

The Effect of Corporate Social Responsibility on Financial Performance – An empirical study on
US firms

ERASMUS UNIVERSITY ROTTERDAM

Erasmus School of Economics

Department of Economics

Supervisor: Dana Sisak

Name: Angela Hogeveen

Student Number: 430404

Email address: 430404ah@student.eur.nl

Abstract

This research investigates the effect of corporate social responsibility (CSR) on financial performance for US firms. By empirically testing data from 2000 until 2013 for 5272 unique firms resulting in 27440 observations, this study finds general support for the hypothesized positive relationship between CSR and financial performance when a market-based measure of financial performance is used. This finding is in line with the existing literature and the enlightened stakeholder theory. However, when financial performance is measured by an accounting-based measure, nonsignificant results are obtained. In addition, this study suggests that the effect of CSR on financial performance varies across different dimensions of CSR and across industries. CSR in the corporate governance dimension and in the community dimension could be considered as the key drivers to improve financial performance, although depending on the level of risk of the firm. In addition, CSR in the manufacturing industry and in the retail trade industry shows significant effects on financial performance. This research contributes to the existing literature by further clarifying and deepening the empirical linkages between CSR and financial performance, mainly approached from an economic perspective. The findings of this research provide guidelines for shareholders and managers for optimizing financial performance by CSR engagement.

Keywords: corporate social responsibility, CSR, financial performance, enlightened stakeholder theory

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1. Introduction

Corporate social responsibility (from now on abbreviated to CSR) receives increasingly attention from academics, business, consumers and policy makers. Firms are increasingly considered as a main cause of economic, environmental and social problems. They are accused of pursuing maximum financial gains at the expense of the broader community (Kramer, 2011). Therefore, the pressure on firms to engage in CSR has increased (Lin, Yang, & Liou, 2009). It is found that almost 4 out of 5 consumers believe that firms should contribute more to society (Ipsos, 2013). Furthermore, 90% of consumers across the 15 largest markets in the world recommends firms that are perceived to deliver on CSR (Reputation Intelligence, 2015). Consequently, during the last decades, firms in various industries are increasingly engaged in CSR activities (Jensen, 2001). Additionally, they become more transparent about their commitment to CSR. For example, they record their actions in their annual report. Almost 60% of N100 firms includes data related to CSR in their annual financial reports of 2015, compared with only 20% in 2011.¹ Two drivers underlie this increase: the increased demand of stakeholders for transparency and the increase of requirements set by governments and stock exchanges (KPMG, 2015). The increase in engagement in CSR indicates an evolvment of CSR into a mainstream business practice: firms are not only expected to serve their customers and thereby generating profit, they also must act in a social responsible way.

The early roots of CSR can be traced back to the eighteenth century. From 1960 onwards, key CSR milestones are reached, which really started the CSR movement.² This was mainly reflected in increasing adoption rates and reporting standards, as well as an increase of the concerns and the expectations regarding CSR of consumers, investors and public authorities (Katsoulakos, Koutsodimou, Matraga, & Williams, 2004). In the beginning of the CSR movement, mainly big firms or firms with a big environmental impact were involved in CSR. Due to a continuous development of CSR, nowadays CSR is increasingly implemented within all kind of companies (Kitzmueller & Shimshack, 2012).

Due to the increased pressure on firms to engage in CSR and due to the evolvment of CSR into a mainstream business practice, a deep understanding of the link between CSR and financial

¹ N100 firms are the largest 100 firms in the world.

² Among others, key CSR milestones were that the Convention establishing the OECD was signed (1960), the Consumer Bill of Rights were presented by President John F. Kennedy (1962) and the International Covenant on Economic, Social and Cultural Rights and the International Covenant on Civil and Political Rights were adopted by the UN (1966) (Katsoulakos et al., 2004).

performance is needed. However, the existing literature shows ambiguous results on the effect of CSR on financial performance, without agreement about its nature or even its very existence (Margolis, Elfenbein, & Walsh, 2009; Orlitzky, Schmidt, & Rynes, 2003). Another challenge for researchers in this field is to define CSR in a proper way, not to mention how to measure it to be able to execute empirical research (Mahoney & Roberts, 2007; Pérez & Del Bosque, 2013).

The aim of this paper is to investigate the effect of CSR on financial performance by controlling for firm size, level of risk and industry, in order to point out the drivers of this relationship. The main research question is formulated as follows: ‘What is the effect of CSR on financial performance?’ The hypothesis states that CSR has a positive effect on financial performance. In addition to the main research question, it is tested whether the effect of CSR on financial performance varies across different CSR dimensions³ and it is investigated whether the effect of CSR on financial performance varies across industries.⁴ Two additional hypotheses are formulated: The second hypothesis states that the effect of CSR on financial performance varies across different dimensions of CSR, while the third hypothesis states that the effect of CSR on financial performance varies across industries.

To perform the statistical tests in order to test the hypothesis, data provided by MSCI KLD and COMPUSTAT is used, which results in a dataset of 27440 observations on 5272 unique firms for the period of 2000 until 2013. The methodology of this research is quantitative and empirical analyses are executed. CSR is measured by the MCI KLD index by which this study attempts to avoid some of the problems that other researchers encountered in measuring CSR. Instead of applying weak and misleading indicators of CSR, the broadly accepted MSCI KLD index is used in a thoughtful manner. While no measure of CSR is without shortcomings, the MSCI KLD index is considered to be the most comprehensive and widely used measure of CSR within the existing literature.

As three hypotheses are tested, the research is broken down into three constituent parts. In the first part of this research, the overall effect of CSR on financial performance is investigated. In the second part, the effect of different dimensions of CSR on financial performance is investigated. This disaggregation enables me to test which CSR dimension is the key driver for improving

³ The following dimensions of CSR are considered in this research: corporate government, community, diversity, employee relations, environment, human rights and product.

⁴ The following industries are considered in this research: mining, construction, manufacturing, transportation/communication/electric/gas/sanitary service, wholesale trade, retail trade, finance/insurance/real estate, services and nonclassifiable.

financial performance. In the third part, it is investigated whether the industry in which a firm operates affects the link between CSR and financial performance. By breaking down the research in these three parts, the effect of CSR on financial performance is fully examined.

This paper builds on the growing amount of literature that emphasizes the importance of CSR for financial performance. Other studies already used a similar approach to examine the effect of CSR on financial performance (e.g. Barnett & Salomon, 2012; Waddock & Graves, 1997). However, they often did not disaggregate the effects of the various dimensions of CSR, even as the difference in effects across industries. The primary focus of this research is on this disaggregation, which is a unique feature. My contribution to the existing literature on CSR is threefold. First, this research contributes to the existing literature by further clarifying and deepening the link between CSR and financial performance. Because of the longitudinal nature of the sample, its wide industry coverage, the different proxies for financial performance and the complete set of control variables, this research provides a complete picture of the effect of CSR on financial performance, while other studies are often based on a narrower scope. Second, the existing line of research is extended by disaggregating the MSCI KLD index into seven different dimensions, which enables this research to identify the key drivers of financial performance. Not only the MSCI KLD index is disaggregated, also industry is broken down into nine different industries. This enables the research to test whether the effect of CSR on financial performance varies across industries. Third, CSR is clearly approached from an economic perspective. This is important, as the mechanisms of CSR in other disciplines like management⁵ or politics⁶ already are more examined; however, this is not the case for the economic perspective (Kitzmueller & Shimshack, 2012).

By revisiting the main research question, the following conclusions can be formulated. This study finds general support for the hypothesized positive relationship between CSR and financial performance when a market-based measure of financial performance is used. This finding is in line with the existing literature and the enlightened stakeholder theory. Therefore, the results of this research show the advantages of adopting CSR activities when using a market-based measure of financial performance. However, when financial performance is measured by an accounting-based measure, nonsignificant results are obtained. In addition, this study finds support in favor of the

⁵ Among others, Babiak, and Trendafilova (2011), Locke (2002), Moneva, Rivera-Lirio, and Muñoz-Torres (2007), Pelozo (2006), Tang, Hull, and Rothenberg (2012).

⁶ Among others, Calveras, Ganuza, and Llobet (2007), Lyon and Maxwell (2004), Maxwell, Lyon, and Hackett (2000), Rodriquez, Shimshack and Ward (2008), Scherer and Palazzo (2011), Siegel, Hillman, and Eden (2006).

second hypothesis that the effect of CSR on financial performance varies across different dimensions of CSR. This finding holds when using either an accounting-based measure or a market-based measure of financial performance. CSR in the corporate governance dimension and in the community dimension could be considered as the key drivers to improve next year's financial performance, although depending on the level of risk of the firm. This suggests that CSR investments should be directed to these dimensions. CSR in the human rights dimension shows a negative effect on next year's financial performance. Lastly, the evidence of this research supports the third hypothesis that states that the effect of CSR on financial performance varies across industries. CSR in the manufacturing industry and in the retail trade industry show significant effects on next year's financial performance. The effect of CSR on next year's financial performance in the manufacturing industry is positive, while the sign of the effect of CSR on next year's financial performance in the retail trade industry depends on the measure of financial performance. This mainly confirms the findings in the existing literature that suggested that the effect of CSR on financial performance is the largest in industries that are consumer focused and in industries that have a relatively high environmental impact (Peters & Romi, 2014; Rowley & Berman, 2000). Although the findings of this research provide additional insight on the effect of CSR on financial performance, the limitations within this research are recognized. Quantitatively measuring CSR inevitably leads to issues, which are addressed in the limitations.

The remainder of the paper is organized as follows. Section 2 provides a literature review on the link between CSR and financial performance, combined with a theoretical framework to put the literature review in perspective. Section 3 outlines the methodology and the data description. Section 4 presents and interprets the empirical results, followed by the conclusion in section 5. Section 6 ends with the research implications, policy implications, limitations of this research and recommendations for future research.

2. Literature Review

The economic literature on the effects of CSR is still in his infancy. The mechanisms of CSR in other disciplines like management or politics are more examined; however, this is not the case for the economic perspective. A clear and unambiguous picture of the effects of CSR is still not provided, which could be caused by flawed empirical analysis (McWilliams & Siegel, 2000). Additionally, research have suffered by the difficulty of obtaining a correct measure of CSR (Aupperle, Carroll, & Hatfield, 1985). Different proxies are used for CSR and financial performance and the adopted research methodology varies widely (Conway, 2014; Griffin & Mahon, 1997). Although recent studies have mainly found positive relationships, the financial benefits of CSR are still the subject of extensive debate (Kang, Germann, & Grewal, 2016).

In this literature review, an overview of the findings of prior research is provided. Important to mention is that the terms CSR and corporate social performance (CSP) are used interchangeably in the existing literature.⁷ In order to increase consistency within this research and to increase comparability with other research, only the term CSR is used in this research. First in this literature review, the definition of CSR is discussed in paragraph 2.1. A theoretical framework is introduced to explain why firms might choose to engage in CSR activities in paragraph 2.2. Thereafter, prior research about the effect of CSR on financial performance is elaborated by being split up in subsections. Paragraph 2.3 presents literature that found positive, negative, neutral and mixed relationships. In paragraph 2.4, often-cited meta-analyses are discussed. Thereafter, literature concerning different dimensions of CSR and different industries are presented in respectively paragraph 2.5 and 2.6. Paragraph 2.7 discusses the different measures of financial performance that are mainly used in the existing literature to investigate the effect of CSR on financial performance. In paragraph 2.8, literature on the direction of the relationship between CSR and financial performance is provided. Paragraph 2.9 briefly concludes this literature review. Finally, the hypotheses based on the existing literature are formulated in paragraph 2.10.

⁷ Although the terms CSR and CSP are used interchangeably, their definitions are not identical. CSR arises from moral responsibilities, while this is not the case for CSP. Therefore, CSR implies CSP, but CSP does not imply CSR. Although the motivation behind CSR and CSP differs, the implementation and the subsequent outcomes are comparable. This could be the reason why the terms are used interchangeably in the existing literature (Baron, Agus Harjoto, & Jo, 2011).

2.1. Definitions of CSR

In order to formulate a complete definition of CSR, an entire range of categories should be taken into account (Carroll, 1979). It should cover a multidisciplinary range of inputs, internal behaviors, processes and outputs (Waddock & Graves, 1997). Many scholars tried to come up with a clear, unbiased and robust definition of CSR. However, despite the extensive theoretical development of the last decades, researchers have encountered significant difficulties in appropriately defining CSR (Clarkson, 1995; Wood & Jones, 1995). Therefore, a precise definition has not been agreed upon in the literature, as many scholars have defined CSR in another way (Mahoney & Roberts, 2007; Turker, 2009).

Friedman (1970) was among the first to propose a definition for CSR: “Corporate social responsibility is to conduct the business in accordance with shareholders’ desires, which generally will be to make as much money as possible while conforming to the basic rules of society, both those embodied in law and those embodied in ethical custom” (p. 32). In subsequent years, many scholars attempted to improve this definition (e.g. Hopkins, 1998; McWilliams & Siegel, 2001; Van Marrewijk, 2003). Dahlsrud (2008) analyzed 37 definitions of CSR and concluded that the definition of the Commission of the European communities (2001) is the most frequently used definition of CSR in the academic literature. This commission defines CSR as “a concept whereby companies integrate social and environmental concerns in their business operations and in their interaction with their stakeholder on a voluntary basis” (Commission of the European communities, 2001, p. 6). In 2011, this commission simplified this definition, as part of a renewed EU strategy in order to promote CSR. Therefore, the commission adjusted the definition to “the responsibility of enterprises for their impacts on society” (Commission of the European communities, 2011, para 3.1).

As the definition of the Commission of the European communities is the most frequently used definition of CSR, this definition is applied to this research. However, important to state is that Dahlsrud (2008) also found substantial similarities between all 37 definitions of CSR. Therefore, he concluded that the problem of a lack of one universally accepted definition is overestimated.

2.2. Theoretical framework

2.2.1. Introduction

Many theoretical perspectives and theories are introduced in prior studies to explain why firms might choose to engage in CSR activities. Although this study has an economic perspective, also political, institutional and social perspectives should be considered in order to investigate the economic issues (Deegan & Unerman, 2011). Therefore, in the context of this study, the following theories provide the most appropriate explanation about why firms might choose to engage in CSR activities: agency theory, (enlightened) stakeholder theory, legitimacy theory and the triple-P bottom line theory. Paragraph 2.3.2 until 2.3.5 elaborate on them one by one. Finally, paragraph 2.3.6 summarizes this theoretical framework.

2.2.2. Agency theory

The agency theory focuses on the relationship between principals and agents, who are all driven by self-interest. The neoclassical economist Friedman (1970) argued that the existence of CSR within a firm points at a possible agency problem, due to different interests among stakeholders. He stated that a possible agency problem arises when a firm is engaged in CSR, as he considers CSR as a misuse of corporate resources.⁸ Rather, these resources should be spend on investments that lead to a direct financially gain for the shareholders. As a result, conflicting interests arise between proponents of CSR and proponents of direct profit maximization. In addition, another agency problem that could arise is that managers over-invest in CSR activities to foster their individual reputation, which distracts them from the main objective of the firm. Therefore, profits will decrease (Barnea & Rubin, 2010). Again, conflicting interests arise, in this example between managers and proponents of profit maximization.

However, the agency theory could also foster CSR due to mutual encouraging behavior within the principal-agent relationship. Firms engaging in CSR activities could be considered as agents as well as principals in the principal-agent relationship. First, when a firm is considered as an agent, it has to take care about its relationship with principals (e.g. employees, the government, customers, suppliers). The principals are able to put pressure on the firm to act in a social responsible way, which could lead to improvements of CSR. Second, when the firm takes the role of principal, it could make the agents (e.g. employees, customers, suppliers) adopting CSR policies.

⁸ The view of Friedman is more extensively discussed in paragraph 2.3.2.

For example, when a firm uses widespread applied ideas about CSR as standards, protocols and rules within the firm, it provides direction to its employees to act in a social responsible way (McWilliams & Siegel, 2001). Therefore, in light of the agency theory, CSR does not inevitably lead to an agency problem with conflicting interests, it also could foster CSR due to mutual encouraging behavior within the principal-agent relationship. Therefore, the agency theory provides an explanation for the engagement of firms in CSR.

2.2.3. (Enlightened) stakeholder theory

The stakeholder theory is originated by Freeman (1984) and argues that managers should satisfy all different interests of different stakeholders in order to survive (Clarkson, 1995; McWilliams & Siegel, 2001). This is in contrast with the neoclassical view of Friedman, which states that firms only should strive to satisfy shareholders. The term stakeholder is defined as any group or individual who can affect, or is affected by, the achievement of the organization's objectives (Freeman, 1984). Important to note is that shareholders and stakeholders are not synonyms, because shareholders hold stocks or shares of a firm and therefore, they are mainly concerned with the financial situation of the firm (Clarkson, 1995). The stakeholders of a firm can be categorized into two groups: primary stakeholders (i.e. shareholders, suppliers, employees, customers and investors) and secondary stakeholders (i.e. government, communities, environmental organizations and media) (Clarkson, 1995). The main difference between them is that the continuing participation of primary stakeholders is necessary for the survival of the firm, while the participation of secondary stakeholders is not essential for survival. In other words, secondary stakeholders are not directly engaged in a transaction with the firm. As already mentioned, according to the stakeholder theory, firms should not only try to satisfy the primary stakeholders, but they also should safeguard the interests of the secondary stakeholders (Clarkson, 1995). Therefore, the firm should engage in CSR activities that are also considered important by the secondary stakeholders. By ignoring the interests of the secondary stakeholders, a firm is less likely to be successful (Bird, Hall, Momentè, & Reggiani, 2007). The ultimate goal is to continuously improve stakeholder relations, which for example could lead to lower costs (e.g. caused by lower employee turnover) (Conway, 2014).

However, inevitable conflicts arise when the interests of different stakeholders are completely opposite (Conway, 2014). For example, an environmental organization could lobby for

installing new filters in a factory to reduce carbon dioxide emissions, while investors mainly consider this investment as a high expense and thereby as a threat to profit maximization. In practice, firms often do not value the interests of different stakeholders equally, but give priority to interests of certain stakeholder groups. Typically, firms will try to satisfy the most powerful stakeholders, as they are considered more important for the survival of the firm (Bailey, Harte, & Sugden, 2000; Deegan & Unerman, 2006). This contradicts the essence of the stakeholder theory.

A possible answer is formulated in the enlightened stakeholder theory (Jensen, 2001). According to this theory, managers should strive to maximize the long-term value of the firm. They must make decisions based on this view, and thereby the enlightened stakeholder theory enables managers to make the requisite trade-offs among different stakeholders. The relationship between a firm and its stakeholders determines the firm's ability to generate sustainable wealth and long-term value over time (Post, Preston, & Sachs, 2002). This is also confirmed by Freeman, who argued that a firm would be more successful over time when it increases its ability to manage its relationship with all kind of stakeholders (Freeman, 1984). It is not only argued that improved stakeholder relationships increase profits, it is also suggested that CSR is related to the stakeholder theory. This is confirmed by a research of Surroca and Tribó (2008). By using a sample of 358 firms, they found that maximization of CSR is positively related to meeting the interests of the stakeholders. In summary, the enlightened stakeholder theory provides an important explanation for the engagement in CSR of firms, as investments in CSR are likely to increase the long-term value of the firm by actively managing all key stakeholder relationships (Bird et al., 2007).

2.2.4. Legitimacy theory

As defined by Suchman (1995, p. 574), "legitimacy is a generalized perception or assumption that the actions of an entity are desirable, proper, or appropriate within some socially constructed system of norms, values, beliefs, and definitions." The legitimacy theory states that a firm's success depends on how society values the degree of appropriateness of the firm's activities. Therefore, a firm needs to act in a legitimate way in order to be able to survive (Deegan, 2000; Lindblom, 1994). Only then, the firm will not suffer from censure from society (Kaplan & Ruland, 1991). Important to note is that norms and values are not stable over time. Therefore, firms must anticipate quickly in order to be constantly aligned with the norms and values of society (Deegan & Unerman, 2006). As stated by Balabanis, Phillips, & Lyall (1998), firms feel the responsibility

to act in a legitimate way because society allows the company to use its human resources and its natural resources. Therefore, the legitimacy theory could be considered as an explanation for engagement in CSR activities, as these activities prove that a firm acts as a good corporate citizen (Guthrie & Parker, 1989).

2.2.5. Triple-P bottom line theory

This theory was firstly introduced in a publication of John Elkington (1997), who stated that not only the economic performance of a firm should be considered, but also the firm's social and environmental performance. Therefore, the name Triple-P is chosen, in which the P stands for profit, people and planet. Triple-P means that a firm should maximize profits, should think of the interests of all stakeholders and should take care of the environment. These three factors are highly correlated (Deegan, 2000). Elkington (1997) argued that a firm should be able to realize a certain minimum performance concerning all three factors to get the label of being sustainable. The certain minimum performance is also called the bottom line. Moreover, he emphasized the importance of the balance between those three indicators. This provides an important explanation for the engagement in CSR activities of firms, as only economic performance is not good enough, but also social and environmental performance should be taken care of (Sherman, 2012).

2.2.6. Conclusion

In this paragraph, different theories are discussed that explain why firms might choose to engage in CSR activities. Most applicable to this research is the enlightened stakeholder theory, given its focus on the long-term. This theory is also in line with the dominant stream of literature that found a positive relationship between CSR and financial performance. Therefore, the enlightened stakeholder theory is used as a basis in this research.

2.3. Literature review

An extensive body of literature exists on the effect of CSR on financial performance. Yet in spite of all these studies, the connection between these two variables has not been fully established. Researchers have provided convincing justifications for positive, negative, neutral and mixed effects of CSR on financial performance. Although this variety in results, the existing

literature is dominated by studies that identified a positive relationship. In this literature review, all four principal strands of literature as mentioned above are shortly reviewed.

2.3.1. Positive relationship

The largest number of studies focusing on the relationship between CSR and financial performance found a positive relationship, for which the enlightened stakeholder theory provides an argument. This theory implies that firms that are more engaged in CSR will also perform better financially, by actively managing all key stakeholder relationships (Baird, Geylani, & Roberts, 2012). Additionally, three other explanations that are frequently used in the existing literature can also support the positive relationship between CSR and financial performance. First, the increased benefits more than outweigh the cost of having a high level of CSR. Second, according to the slack resources theory, financial performance is positively linked with the CSR score in the next year. This theory states that higher financial performance provides slack resources that enables a firm to engage in CSR activities (Ullmann, 1985; Waddock & Graves, 1997). Third, firms that are engaged in CSR activities are just better managed and are therefore able to generate higher profits (Alexander & Buchholz, 1982; Kang et al., 2016; Stanwick & Stanwick, 1998).

2.3.2. Negative relationship

The neoclassical theory of the firm offers theoretical support for a negative relationship between CSR and financial performance (Aupperle et al., 1985). The American neoclassical economist Friedman argued that the only responsibility of a firm is to maximize profits. Therefore, a firm should not worry about external factors, but the government should manage externalities and provide public goods (Friedman, 1970). Additionally, the neoclassical economists support the view that the costs of having a high level of CSR do not outweigh the increased benefits, which is called the trade-off hypothesis (Preston & O'bannon, 1997). For example, this could be the case when CSR forces the firm into an unfavorable financial position relative to firms that do not act socially responsible (Aupperle et al., 1985). According to the existing literature, two other arguments can explain the negative effect of CSR on financial performance. First, it is argued that investors only value the additional marginal costs of CSR and therefore do not take into account the potential future benefits from CSR (Marsat & Williams, 2011). Second, managers could over-

invest in CSR activities to foster their individual reputation, which distracts them from the main objective of the firm. Therefore, profits will decrease (Barnea & Rubin, 2010).

2.3.3. Neutral relationship

In addition to the positive and negative relationships that are found between CSR and financial performance, also some researchers found a neutral relationship. An argument could be that the environment in which firms operate is too complex to state that a simple, direct relationship exists (Waddock & Graves, 1997). A neutral effect of CSR on financial performance is found by McWilliams and Siegel (2000). They included R&D intensity, risk, firm size and industry variables as regressors in the model and they used a sample of 524 firms. They argued that positive or negative relationships that are found by other researchers are biased due to specification errors. According to their research, any relationship only could exist by chance, as too many variable play a role in this relationship. For example, by excluding R&D intensity and therefore causing an omitted variable bias like is also done in many other studies on this topic, a positive effect emerges. Therefore, they pointed at the incredibility of the results of studies that found a positive relationship, as they stated that R&D intensity affects this relationship and therefore should be included in the regression.

