Erasmus University Rotterdam
Making Minds Matter

Real effect of the EU Directive 2014/95/EU on environmental and social practices

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Date final version:	12-08-2021
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Abstract

This thesis was written to examine the possible effect of a mandatory standard on environmental and social practices. The mandatory standard of interest is the Directive 2014/95/EU. This standard requires certain large firms to publish reports on their impact on the environment, nature and mankind. Previous literature has shown that a mandatory standard will lead to an increase in environmental and social practices (Cordazzo et al. 2020; Vukuvić et al. 2017). It has also been discussed that the size of a firm can have a moderating effect on this effect (Giannarakis et al. 2009). In order to contribute to the existing literature, a study was conducted using a difference-in-difference regression. The regression models used the Thomson Reuters ESG score as the dependent variable and multiple dummies to determine the treatment effect. In addition, the regression models used several control variables. The study was conducted over the following sampling period: 2016-2019. This research concludes that the Directive 2014/95/EU does not affect environmental and social practices. In addition, the size of the firm has no moderating effect on the degree of environmental and social practices and CSR performance.

Acknowledgments

In front of you lies the master thesis: Real effect of the EU Directive 2014/95/EU on environmental and social practices. In a time with severe forest fires and where climate change is an intense debate, it is especially important to not forget the environment and our society. Companies can contribute to the environment and society by acting on their corporate social responsibilities. I contributed to the issue by investigating the possible effect of the mandatory EU Directive 2014/95/EU on the CSR performance of companies. This master thesis is the final act of the master Accountancy, Audit and Control. This master thesis is written for the Accounting and Audit track.

I would like to take this opportunity to thank certain people for their guidance and advice during this graduation process. First of all, I would like to thank Dr. Jilde Garst MSc for her guidance and versatile feedback during this project. Mrs. Garst gave me the space to search for answers myself but was always available if I had any questions. Her feedback was clear and helped me to elevate this thesis. In addition, I would also like to thank Mrs. Garst for the interesting discussions that have arisen from the subject of this master thesis. Also, I would like to express my thanks to
Dr. Nico L. Lehnmann MSc as the second assessor for providing a fresh look at this master thesis.

I hope you will enjoy reading this thesis.

H. Bouriou (Hamza)

MSc Accounting Audit and Control

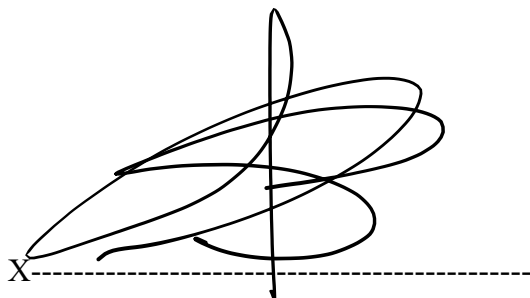School of Economics, Erasmus University Rotterdam

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1 Introduction

Over the years, the society became more aware of their impact on the environment, nature and mankind. As a result of the progressive awareness among the society, people also became aware that the way of operating a firm had to change. Corporate social responsibility (CSR) is a strategy of a firm that is becoming increasingly popular and common among firms. Aspects such as the environment, nature and mankind should be considered in the decision-making process of a firm. The society attaches more value to the effect of firms on the environment, nature and mankind. Therefore, firms have the intention to become sustainable, also known as CSR (Rangan et al. 2015).

Primarily, executives' center of attention was serving the shareholders. Over the years, this focus has shifted to serving the stakeholders. This happened simultaneously with the increasing public interest to invest in sustainable firms. This growth resulted in an increase in public demand for information about CSR. To meet this demand, firms started publishing sustainability reports. As these reports were not required by law, they were published voluntarily. The fact that these reports were published voluntarily is a point of attention. These reports were not regulated. This resulted in a wide spectrum of sustainable reports among firms. Therefore, the reports were less comparable among firms (Christensen et al. 2021).

Sustainability reporting was relatively new and not yet mandatory for firms. This meant that there was not much detailed legislation about sustainability reporting. To address this shortcoming, the European Union has issued a mandatory standard that is the first step in regulating sustainability reports. This mandatory standard has been issued in 2014, but the practical implementation was in the financial year 2017. This mandatory standard is called the EU directive on non-financial reporting, also known as Directive 2014/95/EU. This standard requires certain large firms, that meet the requirements of the directive, to publish reports on their impact on the environment, nature and mankind (European Union, 2014).

To assess the effect of the Directive 2014/95/EU on environmental and social practices, this thesis will address the following research question:

To what extent does the Directive 2014/95/EU affect environmental and social practices?

The Directive/2014/95 is the first law implemented by the European Union regarding non-financial reporting. Caputo et al. (2019) and Sierra-Garcia et al. (2018) and Dumitru et al. (2017) have examined the effect of the new directive on a specific member state of the European Union. To bring this research to a larger scale, this thesis will investigate the effect of the new directive using the European Union as the research population. Fiechter et al. (2020) mention an early positive effect after the new directive was passed in 2014. Due to the standard, information on environmental and social practices should increase. Vukuvić et al. (2017) expected that as the years progressed, pressure would be put on the development of sustainability reporting by the new directive. This will result in more information that will be obtainable for all stakeholders. In 2021, the standard has already been in force for several years. Therefore, this thesis can investigate the effect of the new mandatory standard after the directive has been implemented in 2017. Therefore, this thesis will contribute to the literature by assessing the impact of the new mandatory standard on the European Union. In addition, this thesis will use a different turning point than the prevailing literature. Prior literature uses 2014-2015 as the turning point because the directive has been introduced in 2014. Fiechter et al. (2020) find a positive effect of the directive after this turning point. The firms already adapted before the directive takes effect in the financial year 2017. In order to contribute to the existing literature, this thesis will use the turning point 2017-2018 to investigate whether an effect can still be detected after the actual implementation of the directive in 2017.

2 Theoretical framework

2.1 Corporate social responsibility

In order to understand why firms act in environmental and social practices, the causes of these practices need to be discussed first. Therefore, we must examine and understand what CSR is, since environmental and social practices stem from CSR. CSR indicates the corporate social responsibility of a firm to the society. CSR has developed tremendously over the years. Previously, CSR took place behind the scenes and no explicit attention was placed on it. However, over the years, CSR has increasingly taken over the spotlight. Nowadays, CSR can hardly be ignored in (non-)financial reporting (Lee et al. 2019).

Lindgreen (2010) discusses several pros of implementing CSR. First, implementing CSR strengthens a firm's reputation and legitimacy. Secondly, it reduces the costs and risks. Finally, the implementation of CSR can improve a firm's competitive advantage. In addition to multiple benefits, Freeman et al. (2017) discuss certain criticisms about CSR. The first point of criticism has to do with the intent of the firm and its managers. The prevailing opinion is that managers act in self-interest. This can be harmful to the image of the firm. To make up for the damage, managers try to rehabilitate the image of the firm. By being bad in one feature, they want to be good in another. To compensate for their short-term self-interest, managers tend to do something good and give back to society, in this case CSR. The second form of criticism is that CSR creates a wedge between certain goals and aspects. CSR gives the impression that a choice must be made between business and ethics or between profits and society. This dichotomy that one excludes the other cannot be found in reality (Freeman et al. 2017).

In order to understand the concept of CSR and its effect on environmental and social practices, the pros and cons should not be the only aspects that are discussed. The characteristics of CSR are also an important feature in order to understand this concept. There are three characteristics associated with CSR that are covered by Kakabadse et al. (2005).

