the Accounting Act (1999). The paragraph instructs large enterprises to incorporate CSR in their reports.

To substantiate the results that were presented in the previous chapter, I will compare the results yielded in this study with those of former academic research. Unfortunately, previously published articles offer highly contradictory conclusions about the effects of sustainability on CFP. This is due to differences in data type, selected variables and statistical techniques; while I studied data from different companies, some researchers focused on merely one or two industries. Furthermore, only few of the articles have analysed several ratios, as done in this thesis. For example, there is a scarcity of publications that address the linkage between CSR disclosure and financial efficiency. In this chapter, I will compare and contrast the different results, justify the use of RDD and explain the consequences of eliminating ratios due to the violation of assumptions. Furthermore, I briefly touch upon the possible long-term effects of §3-3c. Additionally, I will delve into the reliability, validity and ethical implications of this study. Finally, I will explain the

contributions this thesis has made to the academic community and also reveal some of the limitations of this project.

5.1 Causal effects of CSR disclosure on profitability

The regression discontinuity analysis conducted in this project revealed a positive relationship between CSR disclosure and profitability. To comprehend the positive effect of CSR disclosure on profitability, one must look at Equation 2.3 and acknowledge that there is a link between CSR reporting and actual practices (Adams and Frost, 2008). The equation indicates that the increase in gross profit margin can be attributed to:

- (i) There is an increase in net sales
- (ii) There is a decrease in cost of goods sold
- (iii) There is an increase in net sales *and* a decrease in cost of goods sold

The increase in net sales can be attributed to a high demand for (Scott, 2019) and higher price of (Benveniste, 2019) sustainable goods. The decrease in cost of goods sold can be explained through the reduction of inputs that results from sustainable business thinking (Lo, 2010). In summation, the positive effect of CSR disclosure on profitability seems reasonable.

Many articles assessed the relationship between CSR and profitability. Authors such as Lee and Park (2010) found evidence that there is no correlation between CSR and profitability, contradicting with the results in the present study. It should be noted that Lee and Park (2010) only analysed airline companies while I looked at firms in various industries – the differing results can be attributed to the differences in analytical approaches. Other publications that studied a variety of companies revealed results that are similar to the ones in this project. Byus et al. (2010) estimate a positive effect of CSR on two profitability indicators, namely gross profit margin and ROA. Likewise Palmer (2012) uncovered a positive relationship between gross profit margin and CSR activities. Anecdotal evidence points to the same conclusion: Patagonia, a company known for its sustainable business practices, has a gross profit margin that is higher than its competitors (Casadesus-Masanell et al., 2010). Even though such publications may indicate the correctness of the results in this thesis, one must note that the current

study estimates the causal effects of CSR *disclosure* on profitability while the mentioned publications addressed the impacts of *actual* CSR on profitability. Authors like Whetman (2018) and Wibowo (2012) have found a positive relationship between CSR reporting and profitability of companies in several industries, as was done in this thesis. In conclusion, the results presented in this thesis regarding the effects of CSR disclosure on profitability is supported by the results in a variety of previous publications.

5.2 Causal effects of CSR disclosure on efficiency

The results in this thesis reveal that CSR disclosure has negative effects on asset and inventory turnover but a positive one on working capital turnover. One can understand these relationships by analysing Equation 2.6, 2.8 and 2.11. The decrease in the asset turnover can be attributed to the increase in average total assets – companies may have bought sustainable machines to decrease their negative externalities. Note that a decrease in net sales is not considered because it is more reasonable to assume that net sales has increased, as explained in Section 5.1. Equation 2.8 reveal that the reduced inventory turnover may be due to a decrease in cost of goods sold. As mentioned in Section 5.1, reduced inputs may have caused the decrease in cost of goods sold (Lo, 2010). A possible increase in average inventory is ignored due to the high demand of products that are perceived as sustainable (Scott, 2019). According to Equation 2.11, the working capital ratio increases when:

- (i) An increase in net sales
- (ii) A decrease in average working capital
- (iii) An increase in net sales *and* a decrease in average working capital

As explained earlier, an increase in net sales matches with the sustainable qualities of a product. The increased average working capital coincides with the assumption that the company may have bought sustainable machines etc. Put together, the changes in asset turnover, inventory turnover and working capital turnover seems logical. However, due to the differences in the directions of the estimands, I cannot make a conclusion regarding the impact of CSR disclosure on efficiency.

It is difficult to defend the findings in this thesis regarding the relationship between CSR

reporting and efficiency due to the lack of previous publications. In fact, I have not come across publications that have discussed the relationship between CSR reporting or just CSR and efficiency. This does, however, prove the novelty of the research done in this project.

5.3 Causal effects of CSR disclosure on liquidity

The liquidity ratio, namely current ratio, was eliminated from further regression discontinuity analysis due to the violation of the fourth assumption. This assumption requires that the treatment occurs only at the specified cut-off point, as explained in Section 4.1. Some may argue that the violation of this assumption is due to the absence of causal effects. However, this may not be the case – the failure of the assumption does not entail a dismissal of the treatment effect, but rather an uncertainty regarding the cause of a potential discontinuity (Thoemmes et al., 2017). Therefore, conclusions cannot be drawn about the causal effects of mandatory CSR reporting on liquidity.

5.4 Causal effects of CSR disclosure on leverage

The regression discontinuity analysis conducted in this project reveals a negative relationship between mandatory CSR reporting and firm leverage because §3-3c in the Accounting Act (1999) had a negative effect on the coverage ratio. Equation 2.15 reveals that the coverage ratios decrease when the interest expense increases, and this corroborates with the decreased working capital explained in Section 5.2. Note that a potential decrease in EBIT is disregarded from this reasoning due to the assumed increase in net sales, detailed in Section 5.1.

The results regarding the effects of CSR disclosure on firm leverage can be strengthened with former publications. Previous research has shown that most of the companies with lower financial leverage do not prepare CSR reports (Andrikopoulos et al., 2014; Brammer et al., 2006). Andrikopoulos and Kriklani (2013) showed that firms with lower debt to equity ratio have less resources to engage in environmental activities; hence the companies opted out of green reporting. In other words, the authors concluded that there is a negative relationship between financial leverage and environmental disclosure – as done in this thesis. However, it is important to note that I analysed the effects of social disclosure

on financial leverage, and the aforementioned authors analysed the effects of financial leverage on environmental disclosure.

5.5 Justifying the use of regression discontinuity design

Regression discontinuity analysis is a strong statistical method that facilitates causal effect estimation. The main merit of RDD is that the pre-post-test design eliminates the ethical implication of randomly assigning observations into treatment and control groups in non-experimental situations, making it a better option than RCT (Ashworth and Pullen, 2015). However, regression discontinuity analyses have lower statistical power than RCTs (Ashworth and Pullen, 2015). Nevertheless, the large sample size, non-parametric approach and data-driven bandwidth selection method adopted in this project yielded high statistical power and low bias of the regression discontinuity estimands (Chaplin et al., 2018). The non-parametric local linear regression used in this study ensured that the analyses used the correct functional form (Jacob et al., 2012). The Imbens Kalyanaraman bandwidth selection algorithm facilitated the use of a bandwidth with high precision (Jacob et al., 2012). The algorithm provided bandwidths within 119 and 644 for the different effect estimations done in this project. These optimal bandwidths selected effective observations in the control and treatment groups, facilitating the use of local linear regression (Imbens and Kalyanaraman, 2011). The points mentioned in this paragraph prove that the regression discontinuity analysis conducted in this thesis was of high quality.

5.6 The ratios that were eliminated from the analysis

For this project, I intended to estimate causal relationships of §3-3c in the Accounting Act (1999) on five profitability, six efficiency, one liquidity and three leverage ratios. Due to the fourth assumption, ten of the 15 ratios were eliminated from the regression discontinuity analysis – see Section 4.1. This brings forth the question regarding the representativeness of the study. To understand the effects on profitability and leverage, is one ratio enough to assess the whole financial aspect? The literature mentioned in this thesis analysed several ratios when delving into a financial aspect – see for instance Byus et al. (2010) or Lee and Park (2010). It is not ideal to use one financial ratio each for profitability and

leverage. However, I did not wish to compromise the reliability of this study by violating any assumptions (Jacob et al., 2012). Furthermore, as the results in this thesis can be supported by the work done by others, I am confident in the conclusions that have been made.

5.7 Long-term effects of CSR disclosure on CFP

By studying the change in financial ratios from 2012 to 2013, this thesis analysed only the short-term effects of §3-3c in the Accounting Act (1999) on CFP. For a deeper understanding, one must delve into the long-term impacts of mandatory CSR disclosure on CFP. This can be done by merely changing the outcome variables that were used in the current study. In this project, the outcome variables were the one-year changes in CFP ratios from 2012 to 2013. To analyse the long-term financial effects of §3-3c in the Accounting Act (1999), one must look at the five-year or even ten-year changes in CFP ratios. This is a suggestion for future research. However, it is important to note that several other factors may affect the differences between small and large enterprises in the long run. One of the factors is the regulatory changes affecting small and big companies. For example, since 2017, small businesses are not required to publish annual reports due to an amendment of the Accounting Act (2017). This implies that §3-3c in the Accounting Act (1999) is no longer the main dissimilarity between small and large companies. Such changes may compromise the internal validity of the results. Therefore, a study analysing the long-term effects of CSR disclosure on CFP must be done with great precaution and by considering confounding factors.