2.3.4. Mixed relationship

Barnett and Salomon (2012) found evidence for a mixed effect of CSR and financial performance. They used an unbalanced panel of more than 1000 firms and almost 5000 firm-year observations over the period 1998 until 2006 and controlled for firm, industry and year effects. They found a nonsymmetrical U-shaped relationship between CSR and financial performance.⁹ They argued that the increasing costs of CSR explains the downward slope of the curve in the beginning; the upward sloping part can be explained by the higher stakeholder influence capacity that result in higher financial performance. In other words, when CSR increases, its financial performance decreases at first, where after it increases. Therefore, the best financial performance is obtained by those with a high level of CSR and those without any CSR. The existence of the U-shaped relationship is confirmed by the study of Nollet, Filis, and Mitrokostas (2016), who also suggested that CSR does not pay off immediately, but that it will pay off in the long-term.

⁹ The U-shape arises when the horizontal axis represents CSR and when the vertical axis represents financial performance.

2.4. Meta-analyses

Meta-analysis functions as a suitable method to summarize the overabundance of different studies within a similar topic. The most cited meta-analyses regarding the link between CSR and financial performance are written by Orlitzky et al. (2003) and Margolis et al. (2009). Both studies emphasized the dominance of positive relationships in the existing literature. Besides of these two meta-analyses, also the meta-analysis of Allouche and Laroche (2005) and Wu (2006) are discussed in this paragraph.

The meta-analysis of Orlitzky et al. (2003) identified 52 studies from 1990 until 1997 with a total sample size of almost 34.000 observations. They found a positive relationship between CSR and financial performance across studies. The level of positivity of the relationship depends on contingencies such as market measures of financial performance, reputation effects and disclosures of CSR. They also concluded that CSR is higher correlated with financial performance when accounting-based measures of financial performance are used, instead of market-based measures. In addition, they described the relationship between CSR and financial performance as bidirectional and simultaneous. Moreover, they argued that sampling error, stakeholder mismatching and measurement errors are the main causes of the variation between results in the existing literature.¹⁰ However, it should be noted that this meta-analysis is based on 30 different dependent variables. In addition, the variability in the measures of CSR is great. This brings into question the outcome of the study of the researchers.

Margolis et al. (2009) also executed a comprehensive meta-analysis and found a modest positive average correlation between CSR and financial performance, which is in line with the finding of Orlitzky et al. (2003). They evaluated 167 studies over a period of 35 years (1972 until 2007) and by coding all the effects from these studies, they found 27% to have a positive relationship, 2% to have a negative relationship and 58% to have a nonsignificant relationship between CSR and financial performance. The remaining 13% could not be tested for significance as they did not report sample size. They used a vote counting procedure in which all results got the same weight. This could be the reason why they found a smaller overall positive relationship between CSR and financial performance in comparison to Orlitzky et al. (2003). In order to extend

¹⁰ With stakeholder mismatching is meant that the literature about CSR mismatches variables in terms of which stakeholders are relevant to which kind of measure (Wood & Jones, 1995).

their research, Margolis et al. (2009) also sorted the studies into nine categories of CSR.¹¹ They found the positive correlation to be higher for the charitable contributions category, the revealed misdeeds category and the environmental performance category. By contrast, they found the positive correlation to be smaller for the corporate policies category and the transparency category.

Allouche and Laroche (2005) also published a meta-analysis concerning the relationship between CSR and financial performance. They employed a multivariate framework using 82 studies from 1972 until 2003 that include 373 observations. They confirmed the findings of Orlitzky et al. (2003) and Margolis et al. (2009) by agreeing on the positive impact of CSR on financial performance. In addition, they found this impact to be the strongest in the UK. They also drew some important conclusion in terms of control variables: reputations on CSR have a substantial effect on financial performance, which is in contrast to social disclosure, which turned out to not strongly affect financial performance.

Wu (2006) conducted a meta-analysis and investigated 121 empirical studies published between 1975 and 1999 on the relationship between CSR, financial performance and firm size. He found an average effect size of CSR on financial performance of 0.1661, thereby confirming the positive relationship as found by the three aforementioned meta-analyses. In addition, he found a non-significant relationship between firm size and financial performance. Similarly, the relationship between firm size and CSR turned out to be non-significant. Therefore, he concluded that firm size has no effect on CSR nor on financial performance.

2.5. Literature regarding different dimensions of CSR

The empirical literature also elaborated on the effect of different dimensions of CSR on financial performance, which contributes to the understanding of the overall relationship between CSR and financial performance. This disaggregation is particularly interesting due to the multidimensional nature of CSR. For example, it could be the case that the effects of different dimensions of CSR on financial performance cancel each other out or strengthen each other. In order to test this, it is helpful to disaggregate CSR into different dimensions (Brammer, Brooks, & Pavelin, 2006; Margolis et al., 2009). CSR is disaggregated into seven dimensions in this research:

¹¹ Margolis et al. (2009) disaggregated CSR into the following nine categories, of which the first five are specific dimensions of CSR and the last four are different approaches for capturing CSR: charitable contributions, corporate policies, environmental performance, revealed misdeeds, transparency, self-reported social performance, observers' perceptions, third-party audits and screened mutual funds.

corporate governance, community, diversity, employee relations, environmental, human rights and product. The existing literature focusing on the effect of CSR in these dimensions on financial performance is one by one discussed in this section. Because the existing literature has not explicitly written about the effect of CSR in the diversity, human rights and product dimension on financial performance, no section is devoted to these dimensions.

2.5.1. Corporate governance dimension

Słoński, Daszyńska-Żygadło and Zawadzki (2014) disaggregated CSR into different dimensions in their research, of which the corporate governance dimension was one dimension.¹² They tested the effect of these specific dimensions of CSR on financial performance measured by the market value of assets. They found that the corporate governance dimension positively affects financial performance. This finding is confirmed by Nollet et al. (2016), who disaggregated CSR into three different dimensions¹³ and found that the government dimension is the only dimension that shows a significant and positive relationship with financial performance. They argued that CSR activities related to governance improvements positively affects financial performance and therefore, the government dimension is considered as the main driver for financial performance. According to the researchers, the underlying argument is that CSR activities related to governance improvements are considered as a credible commitment of firms towards CSR.

In contrast to the above two studies, Margolis et al. (2009) investigated the association between CSR in the corporate governance dimension and financial performance and did not find any significant effect.

2.5.2. Community dimension

Although also negative effects are found, according to the dominant stream of existing literature, a positive relationship exists between CSR in the community dimension and financial performance. In other words, if firms put effort into relationships with their local communities, they see their financial performance rise (Hillman & Keim, 2001; Simpson & Kohers, 2002). Among others, this is proven by Fisman, Heal, and Nair (2005), who found that the community dimension of CSR positively affects profitability in advertising-intensive industries. This

¹² The following dimensions are included: social, environmental and corporate governance.

¹³ The following dimensions are included: environmental, social and government.

finding is confirmed by Margolis et al. (2009), who found that the positive association between CSR and financial performance is relatively large for the community dimension. This is mainly explained by the argument that firms that financially perform better have more money available to spend on charitable contributions, which is one of the indicators of the community dimension. In addition, firms could feel more pressure from their customers to engage in CSR activities.

As already mentioned, also negative effects of CSR in the community dimension on financial performance are also found. Brammer et al. (2006) disaggregated CSR into different dimensions, of which the community dimension was one dimension.¹⁴ They argued that CSR in the community dimension negatively affects stock returns. In line with this finding, also Bird et al. (2007) found a negative effect. They focused on five different dimensions of CSR¹⁵ to investigate the effect of CSR on financial performance. Surprisingly, they found that community strengths negatively affect firm performance. This counterintuitive finding is explained by the authors as a market sanction for excessive spending on philanthropic activities (e.g. charitable contributions and volunteer grants programs).

2.5.3. Employee relations dimension

According to prior studies, the employee relations dimension of CSR has a positive effect on financial performance (Berman, Wicks, Kotha, & Jones, 1999; Turban & Greening, 1997). Among others, this is proven by Tsoutsoura (2004). She suggested that CSR in the employee relations dimension positively affects financial performance, due to increased productivity, reduced error rates and improved quality of the products and/or services.

This finding is confirmed by the research of Nelling and Webb (2009), who executed a time series fixed effects approach with more than 2800 observations and categorized CSR into four dimensions.¹⁶ They found a positive association between stock returns and employee relations, but they did not find a causal relationship between stock returns and one of the other three dimensions of CSR. In addition, they also did not find evidence that an aggregate CSR score affects financial performance.

¹⁴ The following dimensions are included: environment, employee relations and community.

¹⁵ The following dimensions are included: community, diversity, employee relations, environment and product.

¹⁶ The following dimensions are included: community, diversity, employee relations and environment.

In line with the above findings regarding the effect of CSR in the employee relations dimension on financial performance, also Brammer et al. (2006) found that the employee relations dimension of CSR positively affects stock returns, although weakly.

2.5.4. Environmental dimension

Although also negative effects are found, according to the dominant stream of existing literature, CSR in the environmental dimension positively affects financial performance. Porter and Van der Linde (1995) argued that better environmental performance could create a competitive advantage because of a more cost-efficient use of resources. Feldman, Soyka, and Ameer (1997) stated that firms could raise their stock price by 5% when they succeed in improving their environmental performance. In line with this, Russo and Fouts (1997) found that environmental performance is positively linked with economic performance.¹⁷ In addition, they suggested that this relationship strengthens with industry growth.

The positive relationship between environmental and financial performance is also confirmed by Dowell, Hart and Yeung (2000). They found that a firm's adaptation to a single stringent global environmental standard positively affects its market value. They provided two main explanations for this finding. First, environmental externalities are internalized by private valuations. Second, firms that adopt higher environmental standards tend to be better managed and are more likely to act in a more competitive environment. In line with the finding of Dowell et al. (2000), Konar and Cohen (2001) stated that a 10% reduction in emissions of toxic chemicals leads to an increase of \$34 million of the market value. They used a sample of the largest publicly traded firms in the US that represent a diverse line of industries.

Derwall, Guenster, Bauer, and Koedijk (2005) also found evidence that confirms the existence of a positive relationship between CSR in the environmental dimension and financial performance. They evaluated two equity portfolios of which one was high-eco-efficient and the other was low-eco-efficient. Eco-efficiency is defined as the economic value that a company creates relative to the generated waste. They concluded that the high-eco-efficient portfolio yielded substantially higher average returns. In line with this, Mahoney and Roberts (2007) obtained a

¹⁷ Environmental performance is measured by using the environmental ratings of the Franklin Research and Development Corporation (FRDC), which are based on several criteria, such as compliance records, expenditures, initiatives to reduce waste reduction, initiatives used to meet new demands and support of environmental protection organizations.

significant positive effect of the environmental dimension of CSR on financial performance by executing a panel data analysis on a large sample of Canadian firms. They argued that institutional owners are more likely to invest in firms that are engaged in this dimension of CSR, which increases profits. They measured CSR by the Canadian variant of the MSCI KLD index, the so-called Canadian Social Investment Database (CSID).¹⁸ Notable is that the researchers did not find a positive significant effect of the overall CSR score on financial performance.

The meta-analysis of Margolis et al. (2009) found that the positive association between CSR and financial performance is relatively large for the environmental dimensions. This can be explained by the increased attractiveness of the company to stakeholders when the company increases its engagement in environmental CSR activities. In addition, better environmental performance seems to reduce costs and therefore fosters profits.

As already mentioned, also negative effects are found of CSR in the environmental dimension on financial performance. Among others, Brammer et al. (2006) found that the environmental dimension of CSR negatively affect stock returns. In line with this finding, also Makni, Francoeur, and Bellavance (2009) found a negative effect of the environmental dimension of CSR on financial performance. They argued that this negative relationship could be explained by the trade-off hypothesis and the negative synergy hypothesis. The first mentioned hypothesis is based on the neoclassical point of view and states that CSR activities within a firm are associated with higher costs and therefore decrease financial performance. The negative synergy hypothesis suggests that CSR activities within a firm lower profits and reduces shareholder wealth, which subsequently limits the socially responsible investments. Worth mentioning is that Makni et al. (2009) did not find a significant relationship between the overall CSR score on financial performance, only under the condition that market returns are taken as a measure for financial performance.

Lastly, also Słoński, Daszyńska-Żygadło and Zawadzki (2014) argued that the CSR in the environmental dimension has a negative effect on financial performance. The authors explained this finding by the insolvable conflict in perception of investments and the negative relationship between acting towards stakeholder's satisfaction and financial goals. Furthermore, they suggested

¹⁸ This index approximately takes into account the same dimensions as the MSCI KLD index, the only difference is that the CSID index also includes an international dimension.

that firms that focus on CSR activities get distracted from their initial goals, which negatively affect profitability.

2.5.5. Overview literature regarding different dimensions

The existing literature focusing on the effect of CSR in different dimensions on financial performance is one by one discussed in this section. In order to provide a clear overview, table 1 shows a summary of this section.

Literature - Different dimensions of CSR and their effect on financial performance

Dimension	Researcher(s) and year	Conclusion
Corporate governance	Margolis et al. (2009)	Non-significant effect
Corporate governance	Słoński et al. (2014)	Positive effect
Corporate governance	Nollet et al. (2016)	Positive effect
Community	Hillman & Keim (2001)	Positive effect
Community	Simpson & Kohers (2002)	Positive effect
Community	Fisman et al. (2005)	Positive effect
Community	Brammer et al. (2006)	Negative effect
Community	Bird et al. (2007)	Negative effect
Community	Margolis et al. (2009)	Positive effect
Employee relations	Turban & Greening (1997)	Positive effect
Employee relations	Berman et al. (1999)	Positive effect
Employee relations	Tsoutsoura (2004)	Positive effect
Employee relations	Brammer et al. (2006)	Positive effect
Employee relations	Nelling & Webb (2009)	Positive effect
Environment	Porter & Van der Linde (1995)	Positive effect
Environment	Feldman et al. (1997)	Positive effect
Environment	Russo and Fouts (1997)	Positive effect
Environment	Dowell et al. (2000)	Positive effect
Environment	Konar & Cohen (2001)	Positive effect
Environment	Derwall et al. (2005)	Positive effect
Environment	Brammer et al. (2006)	Negative effect
Environment	Mahoney & Roberts (2007)	Positive effect
Environment	Makni et al. (2009)	Negative effect
Environment	Margolis et al. (2009)	Positive effect
Environment	Słoński et al. (2014)	Negative effect

Table 1: Overview of existing literature regarding the effect of CSR in different dimensions on financial performance

2.6. Literature regarding different industries

According to existing literature, the industry in which a firm operates influences the effect of CSR on financial performance, for example due to differences with respect to economies of scale and the intensity of competition (McWilliams & Siegel, 2000). Rowley and Berman (2000) argued that the level of stakeholder action is higher in industries that operate closer in the value chain to consumers. The level of stakeholder action is also higher in industries with a higher environmental impact, mainly because the actions of these firms have consequences for whole society. Therefore, it is suggested that CSR activities are more prevalent in these two industries. In addition, following the finding of Post et al. (2002) that the relationship between a firm and its stakeholders determines the firm's ability to generate sustainable wealth and long-term value over time, the effect of CSR on financial performance in these industries tend to be larger.

This is also confirmed by Konar and Cohen (2001), who found that the size of the positive effect of environmental performance on financial performance varies across industries. Traditionally polluting industries, such as chemical, miscellaneous manufacturing, primary metals and paper industries, experience larger intangible-asset value losses due to poor environmental performance. Smaller losses are encountered in the transportation equipment, petroleum and coal, food products, electric machinery and non-electric machinery industries. This was in line with the expectations of the authors, except for the finding in the petroleum industry. This industry is considered as one of the traditionally polluting industry, but it shows only a small loss. According to the authors, this can be explained by the high capital-intensity of this industry. This results in a replacement value that is five times greater than the average replacement value of all firms in the sample.

Fisman et al. (2005) found that CSR activities are more frequently applied in advertising-intensive and therefore consumer-oriented industries. In addition, they argued that the positive link between CSR and profitability is stronger in competitive industries. Therefore, they stated that CSR activities are an effective tool for firms to differentiate themselves when competition is high.

Peters and Romi (2014) suggested that firms that are active in environmentally sensitive industries encounter greater political and social pressures related to sustainability issues. Therefore, for these firms it is even more important to engage in CSR activities. This finding is in line with Rowley and Berman (2000).

In summary, expected is that the effect of CSR on financial performance is the largest in industries that are consumer focused, because these firms benefit the most from the positive association their customers may attribute to the CSR activities of a firm (Nelling & Web, 2009; Rowley & Berman, 2000). In addition, the effect is expected to be large in industries that have a relatively high environmental impact (Peters & Romi, 2014; Rowley & Berman, 2000).

2.7. Literature regarding accounting-based and market-based measures of financial performance

To measure financial performance, the existing literature can be broadly distinguished in two categories: accounting-based measures (e.g. return on equity, return on assets) or market-based measures (e.g. market-book value, stock returns, earnings per share, Tobin's q) (McGuire, Sundgren, & Schneeweis, 1988). The accounting-based measure is based on past performance and represents a company's internal efficiency, while the market-based measure focuses on market performance (Cochran & Wood, 1984). According to the existing literature, CSR appears to be higher correlated with accounting-based measures of financial performance than with market-based measures. Among others, this is proven by McGuire et al. (1988). They found that accounting-based measures, and in particular ROA, better predict the level of CSR than market measures. Their explanation for this finding is that accounting-based measures are more likely to capture unique and unsystematic attributes of a firm. In line with this finding, Orlitzky et al. (2003) concluded that CSR is higher correlated with financial performance when accounting-based measures of financial performance are used, instead of market-based measures. Moreover, also Margolis et al. (2007) found that CSR is a better predictor of accounting-based measures than market-based measures. In contrast to the above three studies, Makni et al. (2009) only found a significant negative relationship between lagged CSR and financial performance by using market returns as a measure of financial performance. In their research, no significance is found between CSR and accounting-based measures of financial performance.

2.8. The direction of the relationship between CSR and financial performance

The direction of the relationship between CSR and financial performance has attracted the attention of researchers. However, a clear answer still does not exist on the question in which direction the relationship runs. It is suggested that the direction could run from CSR to financial

performance, as a higher level of CSR may attract investors and customers and could motivate employees to work better, which all leads to a higher financial performance. However, it also could be argued that the direction runs from financial performance to CSR, which is supported by the slack resources theory. As already mentioned in paragraph 2.3.1, according to this theory, financial performance is positively linked with the CSR score in the next year, as a higher financial performance provides slack resources that enables a firm to engage in CSR activities in the next year (Ullmann, 1985; Waddock & Graves, 1997). In addition, firms could also face stiffer pressure to engage in CSR activities when their financial performance is high (Margolis et al., 2009). Lastly, research suggests that a virtuous circle could exist between CSR and financial performance, which means that the causality runs in both directions (Waddock & Graves, 1997). In that case, CSR and financial performance are considered as two sides of a coin that have a mutually strengthening effect (Saleh, Zulkifli, & Muhamad, 2011). In other words, financially successful companies spend more on CSR activities because they can afford it, but CSR also stimulates their financial success. Hillman and Keim (2001) confirmed the existence of the virtuous circle as stated by Waddock & Graves (1997). As this research investigates the effect of CSR on financial performance, testing the existence of a virtuous circle is beyond the scope.

2.9. Conclusion literature review

An extensive body of literature has investigated the effect of CSR on financial performance, on which is shed light in this section. When comparing all discussed theories that explain why firms might choose to engage in CSR activities, the enlightened stakeholder theory is the most applicable to this research, given its focus on the long-term. When disaggregating the effect of CSR on financial performance into different dimensions of CSR, the existing literature states that a positive effect of CSR on financial performance could be expected in the corporate governance dimension, community dimension, employee relations dimension and the environmental dimension. No a priori expectations can be made regarding the effects of CSR in the diversity dimension, human rights dimension and product dimension, due to a lack of available literature. Despite the fact that the overall finding concerning the link between CSR and financial performance is slightly positive, the effect of CSR on financial performance remains disputed. Different methodologies and different indices of CSR mainly make the results inconclusive. Expected is that the effect of CSR on financial performance is the largest in industries that are

consumer focused and in industries that have a higher environmental impact. According to the existing literature, an accounting-based measure of financial performance is more appropriate than a market-based measure when investigating the effect of CSR on financial performance.

2.10. Hypotheses development

Based on the existing literature as described above, three testable hypotheses are formulated that are useful for assessing the results of this analysis in order to answer the main research question. The first null hypothesis states that CSR does not have any effect on financial performance. In line with the existing literature as discussed in section 2, the expectation is that a positive effect of CSR on financial performance will be found (Margolis et al., 2009; Orlitzky et al., 2003). Therefore, the first alternative hypothesis is defined as follows:

H1: CSR has a positive effect on financial performance.

This analysis is extended by examining whether this effect varies across different dimensions of CSR. Therefore, the second hypothesis is formulated. An important feature of this hypothesis is that it does not focus on the total CSR score as done in hypothesis 1, but it rather analyzes the effect of each specific CSR dimension on financial performance. Hence, the sign of the relationship between each specific CSR dimension and financial performance is interesting. The ability to test each individual dimension of CSR is important to learn more about how each dimension may affect the overall relationship between CSR and financial performance. As explained in the literature review, most empirical studies demonstrated that the effect of CSR on financial performance depends on the dimension to which the CSR activities belong (Bird et al., 2007, Margolis et al., 2009, Słowski et al., 2014). Therefore, the second null hypothesis states that the effect of CSR on financial performance does not vary across different dimensions of CSR. The second alternative hypothesis is formulated as follows:

H2: The effect of CSR on financial performance varies across different dimensions of CSR.

Expected is to find a relatively large and positive effect for the corporate governance, community, employee relations and environmental dimension, as is concluded from the literature

review in paragraph 2.5. Possible explanations are increased pressure of customers, increased attractiveness of the company to stakeholders and relative large cost reductions. In addition, CSR activities within these dimensions could be considered as a credible commitment of firms towards CSR. The existing literature does not provide a clear view on the effect of CSR in the diversity, human rights and product dimensions on financial performance. Therefore, no clear expectations of these dimensions can be formulated.

In addition to extending this analysis by examining whether this effect varies across different dimensions of CSR, this research also examines whether this effect varies across different industries. Multiple arguments underlie the influence of industry on the financial performance and research has proven that studies that did not account for industry effects are likely to produce confounded results (Griffin & Mahon, 1997; Hillman & Keim, 2001; Waddock & Graves, 1997). The focus on one single industry can discover specific characteristics of the effect of CSR on financial performance in that particular industry. For example, regulatory constraints, stakeholder activism and enforcements procedures can differ between industries (Griffin & Mahon, 1997). Thus, based on the discussion above, the third null hypothesis states that the effect of CSR on financial performance does not vary across industries. The third alternative hypothesis is formulated as follows:

H3: The effect of CSR on financial performance varies across industries.

According to the existing literature, the effect of CSR on financial performance is the largest in industries that are consumer focused and in industries that have a higher environmental impact (Nelling & Webb, 2009, Peters & Romi, 2014, Rowley & Berman, 2000). Therefore, expected is to find a large effect of CSR on financial performance in the retail trade industry and services industry, as they operate close in the value chain to consumers. In addition, expected is to find a large effect of CSR on financial performance in the mining industry, manufacturing industry and transportation industry, because these industries are considered to have a relative high environmental impact (Konar & Cohen, 2001).

The three hypotheses of this research are visualized in a conceptual model, presented in figure 1. The three hypotheses are shown with the blue arrows. The control variables that are included in the model to test the particular hypothesis are presented with red arrows. As shown,

industry is not included as control variable when testing the third hypothesis, as the regression is run for every specific industry separately.

