Does CSR Improve Financial Performance?*

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May 15, 2017

Abstract

This study examines the relationship between corporate social performance (CSP) and corporate financial performance (CFP) in a Swedish context, by using data on firms listed on Nasdaq Stockholm between 2009 and 2014. Overall, our study mainly suggests a neutral relationship between CSP and CFP on an aggregated level. By analyzing the link on a disaggregated level, a weak positive relationship is found between social performance and market-based CFP. Furthermore, we expand our study by examining whether risky industries, in terms of exposure to environmental and social issues, show a more positive relationship between CSP and CFP compared to other industries. Our results indicate that there is a stronger positive relationship between social performance and market-based CFP for socially risky industries compared to other industries. This finding suggests that firms operating in these types of industries have more to gain financially from adopting CSR practices aimed to address social issues.

Keywords: Corporate Social Responsibility, Corporate Financial Performance, Industry risk, Stakeholder theory

* First and foremost, we would like to thank our tutor Farzad Saidi, Assistant Professor at the Department of Finance at the Stockholm School of Economics, for his guidance and support throughout the writing of this thesis. Furthermore, we would like to thank Kerstin Fredriksson and Helena Kernell at GES International for making this thesis possible by providing the environmental, social and industry risk ratings used in this study. This paper was written as a bachelor thesis at the Department of Finance at the Stockholm School of Economics.

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List of abbreviations

CSR	Corporate social responsibility
ESG	Environmental, social and corporate governance
CFP	Corporate financial performance
CSP	Corporate social performance
ENV	Environmental performance
SOC	Social performance
ROA	Return on assets
ROE	Return on equity
ROS	Return on sales
ER	Environmentally risky industries
SR	Socially risky industries
ESR	Environmentally and socially risky industries

1 Introduction

Corporate social responsibility (CSR) has during the last few decades been a debated concept, and has since its emergence as a conceptual framework in the middle of the 20th century developed into an integral part of business theory and modern corporations. CSR can be defined as a set of responsible actions that corporations undertake in order to positively contribute to society. The most frequently used concept to measure CSR is based on three dimensions of corporate responsibility – environmental, social and corporate governance – referred to as ESG.

There are different views on CSR and its relevance in modern corporations. Those who oppose investments in CSR argue that managers' primary responsibility is to act in the best interest of their shareholders and propose that this is done by focusing on profit-maximization. This viewpoint is often referred to as the *shareholder theory*. Proponents on the other hand, emphasize the importance of incorporating the needs of stakeholders beyond shareholders and argue that the adoption of CSR practices is a way to achieve this. This point of view is commonly known as the *stakeholder theory*. These opposing views, together with the unsettled case of no distinct answer to the question on what kind of impact CSR has on corporate financial performance (CFP), have driven many researchers to continue to look for an answer.

Previous research in this field has tried to establish a relationship between corporate social performance (CSP) and CFP, suggesting various results, such as positive (Waddock and Graves, 1997), negative (Baron et al., 2011), and neutral relationships (McWilliams and Siegel, 2000). According to Ullman (1985), the ambiguous results can be attributed to deficiencies in the empirical databases available to measure CSP. In addition, Ullman (1985) highlights a lack in theory and inappropriate definitions of key terms, as contributing factors to the mixed results.

Firstly, this paper re-examines the link between CSP and CFP by using recent data on the Swedish market, thus contributing to existing literature with additional findings. In 2007, Sweden became the first country to require sustainability reporting, in accordance with the Global Reporting Initiative (GRI), for all state-owned firms (Government Offices of Sweden, 2010). In recent years, Sweden has also received recognition as a leading country in regards to environmental and social responsibility, indicating that CSR is highly valued among its social institutions (Global Green Economy Index, 2014; Forum's Global Gender Gap Report, 2014). Therefore, we argue that Sweden is an interesting market to examine from a sustainability perspective. As this market is scarcely covered in previous literature, further research is needed.

Secondly, this study examines the underlying industry-specific mechanisms, in terms of environmental and social risk, of the relationship between CSP and CFP. More specific, we investigate whether firms operating in risky industries, in terms of exposure to environmental and social issues respectively, have more to gain financially from investments in CSR than do firms operating in other industries.

The assessment of the industry risk level is based on general industry-specific characteristics and incorporates different aspects of environmental and social risk, such as pollution, energy use, discrimination, corruption and more. This will enable us to identify industries that show an exposure to environmental and social issues that is more extensive, and not only limited to certain areas, e.g. only pollution or only corruption.

With our industry-specific findings, we intend to contribute with insights regarding why the link between CSP and CFP might differ depending on the risk-profile of the industry a firm operates in. This industry-specific contribution has, to best of our knowledge, not been done in this way before.