5.8 Reliability and validity

It is vital to analyse the reliability and validity of any study. Reliability addresses the following question (Carmines and Zeller, 1979): if the research is repeated, will it yield the same results? Ergo, reliability evaluates the extent to which the data used is trustworthy (Johannessen et al., 2016). SNF's database of corporate information is highly reliable. The data there stems from Bisnode D&B Norway AS and the Brønnøysund Register Centre – highly commendable organisations that provide accurate data (Berner et al., 2016). There may be negligible human errors in the variables downloaded from SNF's

database – however, they are minuscule and will, therefore, not have a significant impact on our results. Hence, any researcher can reproduce the results by using the regression discontinuity analysis on this data.

When assessing the validity of a study, one must ask this question (Carmines and Zeller, 1979): do the researchers analyse what they intended to analyse? There are two types of validity: internal and external validity (Johannessen et al., 2016). Internal validity pertains to the causal effects of the treatment – we must ask ourselves if the changes in the outcome variable can be attributed to the treatment alone without any impacts from other confounding factors (Campbell, 1957). From a theoretical and empirical standpoint, results from any regression discontinuity analysis have higher internal validity than those from RCTs, as long as the four assumptions are validated (Chaplin et al., 2018; Jacob et al., 2012). The strong internal validity of the RDD is contrasted with its poor external validity. External validity refers to the degree to which the same findings are applicable in other settings (Campbell, 1957). The external validity of the RDD is poor if the treatment is more effective at the chosen cut-offs than at other points – this can be eliminated by using the sharp RDD rather than the fuzzy one (Wing and Bello-Gomez, 2018). This project used sharp RDD to estimate the causal effects of CSR disclosure on CFP. The external validity of the RDD is also weak because the treatment effect considers only observations close to the cut-off (de la Cuesta and Imai, 2016). In this case, an RCT would be the better option. However, as mentioned earlier, RDD is better than the RCT when considering the internal validity. Furthermore, if the assumptions are validated and the sample size is large, as is the case in this project, RDD is a stronger design than the RCT (Lee and Munk, 2008).

5.9 Ethical implications of the study

The general guidelines for research ethics list several criteria that have to be adhered in order to state that a publication complies with ethical standards (The Norwegian National Research Ethics Committees, 2014). Firstly, researchers must honestly, openly and systematically document the research methods and data in a transparent manner – the detailed explanations in this thesis show that this precondition is met. Furthermore, the data obtained from the reliable source SNF and academic knowledge-based theory

prove that this study is of high quality. Moreover, the RDD facilitated an impartial analysis of CFP since it sidesteps the ethical predicaments of random treatment assignment, i.e. the control and treatment groups are decided based on cut-offs. Additionally, the work done in this project is supported by the results from several previous publications. Finally, these results give CSR-related knowledge to companies, and the project is, thereby, of benefit to the society. These points prove that the current study does not have any negative ethical implications.

5.10 Contribution to the academic community

This study is a crucial contribution to the academic community since the project delves into several aspects of CFP, namely profitability, efficiency and leverage. Previous publications focused on either profitability or efficiency, thereby failing to study the effects of CSR reporting on liquidity or leverage. Additionally, this thesis analysed several financial ratios, unlike former publications. This project has also explained a novel method to quantify the size of Norwegian companies based on the three criteria in the Accounting Act (1999). Furthermore, the current study is one of the first to introduce the use of RDD in the world of sustainability, thereby encouraging other academics to do the same in the future. Finally, it should be noted that the positive effects of CSR disclosure on firm profitability may persuade companies to incorporate sustainability and CSR reporting into their business practices, thereby decreasing their negative social and environmental externalities.

5.11 Limitations of this study

There is no such thing as perfect, and this project is no exception. In my opinion, the main limitation of this study is that the results may encourage firms to engage in CSR due to the wrong reasons. Companies must not use the results of this study to justify the adoption of sustainable business practices for pure financial gains – instead, they should embrace the systemic visionary strategy by believing in the positive social and environmental effects of CSR (Baumgartner and Ebner, 2010).

Another limitation of this study is the use of the RDD. Even though regression discontinuity has many merits, it has one great flaw: the myriad of strong assumptions (Chaplin et al.,

2018). Several financial ratios have been eliminated from the analysis after testing all the assumptions. Furthermore, it is crucial to remember that the assumptions are susceptible to researcher subjectivity (Ioannidis, 2005). I have tried to be as objective as possible when validating the assumptions. Furthermore, despite the large sample size used in this study, RDD's weak external validity explained in Section 5.8 is yet another unfavourable aspect of the design. However, one must keep in mind that RDD is a strong tool for statistical analysis, and it is suitable and reliable for this project.

The third limitation of this study is that it has not analysed the long-term effects of §3-3c in the Accounting Act (1999). This is, as mentioned previously, a suggestion for future research. In the current project, I was unable to examine the long-term effects of CSR disclosure on CFP due to data unavailability – the database of SNF contained financial information of Norwegian companies only until 2016. Therefore, one must wait a few years until it is possible to study the long-term relationship between CFP and §3-3c in the Accounting Act (1999).

Another limitation of this study is that I fail to acknowledge all three aspects of sustainability – even though economic and social factors are analysed in this project, the environmental factor is ignored. As explained in Section 2.3, this is because Norway does not have an environmental legislation that facilitates the use of RDD with small and large companies as the control and treatment groups, respectively. However, the regression discontinuity analysis on social and financial aspects yielded fruitful results that can be used by the academic community.

Yet another weakness of this thesis is the fact that it is one among many publications regarding the causal effects of CSR on CFP. This research has many unique aspects such as the adoption of RDD on the CSR/CFP-relationship, the estimation of the impacts of CSR disclosure on four different factors of financial performance, and the focus on Norwegian companies. However, this study is one among many that reveal contradictory results about the link between CSR and CFP. Therefore, it is important to remember that this thesis is one piece of the puzzle – albeit a crucial and fruitful piece – to understand the complex relationship.

6 Conclusion

CS and its subtopic CSR are highly discussed in the business and academic world. CSR addresses the social responsibility of a firm that goes beyond financial profits, and focuses on the expectations set upon a firm by its stakeholders (Carroll, 1979). In recent years, several studies have focused on the impacts of CSR on CFP, i.e. the effectiveness with which an organisation uses financing and investment decisions to achieve its goals. Even though several publications address the linkage between CSR and CFP, there is no agreed-upon conclusion about the relationship. To get one step closer to the revered answer, this thesis analysed the causal effect of a CSR-related legislation, namely §3-3c in the Accounting Act (1999) on the CFP of Norwegian companies. The paragraph states that large companies must disclose their efforts to incorporate human rights, labour rights, corruption and other societal issues into their business practices. The law applies only to large firms, i.e. businesses that satisfy at least two of the following conditions:

- (i) A sales revenue at or above 70 million NOK
- (ii) A balance sheet total of at least 35 million NOK
- (iii) 50 or more FTEs

A regression discontinuity analysis was performed to study the effects of §3-3c in the Accounting Act (1999) on the CFP of companies in Norway. Since the legislation was applicable only to large enterprises, small and big companies were considered as the control and treatment groups, respectively. This means that the organisation size – quantified through the defined variable company size index – was used as the running variable, with small firms located to the left of the cut-off point and large ones located to the right of the cut-off point. The outcome variables were the changes from 2012 to 2013 of different CFP ratios. Five profitability ratios, six efficiency ratios, one liquidity ratio and three leverage ratios were initially selected to understand the effect of §3-3c on CFP. The profitability ratios were net profit margin, ROS, gross profit margin, ROA and ROE, the efficiency ratios were asset turnover, days of inventory, inventory turnover, days sales outstanding, days payable outstanding and working capital turnover, the liquidity ratio was current ratio and the leverage ratios were debt ratio, debt to equity ratio and coverage ratio.

Before starting the actual regression discontinuity analysis, assumptions had to be validated. All ratios passed the first three assumptions, namely the discontinuity in the probability of the treatment assignment at the cut-off, the continuity of the treatment assignment variables and the similarity of non-outcome variables. The first and third assumptions were validated through economic intuition, and the second one was satisfied through McCrary's (2008) hypothesis test. The fourth assumption was that the treatment occurs only at the specified cut-off point. Ten of the 15 financial ratios did not pass the placebo test used to validate the fourth assumption. The ten ratios – namely net profit margin, ROS, ROA, ROE, days of inventory, days sales outstanding, days payable outstanding, current ratio, debt ratio and debt to equity ratio – were omitted from further analysis.