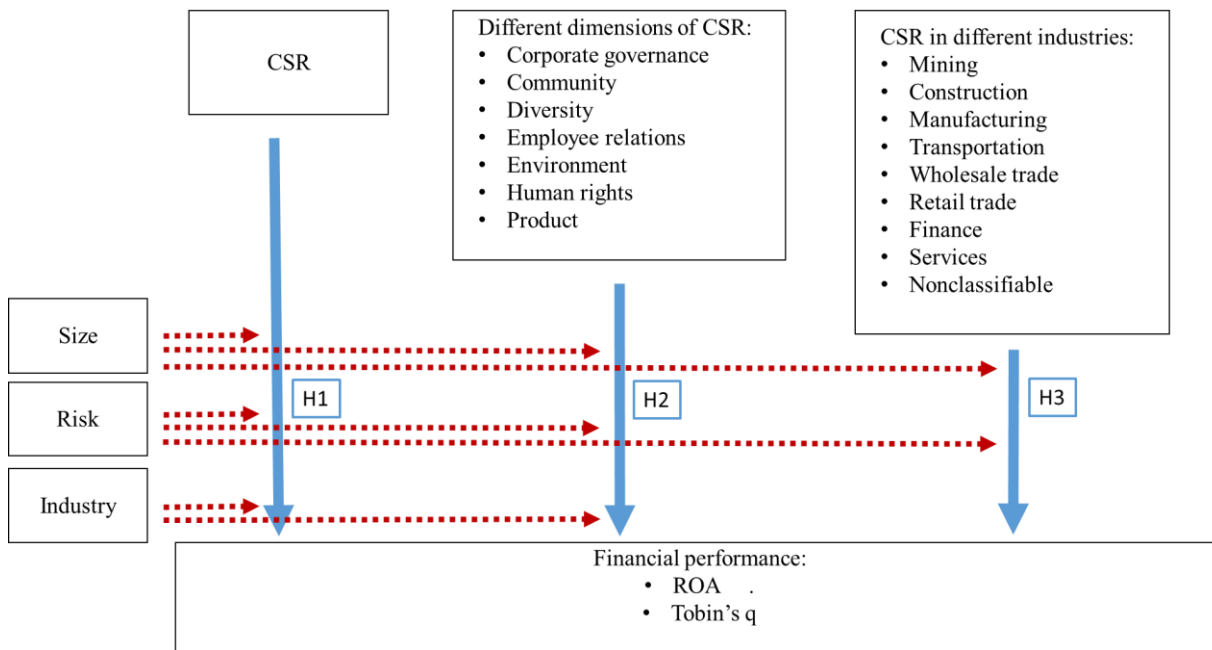


Figure 1: Visualization of hypotheses

3. Methodology and data description

This section describes the methodology and data used to empirically investigate the effect of CSR on financial performance. The first paragraph explains the dependent variables, where after the main independent variable is discussed in the second paragraph. Next, the control variables firm size, level of risk and industry are described in paragraph 3.3. Then, the research sample is described in paragraph 3.4. Finally, paragraph 3.5 elucidates on the specification of the empirical models.

3.1. Dependent variables

Financial performance is the dependent variable of this research. As mentioned in the literature review, two ways of measuring financial performance are widely used in the existing literature on the link between CSR and financial performance: accounting-based measures (e.g. return on equity, return on assets) and market-based measures (e.g. market-book value, stock returns, earnings per share, Tobin's q) (McGuire et al., 1988). In order to provide a complete

picture, both methods are included in this research. Moreover, although no additional hypothesis is formulated, it may be interesting to investigate the differences between these two measures of financial performance, as they both reveal different aspects of financial performance.

In this research, return on assets (ROA) is used as an accounting-based measure of financial performance and Tobin's q is used as a market based measure of financial performance. Both measures know their strengths and weaknesses. A strength of an accounting-based measure is that it only indicates what really happens, which makes it less noisy (López, Garcia, & Rodriguez, 2007). However, a weakness is that accounting-based measures are biased due to accounting policies of firms and managerial manipulation (Orlitzky et al., 2003). Therefore, as firms apply different accounting policies, these measures are incomparable between firms. Another weakness of accounting-based measures is the fact that they only capture past firm's performance (McGuire et al., 1988). The main strength of market-based measures is the lack of influence of accounting policies of firms and managerial manipulation. In addition, the ability to take into account future earnings is a strength, as they rely on perceptions of participants of the stock market (Orlitzky et al., 2003). However, by putting a lot of value on the perception of the investor, the assessment of financial performance could be biased, which could be mentioned as a weakness (Ullmann, 1985). In addition, in the presence of asymmetric information, market-based measures may reflect biased evaluation from investors (Aras, Aybars, & Kutlu, 2010; McGuire et al., 1988). As being said and exemplified by the above arguments, both the market-based measures and the accounting-based measures are subject to particular biases. However, despite the above-mentioned weaknesses, the accounting-based and market-based measures of financial performance are useful in examining the effect of CSR on financial performance. Thence, they are widely used in the existing literature.

Based on the existing literature, it is expected that CSR performance is higher correlated with accounting-based measures relative to market-based measures (Margolis et al., 2009; McGuire et al., 1988; Orlitzky et al., 2003; Wu, 2006). McGuire et al. (1988) provided a possible explanation by arguing that actions leading to a change in CSR are predominately unsystematic. As market-based measures are mainly related to systematic movements among all firms and accounting-based measures are more related to unique and unsystematic movements, this could explain why CSR is higher correlated with financial performance when accounting-based measures of financial performance are used instead of market-based measures.

3.1.1. ROA

Return on assets (ROA) is often used in the existing literature as an accounting-based measure of financial performance (McGuire et al., 1988; Nelling & Webb, 2009; Aras et al., 2010; Waddock & Graves, 1997). ROA is measured as net income divided by total assets (Waddock & Graves, 1997). These financial data is obtained from COMPUSTAT, which is a renowned database with financial, statistic and market data on more than 30,000 publicly traded companies.

3.1.2. Tobin's q

According to the existing literature, Tobin's q is the most adequate market-based proxy for financial performance (Beiner, Drobetz, Schmid, & Zimmermann, 2006; Dowell et al., (2000); Konar & Cohen, 2001; Marsat & Williams, 2013; Tobin, 1969). Tobin's q measures the market valuation of a firm relative to the replacement costs of tangible assets (Lindenberg & Ross, 1981). Intuitively, if a firm invests one extra dollar in its assets, it shows the expectation of the market about how much extra cash flows this increase in investment will generate. This measure is able to look forward by capturing the long-term value of investments. Consequently, the Tobin's q is able to take into account the possible growth opportunities of firms and therefore, it better captures the inherent value of the firm (King & Lenox, 2002; Lindenberg & Ross, 1981). Tobin's q is subject to two types of variation: factors that can affect overall market values (i.e. macroeconomic performance) and industry-specific factors. By using time fixed effects, the first type of variation is taken into account. The second type of variation is taken into account by using cross-sectional fixed effects (Baron, Agus Harjoto, & Jo, 2011).

Tobin's q is defined as the market value of assets divided by replacement costs (Lindenberg & Ross, 1981). The market value of assets is proxied by the sum of the firm equity value, book value of long-term debt and net current liabilities. The proxy of replacement costs is the book value of total assets (Dowell et al., 2000; King & Lenox, 2001). All these financial data is obtained from COMPUSTAT.

3.2. Independent variable

CSR is the main independent variable in this research. Different measures of CSR are used in the existing literature on the effect of CSR on financial performance. Some studies are based on qualitative research, but quantitative research is dominating the field. The most frequently used

quantitative measures of CSR are discussed in paragraph 3.2.1. Thereafter, the MSCI KLD index is explained, which is used to measure CSR in this research.

3.2.1. Different measures of CSR

The Dow Jones Sustainability Index (DJSI), the FTSE4Good index series and the MSCI ESG KLD STATS - Social Ratings (from now on abbreviated to MSCI KLD index) are the most frequently used indices. Therefore, their characteristics are briefly explained below.

Introduced in 1999 and provided by RobecoSAM and S&P Dow Jones Indices, the DJSI is a multidimensional construct based on economic, environmental and social indicators. Based on a scoring and weighting structure, the independent scores on economic, environmental and social performance are aggregated to one final sustainability performance score. Their indices are based on annual reports, company websites, questionnaires, personal contact with companies, media and stakeholders and other publicly available information. Firms have to meet general criteria with respect to industry-specific and general requirements in order to be included in the DJSI. In addition, within each industry, only the highest ranked companies in terms of corporate sustainability are included in the DJSI. By applying these best in class selection rules, they differ from the other indices, as they include all companies except of companies in gambling, tobacco, alcohol and similar industries (Statman, 2005). The DJSI has two main advantages. First, DJSI covers both developed and emerging markets. Second, the accessibility of DJSI is an advantageous characteristic. No fees have to be paid and no license have to be obtained in order to obtain the data, the index is just published (Hawn, Chatterji, & Mitchell, 2011). However, a weakness of DJSI is the fact that it is based on a subjective process, which could make the index unreliable (Fowler & Hope, 2007). Moreover, it uses the size of the corporate board as an indication of good corporate governance, which could be questioned (Chatterji & Levine, 2006).

The FTSE4Good index series are introduced in 1997 and are constructed by the FTSE group, which mainly focuses on the construction of indices and associated data services. The FTSE group is owned by Financial Times and the London Stock Exchange. They mainly collect their information by annual reports, company websites and questionnaires. It is worth mentioning that private information of firms is not allowed to be used for constructing the index, in order to enhance transparency and reliability. The FTSE ESG Ratings are used to determine which firms should be included in the FTSE4Good Index. Firms of which their FTSE ESG Rating is at least 3.2 on a scale of 0 to 5 are included in the FTSE4Good Index, on the condition that they also meet some additional

requirements. One of the most important requirements is that a firm needs to satisfy criteria regarding the environment, stakeholders and human rights. Excluded from this index are firms that manufacture weapons systems, components for controversial weapons and tobacco. Worth noting is that all licensing revenues are donated to UNICEF (Curran & Moran, 2007).

The MSCI KLD index was created by KLD Research & Analytics, Inc. in 1991. At that time, it only included 650 firms, mainly covering the S&P 500 Index and the Domini 400 Social Index. In 2001 and 2003 the sample expanded by including firms from the Russell 1000 index and the Russell 3000 index respectively, which resulted in a sample size of 3100 firms. In 2010, MSCI acquired KLD and therefore the index renamed. A strength of the MSCI KLD index is that it contains a multitude of socially responsible criteria (Kempf & Osthoff, 2007). In addition, the index motivates voluntary disclosure and therefore stimulates transparency (Cho, Lee, & Pfeiffer, 2013).

Besides its multidimensionality and transparency, another important strength of the MSCI KLD index is its independence: the index is constructed by a research-based and independent company, which makes the outcome unbiased and unaffected by commercial purposes (Kim, Park, & Wier, 2012). Despite the wide use and general acceptance, the MSCI KLD index has some weaknesses as well. First, the index is subject to selection bias, as only the largest US public companies are included in the index (Shahzad & Sharfman, 2015). Second, the credibility is mentioned as a weakness, as the data can easily be stretched in order to fit to certain objectives of researchers (Godfrey, Merrill, & Hansen, 2009). Third, as the MSCI KLD index uses mainly subjective measures, drawing the comparison between statistics is considered hard (Chatterji & Levine, 2006).

By comparing these three indices of CSR, their outcomes turn out to be different, as they vary in the emphasis they place on particular characteristics (Statman, 2005). For example, to measure environmental issues, they all apply a different strategy. The MSCI KLD index assigns one fifth of its points on these issues after which a committee makes the final decision, DJSI assigns one third of its points on these issues (but increases this in environmentally sensitive industries) and FTSE4Good does not assign a weight at all (Chatterji & Levine, 2006). The indices DJSI and FTSE4Good are based more on quantitative data than the MSCI KLD index, which could result in low validity of the measures if the measures and weights are poorly chosen (Chatterji & Levine, 2006).

By balancing the pros and cons of different indices of CSR, the MSCI KLD index is considered the best indicator. This is in line with the existing literature, which states that the MSCI KLD index is the most frequently used and most appropriate index to measure CSR (e.g. Chatterji, Levine, & Toffel, 2009; Hillman & Keim, 2001; Hull & Rothenberg, 2008; Griffin & Mahon, 1997; Mahoney & Roberts, 2007; McWilliams & Siegel, 2001; Waddock & Graves, 1997). Moreover, to cite Deckop, Merriman, & Gupta (2006): “KLD is the largest multidimensional corporate social performance database available to the public.” This is also confirmed by Ruf, Muralidhar and Paul (1998), who emphasized the importance of the advantages of the MSCI KLD index and stated that these advantages outweigh the disadvantages. Moreover, The MSCI KLD dataset is called ‘the de facto research standard’ (Waddock, 2003). Therefore, by using the MSCI KLD index in this research, the prevailing instrument for measuring CSR is followed and the findings of this research are comparable with the extensive existing literature that mainly follows the same practice.

3.2.2 MSCI KLD index

The MSCI KLD index is constructed with both qualitative data (e.g. company announcement, media publicity) and quantitative data (e.g. annual reports). The KLD index covers US firms and includes more than 80 indicators within the following seven dimensions: community, corporate governance, diversity, employee relations, environment, human rights and product. Each dimension consists of strength indicators (positive values) and concern indicators (negative values) that both are binary: a value of one indicates the presence of a particular social action (that could be positive or negative); a zero indicates the absence of this action (Wang & Berens, 2015). For example, taken the category employee relations, ‘compensation and benefits’ is a strength and ‘child labor’ is considered as a concern. A firm can simultaneously be engaged in positive and negative behavior (Jayachandran, Kalaignanam, & Eilert, 2013). For example, during one week in 2012, the world’s largest furniture retailer IKEA was accused of bribing to get illegal access to policy files in France (BBC News, 2012), while the firm also got into the newspapers by announcing that they drop suppliers that did not comply with sustainability codes (CIPS, 2012).

Besides of the seven dimensions as discussed above, the index also provides information for involvement in the following controversial business issues: alcohol, firearms, gambling, military, nuclear power, and tobacco. These controversial business issues are excluded from this research, because they are primarily used as exclusionary lists and consequently, they only consist

of concern indicators. Therefore, given the nature of these issues, they are excluded from this research (Galema, Plantinga, & Scholtens, 2008).

By following prior research, all ‘strength’ indicators as well as all ‘concern’ indicators are aggregated separately. By subtracting the concerns scores from the strengths scores, one aggregated CSR score per firm for each year is created, also known as the net MSCI KLD score (e.g. Chatterji, et al., 2009; Griffin & Mahon, 1997; Ruf, Muralidhar, Brown, Janney, & Paul, 2001; Waddock & Graves, 1997). The net MSCI KLD score assesses a firm's overall level of SCR, which enhances comparability with prior studies (Hillman & Keim, 2001). A higher score implies a higher level of CSR. All dimensions get an equal weight, as one fits-it-all ranking of importance for the various stakeholders cannot be made (Mitchell, Agle, & Wood, 1997).

Important to note is that the number of indicators is not stable over time. This research anticipates on this by including new indicators and excluding removed indicators from the moment of the change onwards. Across 14 years, 127 unique indicators are observed. Table 2 in appendix 1 shows an overview and a detailed description of all indicators belonging to the seven categories as obtained from the MSCI KLD index, while distinguishing between strength indicators and concern indicators. In figure 2, the evolving pattern of CSR within firms over the period of 2000 until 2013 is explored.

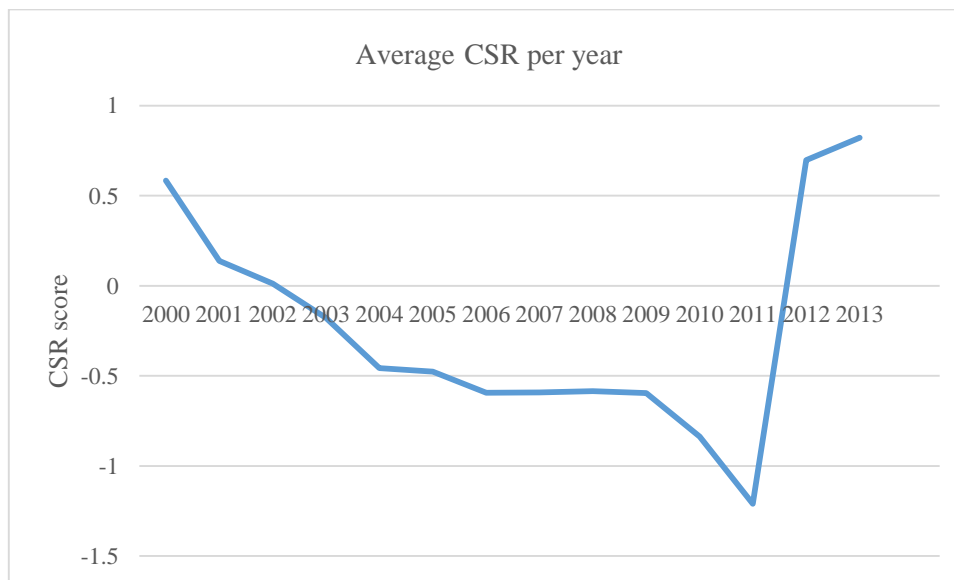


Figure 2: Average CSR score per year, from 2000 until 2013

The graph in figure 2 mainly shows negative values. Only the first three years and the last two years of the sample period show a positive CSR score. In the other years, CSR concerns dominate CSR strengths. Starting in 2000, a downward trend took place with the lowest value in 2011. The financial crisis could be an explanation for this trend. From 2011 onwards, an upward trend is observed and the score changed into a positive value. This could indicate that firms recovered from the financial crisis and therefore have more slack resources available to invest in CSR, which is in line with the slack resources theory.

Interesting to see is to what extent each specific dimension of CSR affects the total CSR score. Therefore, in figure 3, the average CSR score per year per dimension is provided. The biggest positive contribution to the total CSR score belongs to the employee relations dimension in 2013 (0.8199), the biggest negative contribution to the total CSR score belongs to the corporate governance dimension in 2011 (-0.8741). It turns out that all CSR dimensions show a negative value from 2003 until 2009, except for the community and diversity dimensions. Notable is that the community dimension is the only dimension that did not show negative values during the period from 2000 until 2013. It is also worth mentioning that figure 3 shows that the community, human rights and product dimension scores are relatively stable over time. They do not have striking negative or positive outliers, which the other four dimensions do have. When comparing the results of 2013 to the results of 2000, an upward trend is observed for all CSR dimensions, except of the community and diversity dimensions. In addition, mainly due to the high positive score of the employee relations dimension and the large improvement of the score of the corporate governance dimension, the total CSR score changed to a positive number again in 2012 and 2013, as already shown in figure 2.

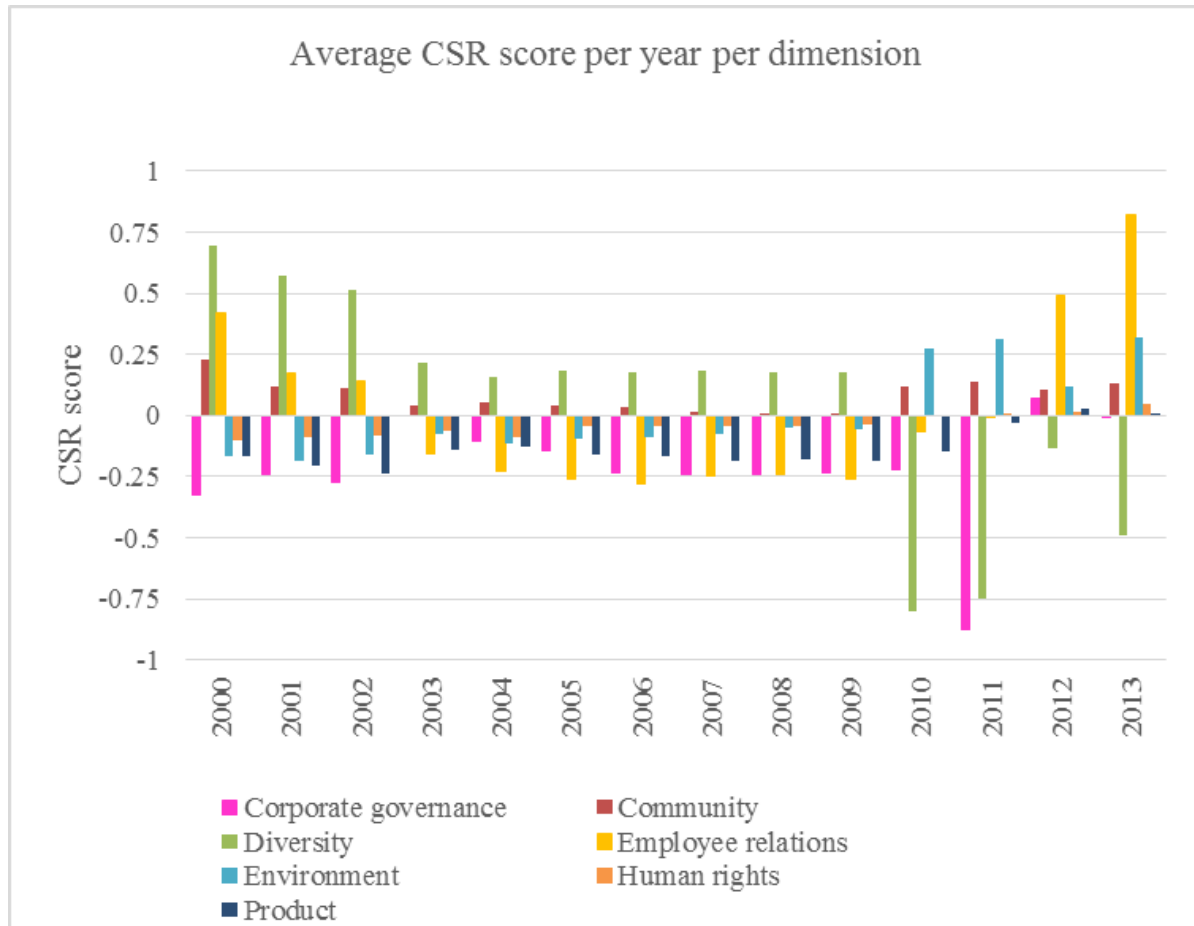


Figure 3: Average CSR score per year per dimension

3.3. Control variables

Following the existing literature, firm size, level of risk and industry are included as control variables to empirically control for the potential effects of these variables when investigating the effect of CSR on financial performance (Margolis et al., 2009; Ullman, 1985; Waddock & Graves, 1997). By including these control variables in the models, the relationship between CSR and financial performance is isolated. All three control variables are discussed in this section.

3.3.1. Size

In the existing literature, firm size is considered to affect both CSR and the financial performance of a firm and therefore, it should be included in the regressions as a control variable (Margolis et al., 2009; Orlitzky, 2001; Słowski et al., 2014; Ullman, 1985; Waddock & Graves, 1997; Wu, 2006). The effect of firm size on CSR can be explained by three arguments. First, larger

firms have more financial resources available to spend on social investments (Waddock & Graves, 1997). Second, as they are bigger, they receive more attention from the public and therefore they could feel a higher pressure to pay attention to CSR (Burke, Logsdon, Mitchell, Reiner, & Vogel, 1986; Wu, 2006). Third, economies of scale could ease the engagement in CSR activities for larger firms (McWilliams & Siegel, 2001; Orlitzky, 2001). The effect of firm size on financial performance can be explained by the finding that larger firms generate relatively stronger competitive capabilities than smaller firms do. This is mainly caused by economics of scope and scale, their better access to resources and greater market power (Clegg, Hardy, & Nord, 1996). However, also a negative effect of firm size on financial performance is found (Hillman & Keim, 2001; Waddock & Graves, 1997). Among others, this is suggested by Denis, Denis and Yost (2002), who stated that an increase of firm size and therefore an increase in global diversification reduces shareholder value by 18-20%. This is mainly caused by increased transaction costs. As both negative and positive effects of firm size on financial performance are found, no agreement is reached on the sign of the effect of firm size on financial performance. Therefore, no a priori expectations are made regarding this sign.

The meta-analysis of Orlitzky et al. (2003) concluded that the natural logarithm of total assets is one of the most commonly used measure of firm size. Therefore, in this research, firm size is proxied by the natural logarithm of total assets. This data is obtained from COMPUSTAT.