2.1.1 Characteristics of corporate social responsibility

Studies show that it is difficult to provide a definition of CSR that is unbiased and clear (Dahlsrud, 2006). There are multiple definitions. This can be traced back to the fact that there are multiple discussions about CSR that are accompanied by multiple interpretations. Nevertheless, Kakabadse et al. (2005) cover three characteristics of CSR in their study with which you can associate CSR.

Kakabadse et al. (2005) mention the first characteristic of CSR as 'beyond the law'. This indicates that a firm goes above and beyond the requirements of the law. Simply complying with the law does not make a firm sustainable. This is the bare minimum that a firm must adhere to. When a firm undertakes more than the law specifies and voluntarily acts to improve the environment, nature and mankind, then CSR can be mentioned. The second characteristic is the long-term perspective. Due to the rising public appreciation, CSR is becoming increasingly valuable. This means that CSR can create value in the long term that cannot be measured financially. This is a future asset that can be very useful in the long run to stay in business**.** The third characteristic of CSR is the accountability to stakeholders. A firm is responsible for all stakeholders and not only for the shareholders (Kakabadse et al. 2005). This characteristic is linked to the stakeholder theory first mentioned by freeman in 1984 (Freeman, 1984). The neglect of the responsibility towards the stakeholders can result in legal claims and costs. It is also possible that a firm is morally responsible for certain stakeholders. No legal claims can arise from this, but moral claims should not be neglected. A violation of moral responsibility to the stakeholders can eventually result in costs, for example a decrease in the stock price if the reputation of the firm is damaged. One of the characteristics of CSR that was mentioned is the accountability to stakeholders. Although CSR is nowadays focusing on the stakeholders, this was not always the case. CSR has developed from a shareholder perspective to a stakeholder perspective (Kakabadse et al. 2005).

2.1.2 Shareholder model vs. stakeholder model

CSR has developed from a shareholder perspective to a stakeholder perspective, and it is still evolving (Kakabadse et al. 2005). In the 1950s, the shareholder model was the primary way to run a firm. The purpose of the shareholder model was to maximize the profit for the shareholders. Tse (2011) mentioned in his paper that the main reason for the success of the shareholder model was the agency costs. These costs can be derived from the agency theory where the managers play the role of the agents, and the shareholders play the role of the principals. Hereby, the managers must fulfill the wishes of the shareholders. In some cases, the managers fail to align their goals with the goals of the shareholders. This means that the managers' primary goal was not to maximize the profit for the shareholders. It was up to the shareholders to introduce incentives to match the managers' goals with the shareholders' goals. One of the most used strategies to achieve this was to grant stock options to the managers. The shareholders then measured the firm's performance using the share price (Tse, 2011).

There has been a change from the shareholder model to the stakeholder model (Freeman 1984; Kakabadse et al. 2005)). Tse (2011) examined this change in his paper. The stakeholder model does not abandon the shareholder model completely but rather expands it. The stakeholder model focuses on several groups where shareholders are among them. In addition, the stakeholder model includes several stakeholders such as employees, suppliers and consumers (Tse, 2011). Schwartz et al. (2008) mention four conditions that the stakeholder model must meet. First of all, the stakeholder model should consider groups as stakeholders if they affect or are affected by the firm. Secondly, all stakeholders are equal and no particular group is prioritized over another group. Thirdly, the stakeholder model focuses on the managerial decision-making process. Finally, the stakeholder model must guarantee the processes and outcomes between the firm and the stakeholders (Schwartz et al. 2008).

The stakeholder model has various benefits. Firstly, if employees are considered in the decision-making process of a firm, the employees will probably work harder, which can increase the efficiency of the firm. In addition, there is a possibility that consumers are willing to pay more for the services and products if the consumers are also considered in the decision-making process. The stakeholder model can also increase the competitive advantage of a firm. The stakeholder model is different for each firm because each firm has a different pool of stakeholders. As a result, the management strategy that belongs to the stakeholder model is specifically tailored to the firm. This makes it difficult for the competition to imitate this which can result in a better competitive advantage. Unfortunately, there are also some drawbacks. A problem that can arise is that there are multiple goals from different stakeholders that the managers must consider. This creates confusion. (Tse, 2011).

2.1.3 Corporate social responsibility vs. corporate social sustainability

Before I can proceed with the theoretical framework, a distinction must be made between corporate social responsibility and corporate social sustainability. This is important so that the answer to the research question cannot be misinterpreted. Corporate social responsibility and corporate social sustainability are usually used as synonyms. Nevertheless, these concepts are not the same. There is a difference between the corporate social responsibility and the corporate social sustainability of a firm. The main difference between the two concepts is that responsibility is based on normative behavior and sustainability is based on descriptive behavior. However, there are several overlaps between the concepts (Bansal et al. 2017).

As mentioned earlier, there are no fixed definitions for corporate social responsibility and corporate social sustainability that are accepted by all academics due to the multiple interpretations (Dahlsrud, 2006). However, there has been a convergence of the two concepts in recent years. Bansal et al. (2017) covered this convergence in their paper. The first overlap between the two concepts is the core constructs. Responsibility was previously linked to social issues and sustainability was previously linked to environmental issues. However, over the years literature appeared about the link between social and environmental issues, which meant that the boundary between responsibility and sustainability became blurred. The second overlap between the two concepts is the role of the firm. The point of view of the two concepts has converged over the years. Responsibility viewed the firm at its core and examined the influence of the firm on its stakeholders. Sustainability, on the other hand, views the firm as part of an environmental (eco-)system. Due to literature over the years on the link between social and environmental issues, the boundary between responsibility and sustainability became increasingly blurred. The third overlap is the causes and consequences arising from corporate social responsibility and corporate social responsibility. Because the causes and consequences are so close to each other, it is difficult to discriminate between the two concepts (Bansal et al. 2017).

To summarize, environmental and social practices are based on corporate social responsibilities. Corporate social responsibility indicates the responsibility of a firm to its stakeholders (Lee et al. 2019; Schwartz et al. 2008; Tse 2011). Corporate social responsibility is based on three characteristics: 'beyond the law'; long-term perspective & accountability to stakeholders (Kakabadse et al. 2005). A firm should acknowledge and consider its legitimate stakeholders and treat them equally (Schwartz et al. 2008). Now that the corporate social responsibilities that lead to environmental and social practices are discussed, I can examine sustainability reporting.

2.2 Sustainability reporting

Acting on a firm's CSR affects stakeholders and society at large. Because the actions associated with the CSR strategy affect stakeholders and society, these consequences should be reported (Lozano, 2011). In order to counter information asymmetry between the firm and the stakeholders, the managers communicate with the stakeholders. This is based on the signaling theory (Su et al. 2014). Although this is done voluntarily, it is desired by the public. This is achieved through sustainability reporting. Sustainability reporting is based on descriptive behavior. It reflects the state of affairs with regard to CSR and not the normative behavior. In conclusion, sustainability reporting is based on two objectives. Firstly, to assess the state of the firm regarding environmental and social practices. Secondly, to communicate the firm's sustainability practices to their stakeholders (Lozano, 2011).