After testing the four assumptions, the regression discontinuity analysis estimated the causal effects of §3-3c in the Accounting Act (1999) on the CFP of Norwegian companies. The analysed financial ratios, namely gross profit margin, asset turnover, inventory turnover, working capital turnover and coverage ratio were significantly affected by mandatory CSR reporting. Since gross profit margin increased in the presence of mandatory CSR disclosure, I concluded that profitability and the aforementioned law are positively linked, as proven in several former publications. Asset turnover and inventory turnover had a negative relationship with CSR reporting, while working capital turnover had a positive one. These contradictory results signal the inconclusive results of the regression discontinuity analysis of CSR-related legislation on firm efficiency. Even though there are no previous publications about this linkage, economic intuition shows that the results are valid. The effects of §3-3c in the Accounting Act (1999) on liquidity are not revealed in this thesis as the current ratio was eliminated from the regression discontinuity analysis due to the violation of the fourth assumption. The coverage ratio was negatively impacted by the CSR law, indicating a negative effect of mandatory CSR reporting on firm leverage. This result coincides with those in former publications. Furthermore, this thesis could not estimate the causal effects of §3-3c on liquidity as the specified liquidity ratio did not satisfy one of the assumptions necessary to perform a regression discontinuity analysis. In summation, the mandatory CSR reporting had some causal effects on CFP, as hypothesised in Section 2.2.

The regression discontinuity analysis revealed that CSR disclosure had positive and

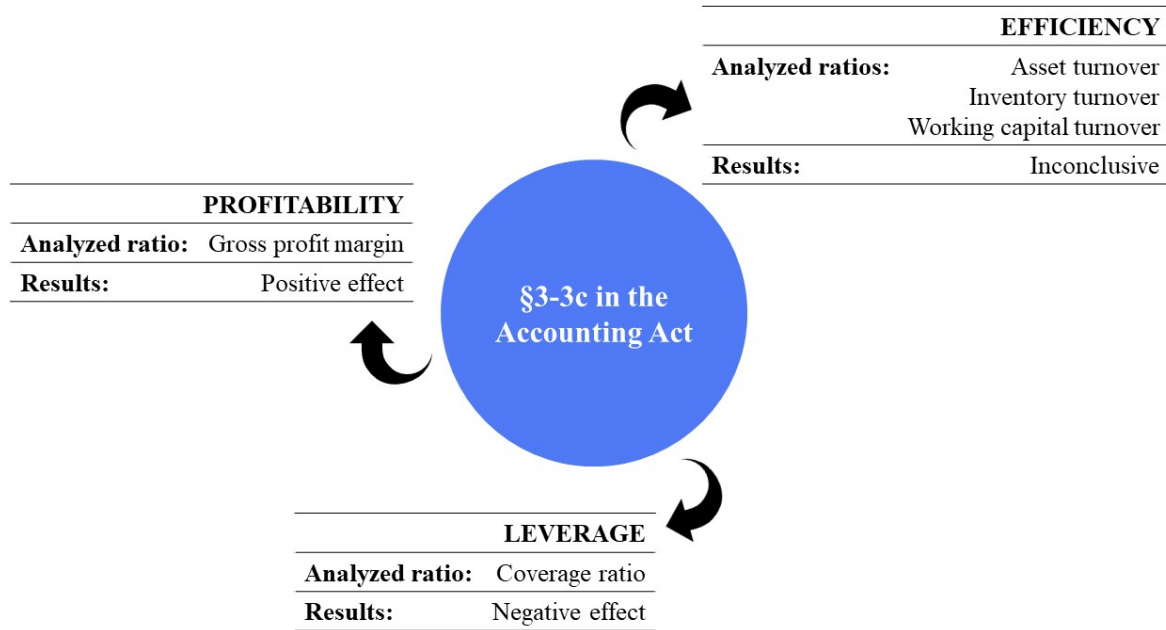


Figure 6.1: The effects of §3-3c in the Accounting Act (1999) on CFP

negative effects on profitability and firm leverage, respectively, but yielded inconclusive results for the impacts on financial efficiency – see Figure 6.1. These results are only one piece of the puzzle about the relationship between CSR and CFP. Hopefully, the academic world will one day discover the true effects of CSR and sustainability as a whole on CFP. Regardless of the relationship between CS and CFP, all companies must embrace CS. In a Utopian world, all firms will consider CS to be the norm, and managers will consider it to be a crucial part of the business strategy.

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Appendix

A1 Codes for calculating company size index

Company size index was calculated employing the following codes:

```
1 three_df <- dataset %>%
2   filter(sales.revenue > 70 & balance.sheet.total > 35 & fte > 50) %>%
3   mutate(company.size.index = ((sales.revenue - 70) +
4     (balance.sheet.total - 35) +
5     (fte - 50)))
6
7
8 two_a_df <- dataset %>%
9   filter(sales.revenue > 70 & balance.sheet.total > 35 & fte < 50) %>%
10  mutate(company.size.index = ((sales.revenue - 70) + (balance.sheet.total - 35)))
11 two_b_df <- dataset %>%
12   filter(sales.revenue > 70 & balance.sheet.total < 35 & fte > 50) %>%
13   mutate(company.size.index = ((sales.revenue - 70) + (fte - 50)))
14 two_c_df <- dataset %>%
15   filter(sales.revenue < 70 & balance.sheet.total > 35 & fte > 50) %>%
16   mutate(company.size.index = ((balance.sheet.total - 35) + (fte - 50)))
17 two_df <- rbind(two_a_df, two_b_df, two_c_df)
18
19
20 one_a_df <- dataset %>%
21   filter(sales.revenue > 70 & balance.sheet.total < 35 & fte < 50) %>%
22   mutate(company.size.index = ((balance.sheet.total - 35) + (fte - 50)))
23 one_b_df <- dataset %>%
24   filter(sales.revenue < 70 & balance.sheet.total > 35 & fte < 50) %>%
25   mutate(company.size.index = ((sales.revenue - 70) + (fte - 50)))
26 one_c_df <- dataset %>%
27   filter(sales.revenue < 70 & balance.sheet.total < 35 & fte > 50) %>%
28   mutate(company.size.index = ((sales.revenue - 70) + (balance.sheet.total - 35)))
29 one_df <- rbind(one_a_df, one_b_df, one_c_df)
30
31
32 zero_df <- dataset %>%
33   filter(sales.revenue < 70 & balance.sheet.total < 35 & fte < 50) %>%
34   mutate(company.size.index = ((sales.revenue - 70) +
35     (balance.sheet.total - 35) +
36     (fte - 50)))
```

A2 Explanation of company size index

The calculation method of the company size index can be easily understood with the help of an example. Assume that there is a dataset with ten firms. The sales revenue, balance sheet total and FTEs of these observations are given in Table A2.1. By looking at the codes and explanation in Section 3.2, one can comprehend the company size index values of the ten example firms. The businesses with negative company size index values are small firms and located to the left of the cut-off point, while businesses with positive company size index values are large enterprises and located to the right of the cut-off point (Figure A2.1). By using this calculation method, small and large companies were placed in the control and treatment groups, respectively.

Table A2.1: Hypothetical companies and their financial values and company size indexes

Company	Sales revenue	Balance sheet total	FTE	Company size index
A	80.00	36.00	59.00	20.00
B	80.00	37.00	45.00	12.00
C	100.00	50.00	70.00	65.00
D	60.00	39.00	51.00	5.00
E	69.00	32.00	49.00	-5.00
F	72.00	31.00	47.00	-7.00
G	30.00	10.00	15.00	-100.00
H	100.00	29.00	49.00	-7.00
I	71.00	50.00	10.00	16.00
J	60.00	100.00	40.00	-20.00

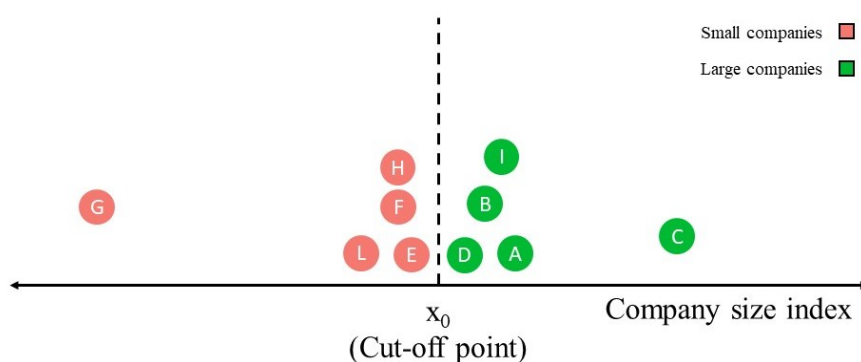


Figure A2.1: Placement of observations on either side of the cut-off points based on their company size index values

A3 Graphs from the placebo test

In this section, the results of the placebo tests at various cut-off points are illustrated. All the figures have the same range of cut-off points in the x-axis. However, since the different financial ratios revealed different regression discontinuity estimands, the values of LATEs in the y-axis will differ from one ratio to another. As explained in Section 4.1, the assumption was satisfied for gross profit margin, asset turnover, inventory turnover, working capital turnover and coverage ratio. The assumption was *not* satisfied for net profit margin, ROS, ROA, ROE, days of inventory, DSO, DPO, current ratio, debt ratio and debt to equity ratio.