3.3.2. Risk

In addition to firm size, the level of risk is also considered to affect the relationship between CSR and the financial performance. To begin with, risk affects financial performance (Barbosa & Louri, 2005; Choi & Wang, 2009; D’Arcimoles & Trebucq, 2002; Mahoney & Roberts, 2007). Traditionally, according to the existing literature, debt could lead to financial distress, which could be costly for mainly two reasons. First, it forces the firm to make decision that could be harmful for debtholders and nonfinancial stakeholders. Second, it could provoke the competitors to aggressively attempt to gain a bigger market share due to the debilitated condition of the highly leveraged firm (Opler & Titman, 1994). In line with this, Capon, Farley and Hoenig (1990) found that risk negatively affects financial performance. They executed a meta-analysis of 320 studies concerning factors that affect financial performance and they measured risk by the debt level. Consistent with this finding, also Waddock and Graves (1997) showed that risk, measured by the

long-term debt to total assets ratio, has a negative effect on financial performance when also CSR is entered into the regression as an independent variable. In addition, Cai, Jo and Pan (2012) confirmed that risk, measured by the debt ratio, is significant and negatively related to Tobin's q.

According to the existing literature, risk does not only affect financial performance, but CSR also influences risk. Research found that a lower level of CSR might increase a firm's financial risk (Aupperle et al., 1985; McGuire et al., 1988; Spicer, 1978). The following three arguments can explain this. First, investors may consider investments in less socially responsible firms to be riskier because they consider management skills at these firms to be low. Second, investors could expect an increase in the costs (e.g. fines and lawsuits) because of the lack of CSR. Third, a lower level of CSR could complicate the ability of the firm to obtain capital.

Moreover, it is not only suggested that risk affects financial performance and that CSR affects risk, also risk is considered to influence CSR. Among others, this is confirmed by Orlitzky and Benjamin (2001), who found that a virtuous circle exists between CSR and financial risk. Specifically, in this virtuous circle, CSR negatively affects financial risk in the next year and financial risk negatively affects CSR in the next year. In line with this, significant correlation coefficients are found to be highly negative between risk and CSR (Cai et al., 2012; Jo & Nas, 2012). Therefore, risk is not only included in the regression as a control variable, but the interaction term between CSR and risk is also included in the regression.

By using the Bayesian Information Criterion (BIC) (also called the Schwarz Criterion), it is tested whether the model that includes the interaction term fits better. The BIC provides a trade-off between goodness-of-fit and the simplicity of the model, measured by the number of regressors. BIC determines which model fits the best and therefore, it is a useful tool for model selection. The best model is the model with the lowest BIC score, as this model minimizes the information loss. In other words, when the number of regressors increase, the BIC also increases, and therefore the model becomes less favorable. Worth mentioning is that the absolute value of BIC does not have a meaning, only the relative value compared to other models can be interpreted. As shown in table 3 in appendix 2, the BIC score is lower when the interaction term is included in three out of four models.¹⁹ This indicates that this model fits the best.

¹⁹ The only exception is the first model, which shows a higher BIC score for the model that includes the interaction term. Because model (5) and (6) are specified the same as model (1) and (2), these tests are not repeated for model (5) and (6).

This is confirmed by the Redundant Variable Likelihood Ratio test, which tests for the redundancy of the interaction term in the models of this research. A t-test of the significance of the interaction term is performed in the unrestricted model. This unrestricted model is compared with the restricted model, in which the interaction term is removed. Worth noting is that model 3 and 4 contain more than one interaction term. Therefore, the t-test is replaced by an F-test and the joint significance of the interaction terms is tested in the unrestricted model. The null hypothesis states that the coefficient of the interaction term is zero in the unrestricted model and therefore, the interaction term is redundant. As shown in table 4 in appendix 2, the F-statistic is significant for three out of four models ($P < .05$).²⁰ As a result, the null hypothesis is rejected. Therefore, consistent with the expectations and in line with the outcome of the BIC, the coefficients of the interaction terms are not equal to zero and therefore, the interaction terms are not redundant. Given this rejection of redundancy of the interaction term, this test justifies the use of the interaction term between CSR and risk.

The debt ratio proxies the riskiness of a company, which is calculated by total debt divided by total assets (Lang, Ofek, & Stulz, 1996; Mahoney & Roberts, 2007; Waddock & Graves, 1997). These financial data is obtained from COMPUSTAT. A low debt ratio indicates the ease of the firm to meet its debt obligations, while a higher debt ratio points at potential problems to meet these obligations. The expectation is to find a significant and negative relationship between the level of risk as a control variable and financial performance. In addition, no a priori expectation is made regarding the sign of the interaction term between CSR and the level of risk.

3.3.3. Industry

According to existing literature, the industry in which a firm operates influences CSR and financial performance as well and therefore the industry is often included as a control variable when studying the effect of CSR on financial performance (Branco & Rodrigues, 2008; Newson & Deegan, 2002). Research has proved that studies in this field that did not account for industry effects are likely to produce confounded results (Griffin & Mahon, 1997; Hillman & Keim, 2001; Waddock & Graves, 1997). Multiple arguments underlie the influence of industry on the relation between CSR and financial performance. First, the differences with respect to economies of scale

²⁰ The only exception is the first model, which shows a nonsignificant F-statistic. Again, because model (5) and (6) are specified the same as model (1) and (2), these tests are not repeated for model (5) and (6).

and the intensity of competition could play a role (McWilliams & Siegel, 2000). Second, the industry in which a firm is active matters because of the variety in their social responsibility practices (Margolis et al., 2009). For example, industries like oil and chemicals have a higher environmental impact than others do. Third, the extent to which industry specific organizations are active in stimulating CSR activities is affecting the financial performance, as it is argued that external support on CSR activities increases financial performance (Campbell, 2007). Fourth, industry specific regulations and possible industry specific sanctions imposed by the government affect the engagement of a firm in CSR activities and therefore affect its profitability, either positive or negative (Campbell, 2006; Waddock & Graves, 1997). For example, on the one hand industry specific reporting rules can positively affect CSR activities as it stimulates responsible behavior; on the other hand, reporting rules can have a negative effect on CSR activities as it impedes the charitable donations due to reporting obligations (Margolis et al., 2009). Schmalensee (1985) proved that the influence of the industry on financial performance should not be underestimated. He calculated that the industry accounts for at least 75 percent of the variance of industry rates of return on assets. As mentioned above, the effect of the firms industry on financial performance could be either positive or negative. Therefore, no a priori expectations is made regarding the sign of the effect.

A 2-digit SIC (Standard Industrial Classification) code is used to control for industry effects (López et al., 2007; McWilliams & Siegel, 2000; Waddock & Graves 1997). This code is launched by the U.S. government in order to identify the core business of firms and therefore to stimulate comparability and uniformity. The code disaggregates the economy into eleven industries. The sample of this research does not include firms belonging to the agricultural industry and the public administration industry. Therefore, only nine industries remain. In table 5, an overview of these nine industries is shown. In order to promote the convenience of reading, the name of the transportation/communication/electric/gas/sanitary service industry is simplified to transportation industry for the remainder of this research. Similarly, the name of the finance/insurance/real estate industry is simplified to financial industry.

Distribution of firms across industries

Industry	Abbreviation	SIC code	Amount of observations	% of total observations	Average CSR score	Average ROA	Average TQ
Mining	MIN	1000-1499	1149	4.19%	-1.3612	0.0189	0.7376
Construction	CONS	1500-1799	327	1.19%	-1.5229	0.0239	0.6845
Manufacturing	MANU	2000-3999	10688	38.95%	-0.2508	-0.0030	0.7164
Transportation, Communications, Electric, Gas and Sanitary service	TRSP	4000 - 4999	2562	9.34%	-0.5246	0.0212	0.6865
Wholesale trade	WHOT	5000 - 5199	697	2.54%	-0.6141	0.0494	0.6637
Retail trade	RETT	5200 - 5999	1814	6.61%	-0.3804	0.0579	0.6728
Finance, Insurance and Real Estate	FIN	6000 - 6799	5993	21.84%	-0.1173	0.0240	0.4983
Services	SERV	7000 - 8999	4153	15.13%	-0.3157	0.0224	0.6878
Nonclassifiable	NONC	9900 - 9999	57	0.21%	-0.5614	-0.0651	0.7458
Total			27440	100%			

Table 5: Overview of the distribution of firms across industries in the sample. Information is also provided on the observations, average CSR scores, average ROA and average Tobin’s q.

In figure 4, a pie chart is presented of the industries in the sample. As shown, the biggest industry group in the dataset is the manufacturing industry (10688 observations), followed by the financial industry (5993 observations) and the service industry (4153 observations). The smallest industry in the dataset is the nonclassifiable industry (57 observations).

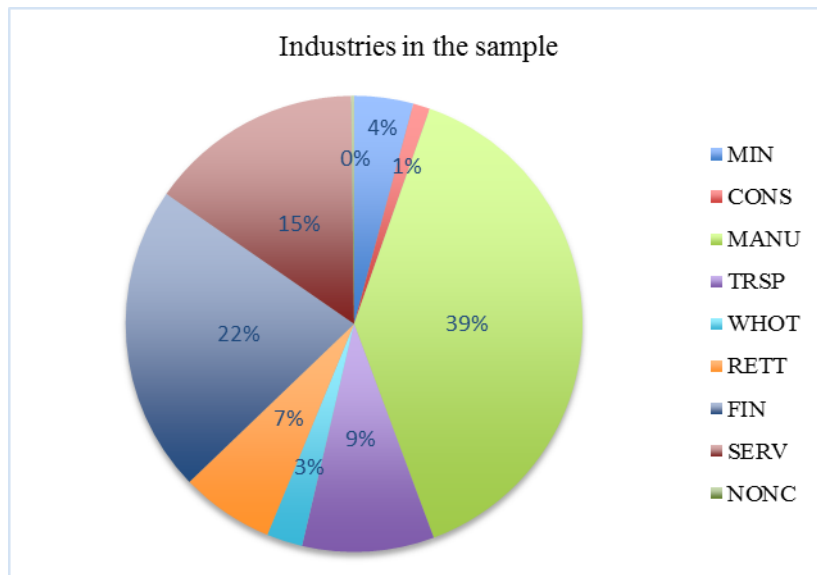


Figure 4: Industries in the sample represented in a pie chart

3.4. Research sample

The sample of this research consists of all firms that have been index constituents in the MSCI KLD index from 2000 until 2013. These firms were chosen because their substantial portion of the total economic output in the US and because their accurate representation of industrial

sectors. Worth noting is that the included firms in the MSCI KLD index change every year, for example due to expansion of the scope of the dataset, acquisitions, private buy-outs and lack of data. Financial data on all available firms in the MSCI KLD index from 2000 until 2013 are extracted from COMPUSTAT. Observations with missing data on ROA, Tobin's q and the MSCI KLD index are deleted. Important to note is that the observation for the first year that a firm is positioned in the MSCI KLD index is excluded from the dataset as a firm-year observation in the estimations, because the lagged variable of CSR is used. The mean values of the control variables of the dropped data are compared with the mean values of the control variables of the remaining data, in order to check whether the remaining sample is biased. No significant differences are found, which suggests that the remaining dataset is unbiased. The final dataset consists of 27440 observations on 5272 unique firms for the period of 2000 until 2013. Following Peters & Mullen (2009), the models are estimated with and without outliers. No significant differences arose in the results, and therefore it is decided to include all observations in the final models. A summary of all the variables is presented in table 6.

Variable Overview

Abbreviation	Variable	Type	Data source	Description
ROA	Return on assets	Dependent	Compustat	Net income divided by total assets
TQ	Tobin's q	Dependent	Compustat	Total equity plus long-term debt plus net current liabilities divided by total assets
CSR	Corporate social responsibility	Independent	MSCI KLD	Aggregated strengths minus aggregated concerns over specified dimensions
CGOV	Corporate governance	Independent	MSCI KLD	The dimension 'corporate government,' part of the proxy for CSR
COM	Community	Independent	MSCI KLD	The dimension 'community,' part of the proxy for CSR
DIV	Diversity	Independent	MSCI KLD	The dimension 'diversity,' part of the proxy for CSR
EMP	Employee relations	Independent	MSCI KLD	The dimension 'employee relations,' part of the proxy for CSR
ENV	Environment	Independent	MSCI KLD	The dimension 'environment,' part of the proxy for CSR
HUM	Human rights	Independent	MSCI KLD	The dimension 'human rights,' part of the proxy for CSR
PRO	Product	Independent	MSCI KLD	The dimension 'product,' part of the proxy for CSR
SIZE	Firm size	Control	Compustat	Size is proxied by the logarithm of total assets
RISK	Risk	Control	Compustat	Risk is proxied by the debt ratio, calculated as total debt divided by total assets

Table 6: Overview of all variables of the research. The abbreviations are shown, even as the type of the variable, the data source and the description.

3.5. Model development

The three hypotheses of this research are tested by running six separate panel data regressions, because each hypothesis is tested for two measures of financial performance. The associated six empirical models are explained in this paragraph, but first attention is paid to whether or not applying fixed effects to the models.

3.5.1. Fixed effects

First in this paragraph, cross-sectional fixed effects and time fixed effects are discussed. Thereafter, tests are executed to investigate which effects are relevant to include in the models of this research.

3.5.1.1. Cross-sectional fixed effects

Cross-sectional fixed effects reduce the bias in standard errors due to autocorrelation in residuals. They control for time invariant differences in industries. Therefore, by including cross-sectional fixed effects, industry idiosyncrasies are teased out (Kang et al., 2016). As the possibility exists that there are omitted variables in the models of this research that vary across industries but do not change over time, it seems to be intuitive to apply cross-sectional fixed effects to this research.

3.5.1.2. Time fixed effects

Time fixed effects reduces the bias in standard errors due to cross-sectional correlation. They pick up any variation in the outcome that happen over time and that is not attributed to the regressors. By including time fixed effects, variables that are the same for all cross-sectional units for each time unit are dropped. In other words, the effect from unobservable factors particular to a time period are removed by time fixed effects. Otherwise, these effects would similarly influence cross-sectional items in one period (Verbeek, 2008).

It seems to be intuitive to assume that part of the time series variation in financial performance is to be explained by overall time trends or other times series. An example is the increase in legislation concerning product requirements over time, which are the same for each firm in the sample. This suggests that time fixed effects may be relevant to add to the models of this research. In order to go beyond this intuition, two tests are executed in the next paragraph to investigate whether time fixed effects are necessary.

3.5.1.3. Tests for time fixed effects

To test whether time fixed effects are needed, dummies for every year are constructed and the Wald test is executed for the first four models.²¹ This test assesses whether the year dummies are jointly significant. The null hypothesis of the Wald test states that time-period coefficients are jointly equal to zero, which means that time fixed effects are not needed (Verbeek, 2008). In table 7 in appendix 3, the output of the Wald test is shown.²² When taking ROA as dependent variable, the null hypothesis is rejected at the 1%-level (F-stat = 19.2345, $P < .01$). The same conclusion can be drawn when Tobin's q is the dependent variable (F-stat = 13.7528, $P < .01$). In addition, the Wald test executed for the third and the fourth model led to the same conclusion (respectively, F-stat = 19.6262, $P < .01$ and F-stat = 13.0280, $P < .01$). This means that the year dummies are jointly significant in all four models and therefore, introducing time fixed effects in the model is needed (Verbeek, 2008).

Another method of testing whether time fixed effects are needed, is to compare the model without time fixed effects with the model with time fixed effects by using the Bayesian Information Criterion (BIC). As already explained, the best model is the model with the lowest BIC score, as this minimizes the information loss (Verbeek, 2008). As shown in table 8 in appendix 3, the BIC scores of the models that include time fixed effects are lower than the BIC scores of the models that do not include time fixed effects for all four models.²³ Therefore, the outcome of BIC confirms the result of the Wald test that the time fixed effects should be included in the model.

This outcome is also confirmed by the Hausman specification test, which tests whether it is more appropriate to use a fixed effects model or a random effects model. The Hausman test tests whether the fixed effects and random effects estimators are significantly different. The null hypothesis of the Hausman test states that no correlation exists between cross-sectional random effects and the independent variables. The alternative hypothesis states that a correlation does exist. By executing the Hausman test, the estimator that is consistent under both the null and alternative hypothesis is compared with the estimator that is only consistent under the null hypothesis (Verbeek, 2008). This test is executed for all six models and the results are shown in table 9 in appendix 3. As shown, except for only three regressions, the p-values of the Hausman tests of all

²¹ The Wald test is executed by applying cross-sectional fixed effects. Because model (5) and (6) are specified the same as model (1) and (2), these tests are not repeated for model (5) and (6).

²² The dummies for the years 2000 and 2013 are omitted from the regression to avoid multicollinearity.

²³ Because model (5) and (6) are specified the same as model (1) and (2), these tests are not repeated for model (5) and (6).

regressions are smaller than 0.10.²⁴ Therefore, the null hypothesis is rejected at the 10%-level. As a result, it is suggested that a correlation exists between cross-sectional random effect and the dependent variables and therefore the fixed effects model is more appropriate. This specification turns out to be a more powerful and efficient estimator.

In summary, based on the outcomes of the Wald test, the Bayesian Information Criterion and the Hausman test, the models of this research include cross-sectional fixed effects and time fixed effects (also called a 2-way fixed effects model) to control for systematic differences across cross-sections and time periods. The fixed effects control for unobservable variables and therefore, an omitted variable bias is avoided.

3.5.2. Empirical model hypothesis 1

In order to be able to test the first hypothesis, the following models are estimated. As mentioned earlier, the MSCI KLD index is used as a measure of CSR, and both ROA and Tobin's q assess financial performance.

$$ROA_{i,t} = \alpha_i + \beta_1 CSR_{i,t-1} + \beta_2 CSR_{i,t-1} * RISK_{i,t} + \beta_3 RISK_{i,t} + \beta_4 \ln SIZE_{i,t} + \varepsilon_{i,t} \quad (\text{model 1})$$

+
+/-
-
+/-

$$TQ_{i,t} = \alpha_i + \beta_1 CSR_{i,t-1} + \beta_2 CSR_{i,t-1} * RISK_{i,t} + \beta_3 RISK_{i,t} + \beta_4 \ln SIZE_{i,t} + \varepsilon_{i,t} \quad (\text{model 2})$$

+
+/-
-
+/-

Where:

- α_i = fixed effects
- ROA = return on assets
- TQ = Tobin's q
- CSR = a proxy for corporate social responsibility
- RISK = a proxy for the level of risk of the firm, measured by the debt ratio
- SIZE = a proxy for the size of the firm, measured by the logarithm of total assets
- ε = residual
- i = firm index
- t = year index

²⁴ The three exceptions are model 5 – wholesale trade industry, model 6 - retail trade industry and model 6 – nonclassifiable industry.

As this is a fixed effects model, individual-specific intercept terms are included in the model (α_i). Fixed effects assume that the individual specific effect is correlated with the independent variable. α_i are fixed unknown constants that are estimated along with the β 's. The overall intercept term β_0 is removed from the model, because it is incorporated in the individual intercepts α_i . The error term is assumed to be independent and identically distributed over individuals and time (Verbeek, 2008).

The plus and minus signs (+/-) below the variables show the expected relationship with the dependent variable. As already extensively explained in paragraph 3.3, CSR is expected to show a positive relationship with financial performance and the level of risk is expected to show a negative relationship with financial performance. In addition, no a priori expectations are made about the sign of the coefficient of size and the interaction term between CSR and the level of risk.

Following the existing literature, the main independent variable CSR is specified with a lag-time of one year, as changes in CSR do not immediately affect financial performance (Baron et al., 2011; Conway, 2014; Mahoney & Roberts, 2007; Scholtens, 2008; Shahzad & Sharfman, 2015; Waddock & Graves, 1997). Rather, financial performance depends on CSR of the previous year. This is particularly the case when firms start with CSR activities by picking the 'lowest hanging fruit' first, where after bigger investments have to be made in order to pick the 'higher hanging fruits' (Waddock & Graves, 1997). In addition, stakeholders' reactions on CSR activities unfold over the long term (Marom, 2006). By using the lagged value, potential endogeneity is avoided and it is ensured that the causal direction flows from CSR and the control variables to financial performance instead of the other way around (Baron et al., 2011; Kotchen & Moon, 2012; Shahzad & Sharfman, 2015).

The control variables firm size and the level of risk are not lagged, as they directly affect financial performance (Waddock & Graves, 1997). The control variable size is transformed to a logistic form. This has been done to avoid that they take up all the variations due to their size, as the variation is large between firms in the dataset (Brown & Perry, 1995; Gordon, Loeb, & Tseng, 2009; Kotchen & Moon, 2012; McShane, Nair, & Rustambekov, 2011). By incorporating fixed effects into the specification, the fixed effects control for all firm-constant variables. As industry can be considered time-invariant and therefore it is the same over time for each-cross-sectional

unit, this control variable would be wiped out by the fixed-effects transformation. Therefore, industry is not explicitly entered in the regression as a control variable (Greene, 2000).

3.5.3. Empirical model hypothesis 2

In order to be able to test the second hypothesis, the following two models are estimated. Two time-series regressions are estimated in which the effects of the different dimensions of CSR on financial performance are disaggregated. This enables the research to determine whether there are any differences between them.

$$\begin{aligned} ROA_{i,t} = & \alpha_i + \beta 1CGOV_{i,t-1} + \beta 2CGOV_{i,t-1} * RISK_{i,t} + \beta 3COM_{i,t-1} + \beta 4COM_{i,t-1} * RISK_{i,t} + \beta 5DIV_{i,t-1} \\ & + \beta 6DIV_{i,t-1} * RISK_{i,t} + \beta 7EMP_{i,t-1} + \beta 8EMP_{i,t-1} * RISK_{i,t} + \beta 9ENV_{i,t-1} + \beta 10ENV_{i,t-1} * RISK_{i,t} + \\ & \beta 11HUM_{i,t-1} + \beta 12HUM_{i,t-1} * RISK_{i,t} + \beta 13PRO_{i,t-1} + \beta 14PRO_{i,t-1} * RISK_{i,t} + \beta 15RISK_{i,t} + \\ & \beta 16lnSIZE_{i,t} + \varepsilon_{i,t} \end{aligned} \quad (\text{model 3})$$

$$\begin{aligned} TQ_{i,t} = & \alpha_i + \beta 1CGOV_{i,t-1} + \beta 2CGOV_{i,t-1} * RISK_{i,t} + \beta 3COM_{i,t-1} + \beta 4COM_{i,t-1} * RISK_{i,t} + \beta 5DIV_{i,t-1} \\ & + \beta 6DIV_{i,t-1} * RISK_{i,t} + \beta 7EMP_{i,t-1} + \beta 8EMP_{i,t-1} * RISK_{i,t} + \beta 9ENV_{i,t-1} + \beta 10ENV_{i,t-1} * RISK_{i,t} + \\ & \beta 11HUM_{i,t-1} + \beta 12HUM_{i,t-1} * RISK_{i,t} + \beta 13PRO_{i,t-1} + \beta 14PRO_{i,t-1} * RISK_{i,t} + \beta 15RISK_{i,t} + \\ & \beta 16lnSIZE_{i,t} + \varepsilon_{i,t} \end{aligned} \quad (\text{model 4})$$

Where:

α_i	= fixed effects
ROA	= return on assets
TQ	= Tobin's q
CGOV	= the dimension 'corporate government,' part of the proxy for CSR
COM	= the dimension 'community,' part of the proxy for CSR
DIV	= the dimension 'diversity,' part of the proxy for CSR
EMP	= the dimension 'employee relations,' part of the proxy for CSR
ENV	= the dimension 'environment,' part of the proxy for CSR
HUM	= the dimension 'human rights,' part of the proxy for CSR
PRO	= the dimension 'product,' part of the proxy for CSR
RISK	= a proxy for the level of risk of the firm, measured by the debt ratio

α_i	= fixed effects
ROA	= return on assets
TQ	= Tobin's q
CSR	= a proxy for corporate social responsibility
RISK	= a proxy for the level of risk of the firm, measured by the debt ratio
SIZE	= a proxy for the size of the firm, measured by the logarithm of total assets
ε	= residual
i	= firm index
t	= year index

Similar to the first four models, individual-specific intercept terms are included in the model (α_i). The plus and minus signs (+/-) under the variables represent the expectations regarding the signs of the variables based on the existing literature. Moreover, CSR is lagged by one year, the control variable firm size is transformed to a logistic form and fixed effects are incorporated into the specification.