Prior literature mentions various direct and indirect costs and benefits associated with sustainability reporting. There are direct benefits associated with sustainability reporting. Sustainability reporting can lead to a lower cost of capital; better liquidity and higher firm value. There are multiple indirect benefits. First, sustainability reporting will increase a firm's credibility towards the public. In addition, it increases awareness within and outside the firm regarding broad environmental issues. Another indirect benefit is the mitigation of information asymmetry between the firm and stakeholders. Unfortunately, there are also direct and indirect costs with sustainability reporting. An example of direct costs is that it can be expensive and difficult to collect all the necessary data to set up a sustainability report. Sustainability reporting can lead to indirect costs like proprietary costs that result in a loss of a firm's competitive advantage (Kolk, 2004; Christensen, 2021). However, CSR and associated sustainability reporting can also improve competitive advantage through the stakeholder view. The stakeholder model can increase the competitive advantage of a firm. The stakeholder model is different for each firm because each firm has a different pool of stakeholders. As a result, the management strategy that belongs to the stakeholder model is specifically tailored to the firm (Tse, 2011). Sustainability reporting can also damage the reputation of a firm if the results do not meet certain values that stakeholders expect from the firm (Kolk, 2004; Christensen, 2021). This shows that a firm cannot neglect its responsibilities to its stakeholders (Kakabadse et al. 2005; Tse, 2011)

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2.2.1 Mandated disclosure effect

Mandating CSR disclosure has several benefits. A mandated disclosure directive will result in transparency and comparability between firms. However, these benefits in themselves are not sufficient to introduce a mandated directive. In order to see a mandated disclosure effect, positive externalities must take place as a result of the mandated directive. Positive externalities arise when the public value of the disclosure is worth more than the value the firm attaches to the disclosure. Firms do not always include positive externalities in their decision-making process. These firms only consider the private costs and benefits. In order to be able to include these positive externalities, a mandated directive should be implemented (Christensen et al. 2021).

Requiring firms to disclose their CSR activities creates pressure on the firms to act more in CSR, therefore increasing CSR performance. Stakeholder pressure can cause a firm to act more in environmental and social practices (Seroka-Stolka et al. 2020). Stakeholder pressure can be traced back and seen in reality in the paper of Chen et al. (2018). It is concluded in this paper that firms will act and spend more on CSR after a mandated CSR disclosure directive has been implemented and stakeholder pressure. This was associated with positive externalities such as the decrease in industrial wastewater and SO2 emission levels (Chen et al. 2018).

Mandating CSR disclosures can have real effects. Christensen et al. (2017) show in their paper that adding CSR disclosures to annuals reports can have real effects. In their paper, they show that adding safety disclosures in the reports of mining firms leads to a reduction in accidents and injuries. The reason why these disclosures should be mandatory is that this paper also concluded that the productivity of employees decreases as a result of the mandated safety disclosures. This shows that there is a trade-off between productivity and safety. As a result, the firms will not voluntarily add these safety disclosures to their annual reports because productivity declines. For this reason, disclosures should be mandatory (Christensen et al. 2017).

2.2.2 Frameworks for non-financial reporting

Bose (2020) gives an overview in her book about the multiple frameworks related to environmental and social reporting. Over the years, several frameworks have emerged that deal with sustainability reporting. These frameworks are based on the triple bottom lines: the profit and loss account; the social account, and the environmental account. First, there is the Global Reporting Initiative (GRI) framework that originated in 1997. This framework was created primarily to provide a standard for voluntary reporting on sustainability reports that were published alongside regular reports. In addition, there is the Integrated Reporting Framework created by the International Integrated Reporting Council (IIRC) in 2010. The purpose of this framework is to improve the quality of the available reports. Because regular reports and voluntary reports were published, this could become confusing for the (possible) investors. The Integrated Reporting Framework is more difficult to implement than the Global Reporting Initiative since the Integrated Reporting Framework is principle-based. In addition, there is the Sustainability Accounting Standards Board, which was established in 2011. The Sustainability Accounting Standards Board focuses on material sustainability matters. A distinction is therefore made between materiality to decide if something has to be reported or not (Bose, 2020). These frameworks are all voluntary and not required by law. In 2014, the European Union introduced a mandatory standard for the first time, resulting in mandatory non-financial reporting (European Union, 2014).

2.3 European Union's Directive 2014/95/EU

The European Union (2014) has implemented a new directive regarding mandatory non-financial reporting, namely the Directive 2014/95/EU. The directive requires certain large firms, that meet the requirements of the directive, to publish reports on their impact on the environment and social problems. Firms that have more than 500 employees must comply with the directive. In addition, a firm must own at least 20 million in assets or have at least 40 million in sales. The firms must also be listed in the European Union. The firms that meet these requirements must disclose non-financial reports in their annual reports starting with the financial year 2017. Different types of firms are covered by this directive. There are around 11700 firms in the European Union, like banks; insurance firms and others. The information that should be reported, by the firms that must comply with the directive, are related to environmental matters; respect for human rights; anti-corruption and bribery; social matters; treatment of employees and diversity on firm boards (European Union, 2014).

The directive states that firms may prepare non-financial reports based on the GRI guidelines that are in effect at that time. This is mainly about material features and indicator-based disclosures (Bose 2020; Fiechter et al. 2020). The directive had to be implemented in the national laws of the members of the European Union no later than December 6, 2016. It also had to be considered that there were sufficient mechanisms of sufficient quality to enforce the directive. The directive is based on 'minimum harmonization'. This means that all members of the European Union should only oblige the very minimum requirements of the directive (Fiechter et al. 2020; European Union 2014). This leaves room to go beyond what the law specifies. Also known as 'beyond too law' (Kakabadse et al. 2005). Because the directive has a 'minimum harmonization' view, this shows that the directive is principle-based. For this reason, combined with the different transposition options, it is difficult to maintain compliance. For this reason, enforcement of the directive becomes difficult (Fiechter et al. 2020; European Union 2014).

Although the directive is applicable and mandatory for all members of the European Union, there are several transposition options to implement the CSR directive. Due to the different transposition options, there are still differences between the members with regard to the exact mandatory non-financial regulation as a result of the new directive. These options pertain to the scope of affected firms; reporting exemptions; assurance; enforcement and the presentation format of CSR reports (Fiechter et al. 2020; European Union 2014).

Grewal et al. (2019) conducted a study on the response of the equity market to the directive on non-financial reporting in Europe (Directive/2014/95). One of the aspects covered in this paper were the possible net costs/benefits. This study showed that the costs of the directive outweigh the benefits for the treated firms. Grewal et al. (2019) found a negative reaction to the market value of the firms in the treatment group. This negative reaction was less negative for firms with better pre-directive CSR performance. A possible reason for this is that this first mandatory directive gives the go-ahead for future stricter standards, whereby more value is attached to CSR performance by investors, which in turn influences the market value (Grewal et al. 2019). This is in line with what I discussed earlier, positive externalities must take place because the direct costs/benefits for the affected firms are not sufficient to justify the implementation of the mandatory directive (Christensen et al. 2017).

3 Hypothesis development

To summarize, sustainability reporting is based on descriptive behavior. Sustainability reporting is based on two objectives. Firstly, to assess the state of the firm regarding environmental and social practices. Secondly, to communicate the firm's sustainability practices to their stakeholders (Lozano, 2011). Over the years, several frameworks have emerged that relate to voluntary sustainability reporting (Bose, 2020). The European Union (2014) has implemented a new mandatory standard regarding non-financial reporting, namely the Directive 2014/95/EU.

Cordazzo et al. (2020) conclude that there has been a moderate increase in sustainability information after legislation has been enacted. The new legislation caused a transition from voluntary sustainability reporting to mandatory sustainability reporting. Fiechter et al. (2020) mention an early positive effect after the new directive was passed in 2014. Based on the discussed literature, it seems that CSR disclosure can have positive effects on the CSR performance of the firm. By passing legislation that makes CSR disclosure mandatory, this will therefore have a positive effect on the CSR performance. Based on the discussed literature, I state my first hypotheses:

Hypothesis 1_0: There is no effect on the CSR performance due to the Directive/2014/EU on non-financial reporting.