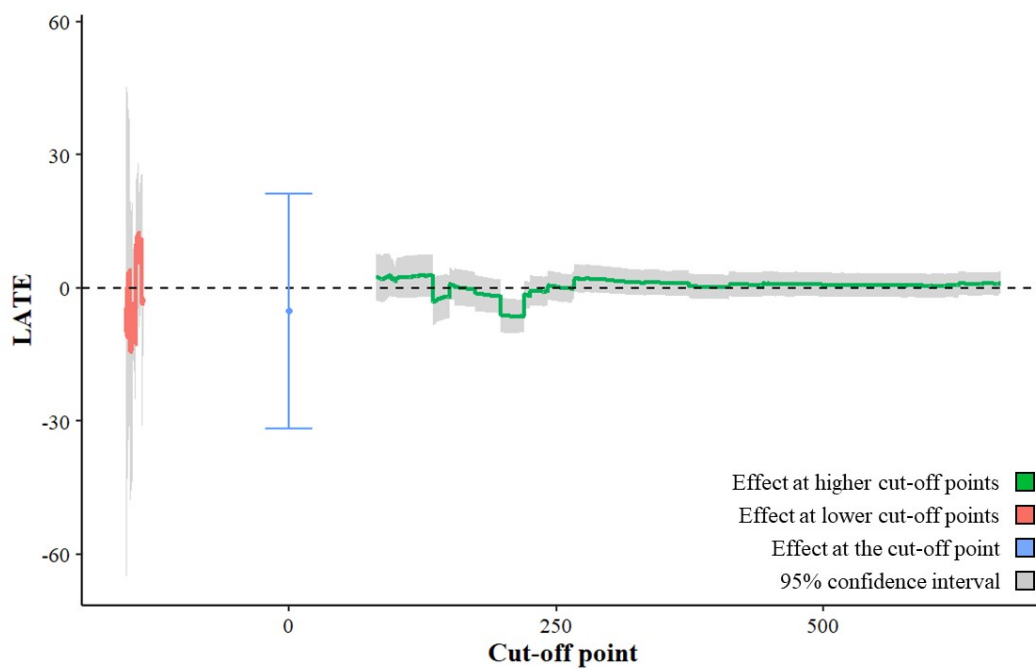


Figure A3.1: Placebo test of net profit margin at various cut-off points

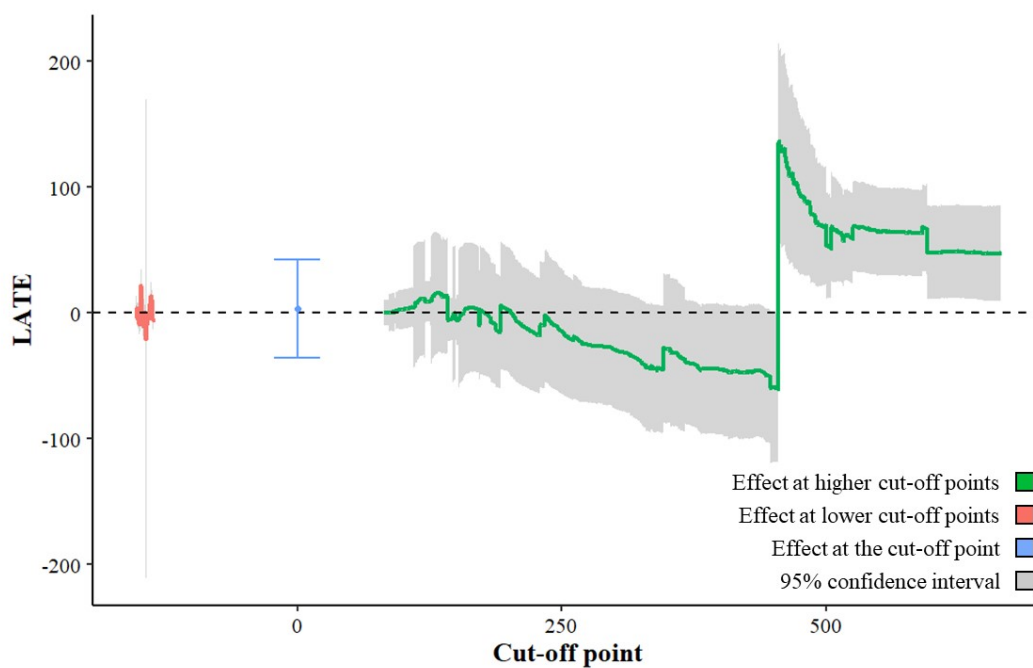


Figure A3.2: Placebo test of ROS at various cut-off points

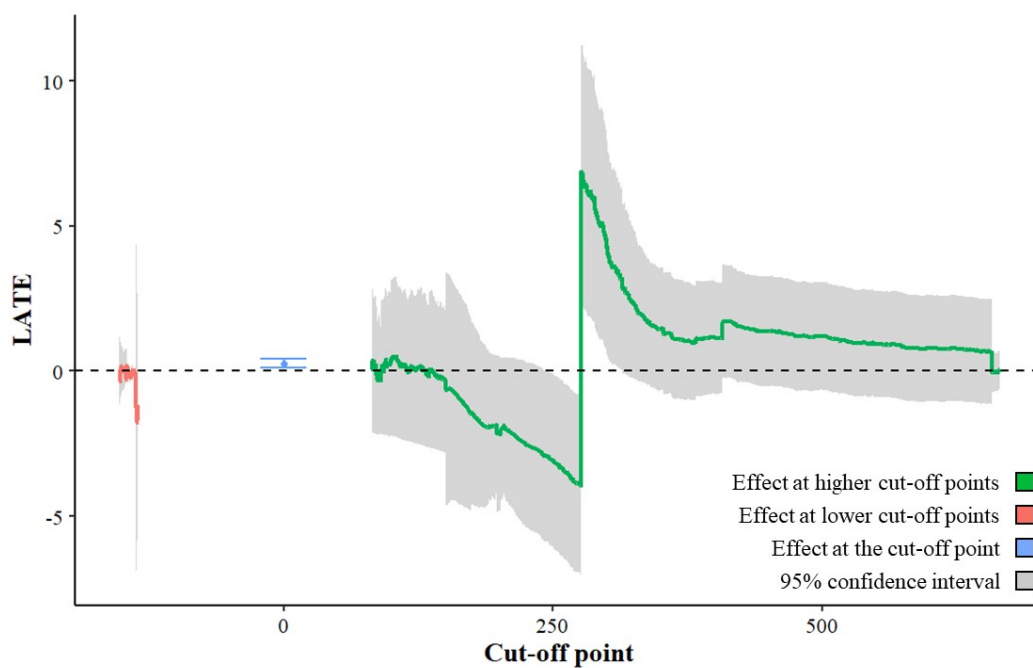


Figure A3.3: Placebo test of gross profit margin at various cut-off points

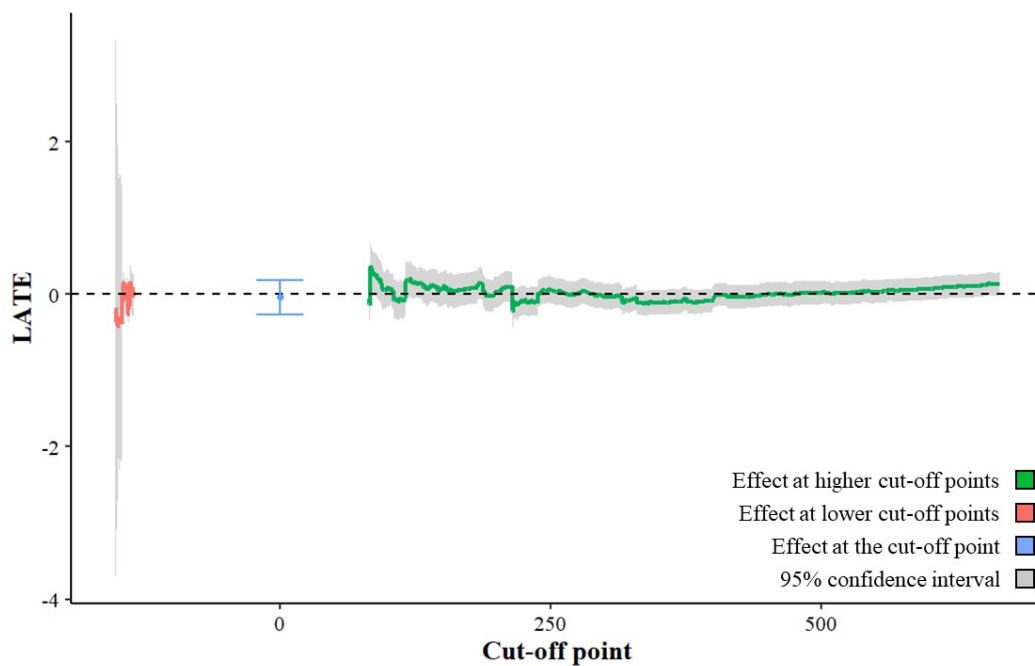


Figure A3.4: Placebo test of ROA at various cut-off points

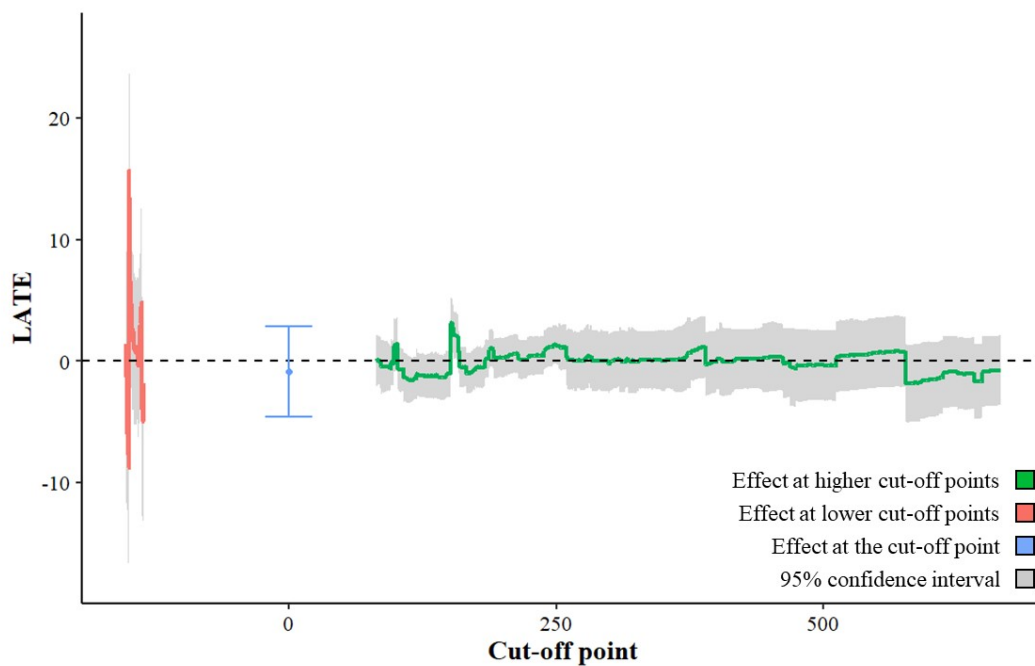


Figure A3.5: Placebo test of ROE at various cut-off points