3.6. Gauss-Markov theorem

The Gauss-Markov conditions test whether the OLS estimator has good properties, formulated by four assumptions. These assumptions are needed to create a valid model for empirical analysis. Assumption 1 states that the expected value of the error term is zero, which means that, on average, the regression line should be correct. Assumption 2 states that the independent variables are independent of the error terms. These two assumptions are made in this research. Assumption 3 states that all error terms have the same variance (also called homoscedasticity). To test the third assumption, the White test is executed in paragraph 3.6.1. Assumption 4 states that zero correlation exists between different error terms (also called no autocorrelation). To test the fourth assumption, the Durbin-Watson test statistic is performed in paragraph 3.6.2 (Verbeek, 2008).

When the above four Gauss-Markov assumptions hold, the error terms are mutually uncorrelated, are independent of the independent variables, have zero mean and have a constant variance. However, in order to perform statistical inference, an additional assumption needs to be made. Assumption 5 states that the errors are jointly normally distributed. Taken together

assumption 1, 3 and 5, it is assumed that the error terms are independent drawings from a normal distribution with mean zero and a constant variance σ^2 . By combining the four Gauss-Markov assumptions and the additional assumption 5 concerning the normality of the error terms, the OLS estimator is considered to have a normal distribution. Therefore, hypotheses regarding the coefficients of the model can be tested (Verbeek, 2008).

3.6.1. Test for heteroscedasticity

Heteroscedasticity means that the error terms are mutually uncorrelated, while the variance of the residuals may vary over the observations. Heteroscedasticity does not bias the coefficients, so OLS is still unbiased in the presence of heteroscedasticity. However, OLS is no longer efficient and the standard errors of the coefficients, the standard estimator of the variance and the statistical tests are biased. Therefore, it is important to test whether the assumption of homoscedasticity is not violated. This could be checked by examining the scatter plots of the residuals against the fitted values of the first four models.²⁵ These scatterplots are shown in figure 5 until 8 in appendix 4. In the absence of heteroscedasticity, the scores are randomly scattered about a horizontal line. In the presence of heteroscedasticity, the scores show a systematic pattern or a clustering of scores. As can be seen in figure 5 until 8, all plots of the residuals against the fitted values show a systematic pattern or a clustering of scores, which strongly indicates the presence of heteroscedasticity (Verbeek, 2008).

However, graphical representations do not provide evidence of heteroscedasticity. Therefore, also the White test is executed, which is the most general test for heteroscedasticity. In the White test, the squared residuals are regressed against all regressors, squared regressors and all possible interactions of regressors. This is called the auxiliary equation. Then, the LM statistic is calculated by the amount of observations times the R^2 of the auxiliary equation. The LM statistic is distributed Chi-squared. The null hypothesis states that no heteroscedasticity exists, against the alternative hypothesis that heteroscedasticity is present in the model. If the LM statistic is bigger than the Chi-squared critical value, the null hypothesis is rejected.²⁶ In table 10 in appendix 4, the output of the White tests of the first four models is shown.²⁷ For all models, the null hypothesis is

²⁵ Because model (5) and (6) are specified the same as model (1) and (2), these tests are not repeated for model (5) and (6).

²⁶ The test statistic follows an asymptotically Chi-squared distribution with P degrees of freedom, where P is the number of regressors in the auxiliary regression, excluding the intercept.

²⁷ Because model (5) and (6) are specified the same as model (1) and (2), these tests are not repeated for model (5) and (6).

rejected, because the LM statistic is significant at the 5% level. Therefore, evidence is found of heteroscedasticity in the model (White, 1980).

To overcome the problem that the assumption of homoscedasticity appeared to be violated, standard errors are adjusted for heteroscedasticity by using White standard errors (Verbeek, 2008; Wooldridge, 2002).²⁸ These robust standard errors do not change the regression coefficients, only the standard errors are changed. As a result, all standard tests for the models are asymptotically valid in the presence of heteroscedasticity.

3.6.2. Test for first-order serial correlation

Serial correlation implies that the covariances between different error terms are not all equal to zero. It suggests that the value of the errors can be explained by previous values of the errors. The consequences of serial correlation are equal to the consequences of heteroscedasticity: OLS becomes inefficient and the standard errors are biased, but OLS remains unbiased (Verbeek, 2008).

To test for first-order serial correlation, the Durbin-Watson (DW) statistic is used. This statistic measures the linear association between residuals from a regression model. A value of the DW statistic around 2 indicates no serial correlation, a value below 2 indicates positive serial correlation and a value above 2 indicates negative serial correlation. Positive serial correlation underestimates the true standard errors of the regression coefficients, while negative serial correlation overestimates the true standard errors of the regression coefficients (Verbeek, 2008). Field (2005) stated that only values below 1 and above 3 cause concern. The null hypothesis of this test states that no serial correlation exists. The alternative hypothesis indicates the existence of first-order serial correlation. As shown in table 11 in appendix 5, the DW values are between 1 and 3 for all models. This suggests that these models meet the assumption of independence of errors. Therefore, the null hypothesis cannot be rejected, suggesting that no serial correlation exists (Verbeek, 2008).

²⁸ White period is used as coefficient covariance method in order to apply White standard errors. The reason behind this decision is that the amount of cross-sections (firms) is higher than the amount of time periods (years) in the sample. This makes it common practice to use the White period estimator instead of the White cross-section or White diagonal estimator. In addition, a degree-of-freedom correction is included. However, as the number of observations is large, this makes only little difference (Wooldridge, 2002).

3.7. Additional robustness tests

Besides the two tests performed above, additional robustness checks are performed in this paragraph to validate the results of the models of this research. First, the causal relationships are tested by executing the Granger causality test. Second, the presence of multicollinearity is investigated by calculating the variance inflation factors (VIF).

3.7.1. Test for causality

The causal relationship between CSR and financial performance is investigated by executing the Granger causality test. The Granger causality test checks whether a value or its lagged value helps to predict the other variable and in which direction the relationship exists. The null hypothesis states that no Granger Causality exists, against the alternative hypothesis that Granger causality does exist (Granger, 1969). The tables in appendix 6 show the Granger causality tests for ROA and Tobin's q with a lag length of one, two and three years. Table 12 in appendix 6 shows that five out of six probability coefficients between KLD and the measures of financial performance are smaller than 0.1. The only exception is the unidirectional Granger-causality that is found between KLD and ROA when including a lag of three years, as shown in panel C of table 12. As a result, the null hypothesis is rejected at the 10% level. Therefore, Granger causality is found between the KLD and both measures of financial performance for a lag length of one until three years. Although it is good to be aware of the above finding, it should be noticed that Granger causality is not necessarily true causality. It only helps to make predictions. For example, the Granger causality does not indicate true causality in the case that the independent and dependent variables are driven by a common third variable and this variable affects both the independent and the dependent variable. Therefore, no inference on the causal directions is drawn.

3.7.2. Test for multicollinearity

Multicollinearity points at an approximately linear relationship among independent variables, which leads to unreliable regression estimates. When multicollinearity exists, the standard errors and therefore the variances of the estimated coefficients are inflated. To test for multicollinearity, the variance inflation factors (VIF) are calculated for every independent variable

in the first four models.²⁹ The VIF indicates the factor by which the variance of a coefficient is inflated compared with the hypothetical situation when no correlation exists between the independent variables (Verbeek, 2008). A VIF higher than 10 indicates a high level of multicollinearity (Field, 2005). The VIF results are presented in table 13 in appendix 7. For example, the VIF for the lagged independent variable CSR of model 1 and 2 shows that the variance of the estimated coefficient of lagged CSR is inflated by a factor of 5.3155 because CSR is highly correlated with at least one of the other independent variables in the model. As can be seen in panel A and panel B in table 13, the VIF for all variables remained below 10. Therefore, the models do not suffer from multicollinearity.

3.7.3. Concluding remarks robustness

All tests that are performed in this section are visually represented in table 14. In case a possible problem is encountered, an appropriate solution is provided in the last column, which is also adopted in the models. The conclusion can be drawn that under a strong set of assumptions, the OLS estimator in the linear model has many desirable properties and is the most accurate linear unbiased estimator (Verbeek, 2008). By performing the tests as visually represented below and by correctly anticipating on the findings, the models used in this research are robust and conform the assumptions of the Gauss-Markov theorem.

Overview of robustness tests

Potential problem	Test	Outcome of the test	Solution
Heteroscedasticity	White test	Presence of heteroscedasticity	White standard errors
Serial correlation	Durbin-Watson (DW) test statistic	No serial correlation	-
Causality	Granger causality test	Presence of Granger Causality	No solution required
Multicollinearity	Variance Inflation Factors (VIF)	No multicollinearity	-

Table 14: Overview of executed robustness tests. The potential problem, the associated test, the outcome and the solution are provided.

²⁹ VIF is calculated by $1/(1-R^2)$, where R^2 is the explanatory power of the model with one regressor as dependent variable and all other regressors (including the constant term) as independent variables. In these models, also cross-sectional and time fixed effects are included. Because model (5) and (6) are specified the same as model (1) and (2), the variance inflation factors are not repeatedly calculated for model (5) and (6).

4. Empirical Results

In this section, the empirical results of the regression analyses are shown, as obtained with help of the statistical package Eviews. Paragraph 4.1 provides the descriptive statistics and paragraph 4.2 shows the correlation analysis. Thereafter, paragraph 4.3 presents the results of the regression analyses. Hypothesis 1, 2 and 3 are tested in paragraph 4.3.1, 4.3.2, 4.3 respectively.

4.1. Descriptive statistics

Table 15 shows the descriptive statistics of all the variables used in this paper, including the total amount of observations, mean, standard deviation, minimum value and maximum value.

Descriptive Statistics					
<i>Panel A</i>					
Variables	Obs	Mean	Std. Dev.	Min	Max
ROA	27440	0.0155	0.2017	-12.3310	2.4076
TQ	27440	0.6580	0.2166	-4.2861	0.9987
CSR	27440	-0.3371	2.4392	-11	19
SIZE	27440	12537.27	84138.36	0.9790	2463207
RISK	27440	0.1855	0.2268	0	3.6757
<i>Panel B</i>					
Variables	Obs	Mean	Std. Dev.	Min	Max
CGOV	27440	-0.2139	0.7043	-4	2
COM	27440	0.0693	0.4859	-2	4
DIV	27440	-0.0521	1.3247	-3	7
EMP	27440	-0.0200	0.9733	-4	8
ENV	27440	0.0331	0.7375	-5	5
HUM	27440	-0.0305	0.2497	-3	2
PRO	27440	-0.1231	0.5749	-4	3

Table 15: Descriptive Statistics, including amount of observations, mean, standard deviation, minimum and maximum.

Panel A of table 15 shows that both measures of financial performance exhibit negative values. A negative ROA indicates that the utilization of capital could be more effectively managed. This is the case for 5678 firm-year observations in the sample. A negative Tobin's q indicates that the market value of assets or the replacement costs are negative, which only applies to 80 firm-year observations. The negative Tobin's q are mainly observed in the manufacturing industry. A Tobin's

q with a value between zero and one shows that the replacement costs of the assets of a firm are higher than the value of its stock, which points toward an undervaluation of the stock. A Tobin's q with a value higher than one implies an overvaluation of the stock. However, these values do not appear in the sample. The most volatile indicator of financial performance is Tobin's q, given its standard deviation. However, this volatility does not differ much from the volatility of ROA.

The minimum value of CSR is -11, which only applies to five observations belonging to two firms operating in the oil and gas industry. This is in line with the expectations, as this industry is considered to have a relatively high environmental impact. The maximum value of CSR is 19, only obtained in 2011 by Intel Corporation, a multinational technology company. Size, as measured by total assets, shows large values. Therefore, as already mentioned, it is decided to take the logarithm of total assets, in order to avoid that they take up all the variations due to their size, as the variation is large between firms in the sample. The minimum value of the level of risk is zero. The level of risk cannot take a negative value, because it is calculated by dividing total debt by total assets, which both cannot take a value below zero. When the firm holds no debt, the level of risk is equal to zero. 34.75% of the observations with a level of risk equal to zero belongs to the financial industry and 29.61% belongs to the manufacturing industry. Hence, these industries contain the most debt-free firms in the sample. The highest level of risk is observed by the firm Domino's Pizza's, mainly caused by a relative high total debt instead of a low value of total assets. This high total debt is the consequence of their recapitalization in 2007 (Bolduc, 2012). Important to note is that the maximum value of the level of risk is much higher than the mean value, which could suggest the existence of outliers. The presence of outliers could lead to inflated error rates and distortions of statistic estimates and parameters (Osborne & Overbay, 2008). Table 16 in appendix 8 shows that only 0.59% of the total sample has a risk level higher than one. However, as these outliers are not the result of measurement errors but indicate current situations of firms, they are a legitimate part of the data and reveal important information (Osborne & Overbay, 2008). Therefore, it is decided is to retain these outliers in the sample.

Panel B of table 16 shows the descriptive statistics of all seven dimensions of CSR. It could be noticed that the highest average CSR score belongs to the community dimension. A possible reason could be that the CSR activities in the community dimension are relatively visible to consumers in comparison to other dimensions, which makes it attractive for firms to invest in this dimension (Fisman et al., 2005). Additionally, due to the high visibility of CSR activities in the

community dimension relative to other dimensions, firms could feel more pressure from their customers to engage in these kind of CSR activities (Margolis et al., 2009). The lowest average CSR score applies to the corporate governance dimension. An explanation could be that this dimension is associated with complex and strict legislation, which makes it harder for firms to make good investment decisions within this dimension. Therefore, it would be likely that firms prefer to invest in other dimensions (Nollet et al., 2016). The diversity dimension exhibits the highest volatility relative to the other CSR dimensions, given its standard deviation. By contrast, the lowest volatility belongs to the human rights dimension. This could be explained by the fact that the firms of the sample might have different programs concerning other dimensions like community and product, but that they exhibit a relatively similar human rights performance due to legislation. For example, labor rights of employees are established by law and firms do not have any individual maneuvering space to circumvent these laws (Wettstein, 2012).

4.2. Correlation analysis

Table 17 presents the correlation coefficients between CSR measures, financial performance measures and the control variables, based on the widely used Pearson's correlation coefficients. Pearson's correlation coefficients are used because they are parametric statistics, which is the most appropriate measure of the correlation between linear related variables. The correlation coefficients range from -1 to +1, which points at perfect negative and positive correlations, respectively (Verbeek, 2008). As explained in paragraph 3.5, financial performance is considered to have a delayed response to CSR, and therefore the CSR measures are lagged by one year in the correlation matrix.

Correlation matrix

Variables	ROA	TQ	CSR	CGOV	COM	DIV	ENV	EMP	HUM	PRO	SIZE	RISK
ROA	1.0000											
TQ	0.0884 ***	1.0000										
CSR	0.0409 ***	-0.0824 ***	1.0000									
CGOV	-0.0192 ***	-0.0290 ***	0.3392 ***	1.0000								
COM	0.0319 ***	-0.0698 ***	0.4834 ***	-0.0038	1.0000							
DIV	0.0644 ***	-0.1385 ***	0.6258 ***	-0.0843 ***	0.2935 ***	1.0000						
ENV	0.0082	0.0089	0.5364 ***	0.0707 ***	0.2514 ***	0.1180 ***	1.0000					
EMP	0.0440 ***	-0.0190 ***	0.4943 ***	0.0020 ***	0.1098 ***	0.1108 ***	0.0795 ***	1.0000				
HUM	-0.0411 ***	-0.0049	0.1811 ***	0.1046	-0.0162 **	-0.1234 ***	0.1849 ***	0.0434 ***	1.0000			
PRO	-0.0445 ***	0.1034 ***	0.2534 ***	0.1694 ***	-0.0680 ***	-0.2048 ***	0.1189 ***	0.0692 ***	0.1766 ***	1.0000		
SIZE	0.1811 ***	-0.3154 ***	0.1219 ***	-0.2585 ***	0.1908 ***	0.4103 ***	-0.0251 ***	0.1089 ***	-0.1879 ***	-0.3433 ***	1.0000	
RISK	-0.0797 ***	0.2917 ***	-0.0766 ***	-0.0993 ***	-0.0252 ***	-0.0292 ***	0.0095	-0.0610 ***	0.0062	-0.0198 ***	0.0875 ***	1.0000

Note: The significance levels are indicated by ***, **, and * for 1%, 5%, and 10%, respectively. For size the natural logarithm is taken. The CSR variable is lagged with one year, even as all different dimensions of CSR.

Table 17: Correlation matrix, presents the correlation coefficients between all variables, based on Pearson's correlation coefficients.

The correlation coefficients in the matrix are generally moderate in magnitude and most of them are statistically significant at the 1%-level, based on a two-tailed test. The correlation between lagged CSR and ROA is significant at the 1%-level and slightly positive (0.0409), which suggests that a higher CSR is associated with a higher ROA in the next year. The correlation between lagged CSR and Tobin's q is significant at the 1%-level and slightly negative (-0.0824), which indicates that the CSR activities decrease Tobin's q in the next year. These correlations give a first indication that CSR positively affects the accounting-based measure of financial performance (ROA) and that CSR has a negative effect on the market-based measure of financial performance (Tobin's q). However, it does not address issues of causality, because correlation is no causation. Even when the correlation between two variables is high, a causative connection does not have to exist (Verbeek, 2008). Also important to note is that the correlation analysis does not shed much light on whether the one variable antecedes the other variable or vice versa (Verbeek, 2008).

The matrix shows that the highest negative correlation exists between firm size and the lagged product dimension of CSR (-0.3433). The highest positive correlation exists between the lagged diversity dimension of CSR and lagged CSR (0.6258), followed by the correlation between the lagged environmental dimension of CSR and lagged CSR (0.5364). This can be explained by the fact that these dimensions are components of the total CSR score. Although these correlation values are high, they do not raise concerns for issues of multicollinearity.

In addition, the matrix shows that the different lagged dimensions of CSR are not only significantly and positively associated with the lagged CSR score, but it also shows that almost all

of them are significantly associated with each other. The only exception is the association between the lagged corporate government dimension and the lagged human rights dimension, which turned out to be nonsignificant. This suggests that little contemporaneous association exists between these two dimensions.

The control variables firm size and the level of risk are significantly correlated with financial performance, as was expected from the literature review. However, the signs of the correlation coefficients depend on which measures of financial performance is used. ROA and Tobin's q are significant and positively correlated with each other at the 1% level (0.0884). This is in line with the expectations, because even though ROA is an accounting-based measure and Tobin's q is a market-based measure, they both measure financial performance.

In contrast to what was predicted, not all lagged CSR dimensions are significantly correlated with measures of financial performance. This applies to the association between the lagged environmental dimension and both measures of financial performance and to the association between the lagged human rights dimension and Tobin's q. This makes it interesting to investigate the effect of the different lagged CSR dimensions on financial performance, instead of only measuring the effect of the total lagged CSR score on financial performance. This is done in paragraph 4.3.2.

Figure 9 and 10 in appendix 9 show the scatterplots of lagged CSR in relationship with both measures of financial performance. They provide a visual picture of the association between these variables, in which all years of the dataset are presented as a dot. The scatterplots clearly indicate that CSR is positively associated with next year's ROA, while CSR is negatively associated with next year's Tobin's q. As a scatterplot is just a visual representation of the correlation, these findings are in line with the correlation coefficients as presented in table 17 (0.0409 and -0.0824 respectively). Again, correlation does not address issues of causality. In order to provide more insight into the effect of CSR on financial performance, the results of the panel data regression analyses are discussed in the next paragraph.

4.3. Panel data analysis

The existing literature on the link between CSR and financial performance mainly conducted cross-sectional analysis or panel data analysis. This research makes use of panel data analysis, because this provides some important advantages. First, with panel data it is possible to

analyze causal effects while adjusting for unobserved characteristics. Therefore, panel data analysis is able to isolate the effects of specific actions, treatments or more general policies (Hsiao, 2003). Second, panel data analysis can solve the problem of unobserved heterogeneity, of which cross-sectional analysis may suffer (Dougherty, 2007).

In this paragraph, the output of the three panel data regressions is shown. The interpretation of this output is mainly done in the discussion section of this research. As already stated, all regression results in this study are based on robust (White, 1980) standard errors and all tests are conducted with cross-sectional and time fixed effects.

4.3.1. Panel data analysis hypothesis 1

The first panel data analysis tests the null hypothesis that CSR has no effect on financial performance, while controlling for firm size and the level of risk and by using Tobin's Q and ROA as dependent variables. The regression output is shown in table 18. The first two specifications concern the effect of CSR on ROA, whereas the latter two specifications focus on the effect of CSR on Tobin's q. In addition, specification 1 and 3 show the regression outputs of the base model without the inclusion of control variables, while the control variables and the interaction term are included in the regressions in specification 2 and 4. In this way, the additional explanatory power of the model that includes the control variables relative to the base model is shown.

As an interaction term is added to the model, the coefficient of CSR should be interpreted carefully. When the coefficient of the interaction term is significant, it implies that the effect of CSR on financial performance is sensitive to the level of risk. In other words, the effect of CSR on financial performance is different at different levels of risk. Without the inclusion of the interaction term in the model, β_1 would solely describe the unique effect of CSR on financial performance. However, by including the interaction term, the effect of CSR on financial performance is not only measured by β_1 anymore. It also depends on the value of β_2 and the level of risk. β_1 is only equal to the unique effect of CSR on financial performance when the level of risk is equal to zero (Wooldridge, 2002).

Regression output hypothesis 1				
<i>Cross-sectional and time fixed effects model</i>				
Independent variable	Dependent variable			
	(1)	(2)	(3)	(4)
	ROA	ROA	TQ	TQ
α	0.0195 *** (65.1966)	-0.3277 *** (-5.2968)	0.6540 *** (2726.0330)	0.2539 *** (4.1691)
CSR	0.0002 (0.3007)	0.0001 (0.1158)	0.0003 (0.5358)	-0.0010 (-1.3875)
CSR*RISK		0.0010 (0.2875)		0.0064 ** (2.1606)
RISK		-0.2329 *** (-10.0724)		0.0577 *** (3.2447)
SIZE		0.0524 *** (6.2700)		0.0522 *** (6.3604)
Observations	20594	20594	20594	20594
F-statistic	7.4436	8.0627	43.776	46.129
Prob(F-statistic)	0.0000	0.0000	0.0000	0.0000
R ²	0,6169	0,6358	0,9045	0,9090

Note: The t-statistics are stated between parentheses and the levels of significance are indicated by ***, **, and * for 1%, 5%, and 10%, respectively. For size the natural logarithm is taken. CSR is lagged one year. All regression results are based on robust (White, 1980) standard errors.

Table 18: Regression output hypothesis 1

According to hypothesis H1, expected is that CSR has a statistically significant and positive effect on financial performance. However, in conflict with H1, CSR turns out to have a nonsignificant relationship with next year's financial performance as shown in specification 2 ($\beta_1 = 0.0001$, $p > .10$; $\beta_2 = 0.0010$, $p > .10$). Therefore, the null hypothesis cannot be rejected when ROA is used as a measure of financial performance.

Specification 3 and 4 report on the effect of CSR on financial performance when using Tobin's q as a measure of financial performance. In line with H1, CSR turns out to have a significant and positive relationship with next year's financial performance measured by Tobin's q. This is caused by the interaction term between CSR and the level of risk, which captures whether CSR may affect next year's financial performance via the level of risk. Without this interaction term, the individual effect of CSR on next year's financial performance would be negative and nonsignificant ($\beta_1 = -0.0010$, $p > .10$). The interaction term is significant and positive ($\beta_2 = 0.0064$, $p < .05$). The regression output shows that an increase in CSR by 1 percentage point

leads to a change of next year's Tobin's q of $(0.0064 * \text{RISK})$ percentage point, ceteris paribus. Therefore, the effect of CSR on next year's financial performance strongly depends on the level of risk. Given this finding, the null hypothesis is rejected when Tobin's q is used as a measure for financial performance.