Our results indicate that there is a neutral relationship between CSP and CFP on an aggregated level. An analysis of the CSP-CFP link on a disaggregated level uncover a weak positive relationship between social performance and the marked-

based financial performance measure, Tobin's Q. This indicates that investors value efforts that aim to address social issues. Furthermore, our results also suggest that socially risky industries show a stronger positive relationship between social performance and Tobin's Q compared to other industries. This implies that investors in firms that operate in these types of industries value social efforts to a higher degree than do investors in firms operating in other industries.

1.1 Purpose of study

The purpose of this study is to examine whether investments in CSR are associated with financial benefits for firms. The aim is to study the link between CSP and CFP for firms based in Sweden. Furthermore, the study will analyze whether firms operating in industries that are to a higher degree exposed to environmental and social risk, respectively, have more to gain financially from investments in CSR than do firms operating in other industries. This is done to gain a deeper understanding on the implications that the risk-profile of an industry might have on the relationship between CSP and CFP.

1.2 Research boundaries

The study will focus on firms listed on Nasdaq Stockholm in Sweden. Our study covers the time period 2009-2014, and this limitation in time is set by the CSR data – GES Risk Rating – retrieved from GES International. GES Risk Rating includes ratings on the environmental, human rights and corporate governance dimensions. Ratings covering corporate governance are not available for the entire time period covered in this study, and are therefore excluded from our analysis.[1] To measure CFP, both market-based performance measures, Tobin's Q, and accounting-based performance measures, return on assets (ROA), are used.

[1] Corporate governance ratings are only available for 2013 and 2014.

1.3 Thesis outline

In the study's first section, a brief introduction to the concept of CSR together with the purpose and boundaries of our study has been presented. Section 2 presents previous literature within this research field. This is followed by a presentation of the theories used to develop our hypotheses and the hypotheses themselves in section 3. In section 4, a detailed description of the data and the methodological approach used in this study is presented. Results and analysis of the research findings are presented in section 5. Discussion of our findings and final conclusions are provided in section 6. Section 7 addresses limitations of our study and implications for further research. Tables showing descriptive statistics, regression results and more will be presented in section 8. Lastly, a list of references and appendix is found in Section 9 and 10 respectively.

2 Previous Literature

Since sustainability reporting is not standardized, CSR performance is complex to measure. This has been one of the reasons for the inconsistent results in previous studies regarding the nexus between CSP and CFP (Ullmann, 1985). Studies examining the relationship between CSP and CFP conclude positive, negative, and neutral relationships. There are different views on the relevance of CSR, and what implications it might have on the financial performance of firms. The different views in this field can be explained by a number of theoretical frameworks: *shareholder-, institutional-, legitimacy-* and *stakeholder theory.* The definition and measurement concept of CSR will be presented in section 2.1. In section 2.2, we describe the fragmented previous research covering the relationship between CSP and CFP.

2.1 CSR

In previous literature, we have encountered various definitions of CSR. Below, we present two definitions, as stated by the European Commission (2011) and Carroll (1979), that are commonly referred to in the literature:

> *"Corporate social responsibility (CSR) refers to companies taking responsibility for their impact on society." (European Commission, 2011)*

> *"The social responsibility of business encompasses the economic, legal, ethical and discretionary expectations that a society has of organizations at a given point in time." (Carroll, 1979)*

Simply, CSR is a set of responsible actions that corporations undertake in order to positively contribute to society. There are several ways to measure CSR, and the most frequently used concept is based on three dimensions of corporate responsibility – environmental, social and corporate governance – referred to as ESG. The environmental dimension, which has received the greatest attention,

refers to actions that corporations take that influence the natural environment in terms of pollution emissions, water waste, energy use, and natural resources maintenance. The social dimension considers firms' ability to handle human rights issues, diversity, employees' health and safety, and volunteer work. Finally, corporate governance looks at firms' management in terms of usage of proper accounting methods, avoidance of conflict of interest that could lead to agency problems and living up to good business ethics.

Even though ESG is the most used concept when measuring CSR, Waddock and Graves (1997) point out in their paper that due to a lack of standardized methods to measure ESG factors, it is difficult to draw conclusions on the link between CSP and CFP. Different CSR ratings build on different criteria causing inconsistent and incomparable results. Furthermore, the different terms used in research, such as ESG, CSP and sustainable responsible investment (SRI), when measuring CSR lead to complications when tracking and evaluating CSR performance. The measurement complexity within the CSR field has been one of the main issues that may obscure any linkage when trying to examine the relationship between CSP and CFP.