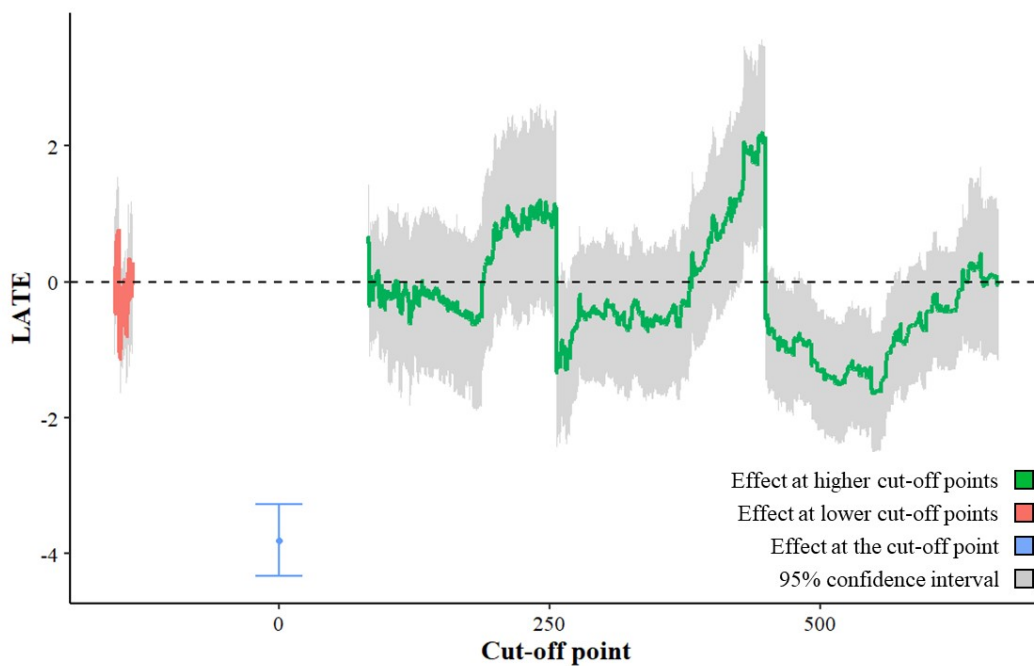


Figure A3.6: Placebo test of asset turnover at various cut-off points

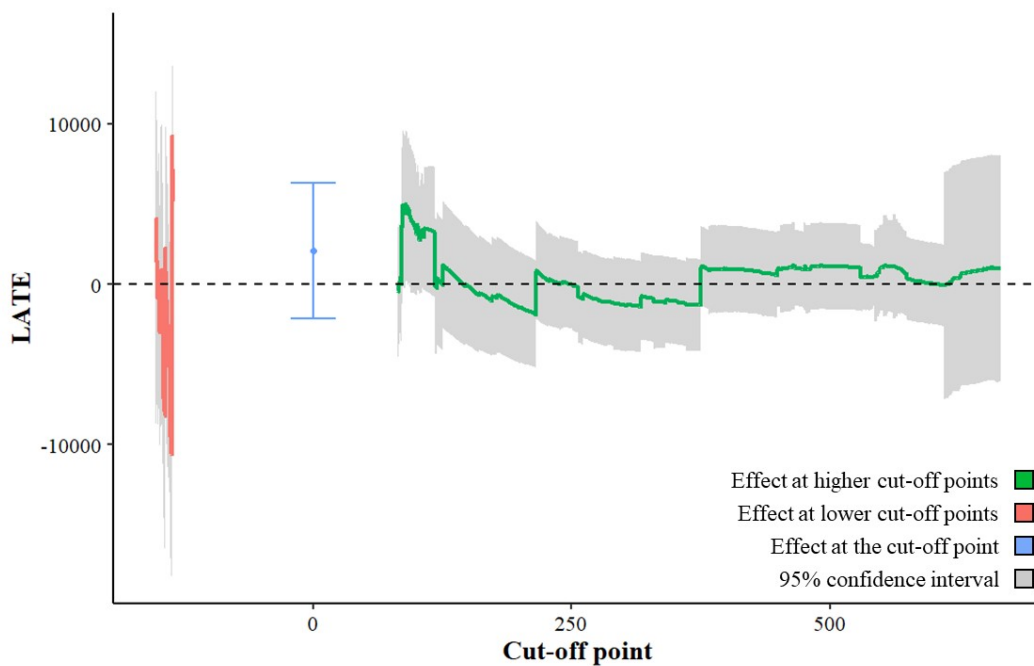


Figure A3.7: Placebo test of days of inventory at various cut-off points

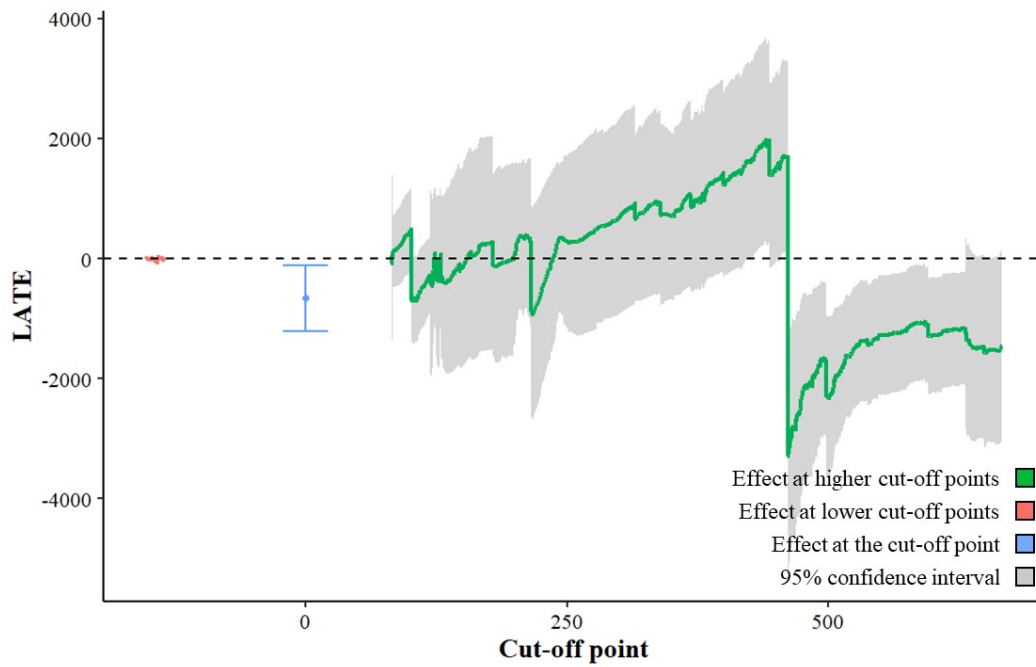


Figure A3.8: Placebo test of inventory turnover at various cut-off points

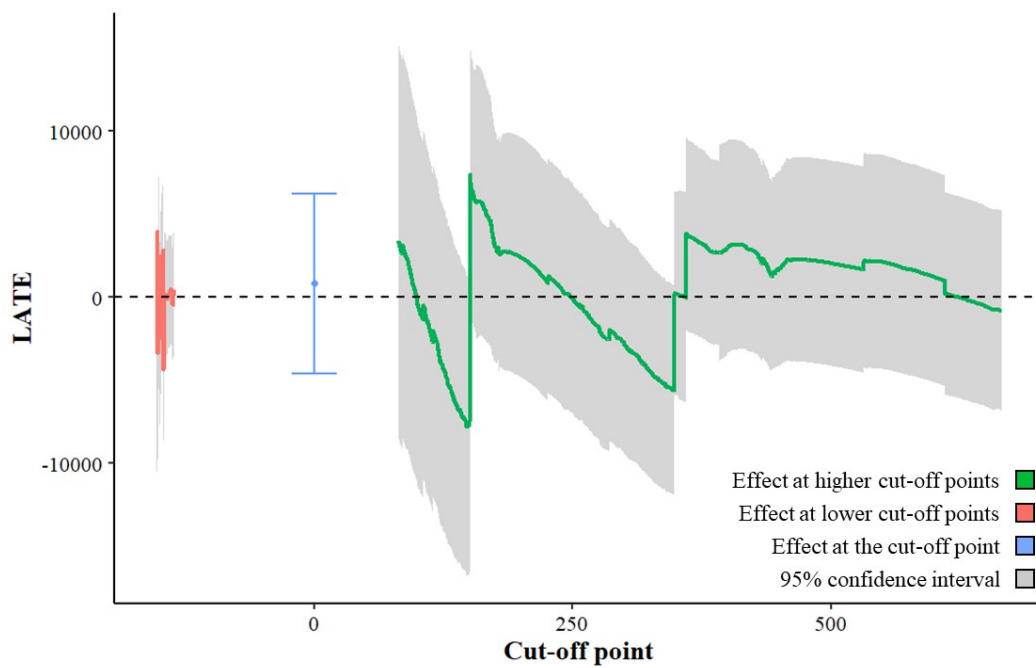


Figure A3.9: Placebo test of days sales outstanding at various cut-off points