In addition, when it comes to control variables, table 18 shows that the control variables in specifications 2 and 4 are significant at the 1% significance level. The coefficient of firm size in the model with ROA as dependent variable is almost equal to the coefficient of firm size in the model with Tobin's q as dependent variable. They show that an increase in firm size by 1% leads to an increase of ROA and Tobin's q by respectively 0.0524 and 0.0522 percentage point, ceteris paribus. The control variable risk has a significant effect on the accounting-based and the market-based measure of financial performance, although not in the same direction. The control variable risk in specification 2 exhibits a negative sign. It shows that an increase in the level of risk by 1% leads to a decrease of ROA by 0.2329 percentage point, ceteris paribus. Against the expectations based on the existing literature, the level of risk is positively related to financial performance in specification 4. It shows that an increase in the level of risk by 1% leads to an increase of Tobin's q by 0.0577 percentage point, ceteris paribus.

As shown in table 18, the regression outputs slightly changed after adding the interaction term between CSR and risk and the control variables level of risk and firm size. The main difference is the significance of CSR in specification 4, via the interaction term of CSR and the level of risk. In addition, worth mentioning is that the explanatory power increased a bit after adding the control variables. Both F-statistics are significant at the 1%-level ($p < .01$) and therefore show the joint significance of the variables. The explanatory power of specification 2 and 4 is relatively high: 63.58% and 90.90% for ROA and Tobin's q respectively. This means that around 63.58% of the variation in ROA can be explained by CSR and that around 90.90% of the variation in Tobin's q can be explained by CSR. The output of this regression output is further interpreted and discussed in the discussion section of this research.

4.3.2. Panel data analysis hypothesis 2

The analysis is taken a step further by examining the relation between different dimensions of CSR and financial performance. Therefore, the same two models are running again, but then using the seven different dimensions of CSR as main independent variables instead of one overall

CSR measure. In this way, the effects of the different dimensions of CSR on financial performance are disaggregated. These regressions test the null hypothesis that the effect of CSR on financial performance does not vary across different dimensions of CSR. Again, the tests are conducted with cross-sectional and time fixed effects and by using robust (White, 1980) standard errors.

Table 19 shows the effect of CSR in the different dimensions on next year's financial performance. Again, the first two specifications concern the effect of CSR on next year's ROA, whereas the latter two specifications focus on the effect of CSR on next year's Tobin's q. In addition, specification 5 and 7 show the regression outputs of the base model without the inclusion of control variables, while the interaction term and the control variables are included in the regressions in specification 6 and 8. In this way, the additional explanatory power of the model that includes the control variables relative to the base model is shown.

In line with H2, evidence is found that the effect of CSR on next year's financial performance differs across different dimensions of CSR. Next year's ROA is significant related to two out of seven dimensions, while next year's Tobin's q is only significant related to one out of seven dimensions. Worth mentioning is that for almost all significant CSR dimensions, whether CSR leads to better or worse next year's financial performance depends on the interaction between CSR and the level of risk.

The regression output for ROA, including control variables, is shown in specification 6. This specification indicates that CSR in the corporate governance dimension is significant related to next year's financial performance ($\beta_1 = 0.0069$, $p < .05$; $\beta_2 = -0.0180$, $p < .10$). The regression output shows that an increase in the corporate governance dimension by 1 percentage point leads to a change of next year's ROA of $(0.0069 - 0.0180 \cdot \text{RISK})$ percentage point, *ceteris paribus*. Therefore, the effect of CSR in the corporate governance dimension on next year's financial performance strongly depends on the level of risk. In addition to the corporate governance dimension of CSR, also CSR in the human rights dimension shows a significant relationship with next year's financial performance, measured by ROA ($\beta_{11} = -0.0108$, $p < .10$).

Specification 8 in table 19 shows the effect of CSR in the different dimensions on next year's financial performance when Tobin's q is used as a measure of financial performance. Only CSR in the community dimension ($\beta_4 = 0.0197$, $p < .10$) turned out to be significant and positive related to next year's financial performance via the level of risk.

Regression output hypothesis 2				
<i>Cross-sectional and time fixed effects model</i>				
Independent variable	Dependent variable			
	(5) ROA	(6) ROA	(7) TQ	(8) TQ
α	0.0204 *** (30.8700)	-0.3304 *** (-5.3197)	0.6541 *** (1090.2940)	0.2515 *** (4.0989)
CGOV	0.0041 * (1.8927)	0.0069 ** (2.1281)	0.0000 (0.0293)	0.0000 (-0.0197)
CGOV*RISK		-0.0180 * (-1.6932)		0.0005 (0.0680)
COM	-0.0015 (-0.9704)	-0.0030 (-1.3618)	-0.0003 (-0.1207)	-0.0036 (-1.2190)
COM*RISK		0.0164 (1.5383)		0.0197 * (1.6971)
DIV	-0.0021 (-1.3508)	-0.0027 (-1.3088)	0.0003 (0.2122)	-0.0011 (-0.6452)
DIV*RISK		0.0032 (0.4544)		0.0049 (0.7187)
EMP	0.0033 * (2.2750)	0.0013 (0.5567)	-0.0005 (-0.3483)	-0.0030 (-1.4092)
EMP*RISK		0.0017 (0.1891)		0.0077 (1.0950)
ENV	-0.0005 (-0.2919)	-0.0010 (-0.3870)	0.0006 (0.3631)	0.0005 (0.2164)
ENV*RISK		0.0119 (1.1532)		0.0041 (0.4893)
HUM	-0.0059 (-1.5795)	-0.0108 * (-1.6568)	0.0037 (0.8484)	0.0030 (0.5011)
HUM*RISK		0.0335 (1.2614)		0.0163 (0.7468)
PRO	-0.0021 (-0.9647)	0.0007 (0.1991)	0.0010 (0.4872)	-0.0012 (-0.3857)
PRO*RISK		-0.0149 (-0.9803)		0.0110 (1.0413)
RISK		-0.2405 *** (-10.0257)		0.0554 *** (2.9234)
SIZE		0.0529 *** (6.3031)		0.0526 *** (6.34680)
Observations	20594	20594	20594	20594
F-statistic	7.4519	8.0507	43.6952	46.9876
Prob(F-statistic)	0.0000	0.0000	0.0000	0.0000
R ²	0,6181	0,6364	0,9045	0,9091

Note: The t-statistics are stated between parentheses and the levels of significance are indicated by ***, **, and * for 1%, 5%, and 10%, respectively. For size the natural logarithm is taken. The dimensions of CSR are lagged one year. All regression results are based on robust (White, 1980) standard errors.

Table 19: Regression output hypothesis 2

Therefore, support is found in favor of the second hypothesis that the effect of CSR on financial performance varies across different dimensions of CSR. As a result, the null hypothesis is rejected for both measures of financial performance

When turning to the control variables, it is shown that the control variables are significant at the 1% significance level. This is in line with the first model. Again, the coefficients of the control variables exhibit the expected signs, except for the level of risk in relation to Tobin's q as shown in specification 8. The coefficients of the control variables only have changed little in comparison to the previous models.

As shown in table 19, the regression outputs changed after adding the control variables firm size, risk and the interaction terms between the different dimensions of CSR and the level of risk. In the model with ROA as dependent variable, the main difference is that CSR in the employee relations dimension becomes insignificant after adding the control variables. The opposite happened to the interaction term of CSR in the corporate governance dimension and the level of risk, which becomes significant after adding the control variables. This is also the case for CSR in the human rights dimension. In the model with Tobin's q as dependent variable, the interaction term between CSR in the community dimension and risk becomes significant after adding the control variables. Moreover, for both models, the explanatory power slightly increased after adding the control variables.

All F-statistics are significant at the 1%-level ($p < .01$) and therefore show that the variables are jointly significant. The addition of the seven dimensions of CSR to the model slightly increases the explanatory power of the models. As shown in table 19, 63.64% of the variation in ROA can be explained by CSR and around 90.91% of the variation in Tobin's q can be explained by CSR.

The output of this regression output is further interpreted and discussed in the discussion section of this research.

4.3.3. Panel data analysis hypothesis 3

In order to fully examine the effect of CSR on financial performance, table 20 examines the relation between CSR and financial performance separately for each industry. As already explained in the data description, the total sample is disaggregated into nine separate industries by using SIC codes. Note that the amount of observations shown in table 20 does not correspond with the amount of observations shown in table 5. This is caused by the fact that the observations for

the first year that a firm is positioned in the MSCI KLD index are excluded from the sample as a firm-year observation in the estimations, as the lagged variable of CSR is used in the model. The regressions in table 20 test the null hypothesis that the effect of CSR on financial performance does not vary across industries.

As presented in table 20, specification 9 concerns the effect of CSR on next year's ROA, whereas specification 10 focuses on the effect of CSR on next year's Tobin's q. The base models without control variables are left out from the table in order to increase readability. Specification 9 shows that CSR is significant related to ROA in the retail trade industry ($\beta_2 = 0.0101$, $p < .10$) via the level of risk and to the nonclassifiable industry ($\beta_1 = 0.0432$, $p < .10$). For example, an increase in CSR performance by 1 percentage point in the retail trade industry is associated with an $(0.0101 \cdot \text{RISK})$ percentage point increase in next year's ROA, *ceteris paribus*. Therefore, the effect of CSR on next year's financial performance in the retail trade industry depends on the level of risk. An increase in CSR of 1 percentage point in the nonclassifiable industry is associated with an increase in next year's ROA of 0.0432 percentage point, *ceteris paribus*. The interaction term is nonsignificant for the nonclassifiable industry, indicating that the effect of CSR on next year's financial performance in this industry is constant across all level of risk.

When Tobin's q is used as a measure for financial performance, other results are found, as shown in specification 10. CSR turns out to be significantly related to next year's Tobin's q only in the manufacturing industry and retail trade industry. The regression output shows that the effect of CSR on next year's financial performance in the manufacturing industry depends on the level of risk ($\beta_2 = 0.0112$, $p < .05$). This is also the case for the retail industry ($\beta_1 = -0.0051$, $p < .01$; $\beta_2 = 0.0157$, $p < .01$). An increase in CSR performance by 1 percentage point in the manufacturing industry is associated with an $(0.0112 \cdot \text{RISK})$ percentage point increase in next year's Tobin's q, *ceteris paribus*. An increase in CSR performance by 1 percentage point in the retail trade industry is associated with an $(0.0157 \cdot \text{RISK} - 0.051)$ percentage point increase in next year's Tobin's q, *ceteris paribus*. Hence, support is found in favor of the third hypothesis that the effect of CSR on financial performance varies across industries.

Regression output hypothesis 3

Cross-sectional and time fixed effects model

Sector	Dependent variable: ROA (9)					Dependent variable: TQ (10)					R ²	
	α	CSR	CSR*RISK	RISK	SIZE	R ²	α	CSR	CSR*RISK	RISK		SIZE
MIN (N=844)	-0.0058 (-0.0336)	-0.0053 (-1.2276)	0.0171 (0.7517)	-0.3859 *** (-2.6117)	0.0156 (0.7349)	0.5942	0.6299 *** (5.0290)	-0.0002 (-0.0640)	0.0013 (0.1116)	0.1110 * (1.9267)	0.0093 (0.5703)	0.8538
CONS (N=243)	-0.5382 ** (-2.0268)	0.0102 (1.1725)	-0.0127 (-0.6119)	-0.1897 (-1.3657)	0.0815 *** (2.6255)	0.5925	0.6032 * (1.9615)	-0.0009 (-0.1431)	0.0192 (1.2936)	0.0613 (0.4702)	0.0101 (0.2677)	0.9150
MANU (N=8090)	-0.6433 *** (-6.0718)	0.0015 (0.8716)	-0.0053 (-0.8520)	-0.2934 *** (-8.8124)	0.1003 *** (6.5700)	0.6713	0.1930 *** (2.6227)	-0.0020 (-1.4674)	0.0112 ** (2.0349)	0.0231 (0.8203)	0.0738 *** (6.9171)	0.7686
TRSP (N=1961)	0.0214 (0.1108)	-0.0043 (-1.1750)	0.0073 (1.3093)	-0.1647 *** (-3.5342)	0.0040 (0.1752)	0.4726	0.2092 (1.5268)	0.0010 (0.8357)	0.0032 (0.6877)	0.0374 (0.9533)	0.0567 *** (3.4119)	0.8284
WHOT (N=520)	-0.2630 (-1.3135)	0.0030 (0.5485)	0.0034 (0.1248)	-0.1196 * (-1.9124)	0.0460 (1.6216)	0.5434	0.4831 *** (2.8412)	-0.0002 (-0.0692)	0.0072 (0.7139)	0.1993 *** (3.6540)	0.0187 (0.8005)	0.9392
RETT (N=1383)	-0.0083 (-0.0865)	-0.0021 (-0.9394)	0.0101 * (1.6625)	-0.1480 *** (-3.1403)	0.0128 (0.9534)	0.5845	0.2199 ** (2.1395)	-0.0051 *** (-2.6708)	0.0157 *** (2.7587)	0.0479 ** (2.0861)	0.0607 *** (4.2993)	0.9051
FIN (N=4474)	-0.0242 (-0.3103)	0.0005 (0.9139)	-0.0024 (-0.6038)	-0.1695 *** (-3.0734)	0.0089 (0.9314)	0.7228	0.6349 *** (3.8487)	0.0006 (0.4099)	0.0015 (0.2850)	0.1543 *** (2.9475)	-0.0201 (-1.0160)	0.9737
SERV (N=3036)	-0.1043 (-0.7756)	-0.0019 (-0.6434)	0.0074 (0.7519)	-0.1385 ** (-2.1125)	0.0240 (1.2171)	0.5491	0.0437 (0.3998)	-0.0018 (-0.7005)	0.0016 (0.1648)	0.0747 * (1.6923)	0.0924 *** (5.7417)	0.8472
NONC (N=43)	-0.0902 (-0.0579)	0.0432 * (1.8019)	-0.0752 (-1.6522)	-1.1255 (-1.4680)	0.0313 (0.1710)	0.8183	0.4168 (0.5692)	-0.0032 (-0.2286)	0.0184 (0.3927)	0.3450 ** (2.2973)	0.0317 (0.3786)	0.9035

Note: The t-statistics are stated between parentheses and the levels of significance are indicated by ***, **, and * for 1%, 5%, and 10%, respectively. For size the natural logarithm is taken. CSR is lagged one year. All regression results are based on robust (White, 1980) standard errors.

Table 20: Regression output hypothesis 3

When turning to the control variables, it is shown that the control variable risk is highly significant and negatively related to ROA in seven out of nine industries ($p < .10$).³⁰ The control variable risk is positive and significant related to Tobin's q in six out of nine industries ($p < .10$).³¹ The control variable firm size is significant and positive related to ROA in the construction industry and the manufacturing industries ($p < .01$). Additionally, the control variable firm size is positive and significant related to Tobin's q in four out of nine industries ($p < .01$).³²

Again, the explanatory power is higher in all models where Tobin's q is used as a measure of financial performance, relative to the models where ROA is used. The output of this regression output is further interpreted and discussed in the discussion section of this research.

5. Conclusion

This study examines whether the financial performance of firms is affected by their CSR performance. The hypothesis states that a positive relationship exists between CSR and financial performance, which is based on the enlightened stakeholder theory and the existing literature. In addition, the second hypothesis states that the effect of CSR on financial performance varies across different dimensions of CSR and the third hypothesis states that the effect of CSR on financial performance varies across industries. These hypotheses have been tested by executing multiple regressions on a sample of 5272 unique firms over the period of 2000 until 2013, resulting in 27440 observations. An accounting based-measure and a market-based measure are used to measure financial performance, while the MSCI KLD index is used as a proxy for CSR. Firm size and the level of risk are included as control variables, the tests are conducted with cross-sectional and time fixed effects and the standard errors are adjusted for heteroscedasticity by using White standard errors.

By revisiting the main research question, the following conclusions can be formulated. This study finds general support for the hypothesized positive relationship between CSR and next year's financial performance when a market-based measure of financial performance is used. This finding is in line with the existing literature and the enlightened stakeholder theory. Therefore, the results

³⁰ Risk is negatively related to ROA in the mining industry, manufacturing industry, transportation industry, wholesale trade industry, retail trade industry, the financial industry and the service industry. Nonsignificant results are obtained in the construction industry and nonclassifiable industry.

³¹ Risk is positively related to Tobin's q in the mining industry, wholesale trade industry, retail trade industry, financial industry, service industry and the nonclassifiable industry. Nonsignificant results are obtained in the construction industry, manufacturing industry and transportation industry.

³² Size is positively related to Tobin's q in the manufacturing industry, transportation industry, retail trade industry and the service industry.

of this research show the advantages of adopting CSR activities when using a market-based measure of financial performance. However, when financial performance is measured by an accounting-based measure, nonsignificant results are obtained. In addition, this study finds support in favor of the second hypothesis that the effect of CSR on financial performance varies across different dimensions of CSR. This finding holds when using either an accounting-based measure or a market-based measure of financial performance. CSR in the corporate governance dimension and in the community dimension could be considered as the key drivers to improve next year's financial performance, although depending on the level of risk of the firm. This suggests that CSR investments should be directed to these dimensions. CSR in the human rights dimension shows a negative effect on next year's financial performance. Lastly, the evidence of this research supports the third hypothesis that states that the effect of CSR on financial performance varies across industries. CSR in the manufacturing industry and in the retail trade industry show significant effects on next year's financial performance. The effect of CSR on next year's financial performance in the manufacturing industry is positive, while the sign of the effect of CSR on next year's financial performance in the retail trade industry depends on the measure of financial performance.

6. Discussion

First in this section, research implications of the results are evaluated and interpreted in paragraph 6.1. Thereafter, paragraph 6.2 formulates the policy implications for managers and shareholders. Then, paragraph 6.3 identifies and acknowledges the limitations of this research that should be addressed in future studies, followed by recommendations to accomplish this in paragraph 6.4. These recommendations could strengthen future research and help to advance the field.

6.1. Research implications

This research has investigated the effect of CSR on financial performance. In addition, it has been tested whether this effect varies across different dimensions of CSR and across industries. This study reviewed literature and provided empirical support by using a data on US firms that were included in the MSCI KLD index. Because of the longitudinal nature of the sample, its wide industry coverage, the different proxies for financial performance and the complete set of control

variables, this research provided a complete picture of the effect of CSR on financial performance. In this paragraph, the research implications are discussed for every hypothesis separately.

6.1.1. First hypothesis

Based on the enlightened stakeholder theory and the extensive literature review, this study predicted that CSR positively affects financial performance and based on that, the first hypothesis is formulated. While controlling for firm size and the level of risk, including an interaction term between CSR and risk, taking a lag-time of CSR of one year and using robust (White, 1980) standard errors, support is found for this hypothesized positive relationship when a market-based measure of financial performance is used (specification 4). This is caused by the interaction term between CSR and the level of risk, which captures whether CSR may affect next year's financial performance via the level of risk. As the level of risk only takes values of zero or higher in the sample of this research ($0 \leq \text{RISK} \leq 3.6757$), the coefficient of CSR on next year's Tobin's q is positive. A positive interaction term implies that increasing CSR yields increasing next year's financial performance, but the size of this effect depends on the level of risk. When the level of risk is between zero and one, the size of the effect of CSR on next year's financial performance is reduced by the level of risk.³³ However, when the level of risk is higher than one, the size of the effect of CSR on next year's financial performance is magnified by the level of risk.³⁴ This suggests that firms with a relative high level of risk (above one) experience a bigger increase in next year's financial performance after an increase in CSR in comparison to lower leveraged firms. This could be explained by the fact that a relative high level of risk of the firm makes the shareholders more sensitive to believe that the CSR investments are a credible commitment towards an improvement of the financial situation of the firm (i.e. lower debt ratio and higher profits). This could increase the market value of the firm and consequently, it could increase profits in the next year.

The size of the coefficient of the interaction term between CSR and risk is low in comparison to similar studies. Even when the highest amount of risk is assumed ($\text{RISK}_{\text{MAX}} = 3.6757$), the coefficient of CSR shows a lower value (0.0235) than the average effect size of CSR on financial performance equal to 0.093 that was found in the meta-analysis of Wu (2006). The

³³ The level of risk is between zero and one for 71.28% of the observations in the sample ($19559/27440 \cdot 100 = 71.28\%$)

³⁴ The level of risk is higher than one for 0.59% of the observations in the sample ($163/27440 \cdot 100 = 0.59\%$). This percentage plus the percentage of observations with a level of risk between zero and one does not sum up to 100%, due to observations that are equal to zero and equal to one.

small size of the coefficient of the interaction term could suggest that its importance should not be overestimated. However, one could also argue that CSR is only one of the instruments of a firm to increase its financial performance. Therefore, when combining this instrument with other profit enhancing instruments, this could lead to bigger effects on financial performance. In addition, an increase of only 1% is not a likely increase of CSR. Given the characteristics of the dimensions of CSR, improvements of CSR are not likely to be implemented by many small steps. In contrast, improvements are more likely to be made by one big step once in a certain period (e.g. every six months). This is confirmed by the research of Kang et al. (2016), who suggested that firms evaluate and plan their CSR goals and activities once a year or even less frequently. These shock wise improvements are even strengthened by the method of the KLD index of giving a score of one when a particular social action is present and a score of zero when this action is absent. Therefore, the coefficient of CSR seems to be small, but this should be put in perspective.

When turning to the model where an accounting-based measure (ROA) is used as a measure for financial performance (specification 2), nonsignificant results are obtained. Therefore, no support for the first hypothesis is found. This is in line with the finding of McWilliams and Siegel (2000), who argued that positive or negative relationships that are found by other researchers are biased due to specification errors. According to their research, any relationship between CSR and financial performance only could exist by chance, as too many variables play a role in this relationship.

When turning to the control variable size, it is shown that the control variable firm size has a significant and positive effect on financial performance (specification 2 and 4). This is in line with the expectations, as it was hypothesized that firm size is positively related to financial performance. This can be explained by the finding that larger firms generate relatively stronger competitive capabilities than smaller firms do. This is mainly caused by economics of scope and scale, their better access to resources and greater market power (Clegg, Hardy, & Nord, 1996). Worth mentioning is that the size of the coefficient of the control variable size (0.0524 in the second specification and 0.0522 in the fourth specification) turns out to be relatively high in comparison to findings in the existing literature. For example, Wu (2006) stated that the average effect size of the variable size as measured by assets is equal to 0.010, based on their meta-analysis. A possible

explanation for this discrepancy is that most of the firms included in this analysis are large corporations, as only publicly traded companies are listed in the index (Wu, 2006).³⁵

When turning to the control variable risk, it is found that risk is significant and negative related to ROA (specification 2). This is in line with the existing literature (Waddock & Graves, 1997). The underlying argumentation is that debt could lead to financial distress, which in turn could lead to harmful decisions of managers for stakeholders and more manoeuvring space for competitors to capture market share (Opler & Titman, 1994). However, the level of risk is significant and positive related to Tobin's q (specification 4), which contradicts the expectations. This suggests that a higher debt ratio, *ceteris paribus*, increases Tobin's q. A possible explanation could be that investors expect that a higher debt ratio is caused by investments that will pay off in the future. In other words, investors could value the risk-taking behavior of the firm (Campello, 2006). This suggests that the market-based measure of financial performance is positively related with the level of risk. This is also confirmed by the calculation of Tobin's q, where the book value of long-term debt and net current liabilities are part of the proxy of the market value of assets, which is the numerator of the fraction. Therefore, an increase of the long-term debt or the net current liabilities leads to an increase of the numerator of the fraction, which in turn increases Tobin's q. The above results regarding the control variables support the importance of controlling for firm size and the level of risk when investigating the effect of CSR on financial performance, as is often acknowledged in the existing literature.

It is worth noting that while no hypotheses are proposed for the appropriateness of the dependent variables in investigating the effect of CSR on financial performance, the explanatory power of the model with ROA as dependent variable turns out to be lower than the explanatory power of the model with Tobin's q as dependent variable. This finding is not in line with the expectations, as the existing literature has shown that an accounting-based measure of financial performance turns out to be more appropriate than a market-based measure when investigating the effect of CSR on financial performance. For example, Orlitzky et al. (2003) found that accounting-based measures were higher correlated with CSR than market-based measures. However, this finding is in line with the study of Makni et al. (2009). As already mentioned in the literature review, they only found a significant relationship between CSR and financial performance by using

³⁵ This is more extensively discussed in the limitations of this research (paragraph 6.3).

a market-based measure of financial performance. Nonsignificant results are obtained when an accounting-based measures of financial performance is used.