2.2 CSR and Financial Performance

Positive and Neutral relationship

According to Margolis et al. (2007), who conduct a meta-analysis on 167 different studies from 1997 to 2007, the relationship between CSP and CFP is on average positive. One of the studies that Margolis et al. (2007) analyze, that has been able to find a positive relationship, is made by Waddock and Graves (1997). In a study, in which they examine the majority of the companies in S&P 500 (469 firms), they use a CSR performance measure based on the KLD index and accounting-based measures – ROA, return on equity (ROE), and return on sales (ROS) – as proxies for financial performance. Their results indicate a two-way relationship, meaning that CSP not only has a positive effect on CFP, but also

that CFP has a positive effect on CSP. These results indicate that there may be a presence of reverse causality, also referred to as simultaneous causality. This complicates any attempts to conclude whether the positive relationship is explained by the fact that financially successful firms have the financial position to invest more intensively in CSR related activities, referred to as *slack resources theory*, or whether CSR actually affects financial performance positively, known as the *good management theory*. Despite the uncertainty of causation, Waddock and Graves (1997) emphasize the potential positive effect on the customer side when investing in CSR, as it can function as a source of competitive advantage to help attain and attract customers, and thus lead to increased sales.

Another study, conducted by McGuire et al. (1988), uses Fortune magazine's annual survey of corporate reputations as a CSR performance measure and a dataset of the largest US firms in 20-25 industry groups. Using both accounting- and market-based financial performance measures in their model, McGuire et al. (1988) find a positive bidirectional relationship. Although, they suggest that the slack resources theory – that prior financial performance of firms impacts investments in CSR – is a more likely explanation of the relationship than the good management theory. One of the reasons that the outcomes differ in the study by McGuire et al. (1988) compared to the study by Waddock and Graves (1997) can be attributed to their usage of different empirical databases and CFP measures, something that Ullmann (1985) also points out as a reason for inconsistent results. Furthermore, the link between firm risk and social responsibility is highlighted by McGuire et. al (1988), implying that investments in social sustainability may lead to reduced firm risk. Cruz (2009) discover a similar pattern as he examines the link between CSR and supply-chain management. He concludes that CSR can function as a risk management tool to help minimize transaction costs associated with social and environmental risk. His results indicate that investment in social responsibility activities is capable of increasing profit and sales.

The bidirectional relationship found by Waddock and Graves (1997) is also found by Orlitzky et al. (2003), who conducted a rigorous review by analyzing 52 previous studies on the relationship between CSP and CFP, resulting in a sample of 33 878 unique observations. In addition, Orlitzky et al. (2003) show that by using different financial performance measures, the conclusion regarding CSR's impact on CFP may be altered. They argue, however, that accounting-based measures are better predictors of CFP than market-based measures.

In a more recent study, Semenova and Hassel (2008) examine the link between environmental performance and market value using a dataset of 563 US firms between 2002 and 2006. Their findings suggest a positive link. The main point in their study, however, is that the positive impact on CFP is achieved by a firm's reputational benefits. They also show that environmentally risky industries tend to have lower market value than low-risk industries, even if they are more profitable.

A more neutral approach to the relationship is concluded by McWilliams and Siegel (2000). In their study, they replicate the regressions made by Waddock and Graves (1997) with the exception that they additionally control for R&D and advertising intensity, which they argue cause biased estimators if omitted. By controlling for these variables, they find a neutral relationship. Their findings highlight the importance of control variables, in this case the impact of R&D and advertising intensity, on the relationship between CSP and CFP.

In sum, the causality of the relationship between CSP and CFP is not fully established. It is not clear whether firms are "doing good by doing well" or "doing well by doing good", and the empirical studies so far indicates ambiguous results (Ullman, 1985; Aupperle et al., 1985).

Negative relationship

Scholars who argue for a negative relationship between CSP and CFP are seeing investments in CSR as unnecessary costs that reduce shareholder wealth in terms of profit (Hull and Rothenberg, 2008). Empirical evidence suggesting a negative linkage between environmental disclosure and stock performance have been found by Shane and Spicer (1983). They study the reaction of US stocks in connection with the releases of environmental reports on firms, regarding the pollution control performance, by the Council of Economic Priorities. Their results indicate that firms, two days after the release of the reports, experience negative abnormal returns, regardless of whether the firms were highly or lowly ranked. Although, those that were lowly ranked by the report showed negative results that were more severe.

Another reputed article in the field of business and society is written by Milton Friedman (1970), who base his arguments on the shareholder theory. Friedman (1970) states that managers' primary responsibility is to act in the best interest of their shareholders. Investments in social welfare should not be done by managers directly, because it is considered value decreasing for firms. Friedman (1970) further states that great social welfare is achieved by the free market capitalism.

Moreover, Baron et al. (2011), who study 1.600 companies on the US market between 1996 and 2004, find a negative relationship between the social dimension of CSR and financial performance, measured by Tobin's Q, but not between CSR overall and financial performance. In order to achieve a more accurate model, firm fixed effects were used to control for unobserved heterogeneity. Furthermore, to capture that investments in CSR take time to translate into financial performance, Baron et. al. (2011) used a one-year lag between CFP and CSP.