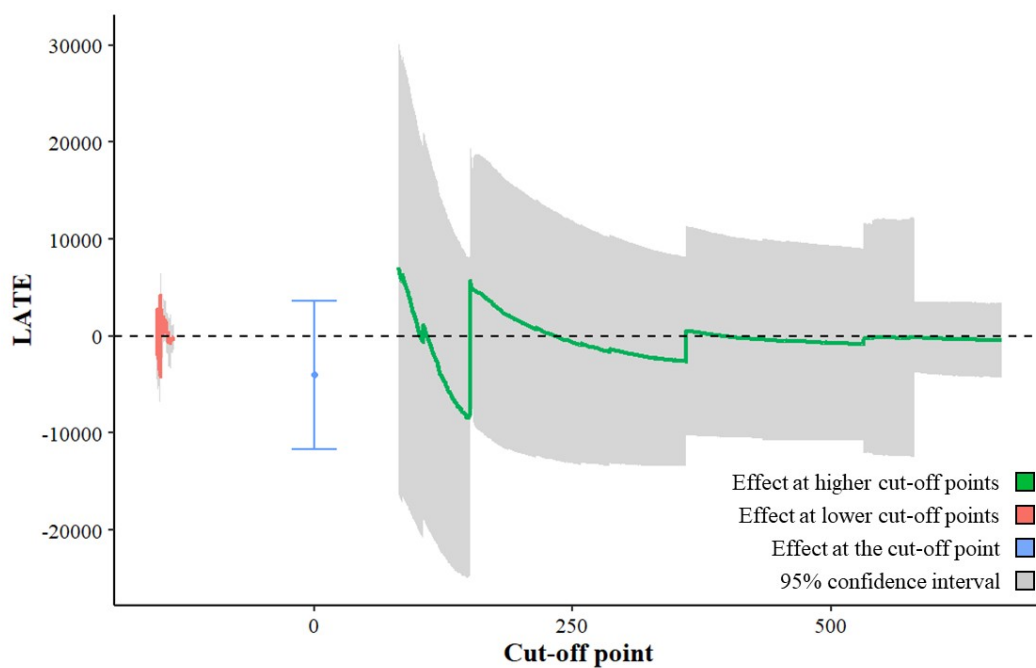


Figure A3.10: Placebo test of days payable outstanding at various cut-off points

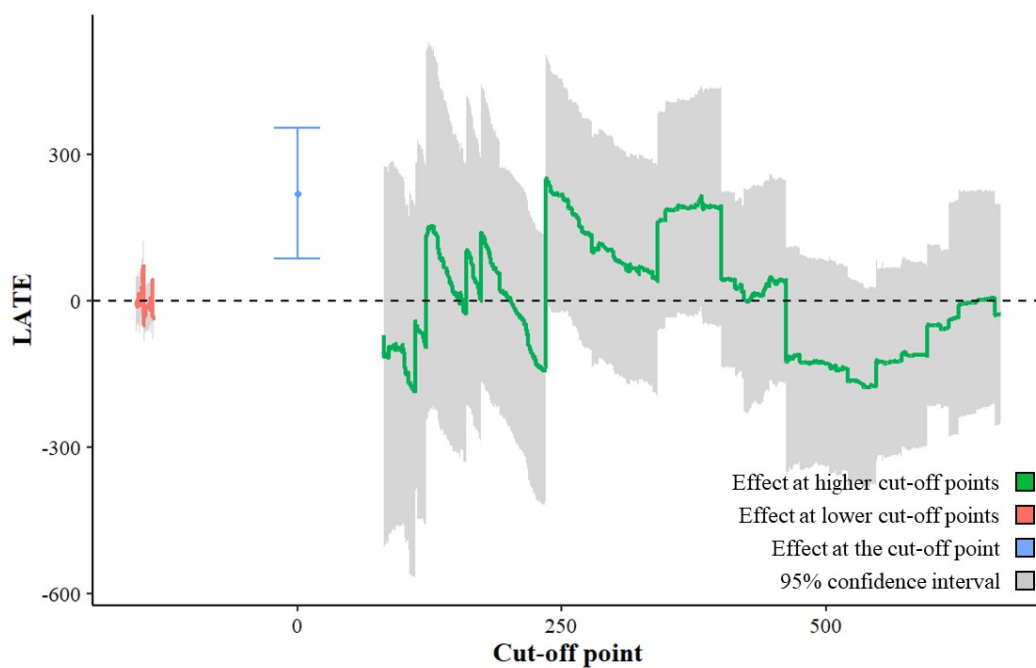


Figure A3.11: Placebo test of working capital turnover at various cut-off points

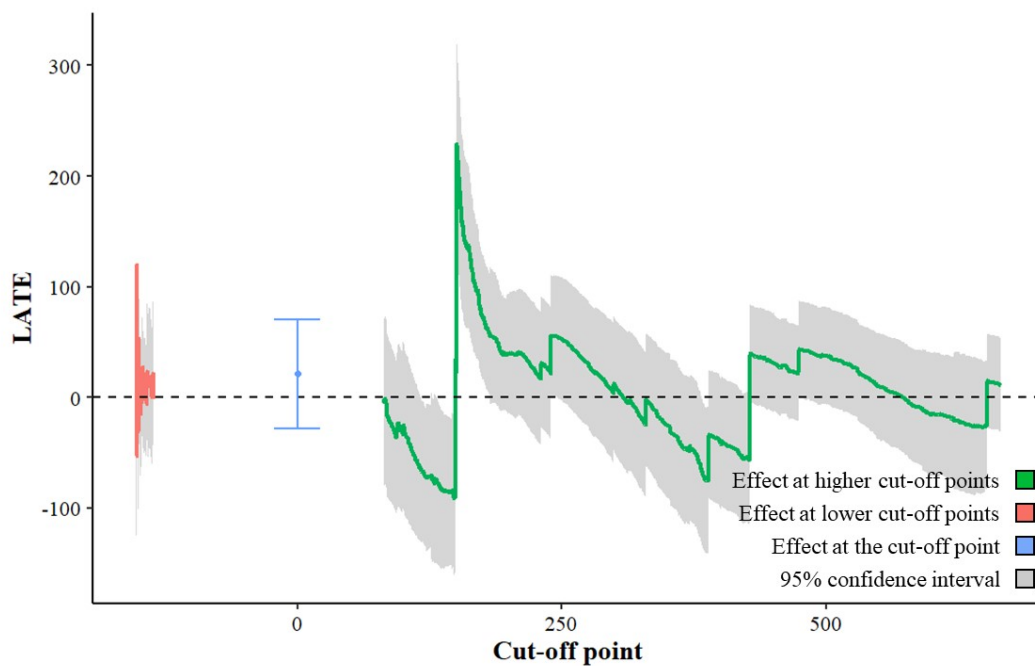


Figure A3.12: Placebo test of current ratio at various cut-off points

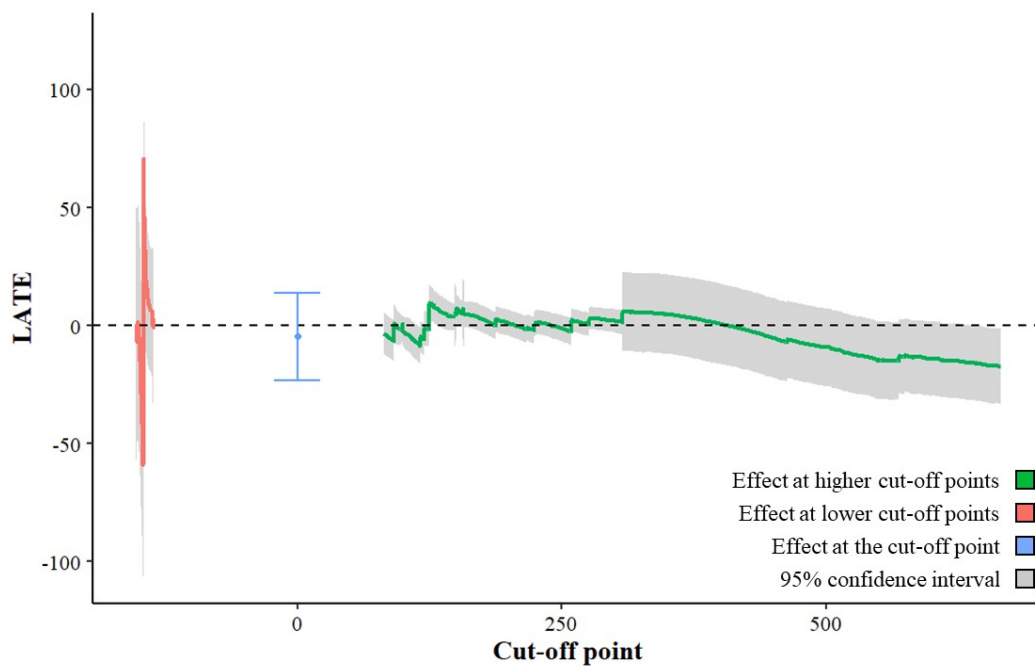


Figure A3.13: Placebo test of debt ratio at various cut-off points

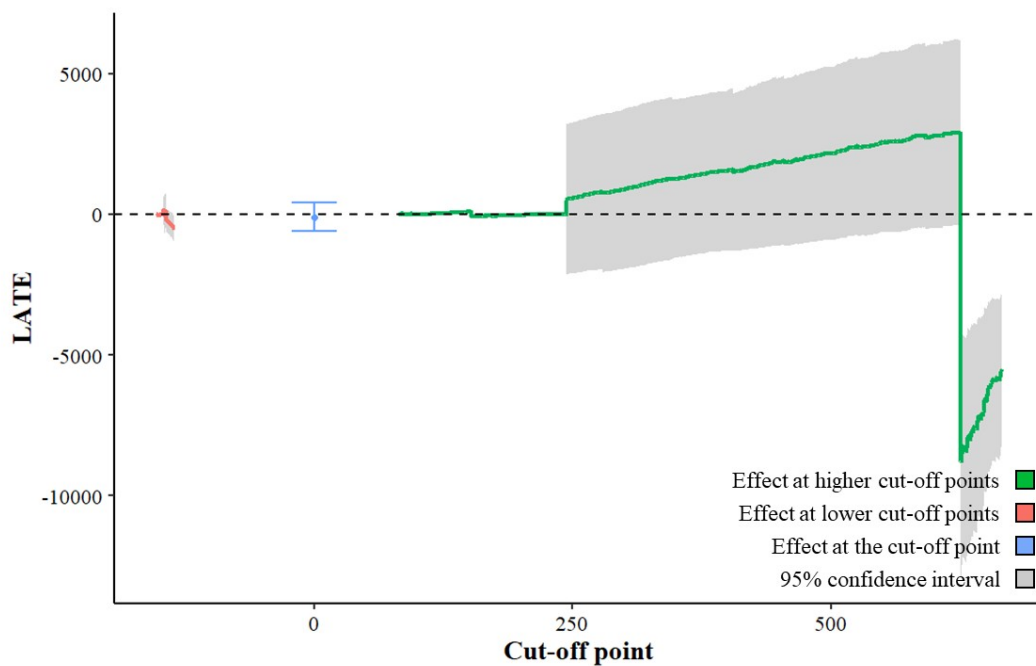