Hypothesis 1_a: There is a positive effect on the CSR performance due to the Directive/2014/EU on non-financial reporting.

In addition to the possible effect that the new directive has on the CSR performance of firms, the size of the firms should also be considered. Giannarakis et al. (2009) discuss various effects that the size of a firm can have. The size of a firm can ensure that a firm can resist the pressure of the stakeholders and therefore invest less in CSR (Giannarakis et al. 2009). Large firms can deploy financial and intangible resources to be less influenced by stakeholders. Furthermore, large firms have great lobbying power to counter stakeholder pressure. Therefore, larger firms are less sensitive to stakeholder pressure (Seroka-Stolka et al. 2020). Godos-Diez et al. (2020), on the other hand, mention that larger firms are more likely to act in environmental and social practices due to stakeholder pressure because larger companies are more visible to stakeholders. As a result, they are more likely to be held liable. In addition, there are also cost advantages like reputation benefits for larger firms to act in environmental and social practices (Godos-Diez et al. 2020). In summary, size can have different effects. Therefore, there is an ambiguous effect between size and CSR performance. Hence, I assume the following:

Hypothesis 2_0: The size of a firm has no moderating effect on the treatment effect of the Directive/2014/95 on the CSR performance.

Hypothesis 2_a: The size of a firm has a positive moderating effect on the treatment effect of the Directive/2014/95 on the CSR performance.

4 Methods and materials

In order to execute the research design, sufficient data must be collected. Data has been obtained through the Erasmus Data Service Center. On their website, the ESG scores over several years for 8700 firms are available. The database is called: esg_entire_universe. However, this is not all the data that was needed. Wharton Research Data Services was used to obtain multiple variables that will be used in the research as control variables.

4.1 Data sample

For the research, a sample of firms that are listed in the European Union and meet the requirements of the directive is necessary. This will be the treatment group that will be affected by the directive. The control group consists of firms that are listed in Asia. In order to match the treatment group and the control group, it was checked whether the firms in both groups met the requirements of the directive. The firms in both groups meet all the requirements of the directive. The only difference that remains is whether the firm is listed in Europe or Asia. This indicates whether the firm has to comply with the directive or not (European Union, 2014). The countries that are part of the treatment or control group can be found in table 1 (Appendix).

The initial dataset consists of 1964 firms over the sampling period of 2016-2019 with 7,856 observations. However, several mutations were made to the obtained data. First of all, all observations with missing values were dropped. In addition, all observations that did not meet the requirements of the directive were dropped. The data is also checked for outliers and abnormal data. Due to these adjustments, a total of 5,835 observations were dropped. The final treatment group consists of 1451 observations belonging to 645 firms. The final control group consists of 571 observations belonging to 254 firms. The time period covered by the final data sample is 2016-2019. Since the directive has been implemented since the financial year 2017, the annual reports published in 2018 will have to comply with the new standard. This provides two years of data before the directive is required and two years of data after the directive is required. The final data sample has 2,021 observations. With this data sample, the possible effect of the new directive will be measured (European Union, 2014).

4.2 Variable description

In order to be able to answer the research question, a study must be carried out that examines the effect of the new directive on environmental and social practices. To conduct the research, several variables were gathered that will be needed to perform a regression. It is important to understand the variables. For this reason, the dependent, independent and control variables will be discussed in the following paragraphs.

4.2.1 Dependent variable

To measure the environmental and social practices mentioned in the research question, I will use the Thomson Reuters ESG score as a proxy for the dependent variable (Libby boxes, Appendix C). The Thomson Reuters ESG score was created to measure a firm's CSR performance across ten themes. This provided extra transparency. The data on which the score is based are the published reports of the firms. The ESG score consists of a percentage that is benchmarked against the industry-level for all environmental and social categories and against the country-level for all governance categories (Thomson Reuters EIKON, 2017). The method of data collection can be seen in figure 1 (Appendix B).

4.2.2 Independent variable

To examine the effect of the new directive, the implementation of the directive will be used as an independent variable (Libby boxes, Appendix C). This effect will be measured based on three variables. First, the dummy variable Directive will be used as a proxy to show whether an observation belongs to a firm that is listed in the European Union and therefore has to comply with the directive or an observation that belongs to a firm listed in Asia. If the observation is in the European Union, the dummy variable will have a value of 1 and if the observation is from a firm from Asia, the dummy variable will have a value of 0 (European Union, 2014).

Secondly, the dummy variable Post will be used as a proxy to indicate the time period the observation belongs to. The dummy variable will have a value of 1 if the observation is from 2018 onwards, as the reports published in 2018 must comply with the directive. In addition, the dummy variable will have a value of 0 if the observation is from before 2018. To merge these effects, multiple interaction terms will be added. The variable DirectivexPost will show the effect of the new directive on the ESG score. For this reason, the interaction term DirectivexPost will be the variable of interest for the first hypothesis. An interaction term will be added to determine the moderating effect of Size on the treatment effect. This interaction term will be captured by DirectivexPostxSize. For this reason, the interaction term DirectivexPostxSize will be the variable of interest for the second hypothesis. In addition, two additional interaction terms, DirectivexPost and PostxSize, will be used in the second hypothesis.

4.2.3 Control variables

Song et al. (2021) identify a potential problem in their literature that must be considered in the research design, namely endogeneity. The endogeneity problem that needs to be addressed is the possibility of omitted variables. This can lead to an omitted variable bias in the results. Endogeneity arises when the assumption of independence between an independent variable and the error term is violated. To counter omitted variables and thus endogeneity associated with a regression, control variables will be used in the regression. In addition, year-fixed effects and firm-fixed effects will be used in the regressions to counter omitted variable bias (Song et al. 2021).

The first control variable that will be used is Size. Total assets will be used as a proxy to implement the size of a firm in the regression. Prior literature discusses different effects that the size of the firm can have. The size of a firm can ensure that a firm can resist the pressure of the stakeholders and therefore invest less in CSR. Besides being able to resist the stakeholders, the size of the firm can also have a positive effect on investing in CSR and satisfying the stakeholders. Because large firms are extra visible to society and are therefore held more accountable. The size of the firm can be measured by total sales; total assets or number of employees (Giannarakis et al. 2009; Godos-Diez et al. 2020).

The second control variable that will be used is the return-on-equity (ROE). The ROE will be used as a proxy to implement a firm's financial performance in the regression. The costs of CSR for a firm that performs well will be relatively less burdensome. Cho et al. (2019) mention that there is a positive correlation between CSR and financial performance. Therefore, the costs of CSR for a firm that performs well will be relatively less burdensome. In addition, in accordance with the paper by Fiechter et al. (2020), the following control variables will be added: Asset Turnover; Property, Plant & Equipment (PPE) and Leverage (Fiechter et al. 2020). An overview of the definitions of the variables is included in table 2 (Table 2, Appendix B). In addition, the core statistics of the variables associated with the data sample are listed in table 3 (Table 3, Appendix B).

4.3 Regression models

In order to answer the research question, there will be conducted a study to measure the effect of the new standard directive. This effect will be examined by a difference-in-difference regression model. A difference-in-difference regression model firstly looks at the change in the variable of interest, dependent variable, over time. In this case the Thomson Reuters ESG score. Nevertheless, I cannot rely on this change as the final effect. I also need to know the counterfactual effect. That is why the difference-in-difference regression model is also called a counterfactual analysis. This means that I need to know the change in the dependent variable as if the new directive would never have been issued.