Concluding the results for the first hypothesis, a positive effect is found of CSR on next year's financial performance when using Tobin's q as a measure of financial performance, although the size of this effect depends on the level of risk. This finding is in line with the dominant stream of literature and the enlightened stakeholder theory (e.g. Margolis et al., 2009; Orlitzky et al., 2003; Ullmann, 1985; Waddock & Graves, 1997). Therefore, the results of this research show the advantages of adopting CSR activities when using a market-based measure of financial performance. However, when ROA is used as a measure of financial performance, nonsignificant results are obtained.

6.1.2. Second hypothesis

Support is found in favor of the second hypothesis that the effect of CSR on financial performance varies across different dimensions of CSR. This finding holds when using either ROA or Tobin's q to measure financial performance. Next year's ROA is significant related to two out of seven dimensions of CSR, while next year's Tobin's q is related to one out of seven dimensions of CSR.

Regression outputs show that CSR in the corporate governance dimension and in the human rights dimension significantly affects next year's ROA (specification 6). The effect of CSR in the corporate governance dimension on next year's ROA depends on the level of risk. Only with low levels of risk (approximately between 0 and 0.3833³⁶), the effect of CSR in the corporate governance dimension positively affects next year's financial performance. This is in line with the finding of Nollet et al. (2016) and Słowski et al. (2014), who found that CSR in the government dimension positively affects next year's financial performance. They argued that CSR activities related to governance improvements are considered as a credible commitment of firms towards CSR and therefore, it increases financial performance. When the level of risk passes the certain threshold value of approximately 0.3833, the effect of CSR in the corporate governance dimension on next year's ROA becomes negative. The negative relationship between CSR in the corporate governance dimension and next year's financial performance supports the view of Friedman (1970), who stated that the only responsibility of a firm is to maximize profits. However, only

³⁶ Calculated by $(\beta_1 / -\beta_2) = (0.0069 / 0.0180) = 0.3833$

16.52% of the observations in the sample has a level of risk that is higher than the threshold value of 0.3833.³⁷ Therefore, it is more likely that the effect of CSR in the corporate governance dimension positively affects next year's ROA. As already explained, this finding is in line with the dominant stream of literature and the enlightened stakeholder theory. When the level of risk is between 0.3833 and one, the size of the negative effect of CSR in the corporate governance dimension on next year's ROA is reduced by the level of risk. However, when the level of risk is higher than one, the size of the effect of CSR in the corporate governance dimension on next year's ROA is magnified by the level of risk. This could be explained by the fact that a relative high level of risk of the firm makes the stakeholders more sensitive to believe that the CSR investments in the corporate governance dimension are a credible commitment towards an improvement of the financial situation of the firm (i.e. lower debt ratio and higher profits). This could increase profits in the next year.

In addition to CSR in the corporate governance dimension, also CSR in the human rights dimension shows a significant relationship with next year's financial performance, measured by ROA ($\beta_{11} = -0.0108$, $p < .10$). Specifically, an increase of CSR in the human rights dimension by 1 percentage point leads to a decrease of next year's ROA of 0.0108 percentage point, *ceteris paribus*. As the interaction term between CSR in the human rights dimension and the level of risk is nonsignificant, the effect of CSR in the human rights dimension on ROA seems to be constant across all level of risk. Again, the found negative relationship is in line with the view of Friedman (1970).

CSR in the community dimension is significantly related to next year's Tobin's q via the level of risk ($\beta_4 = 0.0197$, $p < .10$) (specification 8). As the level of risk only takes values of zero or higher in the sample of this research ($0 \leq \text{RISK} \leq 3.6757$), CSR in the community dimension is positively related to next year's Tobin's q. This is in line with the existing literature as described in paragraph 2.5.2, which mainly suggested that the financial performance of a firm rises when it puts effort into relationships with their local communities. When the level of risk is between zero and one, the size of the effect of CSR in the community dimension on next year's Tobin's q is reduced by the level of risk. However, when the level of risk is higher than one, the size of the effect of CSR in the community dimension on next year's Tobin's q is magnified by the level of risk. This could be explained by the fact that a relative high level of risk of the firm makes the

³⁷ Calculated by $(4534/27440)*100=16.52\%$

shareholders more sensitive to believe that the CSR investments in the community dimension are a credible commitment towards an improvement of the financial situation of the firm (i.e. lower debt ratio and higher profits). This could increase the market value of the firm and consequently, it could increase profits in the next year.

The size of the coefficients of CSR is low in comparison to similar studies (e.g. Wu et al., 2006). Again, this can be explained by the fact that CSR is only one of the instruments of a firm to increase its financial performance, by the fact that CSR improvements tend to be implemented shock wise and by the construction of the MSCI KLD index. Therefore, the coefficients of CSR seems to be small, but this should be put in perspective.

When turning to the control variables, the results are the same as in the panel data analysis of the first hypothesis. The control variable firm size has a significant and positive effect on financial performance. The control variable risk is significant and negative related to ROA (specification 6), but significant and positive related to Tobin's q (specification 8). The same arguments as provided in paragraph 6.1.1. explain these findings.

Similar to the findings for the first hypothesis, the explanatory power is higher in all models where Tobin's q is used as a measure of financial performance, relative to the models where ROA measures financial performance. According to the existing literature, an accounting-based measure of financial performance is more appropriate than a market-based measure when investigating the effect of CSR on financial performance. Therefore, the explanatory powers of these models contradict the expectations. Again, however, this finding is in line with the study of Makni et al. (2009), who only found a significant relationship between CSR and financial performance by using a market-based measure of financial performance. Nonsignificant results are obtained when an accounting-based measures of financial performance is used.

Worth mentioning are the surprising nonsignificant coefficients of CSR in the employee relations dimension and the environmental dimension in specification 6 and 8. In line with the existing literature, it was expected to find a positive effect of CSR in these dimensions on next year's financial performance. However, the effect of CSR in these dimensions on financial performance turns out to be nonsignificant.

Concluding the results for the second hypothesis, CSR in the corporate governance dimension, the human rights dimension and the community dimension show significant effects on next year's financial performance. CSR in the corporate governance dimension predominantly

shows a positive effect on next year's financial performance as measured by ROA, although the sign and the size of this effect depends on the level of risk. CSR in the human right dimension negatively affects next year's financial performance as measured by ROA. CSR in the community dimension positively affects next year's financial performance as measured by Tobin's q, although the size of this effect depends on the level of risk. This suggests that CSR in the corporate governance dimension and in the community dimension could be considered as the key drivers to improve financial performance, although depending on the level of risk of the firm. Therefore, CSR investments should be directed to these dimensions.

6.1.3. Third hypothesis

Support is found in favor of the third hypothesis that the effect of CSR on financial performance varies across industries. These results support the critics from the existing literature that empirical studies that did not account for industry effects are likely to produce confounded results (Van Beurden & Gössling, 2008). The results are partly consistent with the expectation that the effect of CSR on financial performance is the largest in industries that are consumer focused and in industries that have a higher environmental impact.

CSR in the retail trade industry and in the nonclassifiable industry is positive and significant related to next year's ROA (specification 9). This is in line with the existing literature that suggested that the effect of CSR on financial performance is the largest in industries that are consumer focused, because these firms benefit the most from the positive association their customers may attribute to the CSR activities of a firm. The retail trade industry fits in with this argumentation, as firms in this industry operate closer in the value chain to consumers and therefore CSR activities are more likely prevalent in this industry (Rowley & Berman, 2000). However, the finding for the retail trade industry is also somehow surprising. It was expected to find a purely positive effect of CSR on next year's financial performance in the retail trade industry, because this industry operates close in the value chain to consumers. However, the coefficient of CSR (β_1) is nonsignificant. CSR only has a positive effect on next year's financial performance in the retail trade industry via the interaction term between CSR and the level of risk. When the level of risk is between zero and one, the size of the effect of CSR on next year's financial performance is reduced by the level of risk. However, when the level of risk is higher than one, the size of the effect of CSR on next year's financial performance is magnified by the level of risk. This suggests that firms

operating in the retail trade industry with a relative high level of risk (above one) experience a bigger increase in next year's financial performance after an increase in CSR in comparison to lower leveraged firms. This could be explained by the fact that a relative high level of risk of a firm operating in the retail trade industry makes the stakeholders more sensitive to believe that the CSR investments are a credible commitment towards an improvement of the financial situation of the firm (i.e. lower debt ratio and higher profits). This could increase profits in the next year.

It is hard to interpret the results of the nonclassifiable industry and to compare it with other studies, because the nonclassifiable industry consists of all kind of firms. In addition, this industry is underrepresented in the sample, because it only contains 57 observations. Due to these two reasons, the findings of the nonclassifiable industry will not be further interpreted.

When Tobin's q is used to measure financial performance, other results are found (specification 10). Not only CSR in the retail trade industry shows significant effects, also CSR in the manufacturing industry shows significant effects on the market-based measure of next year's financial performance. Again, the significant effect of CSR in the retail trade industry could be explained by the fact that this industry operates close in the value chain to consumers. The sign of the effect of CSR in the retail trade industry depends on the level of risk. In this industry, the effect of CSR on next year's financial performance is negative with low levels of risk ($0 < \text{RISK} < 0.3248$ ³⁸). However, when risk passes the certain threshold value of 0.3248, the effect of CSR in the retail trade industry on next year's financial performance becomes positive. However, only 22.02% of the observations in the sample has a level of risk that is higher than the threshold value of 0.3248.³⁹ Therefore, it is more likely that the effect of CSR in the retail trade industry negatively affects next year's financial performance. A possible explanation for the negative effect of CSR on next year's financial performance in the retail trade industry when the level of risk is relatively low could be that consumers are afraid of higher prices of consumer goods due to the extra expenditures of the firm associated with increased CSR activities. Therefore, the consumers could decrease their demand, which leads to a worse financial performance of the retailers in the next year. This is in line with the neoclassical point of view, which states that CSR negatively affects financial performance. When the level of risk is between 0.3248 and 1, the size of the positive effect of CSR on next year's Tobin's q in the retail trade industry is reduced by the level of risk. However, when

³⁸ Calculated by $(\beta_1/\beta_2) = (-0.0051/-0.0157) = 0.3248$.

³⁹ Calculated by $(6041/27440)*100=22.02\%$

the level of risk is higher than one, the size of the effect of CSR on next year's Tobin's q in the retail trade industry is magnified by the level of risk. This could be explained by the fact that a relative high level of risk of the firm makes the shareholders more sensitive to believe that the CSR investments in the retail trade industry are a credible commitment towards an improvement of the financial situation of the firm (i.e. lower debt ratio and higher profits). This could increase the market value of the firm and consequently, it could increase next year's profits.

In addition to CSR in the retail trade industry, also CSR in the manufacturing industry is significantly related to financial performance measured by next year's Tobin's q, but only via the level of risk. Given that the interaction term is positive and the level of risk can only take positive values ($0 \leq \text{RISK} \leq 0.36757$), this suggests that CSR in the manufacturing industry positively affects next year's financial performance. This is in line with the existing literature, which stated that the effect of CSR on financial performance is expected to be large in industries that have a relatively high environmental impact, which is the case in the manufacturing industry. When the level of risk is between zero and one, the size of the positive effect of CSR on next year's financial performance in the manufacturing industry is reduced by the level of risk. However, when the level of risk is higher than one, the size of the positive effect of CSR on next year's financial performance in the manufacturing industry is magnified by the level of risk. Again, this could be explained by the fact that a relative high level of risk of the firm makes the shareholders more sensitive to believe that the CSR investments in the manufacturing industry are a credible commitment towards an improvement of the financial situation of the firm (i.e. lower debt ratio and higher profits). This could increase the market value of the firm and consequently, it could increase profits in the next year.

Worth mentioning is the surprising nonsignificant coefficient of the service industry in specification 9 and 10. It was expected to find a positive effect of CSR on next year's financial performance in the service industry, because this industry operates close in the value chain to consumers. However, the effect of CSR on next year's financial performance in this industry turns out to be nonsignificant. Additionally, surprising results are also found for the mining industry and the transportation industry. It was expected to find a positive effect of CSR on next year's financial performance in these industries, because these industries have a relatively high environmental impact. However, nonsignificant results are obtained.

The size of the coefficients of CSR is low in comparison to similar studies (e.g. Wu et al., 2006). Again, this can be explained by the fact that CSR is only one of the instruments of a firm to increase its financial performance, by the fact that CSR improvements tend to be implemented shock wise and by the construction of the MSCI KLD index. Therefore, the coefficients of CSR seems to be small, but this should be put in perspective.

In line with the expectations, the control variable risk is highly significant and negatively related to ROA in seven out of nine industries ($P < .10$).⁴⁰ This confirms the findings from prior studies and therefore it confirms the need to control for the level of risk when investigating the effect of CSR on financial performance. In addition, firm size as a control variable is significant and positive related to ROA in the construction industry and the manufacturing industry ($P < .01$). These results mainly confirm the expectation that firm size is positively related to financial performance. This can be explained by the finding that larger firms generate relatively stronger competitive capabilities than smaller firms do. This is mainly caused by economics of scope and scale, their better access to resources and greater market power (Clegg, Hardy, & Nord, 1996).

When turning to the control variables in the model with Tobin's q as dependent variable, it is shown that the control variable risk is positive and significant related to Tobin's q in six out of nine industries ($P < .10$).⁴¹ As the expectation was that the level of risk and financial performance are negatively related, this finding contradicts the expectations. Again, a possible explanation could be that investors expect that a higher debt ratio is caused by investments that will pay off in the future. In other words, investors could value the risk-taking behavior of the firm and therefore, the level of risk is positively related with financial performance (Campello, 2006). This is also confirmed by the calculation of Tobin's q. Additionally, in line with the expectations, the control variable firm size is significant and positive related to Tobin's q in the manufacturing industry, transportation industry, retail trade industry and the service industry ($P < .01$).

Lastly, it was expected that an accounting-based measure of financial performance is more appropriate than a market-based measure when investigating the effect of CSR on financial performance. The regression outputs show that all explanatory powers of models with Tobin's q

⁴⁰ Risk is negatively related to ROA in the mining industry, manufacturing industry, transportation industry, wholesale trade industry, retail trade industry, the financial industry and service industry. Nonsignificant results are obtained in the construction industry and nonclassifiable industry.

⁴¹ Risk is positively related to Tobin's q in the mining industry, wholesale trade industry, retail trade industry, financial industry, service industry and the nonclassifiable industry. Nonsignificant results are obtained in the construction industry, manufacturing industry and transportation industry.

are higher relative to models with ROA. Therefore, against our expectations, a market-based measure of financial performance turned out to be more appropriate. Again, however, this finding is in line with the study of Makni et al. (2009).

Concluding the results for the third hypothesis, CSR in the retail trade industry is positive and significant related to next year's ROA, while CSR in the retail trade industry is significant and predominantly negative related to next year's Tobin's q. CSR in the manufacturing industry is significant and positive related to next year's Tobin's q. However, important to note is that all sizes of the significant effects depend on the level of risk. The findings as stated above are partly consistent with the existing literature that suggested that the effect of CSR on financial performance is the largest in industries that are consumer focused and in industries that have a higher environmental impact.

6.2. Policy implications

The results from this research have some important implications for shareholders and managers. As the results strengthen the existing belief that financial performance is driven by CSR, this study should be of particular relevance to shareholders and managers. Moreover, as this research found that the effect of CSR on financial performance varies across different dimensions of CSR and varies across industries, it may be important for shareholders and managers of firms to anticipate on this information. The findings of this study emphasize that shareholders and managers should take a disaggregated view of CSR.

The main policy implication for shareholders is that they should invest in industries in which the effect of CSR on financial performance turned out to be positive, which enables them to take advantage of the associated benefits of the firms that increasingly engage in CSR activities. Important to note is that shareholders are more likely to be interested in the market-based measure of financial performance instead of the accounting-based measure of financial performance, as they hold shares or stocks. Consequently, they are more likely to rely on the empirical results based on Tobin's q as dependent variable. Given this statement, shareholders are advised to invest in the manufacturing industry, as this study suggests that CSR has a positive effect on the market-based measure of financial performance in this industry. Additionally, shareholders are advised to avoid investments in the retail trade industry, as this study predominantly found a negative effect of CSR on the market-based measure of financial performance in this industry.

In addition to the policy implications for shareholders, also policy implications for managers can be formulated based on this research. Profit maximization could be achieved by managers through active and strategic involvement in CSR activities. Therefore, it is important that decisions concerning the expenditures on CSR activities are carefully made within the firm. As strategic managers are (partly) responsible to decide where to place the investments of the firm, it could be useful for them to take into account the results of this study. This research suggests that CSR in the corporate governance dimension predominantly positively affects the accounting-based measure of financial performance, while the human rights dimension negatively affects the accounting-based measure of financial performance. In addition, CSR in the community dimension positively affects the market-based measure of financial performance. Therefore, as this research suggests that financial performance is driven by CSR in the corporate governance dimension and in the community dimension, a valuable advice for managers is to encourage CSR in these particular dimensions. A firm might rank CSR improvements within the corporate governance dimension and the community dimension above other possible CSR investments when considering the allocation of financial resources of the firm. At the same time, managers could avoid CSR investments in the human right dimension, given its negative effect on financial performance. However, managers should be cautious to invest in CSR in the corporate governance dimension when the level of risk is high, as this could make the effect of CSR negative.

In addition, a policy implication can also be formulated for managers operating in the industries in which the effect of CSR on financial performance is significant. According to this research, this is the case for the retail trade industry and the manufacturing industry. This finding indicates that managers operating in these industries should pay particular attention to CSR.

Concluding, the findings of this study support broader knowledge of shareholders and managers on the topic of CSR, which could help them to make optimal decisions regarding CSR.

6.3. Limitations

The conclusions drawn from this research must be interpreted with several limitations in mind, which is discussed in this section. The limitations could jeopardize the internal as well as the external validity of the research. First, the limitations regarding the use of the MSCI KLD index are formulated. Thereafter, other limitations are provided.

6.3.1. Limitations regarding the use of the MSCI KLD index

Although the MSCI KLD index is considered the best measure of CSR, the appropriateness and validity of this index requires attention. The five main limitations are formulated in this paragraph, although the existence of more limitations is not ruled out.

The first limitation is related to the construction of the index. The MSCI KLD score is simply constructed by aggregating the different indicators of strengths and concerns for all dimension for each firm in each year, which remains doubtful and already received much criticism (Chatterji et al., 2009). In addition, the next step in calculating the aggregated MSCI KLD score is that the weaknesses are subtracted from the strengths for each dimension. However, by this strategy, important differences between firms are concealed and comparison between firms remains difficult. For example, a firm where five strengths and five concerns are observed differs a lot from a firm without any strengths or concerns observed (Mattingly & Berman, 2006). In this case, the outcome of the index is biased, as it may mask the individual dimensions of a specific firm (Griffin & Mahon, 1997; Mahoney & Roberts, 2007).

The second limitation of the MSCI KLD index is that all dimensions get an equal weight in the net KLD score, as one fits-it-all ranking of importance for the various stakeholders cannot be made (Mitchell, Agle, & Wood, 1997). However, critics argue that a weighted net score may be more appropriate. This gives rise to much discussion about which indicator should receive more weight relative to others in compositing a net KLD score.

Third, this research suffers from the limitation concerning the inability of the KLD index to incorporate the degree in which a given activity or event is deemed good, neutral or bad. The indicator ‘professional development’ that belongs to the employee relations dimension could function as an example for this limitation. This indicator is defined as providing excellent employee training and development programs. A firm that provides these trainings and development programs gets a score of one. However, a firm that even goes a step further and for example assigns a personal academic advisor to its employees and pays its employees for the hours that they are studying, also gets a score of one.

Fourth, the issue of consistency in approach of the assessors arises. It is hard to judge whether assessors all have made their decisions based on the same requirements. It is likely that this at least slightly differs, over time as well as across firms (Cochran & Wood, 1984).

The fifth limitation of the MSCI KLD index that will be addressed in this section is that most of the firms included in this analysis are large corporations, as only publicly traded companies are listed in the index (Wu, 2006). Therefore, the generalizability of this research is limited with regard to smaller firms, as they operate under different circumstances.

With all the above-mentioned limitations of the MSCI KLD index in mind, it becomes clear that much remains to be done to improve the measure of CSR. Worth mentioning is that the above limitations mainly affect the internal validity of the research, which can be described as whether the research measures what it is supposed to measure (Verbeek, 2008).

6.3.2. Other limitations

The research does not only suffer from several limitations regarding the MSCI KLD Index, also other limitations should be kept in mind when interpreting the results. First, a limitation concerns the dataset used. It could be improved by including a larger time horizon, as this would increase the number of observations. Another possibility to increase the number of observations is to work with monthly data instead of annual data. In order to realize this, more data on CSR should become available. This limitation mainly affects the external validity of the research.

Second, a limitation of this study is that other variables, which are not included in the models, might influence the relationship between CSR and financial performance as well. The variables included in this research only present a limited view of the whole spectrum of potential variables that could affect the effect of CSR on financial performance. Examples could be firm reputation, R&D intensity, organizational characteristics (e.g. structure of the firm and resource position), management preferences and social pressures. This limitation affects the internal and external validity of the study. The external validity can be described as the extent to which the results of a particular study are generalizable.

Undoubtedly, despite the above-mentioned limitations that readers need to consider in interpreting the findings, this research provides additional insight on the effect of CSR on financial performance.

6.4. Recommendations for future research

The results of this research reveal new gaps in the literature that have not been sufficiently investigated. Therefore, eight recommendations for future research are formulated in this

paragraph. First, future research could focus on investigating whether other variables could influence the relationship between CSR and financial performance. Specifically, future research could add more independent and/or control variables, such as firm reputation, R&D intensity, organizational characteristics (e.g. structure of the firm and resource position), management preferences and social pressures.

Second, an interesting avenue for future research is the effect of the difference in level of CSR relative to competitors on financial performance. This would be interesting, as one could suggest that the level of CSR relative to competitors matters for financial performance, instead of the absolute level of CSR. Based on this research, the expectation is that the financial performance of socially responsible firms outperform the financial performance of their less socially responsible competitors, irrespectively of their absolute level of CSR.

Third, future work could investigate the possible synergies leading to optimal combinations of investments in different dimensions of CSR. This could maximize the effect on financial performance.

Fourth, it would be interesting to investigate the effect of CSR on financial performance when CSR is used by a firm to offset its corporate social irresponsible behavior of the past (Kang et al., 2016). Future research could test whether CSR that makes amends for the past corporate social irresponsible behavior have the same effect on financial performance in comparison to CSR originated from other considerations.

Fifth, future research may be able to shed light on the effect of the various dimensions of CSR on financial performance by using different weights for each of the CSR dimensions.

Sixth, future research could investigate the lag between CSR and financial performance. It is often assumed that this relationship takes a lag of one year, to account for the necessary time to surpass in order for the taken CSR activities to influence financial performance. However, it could be interesting to research the effect of CSR on financial performance while lagging CSR two, three, four or even more years rather than just one year.

Seventh, future research could test whether the effect of CSR on financial performance could be non-linear. Recent developments in the field of microeconomics already suggested a non-linear set up (Manasakis, Mitrokostas, & Petrakis, 2013, 2014; Nollet et al., 2016).

Finally, it would be interesting if future research could study the effect of CSR on financial performance in periods in which major shocks to the economy occurred, like the Gulf Oil spill and

the recent financial recession. Altogether, these eight research recommendations can advance the existing literature on the effect of CSR on financial performance.