Figure A3.14: Placebo test of debt to equity ratio at various cut-off points

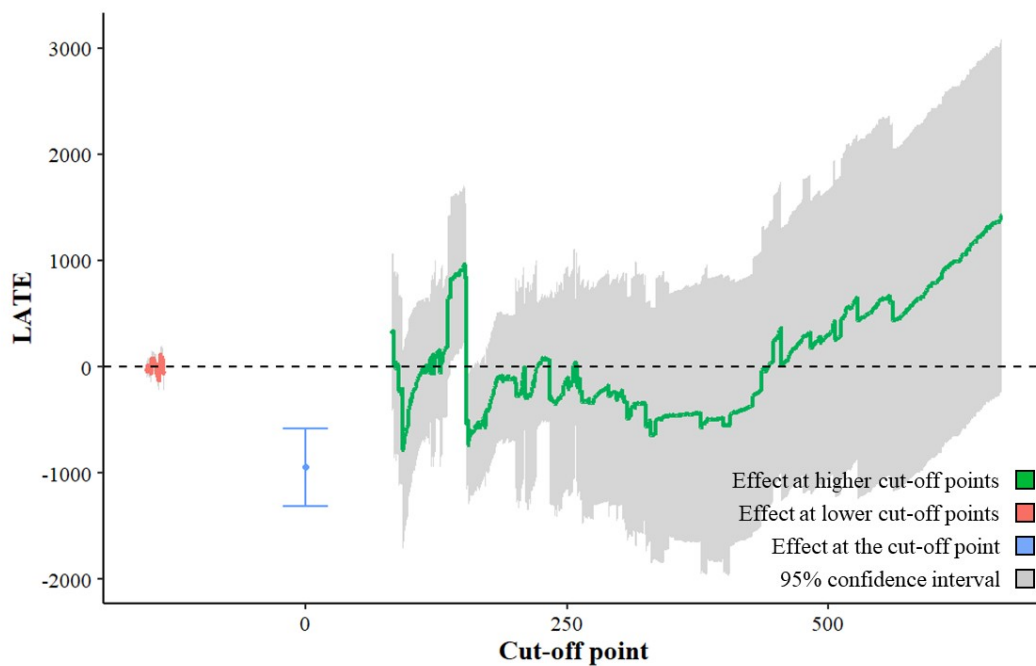


Figure A3.15: Placebo test of coverage ratio at various cut-off points

A4 Graphs from the sensitivity check

As mentioned in Section 4.3, a sensitivity check was conducted on each financial ratio that was used in the regression discontinuity analysis. Similar to the placebo tests, the y-axis for different financial ratios varies due to the differences in estimands. The x-axis depicts different bandwidths.