Therefore, I need to assess the change in the dependent variable and the counterfactual change. To examine the counterfactual change, the change in the dependent variable will be assessed of a control group. The treatment group will consist of firms from Europe that meet the conditions of the directive. The control group will consist of firms that also meet the requirements of the directive but are listed in Asia. These firms in Asia do not need to comply with the standard because the standard only applies in Europe. During the study, an alpha of 0.05 will be used. This means that there is a 5% chance that an effect will be found, while it is not actually present. Therefore, rejecting the null hypothesis incorrectly. Based on the discussed literature, data and variables, the following regression models will be tested for the corresponding hypothesis:

Hypothesis 1:

$$ESG\ Score\ =\ \alpha\ +\ \beta 1\ x\ Treatment + \beta 2\ x\ Post\ +\ \beta 3\ x\ Treatment\ x\ Post\ +\ \beta 4\ \ x\ Size \\ +\ \beta 5\ x\ ROE\ +\ \beta 6\ x\ Asset\ Turnover\ +\ \beta 7\ x\ PPE\ +\ \beta 8\ x\ Leverage \\ +\ Year fixed effects + Firm fixed effects\ +\ \varepsilon$$

$\beta 3$ is the variable of interest because it captures the treatment effect and therefore the effect of the directive on the ESG score. The alternative hypothesis states that the directive will have a positive effect on the CSR performance. I expect that the coefficient $\beta 3$ will be positive and therefore have a positive effect on the ESG score.

Hypothesis 2:

$$ESG\ Score\ =\ \alpha\ +\ \beta 1\ x\ Directive\ +\ \beta 2\ x\ Post\ +\ \beta 3\ x\ Directive\ x\ Post \\ +\ \beta 4\ x\ Directive x Size\ +\ \beta 5\ x\ Post x Size \\ +\ \beta 6\ x\ Directive\ x\ Post\ x\ Size\ +\ \beta 7\ x\ Size\ +\ \beta 8\ x\ ROE \\ +\ \beta 9\ x\ Asset\ Turnover\ +\ \beta 10\ x\ PPE\ +\ \beta 11\ x\ Leverage\ + Year fixed effects \\ +\ Firm fixed effects\ +\ \varepsilon$$

$β6$ is the variable of interest, because it captures the moderating effect of size on the effect of the directive on the ESG score. The alternative hypothesis states that the size of a firm will have a positive moderating effect on the treatment effect of the directive on the CSR performance. I expect that the coefficient $β6$ will be positive and therefore have a positive effect on the treatment effect and the ESG score.

5 Results

In the previous section, the setup of the research design is clearly described and explained. In this section, the results arising from this research will be discussed. These results will be used to test the pre-established hypotheses. These hypotheses will form a base to answer the research question in the conclusion. In this study, the assumption is made that the results are not driven by the governance (G) dimension of the ESG score.

5.1 Descriptive statistics

Table 3 (Appendix B) shows a summary of the statistics of the variables used in the regression models. Here one can see that the ESG score has a large range, namely 10.47 – 95.87 (Table 3, Appendix B). A wide range of the ESG score can be found in the treatment and control groups (Table 4, Appendix B). The average ESG score of the data sample is 57.81. This is close to the median, namely 59.13 (Table 3, Appendix B). In table 4 (Appendix B) a distinction is made between the treatment group and the control group. The first thing you notice is that the firms in Asia have a lower mean ESG score than Europe. The mean of the ESG score of Europe is 62.2 and the mean of the ESG score of Asia is 46.66. In both groups, the means are close to the median. The event that the mean and median are close together is a desirable result because it is an indicator of a normal distribution in the data (Table 4 Appendix B; Enticott et al. 2012). The fact that the mean of Asia is lower than the mean of Europe may be because Asia has been less strict with environmental and social laws in the past. Asia is currently catching up on this shortcoming (Pang, 2020). Furthermore, the treatment group has a higher maximum ESG score. In addition, there are no variables that have a high correlation with each other. This would lead to multicollinearity. This is the event that two or more independent variables have a high correlation with each other and cause a bias in the results. This is not the case in the dataset (Table 5, Appendix B).

In addition to the descriptive variables, several figures should be discussed. Figure 2 (Appendix A) shows the distribution of the ESG score of the data sample in the respective years. It can be seen that the ESG score follows a normal distribution in each year. This is important because one of the assumptions for statistical testing is that the data has a normal distribution. Compliance with these assumptions is necessary in order to be able to make any conclusions (Enticott et al. 2012).

5.3 Effect of the Directive 2014/95/EU on CSR performance

Table 6: Regression models

	Model 0	Model 1	Model 2
Dependent variable:	ESG score	ESG score	ESG score
Directive	17.621*	12.970*	12.620*
	(1.030)	(1.515)	(1.511)
Post	1.949	2.366	2.384
	(1.421)	(1.881)	(1.874)
DirectivexPost	-4.350*	-0.649	-0.587
	(1.667)	(1.186)	(1.201)
DirectivexSize			0.000*
			(0.000)
DirectivexPostxSize			0.000
			(0.000)
PostxSize			0.000*
			(0.000)
Size		0.000	0.000*
		(0.000)	(0.000)
ROE		3.056*	3.114*
		(1.048)	(1.041)
Asset Turnover		0.000*	0.000*
		(0.000)	(0.000)

Table 6: Regression models (continued)

PPE		0.000	0.000
		(0.000)	(0.000)
Leverage		-0.188*	-0.186*
		(3.939)	(3.911)
Intercept	45.947*	18.820*	19.090*
	(0.862)	(7.877)	(7.821)
Firm-fixed effects	Included	Included	Included
Year-fixed effects	Included	Included	Included
F-Statistic	126.1	6.448	6.549
Adjusted R^2	0.157	0.626	0.631
Pr(>|t|)	0.000*	0.000*	0.000*
N	2021	2021	2021

Note: * = P < 0.05. This table consists of the regression results and statistics associated with the corresponding regression model. N is the number of observations. The coefficients between brackets represent the standard deviations.

To establish a baseline, model 0 is created without the control variables and fixed effects included. Model 0 is based on only the treatment variables. This shows the univariate treatment effect. The regression results can be seen in table 6 above. Model 0 will be used to determine whether the added variables in models 1 and 2 are an improvement of model 0. This will be based on the overall p-value. The adjusted R-squared of model 0 is 0.157. This means that 15.7% of the variation in the dependent variable is due to the explanatory variables. Model 0 shows a significant negative effect of -4.350 on the CSR performance due to the new directive. This indicates that the ESG score of treated firms will decrease by 4.350 after the directive has been implemented.

5.3.1 Hypothesis 1

The regression associated with hypothesis 1 can now be examined. Hypothesis 1 states that the directive will have a positive effect on the CSR performance. Regression model 1 is significant because it has an overall p-value of 0.000. This is lower than the alpha of 0.05. This means that the variables of model 1 provide a better fit to the data than model 0. Since the regression consists of multiple variables, the adjusted R-squared must also be considered. The adjusted R-squared associated with model 1 is 0.626. This means that 62.6% of the variation in the dependent variable is due to the explanatory variables. The regression results can be seen in table 6.

$\beta3$ is the variable of interest because it captures the treatment effect and therefore the effect of the directive on the ESG score. The coefficient of the variable DirectivexPost in model 1 is -0.649. Because the coefficient of the treatment variables change after the control variables are added to the model, this shows that the treatment variables are not orthogonal to the control variables and therefore omitted variables were present in the error term. Table 6 shows that the coefficient of the variable DirectivexPost is not significant. The p-value is higher than 0.05, namely 0.585. So there is an insignificant relationship. If the coefficient of interest is insignificant, the hypothesis cannot be empirically validated. This means that no significant effect can be traced between the two variables in the data sample. For these reasons, I maintain hypothesis H_0 and reject H_a. There is no effect on the CSR performance due to the directive on non-financial reporting.