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Appendix

Appendix 1: List of the strength and concern items in the MSCI KLD Index

Category	Strength Items	Concern Items
Community (COM)	Generous Giving Innovative Giving Support for Housing Support for Education Non-U.S. Charitable Giving Community Engagement Volunteer Programs Other strength	Investment Controversies Community Impact Tax Disputes Other concern
Corporate Governance (CGOV)	Limited Compensation Ownership Strength Reporting Quality Political Accountability Strength Public Policy Corruption & Political Instability Financial System Instability Other Strength	High Compensation Ownership Concern Accounting Concern Reporting Quality Political Accountability Concern Public Policy Governance Structures Controversial Investments Bribery & Fraud Governance – Other Concerns
Diversity (DIV)	CEO Representation Board of Directors - Gender Work/Life Benefits Women/Minority Contracting Employment of the Disabled Gay & Lesbian Policies Employment of Underrepresented Groups Other Strength	Workforce Diversity Representation Board of Directors – Gender Board of Directors - Minorities Other Concern
Employee Relations (EMP)	Union Relations No-Layoff Policy Cash Profit Sharing Employee Involvement Retirement Benefits Strength Employee Health and Safety Supply Chain Labor Standards Compensation & Benefits	Union Relations Concern Health & Safety Workforce Reductions Retirement Benefits Concern Supply Chain Child Labor Labor-Management Relations

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	<p>Employee Relations</p> <p>Professional Development</p> <p>Human Capital Development</p> <p>Labor Management</p> <p>Controversial Sourcing</p> <p>Human Capital: Other Strength</p>	<p>Labor Rights & Supply Chain – Other Concerns</p>
<p>Environment (ENV)</p>	<p>Environmental opportunities - Clean Tech</p> <p>Waste Management - Toxic emissions and Waste</p> <p>Waste Management - Packaging Materials & Waste</p> <p>Climate Change - Carbon Emissions</p> <p>Communications Property, Plant, and Equipment</p> <p>Environmental Management Systems</p> <p>Natural Resource Use – Water Stress</p> <p>Natural Resource Use -</p> <p>Biodiversity & Land Use</p> <p>Natural Resource Use – Raw material Sourcing</p> <p>Natural Resource Use – Financing Environmental Impact</p> <p>Environmental Opportunities – Green Buildings</p> <p>Environmental Opportunities – Renewable Energy</p> <p>Waste Management – Electronic Waste</p> <p>Climate Change – Energy Efficiency</p> <p>Climate Change – Product Carbon Footprint</p> <p>Climate Change – Insuring Climate Change Risk</p> <p>Environment - Other Strength</p>	<p>Hazardous Waste</p> <p>Regulatory Compliance</p> <p>Ozone depleting Chemicals</p> <p>Toxic Emissions and Waste</p> <p>Agricultural Chemicals</p> <p>Energy and Climate Change</p> <p>Impact of Products & Services</p> <p>Biodiversity & Land Use</p> <p>Operational Waste</p> <p>Supply Chain Management</p> <p>Water Stress</p> <p>Environment – Other concerns</p>
<p>Product (PRO)</p>	<p>Product Safety & Quality</p> <p>R&D/Innovation</p> <p>Social Opportunities – Access to Healthcare</p> <p>Social Opportunities - Access to Finance</p> <p>Social Opportunities - Access to Communications</p> <p>Social Opportunities - Opportunities in Nutrition and Health</p> <p>Product Safety – Chemical Safety</p> <p>Product Safety – Financial Product Safety</p> <p>Product Safety – Privacy and Data Security</p> <p>Product Safety – Responsible Investment</p> <p>Product Safety – Insuring Health and Demographic Risk</p> <p>Other Strength</p>	<p>Product Quality & Safety</p> <p>Marketing & Advertising</p> <p>Anticompetitive Practices</p> <p>Customer Relations</p> <p>Other Concerns</p>
<p>Human Rights (HUM)</p>	<p>Positive Record in South Africa</p> <p>Indigenous Peoples Relations Strength</p> <p>Labor Rights Strength</p> <p>Human Rights Policies & Initiatives</p>	<p>South Africa</p> <p>Northern Ireland</p> <p>Support for Controversial Regimes</p> <p>Mexico</p> <p>Labor Right Concern</p>

		Indigenous Peoples Relations Concern Operations in Sudan Freedom of Expression & Censorship Human Rights Violations Human Rights – Other Concerns
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Table 2: List of the strength and concern items included in the MSCI KLD index from 2000 until 2013.

Appendix 2: Tests whether to include the interaction term between CSR and risk

Bayesian Information Criterion - Interaction term

Dependent variable	Model	Specification	BIC	ΔBIC
ROA	1	With interaction term between CSR and risk	0.0003	0.0005
ROA	1	No interaction term	-0.0002	0.0000 *
Tobin's q	2	With interaction term between CSR and risk	-0.8799	0.0000 *
Tobin's q	2	No interaction term	-0.8796	0.0003
ROA	3	With interaction term between CSR and risk	0.0021	0.0000 *
ROA	3	No interaction term	0.0045	0.0024
Tobin's q	4	With interaction term between CSR and risk	-0.8772	0.000 *
Tobin's q	4	No interaction term	-0.8750	0.0022

Note: ΔBIC = (BIC - min(BIC)). The preferred model is indicated with an asterix.

Table 3: Bayesian Information Criterion to test whether to include the interaction term.

Redundant Variable Likelihood Ratio test - Interaction term

<i>Panel A</i>				
Model	Dependent variable	t-statistic	t-stat d.f.	Probability
Model 1	ROA	0.3606	16928	0.7184
Model 2	Tobin's q	3.7467 ***	16928	0.0002 ***

<i>Panel B</i>				
Model	Dependent variable	F-statistic	F-stat d.f.	Probability
Model 3	ROA	2.2643 **	(7, 16916)	0.0266 **
Model 4	Tobin's q	2.7820 ***	(7, 16916)	0.0068 ***

Note: d.f. is the abbreviation of 'degrees of freedom.' The degrees of freedom of the F-statistic follow a F-distribution with respectively the number of coefficient restrictions in the null hypothesis and the total regression degrees of freedom.

Table 4: Redundant Variable Likelihood Ratio test to test whether to include the interaction term.

Appendix 3: Tests for fixed effects specification**Wald test****Panel A**

Null Hypothesis: C(6)=0, C(7)=0, C(8)=0, C(9)=0, C(10)=0, C(11)=0, C(12)=0, C(13)=0, C(14)=0, C(15)=0, C(16)=0, C(17)=0

Model	Dependent variable	F-statistic	P-value	Chi-square	P-value
1	ROA	19.2345	0.0000	230.8143	0.0000 ***
2	Tobin's q	13.7528	0.0000	165.0334	0.0000 ***

Panel B

Null Hypothesis: C(18)=0, C(19)=0, C(20)=0, C(21)=0, C(22)=0, C(23)=0, C(24)=0, C(25)=0, C(26)=0, C(27)=0, C(28)=0, C(29)=0

Model	Dependent variable	F-statistic	P-value	Chi-square	P-value
3	ROA	19.6262	0.0000	235.5144	0.0000 ***
4	Tobin's q	13.0280	0.0000	156.3356	0.0000 ***

Table 7: Wald test to test the joint significance of year dummies in order to investigate whether time fixed effects are needed.

Bayesian Information Criterion test - Period fixed effects

Model	Dependent variable	Specification	BIC	Δ BIC
1	ROA	Cross-sectional fixed effects	0.0250	0.0247
1	ROA	Cross-sectional and period fixed effects	0.0003	0.0000 *
2	Tobin's q	Cross-sectional fixed effects	-0.8334	0.0465
2	Tobin's q	Cross-sectional and period fixed effects	-0.8799	0.0000 *
3	ROA	Cross-sectional fixed effects	0.0283	0.0238
3	ROA	Cross-sectional and period fixed effects	0.0045	0.0000 *
4	Tobin's q	Cross-sectional fixed effects	-0.8337	0.0413
4	Tobin's q	Cross-sectional and period fixed effects	-0.8750	0.0000 *

Note: Δ BIC = (BIC - min(BIC)). The preferred model is indicated with an asterix.

Table 8: Bayesian Information Criterion tests to test the information loss of the models in order to investigate whether time fixed effects are needed.

Hausman test - Fixed or random effects

Model	Dependent variable	Chi-square statistic	Chi-square d.f.	Probability
Model 1	ROA	223.8802	4	0.0000 ***
Model 2	Tobin's q	1005.1697	4	0.0000 ***
Model 3	ROA	250.3317	16	0.0000 ***
Model 4	Tobin's q	1271.0758	16	0.0000 ***
Model 5 - mining industry	ROA	37.8122	4	0.0000 ***
Model 5 - construction industry	ROA	8.4094	4	0.0777 *
Model 5 - manufacturing industry	ROA	38.4742	4	0.0000 ***
Model 5 - transportation industry	ROA	17.3495	4	0.0017 ***
Model 5 - wholesale trade industry	ROA	7.6791	4	0.1041
Model 5 - retail trade industry	ROA	50.3870	4	0.0000 ***
Model 5 - finance industry	ROA	65.9847	4	0.0000 ***
Model 5 - service industry	ROA	10.0542	4	0.0395 **
Model 5 - nonclassifiable industry	ROA	10.4007	4	0.0342 **
Model 6 - mining industry	Tobin's q	44.5879	4	0.0000 ***
Model 6 - construction industry	Tobin's q	20.3154	4	0.0004 ***
Model 6 - manufacturing industry	Tobin's q	286.1963	4	0.0000 ***
Model 6 - transportation industry	Tobin's q	67.1974	4	0.0000 ***
Model 6 - wholesale trade industry	Tobin's q	7.9230	4	0.0944 *
Model 6 - retail trade industry	Tobin's q	6.3432	4	0.1749
Model 6 - finance industry	Tobin's q	623.9162	4	0.0000 ***
Model 6 - service industry	Tobin's q	69.4866	4	0.0000 ***
Model 6 - nonclassifiable industry	Tobin's q	0.7123	4	0.9498

Table 9: Hausman test to test whether it is more appropriate to use a fixed effects model or a random effects model.

Appendix 4: Tests for heteroscedasticity

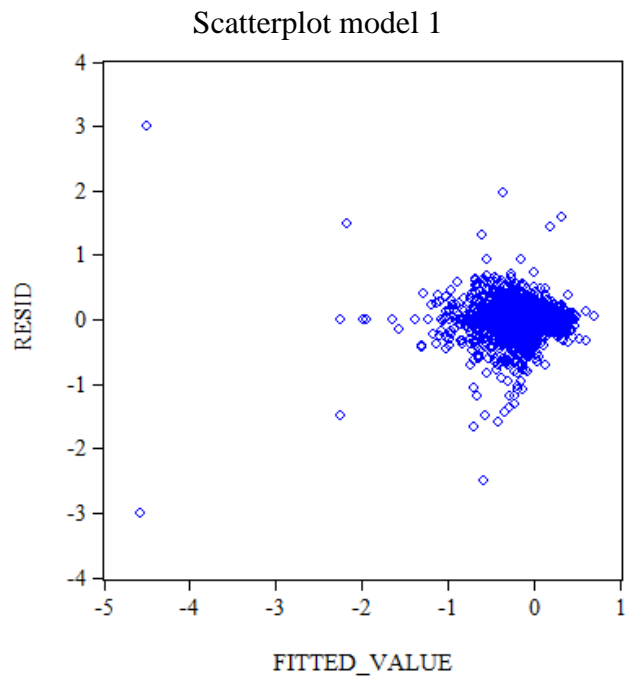


Figure 5: Scatterplot of residuals against fitted value for the model with ROA as dependent variable (model 1).

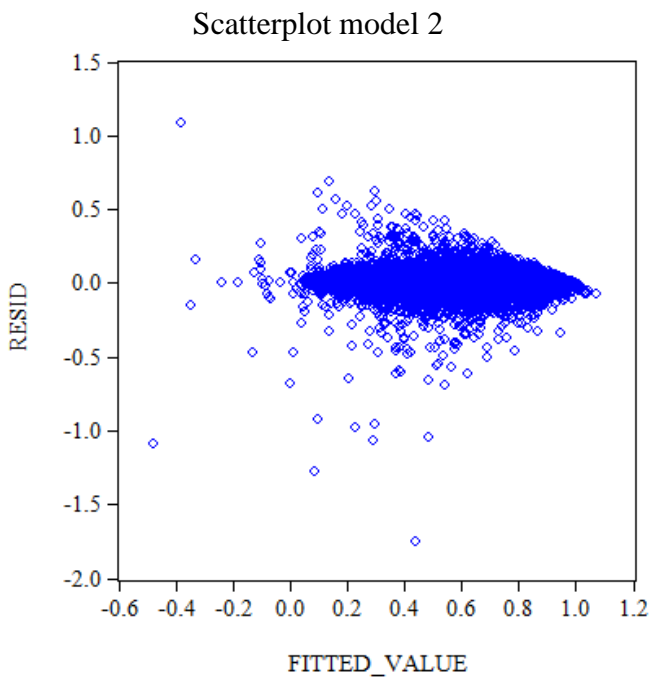


Figure 6: Scatterplot of residuals against fitted value for the model with Tobin's q as dependent variable (model 2).

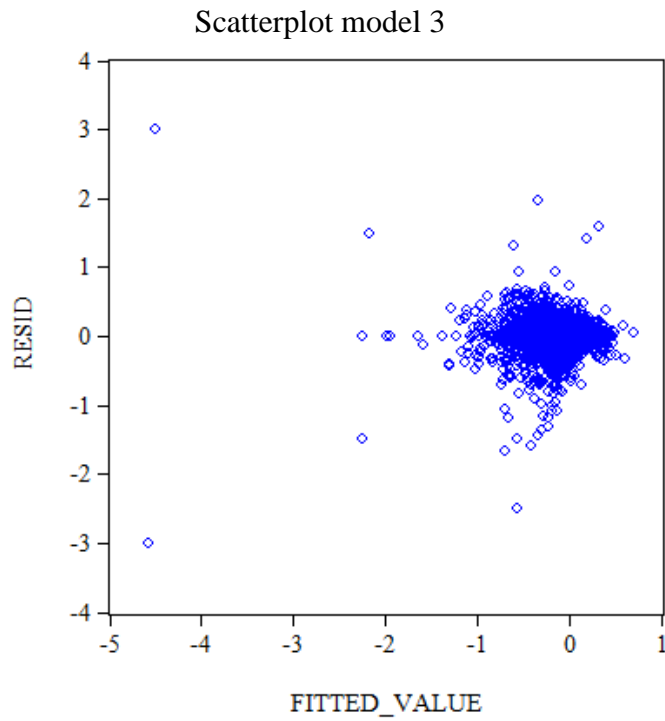


Figure 7: Scatterplot of residuals against fitted value for the model with ROA as dependent variable (model 3).

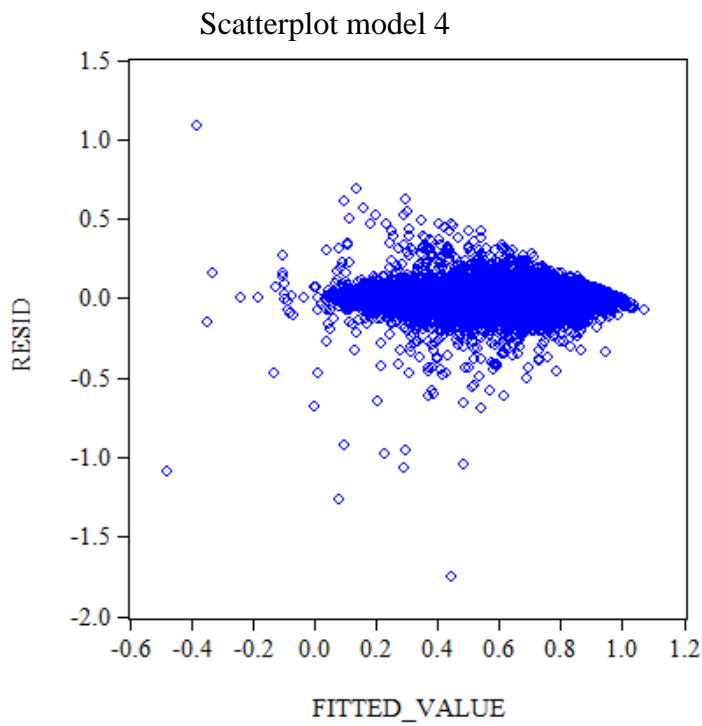


Figure 8: Scatterplot of residuals against fitted value for the model with Tobin's q as dependent variable (model 4)

White test

Model	N	R²	(N * R²)	F-statistic	Prob (F-statistic)	CHI²	DF
Model 1	20594	0.0203	417.7081	47.3504	0.0000 ***	16.9200	9
Model 2	20594	0.0157	323.7583	36.5308	0.0000 ***	16.9200	9
Model 3	20594	0.0251	517.0536	9.7954	0.0000 ***	72.153	54
Model 4	20594	0.0203	418.8202	7.8959	0.0000 ***	72.153	54

Note: Critical value is based on a significance level of 0.05. DF is the abbreviation of 'degrees of freedom.'

Table 10: White test to test for heteroscedasticity

Appendix 5: Tests for first-order serial correlation

Durbin-Watson tests	
Model	Dw value
Model 1	2.0638
Model 2	1.1641
Model 3	2.0635
Model 4	1.1651
Model 5 - mining industry	2.4086
Model 5 - construction industry	1.4646
Model 5 - manufacturing industry	2.1152
Model 5 - transportation industry	1.5456
Model 5 - wholesale trade industry	1.9721
Model 5 - retail trade industry	1.5706
Model 5 - finance industry	1.9457
Model 5 - service industry	2.1617
Model 5 - nonclassifiable industry	2.2168
Model 6 - mining industry	1.1973
Model 6 - construction industry	1.0541
Model 6 - manufacturing industry	1.3274
Model 6 - transportation industry	1.9320
Model 6 - wholesale trade industry	1.2620
Model 6 - retail trade industry	1.1749
Model 6 - finance industry	1.1928
Model 6 - service industry	1.1177
Model 6 - nonclassifiable industry	2.4451

Table 11: Durbin-Watson tests to test for first-order serial correlation

Appendix 6: Tests for Granger Causality

Granger Causality tests			
Panel A: Lags = 1			
Null Hypothesis	Obs	F-Statistic	Prob.
KLD does not Granger Cause ROA	20594	15.2577	0.0001 ***
ROA does not Granger Cause KLD		62.8030	0.0000 ***
KLD does not Granger Cause TQ	20594	20.5285	0.0000 ***
TQ does not Granger Cause KLD		13.5152	0.0002 ***
Panel B: Lags = 2			
Null Hypothesis	Obs	F-Statistic	Prob.
KLD does not Granger Cause ROA	16944	2.4330	0.0878 *
ROA does not Granger Cause KLD		31.1327	0.0000 ***
KLD does not Granger Cause TQ	16944	12.4546	0.0000 ***
TQ does not Granger Cause KLD		14.7541	0.0000 ***
Panel C: Lags = 3			
Null Hypothesis	Obs	F-Statistic	Prob.
KLD does not Granger Cause ROA	13920	1.6906	0.1667
ROA does not Granger Cause KLD		26.4639	0.0000 ***
KLD does not Granger Cause TQ	13920	7.1306	0.0001 ***
TQ does not Granger Cause KLD		10.7569	0.0000 ***

Table 12: Granger Causality tests for KLD, ROA and Tobin's q, with lags of 1, 2 and 3 year(s)

Appendix 7: Tests for multicollinearity**VIF results to test for multicollinearity**

Panel A: Model (1) and (2)

Independent variable	VIF
KLD(-1)	5.3155
KLD(-1)*RISK	5.0223
RISK	8.1336
SIZE	9.6739

Panel B: Model (3) and (4)

Independent variable	VIF
CGOV(-1)	3.8416
CGOV(-1)*RISK	3.5282
COM(-1)	4.8123
COM(-1)*RISK	3.9861
DIV(-1)	7.0171
DIV(-1)*RISK	5.0659
EMP(-1)	4.6781
EMP(-1)*RISK	4.3910
ENV(-1)	6.3818
ENV(-1)*RISK	5.1098
HUM(-1)	4.5704
HUM(-1)*RISK	4.0174
PRO(-1)	6.3892
PRO(-1)*RISK	5.0253
RISK	8.6994
SIZE	9.8612

Table 13: VIF results to test for multicollinearity

Appendix 8: Statistics on the level of risk

Cumulative statistics on the level of risk

Value	Count	Percent	Cumulative count	Cumulative percent
[0, 1)	27277	99.41	27277	99.41
[1, 2)	147	0.54	27424	99.94
[2, 3)	9	0.03	27433	99.97
[3, 4)	7	0.03	27440	100
Total	27440	100	27440	100

Note: the percentages in the third column sum up to 100.1% instead of 100% due to rounding errors.

Table 16: Cumulative statistics on the level of risk, including the amount of observations, the percentage of total observations, a cumulative count and a cumulative percentage.

Appendix 9: Scatterplots CSR and financial performance

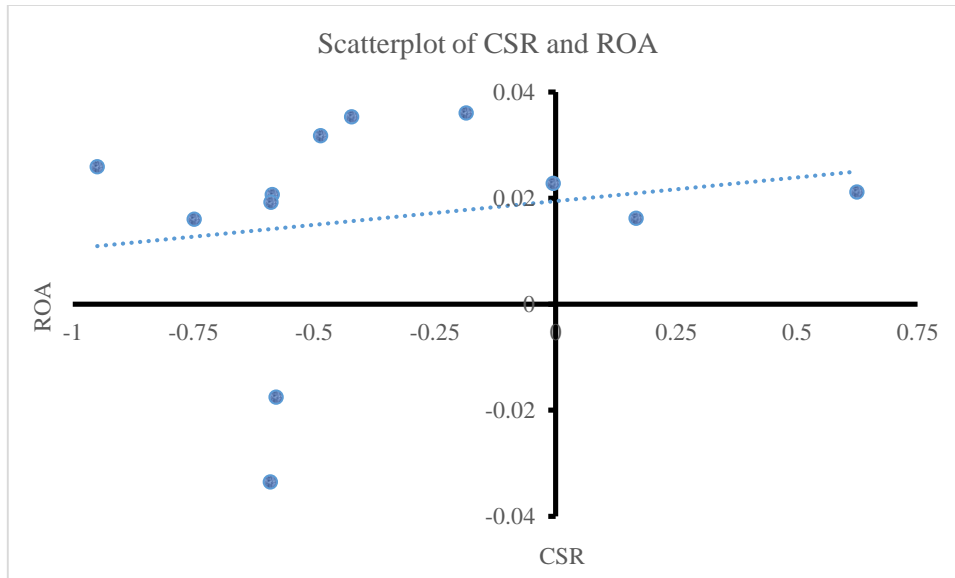


Figure 9: Scatterplot CSR in relation to ROA

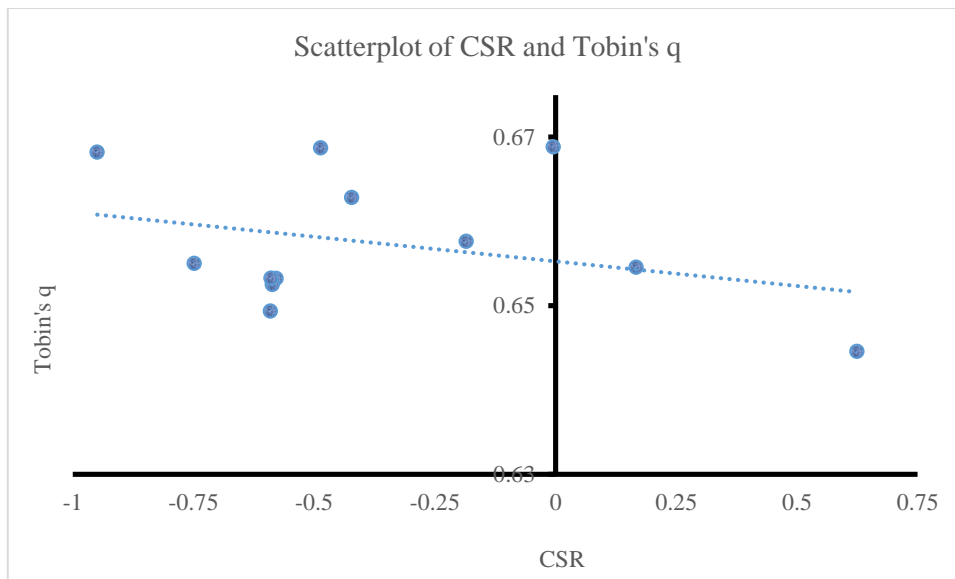


Figure 10: Scatterplot CSR in relation to Tobin's q