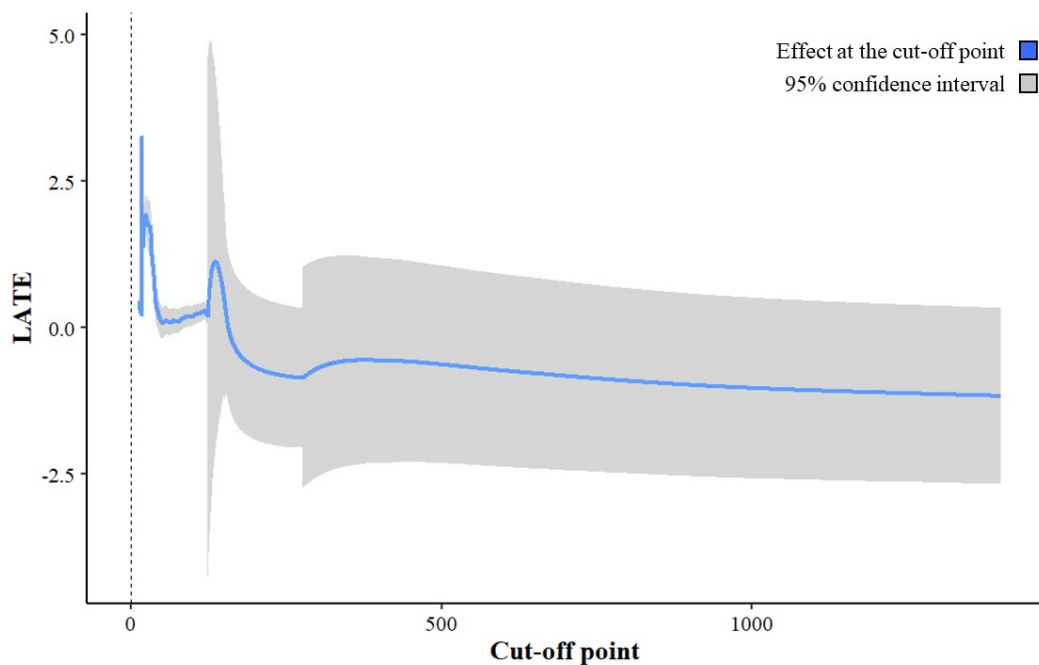


Figure A4.1: Sensitivity check of gross profit margin with various bandwidths

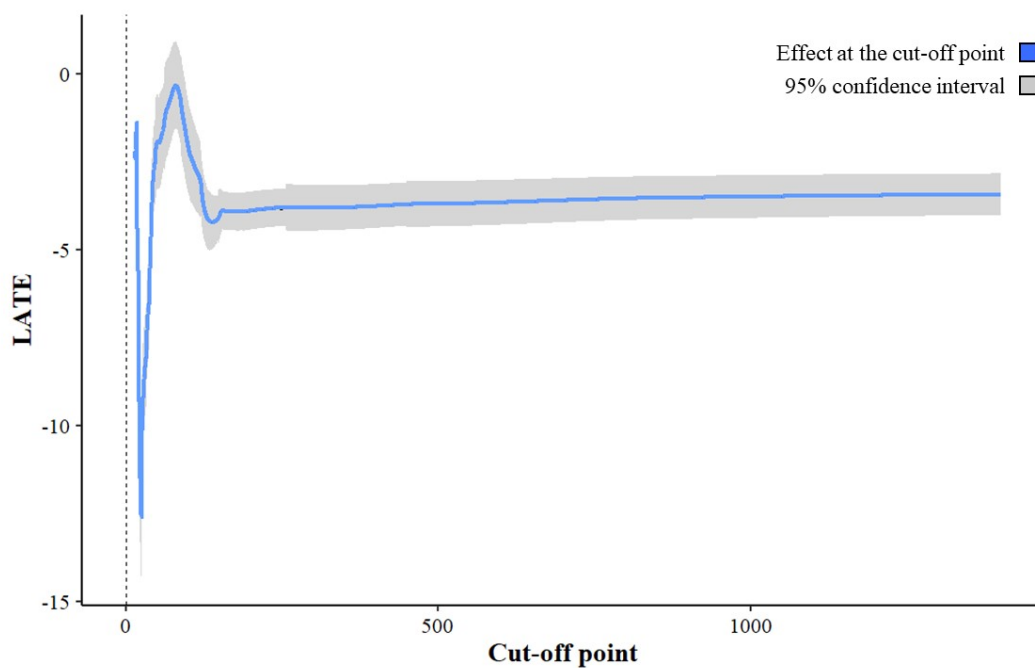


Figure A4.2: Sensitivity check of asset turnover with various bandwidths

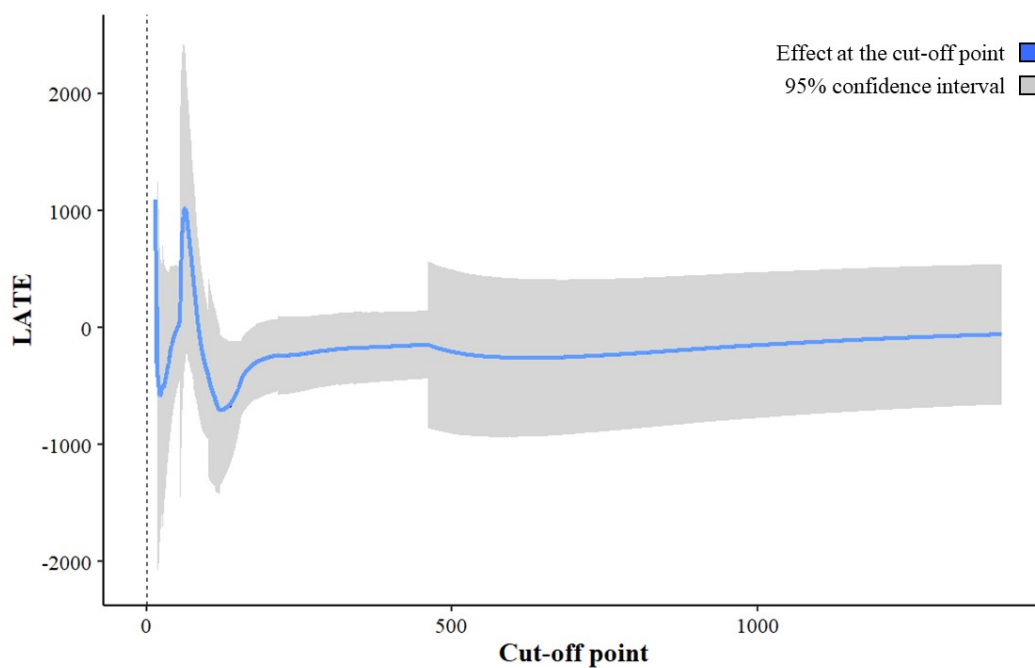


Figure A4.3: Sensitivity check of inventory turnover with various bandwidths

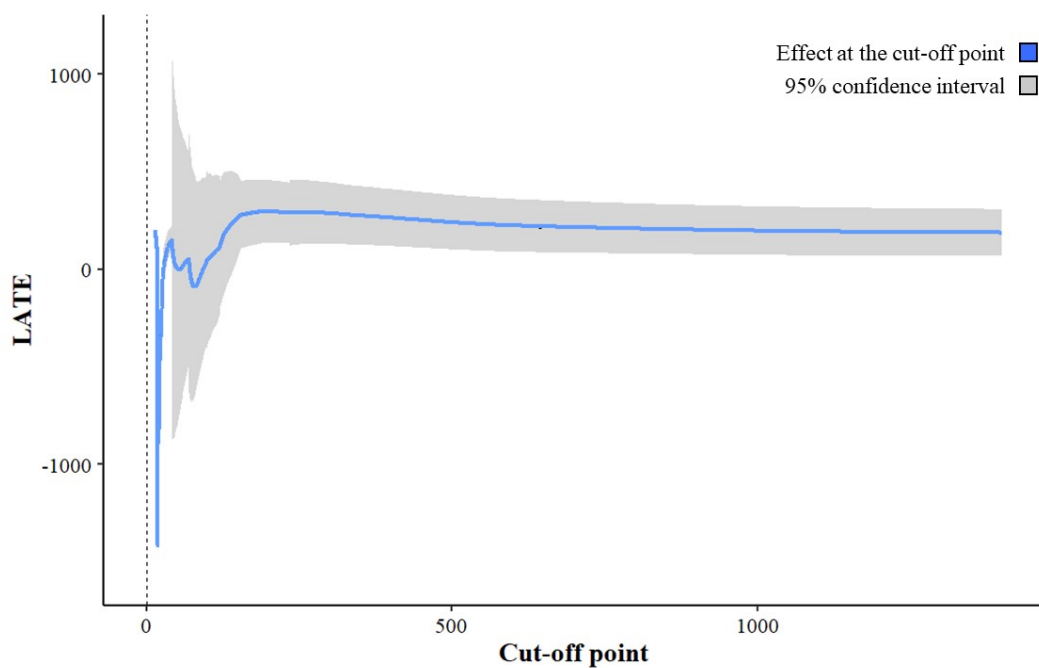


Figure A4.4: Sensitivity check of working capital turnover with various bandwidths

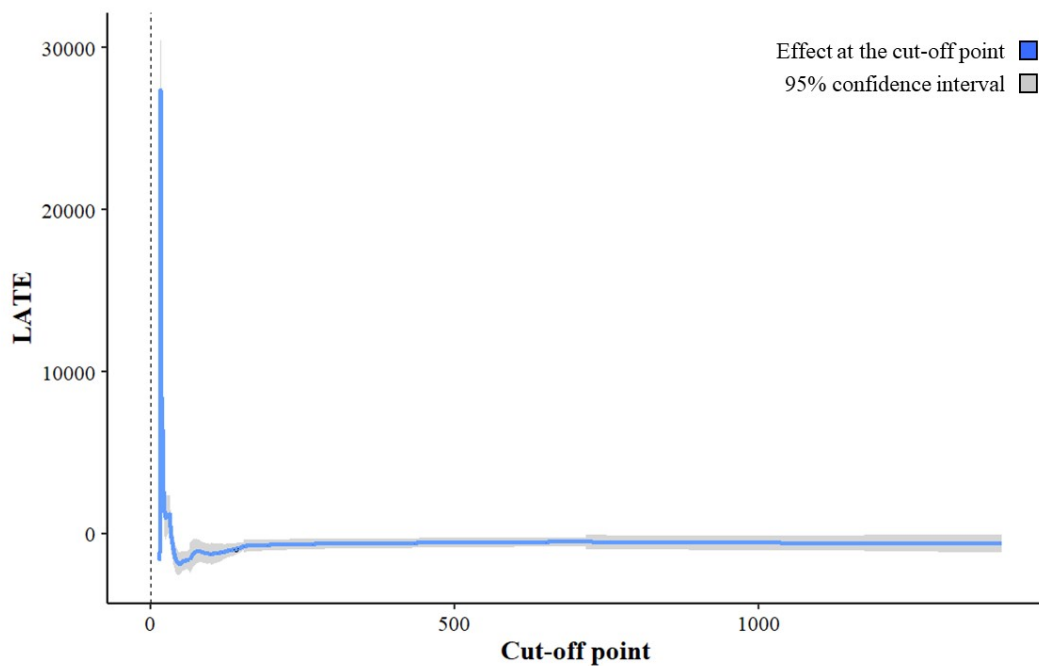


Figure A4.5: Sensitivity check of coverage ratio with various bandwidths