These findings can be traced back to the data. The research design expected that the ESG score in Europe would increase, while the ESG score in Asia would remain the same. Figure 3 (Appendix A) shows that the ESG score in Asia has increased in recent years and that the ESG score in Europe has even slowly decreased.

5.3.2 Hypothesis 2

Hypothesis 2 states that the size of a firm has a positive moderating effect on the treatment effect of the directive on the CSR performance. Regression model 2 belonging to hypothesis 2 is significant because it has an overall p-value of 0.000. This is lower than the alpha of 0.05. This means that the variables of model 2 provide a better fit to the data than model 0. Since the regression consists of multiple variables, the adjusted R-squared must also be considered. The adjusted R-squared associated with model 2 is 0.631. This means that 63.1% of the variation in the dependent variable is due to the explanatory variables. The regression results can be seen in table 6.

$\beta6$ is the variable of interest because it captures the moderating effect of the size on the treatment effect on the ESG score. The coefficient of the variable DirectivexPostxSize is 0.000. Because the coefficient of the treatment variables change after the control variables are added to the model, this shows that the treatment variables are not orthogonal to the control variables and therefore omitted variables were present in the error term. Table 6 shows that the coefficient of the variable DirectivexPostxSize is insignificant. The p-value is higher than the alpha 0.05. The p-value is 0.702 and therefore insignificant. So there is an insignificant relationship. If the coefficient of interest is insignificant, the hypothesis cannot be empirically validated. This means that no significant effect can be traced between the two variables in the data sample. For these reasons, I maintain hypothesis H_0 and reject H_a. The size of a firm has no moderating effect on the treatment effect of the directive on the CSR performance.

6 Conclusion, discussion, recommendations & practical implications

6.1 Conclusion

Now that the research has been completed and the results have been discussed, I will address the conclusion of this thesis. This thesis has been written to answer the following research question: *To what extent does the Directive 2014/95/EU affect environmental and social practices?* To answer this research question, a study was conducted. The research design was executed on the collected data. The treatment group consists of listed firms in Europe that must comply with the directive if they met the requirements of the directive. In addition, the control group consists of listed firms in Asia that also meet the requirements of the directive, but do not have to comply with it because the firms are not listed in Europe. The data collection resulted in a data sample of 2,021 observations over the sampling period of 2016-2019.

To answer the research question, two hypotheses were pre-established. The first hypothesis that was discussed is: *'there is a positive effect on the CSR performance due to the Directive/2014/EU on non-financial reporting.* The study resulted in an insignificant relationship (Table 6). This means that no significant effect could be traced between the two variables in the data sample. For this reason, I can conclude that there is no effect on the CSR performance due to the Directive/2014/EU on non-financial reporting. This contradicts the previously discussed literature as Cordazzo et al. (2020) and Vukuvić et al. (2017) concluded in their papers that there has been a moderate increase in non-financial information after legislation has been enacted (Cordazzo et al. 2020; Vukuvić et al. 2017). This does not appear to be the case in the situation of this thesis. This may be due to the new mandatory standard that was being developed in China (Lee et al. 2021; Liu et al. 2021; Regulation Asia 2021; Tan 2020). It may also be due to the 'crowding out effect' that possibly has taken place within Europe (Atiq, 2014).

The second hypothesis that was discussed is*: 'the size of a firm has a positive moderating effect on the treatment effect of the Directive/2014/95 on the CSR performance'.* The results show an insignificant relationship (Table 6). If the coefficient of interest is insignificant, the hypothesis cannot be empirically validated. This means that no significant effect can be traced between the two variables in the data sample. Therefore, the size of a firm has no moderating effect on the treatment effect of the Directive/2014/95 on the CSR performance. This is consistent with the prevailing literature. Size can have positive or negative effects. Large firms can deploy financial and intangible resources to be less influenced by stakeholders to act on their corporate social responsibilities. In addition, large firms have great lobbying power to counter stakeholder pressure. Therefore, larger firms are less sensitive to stakeholder pressure (Seroka-Stolka et al. 2020). Giannarakis et al. (2009) and Godos-Diez et al (2020) mention that large firms are extra visible to society and are therefore held more accountable.

Therefore, larger firms could be more influenced by stakeholder pressure and more will act on CSR (Giannarakis et al. 2009; Godos-Diez et al. 2020). A possible reason that no significant effect could be found in our study is that the positive and negative effects can cancel each other out, so that size ultimately has no significant effect.

Due to the collected information and the results of the research, it is now possible to answer the research question: *To what extent does the Directive 2014/95/EU affect environmental and social practices?* The Directive 2014/95/EU does not affect environmental and social practices. In addition, the size of the firm has no moderating effect on the degree of environmental and social practices.

6.2 Discussion

The findings of the results can be traced back to the data. The research design expected that the ESG score in Europe would increase, while the ESG score in Asia would remain the same. Figure 3 (Appendix A) shows that the ESG score in Asia has increased in recent years and that the ESG score in Europe has even slowly decreased. China is one of the leading and largest countries in Asia. China has been developing a mandatory standard for ESG disclosure practices for several years. This directive could lead to an increase in the CSR performance of firms. This mandatory standard would have been implemented in 2020. However, due to the covid-19 pandemic, implementation has been postponed to 2021. On 7 May 2021, the China Securities Regulatory Commission (CSRC) added new amendments regarding environmental and social disclosure practices to China's new Securities Law that was implemented 1 March 2020. Because this new mandatory standard was on the way, firms may have already adapted in recent years. From 2013 to 2019, there has been an increase in Chinese firms from the CSI300 list that published ESG reports of 57,4% (Lee et al. 2021; Liu et al. 2021; Regulation Asia 2021; Tan 2020). Because China and Asia are catching up with regard to CSR, this also means that Asia may be in the transition from a shareholder view to a stakeholder view (Tse, 2011). This can be traced back to the fact that China is now increasingly encouraging CSR and is even going to introduce a mandatory standard regarding non-financial reporting (Lee et al. 2021; Liu et al. 2021; Regulation Asia 2021; Tan 2020). If the firms in Asia meet the requirements of the stakeholder model mentioned by Schwartz (2008), they can also experience the benefits of the stakeholder model and CSR (Schwartz et al. 2008; Tse 2011).

Figure 3 (Appendix A) shows that the ESG score in Europa has decreased in recent years. A possible explanation of why the ESG score has decreased in Europe since the new mandatory standard came into effect has to do with virtue ethics. Virtue ethics mean that individuals or organizations take certain actions through intrinsic motivation. CSR is an example of this. Although CSR was not yet mandatory, firms already acted in this because of the intrinsic motivation that these firms had (Constantinescu et al. 2020). A new mandatory standard has been implemented and is no longer voluntary, therefore an incentive is introduced. This can ensure that intrinsic motivation is replaced by the eccentric value of the new standard. This can dispel the intrinsic value. This is also known as the 'crowding-out effect' (Atiq, 2014). As a result of the introduction of the mandatory standard, firms will only comply with the explicit conditions of the standard and will not put any additional input into CSR and go beyond the law. As a result, the characteristic of CSR called 'beyond the law' is no longer met (Kakabadse & Lee-Davies, 2005). Therefore a decrease in the ESG score in Europe.

6.3 Recommendations

Although a lot of time and effort has gone into this master thesis, there are still shortcomings. The first shortcoming of this thesis is the control group matching. For this study, I assumed that the firms in the control group must meet the requirements of the directive, just like the firms in the treatment group. The only difference that remains is that the firms in the control group are listed in Asia and are not part of the European Union. As a result, these firms do not have to comply with the directive. However, there is still a chance that there is a selection bias in the data sample. A recommendation for follow-up research is the use of Propensity Score Matching (PSM). Here, the firms in the treatment group are matched with the control group. This will result in a data sample with the same characteristics and no selection bias. The second shortcoming of this thesis is the parallel trend assumption. Figure 3 (Appendix A) shows that the ESG score in Asia has increased in recent years and that the ESG score in Europe has even decreased. This shows that the control group does not follow the same trend as the treatment group. This is necessary to meet the parallel trend assumption. If the study does not meet the parallel trend assumption, this may cause a bias in the results. A recommendation for follow-up research is to run a yearly difference-in-difference regression and test whether the pre-years treatment effects remain insignificant. Finally, a recommendation for future follow-up research is to enlarge the control group. The treatment group consisted of 1451 observations and the control group consisted of 571 observations. A larger control group gives a better trend than a smaller control group because a larger control group is less sensitive to specific circumstances, just like China. By taking a larger control group, the effect of China will be less predominant in the results and there is a possibility that a possible effect of the directive can be discovered. A final recommendation for follow-up research is to include diversity on firm boards into the study, because the new directive also has an effect on this.

6.4 Practical implications

These results provide new insights for additional research for practical implications. Looking at the mean ESG scores, there is room for improvement, especially in Asia. One of the practical implications to be considered is the degree of virtue ethics that affects the mandatory standard. This effect was most likely not included in the development of the mandatory standard. If this effect can be investigated, actions can be taken to increase the environmental and social practices (Constantinescu et al. 2019). In addition, it must also be considered whether the mandatory standard is clear enough. A mandatory standard that is not clear about the penalty for violation can backfire. This is due to the 'minimum harmonization' view of the directive. This shows that the directive is principle-based. For this reason, combined with the different transposition options, it is difficult to maintain compliance. For this reason, enforcement of the directive becomes difficult. In the future, it can be investigated whether the degree of clarity and level of enforcement can affect compliance and the effect of Directive/2014/95. The directive can then be created with a rule-based perspective. Based on the obtained results of this thesis, there is one more reason that needs to be explored. Perhaps a mandatory standard is not the right mechanism to encourage CSR as I have not found a significant positive effect. I advise the policymakers to amplify the intrinsic values of the firms because this was previously the main reason that firms participated in CSR. This offers an opportunity to build on this foundation by creating more awareness among stakeholders and the firms. As a result, there is more pressure from both internal and external to increase the degree and transparency of CSR and environmental and social practices. This can be done through campaigns demonstrating the consequence of the lack of CSR.

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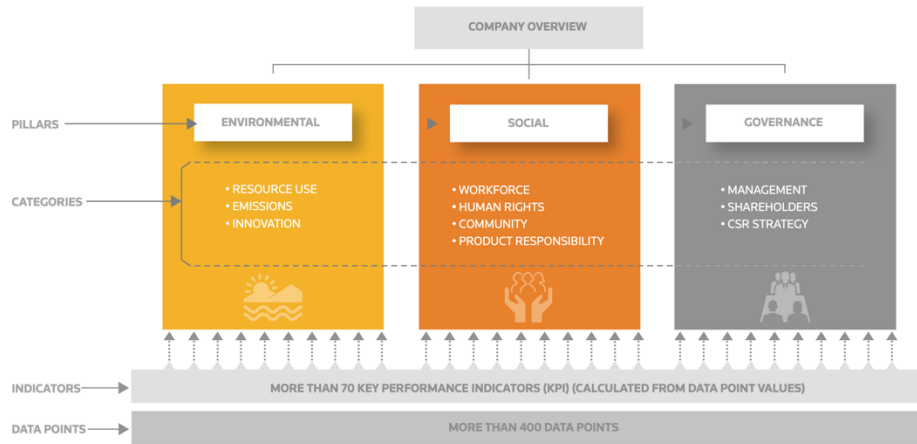
Appendix A: Figures

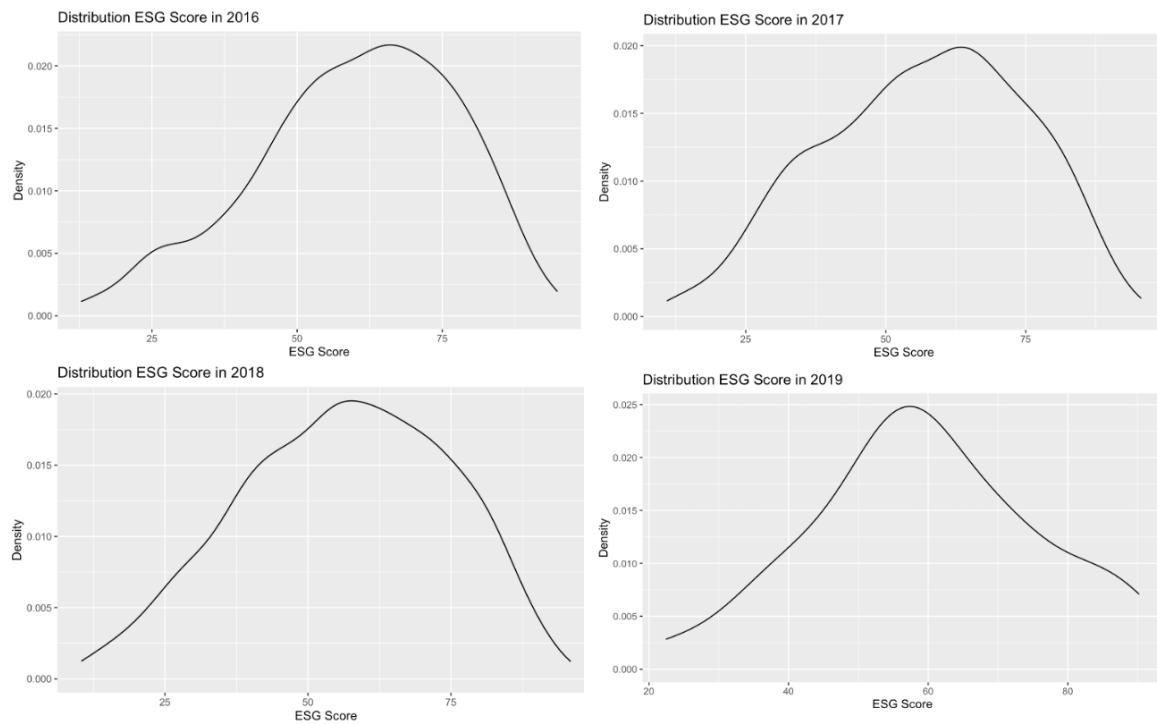*Figure 1: Method of data collection (source: Thomson Reuters EIKON, 2017)*

Figure 2: Distribution of the ESG Score
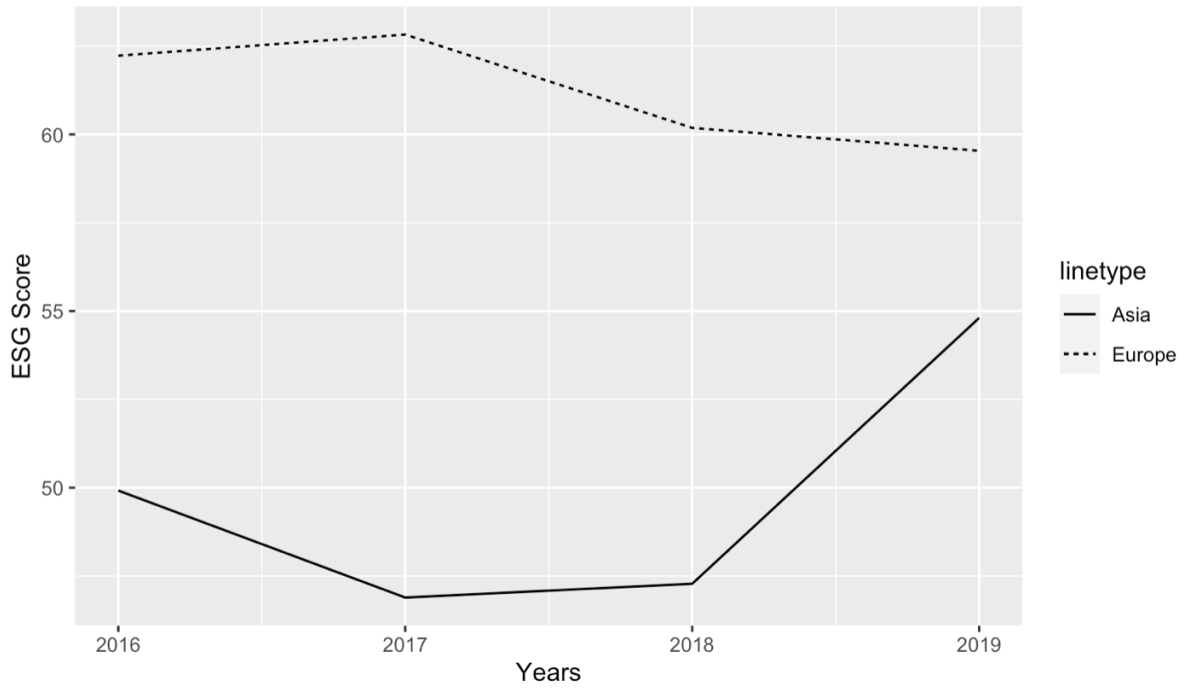
Figure 3: ESG Score per group

Appendix B: Tables

Table 1: Countries per group

Treatment group	Control group
Austria	Bahrain
Belgium	China
Cyprus	Hongkong
Czech Republic	India
Denmark	Indonesia
Finland	Japan
France	Jordan
Germany	Kazakhstan
Greece	Kuwait
Hungary	Malaysia
Ireland	Oman
Italy	Pakistan
Luxembourg	Philippines
The Netherlands	Saudi-Arabia
Poland	Singapore
Portugal	South-Korea
Romania	Sri-Lanka
Slovenia	Taiwan
Spain	Thailand
Sweden	United Arab Emirates

Table 2 Definitions of the variables

Variable	Description
ESG score	ESG is a proxy for CSR performance. Thomson Reuters ESG score will be used as the indicator for the proxy.
Directive	Directive captures if the observation is bound by the Directive/2014/95. The listing of the firm will be used as the indicator for the proxy.
Post	Post captures the common time trend. The turning point will be 2017-2018.
Directive x Post	Directive x Post is the interaction effect that captures the effect of the new directive.
Size	Size is a proxy to capture the impact of the size of the firm. Total assets will be used as the indicator for the proxy.
Directive x Post x Size	Directive x Post x Size is the interaction effect that captures the moderating effect of the size of the firm.
Directive x Size	*Directive x Size* is the interaction effect between the directive and size.
Post x Size	*Post x Size* is the interaction effect between post and size.
ROE	ROE is a proxy to capture a firm's performance. ROE is calculated by dividing net income by stockholders' equity.
Asset Turnover	Asset Turnover measures the efficiency of a firm to generate revenue through its assets. Asset Turnover is calculated by dividing revenue by the average total assets.
Property, Plant and Equipment (PPE)	Property, Plant and Equipment are tangible assets used to generate revenue.
Leverage	Leverage is a ratio that entails the ability of a firm to meet its financial obligations. Leverage is calculated by dividing total liabilities by stockholders' equity.
e	E is the error term.

Table 3 Descriptive statistics complete sample

Variable	Mean	Median	Min.	Max.	Standard Deviation	Number of observations
ESG score	57.81	59.13	10.47	95.87	17.83	2021
Directive	0.718	1	0	1	0.45	2021
Post	0.406	0	0	1	0.49	2021
DirectivexPost	0.302	0	0	1	0.46	2021
DirectivexPostxSize	23.220.000*	0	0	4.612.000*	189,576.3*	2021
Size	1,844,000*	13,290*	141.6*	42,630,000*	1,328,685*	2021
ROE	0.122	0.102	-3.713	4.881	0.1	2021
Asset Turnover	0.03	0	-0.46	0.43	0.05	2021
PPE	616.5*	2.233*	765	130,200*	2.233*	2021
Leverage	0.015	0.000	-0.143	1.658	0	2021

Note: * = EUR x 1 million.

Table 4 Descriptive statistics Europe

Variable	Mean	Median	Min.	Max.	Standard deviation	Number of observations
ESG score	62.2	62.2	10.47	95.87	16.34	2021
Directive	1	1	1	1	0	2021
Post	0.42	0	0	1	0.47	2021
DirectivexPost	0.42	0	0	1	0	2021
DirectivexPostxSize	29,931.9*	0	0	4,611,581*	0	2021
Size	97,058.76*	87,569,000*	78.04*	13,190,230*	520,964.1*	2021
ROE	0.12	0.11	-3.71	4.19	0.30	2021
Asset Turnover	0.04	0.04	-0.32	0.43	0.06	2021
PPE	8.960*	1.330*	765	483*	1.330*	2021
Leverage	0.02	1	-0.14	1.66	0	2021

*Note: * = EUR x 1 million.*

Table 5 Descriptive statistics Asia

Variable	Mean	Median	Min.	Max.	Standard deviation	Number of observations
ESG score	46.66	46.45	10.94	90.97	16.85	2021
Directive	0	0	0	0	0	2021
Post	0.37	0	0	1	0.48	2021
DirectivexPost	0	0	0	0	0	2021
DirectivexPostxSize	0	0	0	0	0	2021
Size	627,415.5*	35,402.2*	141.6*	42,630,000*	3,578,701*	2021
ROE	0.14	0.09	-0.84	4.88	0.28	2021
Asset Turnover	0.02	0.02	-0.46	0.35	0.002	2021
PPE	2,160*	10.102*	26,516	13,017*	10.19*	2021
Leverage	0.01	0	-0.01	1.57	0.02	2021

*Note: * = EUR x 1 million.*

Table 5 Correlation matrix

Variable	ESG score	Directive	Post	DirectivexPost	DirectivexPostxSize	Size	ROE	Asset Turnover	PPE	Leverage
ESG score	1									
Directive	0.431*	1								
Post	-0.052*	-0.012	1							
Directive x Post	0.105*	0.374*	0.813*	1						
Directive x Post x Size	0.116*	0.067*	0.146*	0.179*	1					
Size	0.051*	-0.196*	-0.023	-0.087*	0.116*	1				
ROE	0.025	0.028	-0.011	0.004	-0.008	-0.002	1			
Asset Turnover	-0.319	-0.468	-0.027	-0.193	-0.034	-0.027*	0.053*	1		
PPE	-0.066	-0.176	-0.028	-0.073*	-0.012	0.219*	0.011*	-0.032*	1	
Leverage	-0.1	0.014	0.02	0.028	-0.016	-0.013	0.027	-0.044	0.195	1

Note: * = $P < 0.05$. In this table, the correlations between the respective variables have been calculated and processed in a matrix. The correlation between variables implies the relationship between two variables.

Appendix C: Libby boxes

Libby boxes