3 Theories and Hypothesis Development

3.1 Theories

As presented in **section 2**, different outcomes may occur when analyzing the CSP-CFP link. Whether investments in CSR can lead to financial benefits or not, and the differences in the implications of CSR across industries, will be explained by several theories in this section.

Institutional theory

Institutional theory explains the impact of institutions on firms, and is based on that social institutions – defined as formal or informal rules, regulations, norms and acceptable behavior – influence and shape economic organizations (Morgan et al., 2010). Viewed from a CSR perspective, institutional theory explains CSR implementation as a reflection of institutional influence rather than as voluntary actions undertaken by a company, and that social institutions shape countries' business systems (Brammer et. al 2012). Social institutions also influence preferences and behaviors of stakeholders, and thus the theory may explain the variation of stakeholders' interests across nations, cultures, and different institutional contexts. Moreover, Matten and Moon (2008) suggest that CSR actions can differ between countries due to differences in the institutions that have been entrenched in the society for a long time. For example, Sweden is considered a leading country in regards to environmental responsibility and human rights issues (Global Green Economy Index, 2014; Forum's Global Gender Gap Report, 2014), indicating that sustainability is highly valued among social institutions, and it can therefore be expected of companies operating in Sweden to adopt such practices.

Stakeholder- and Legitimacy theory

There have been various discussions about the connection between CSR and the stakeholder theory, a theory referring to stakeholders' importance to companies' performance and decision processes (Carroll, 1991; Freeman, 1994; and Wicks et al., 1994). Given that social institutions can influence stakeholders, the social pressures on a firm to incorporate sustainability can differ across countries, as explained previously.

Freeman (1984) defines stakeholders as an entity that has an influence or is influenced by an organization's objectives – such as investors, customers, shareholders, government regulation, union labor, and political activist groups. Carroll (1991) argues in his study that firms have an ethical and moral accountability towards the society, and that stakeholders expect this. Furthermore, Carroll (1991) explains that social responsibility change with time and is dependent on the industry that a firm operates in, and firms need to build a strategy to handle the social issues that are most important to them. Carroll (1991) presents a model with a taxonomic approach, which is hard to evaluate through data and lacks a clear measurement methodology. Nevertheless, his paper still highlights the vital aspect of what stakeholders expect from business firms, namely ethical responsibility. Moreover, by investing in CSR that is aligned with the values and norms of the stakeholders, firms could strengthen their relationship with their key stakeholders (Barnett, 2007).

The fact that social responsibility is valued differently based on the industry a firm operates in, is also supported in the study by Roberts (1992) which highlights the variation of CSR actions across industries. By dividing industries into high profile industries and low profile industries, Roberts (1992) finds that firms in high profile industries are more likely to communicate their CSR activities. High profile industries are characterized as having higher levels of political risk and greater consumer transparency. This reinforces the legitimacy theory, which assumes that firms that operate in industries that have negative

associations, for example high-polluting industries, need to disclose their CSR more intensively to reduce the negative associations that stakeholders may have (Campbell et al., 2003).

Furthermore, in order to evaluate what impact stakeholders have on managers, there are three main attributes – power, urgency and legitimacy – that stakeholders can be classified by (Mitchell et al., 1997). Stakeholders with power can get firms to act in a way they would not otherwise do. Urgency stands for a certain level in which stakeholders require instant action. Legitimacy is a general assumption that firms should act in accordance with socially accepted norms, beliefs and values (Suchman, 1995). Stakeholders can possess one, two or three attributes at the same time, leading to different types of characteristics of a stakeholder. Mitchell et al. (1997) state that a combination of two or more attributes, which is likely to be more common in risky industries, increases the responsiveness of firms, and thus the interaction between the firm and its stakeholders is likely to be more intense.

Moreover, the consequences for firms that fail to act upon stakeholders' expectations can, according to Bowie (1988), eventually lead to that a firm ceases to exist. Freeman and Reed (1983) argue that stakeholders are crucial for firms continued survival and managers must satisfy their stakeholders to achieve long term success. And given that firms operating in risky industries have a more intense relationship with their stakeholders, indicating higher expectations on the firms, they are more exposed to potential negative consequences.

3.2 Hypothesis Development

The literature review and the theoretical framework presented in previous sections provide the essential background to this study. Since sustainability is highly valued in Sweden, and social institutions influence stakeholders' behavior, we argue that stakeholders in Sweden expect firms to invest in CSR. Firms that deviate from this norm and fail to incorporate sustainability into their business

operations may experience negative financial impacts because of indirect costs caused by reputational damage and competitive disadvantage. Furthermore, investments in CSR has a positive effect on the customer side, as it can function as a source of competitive advantage to help attain and attract customers (Waddock and Graves, 1997), and as a result lead to increased sales. Therefore, we state our first hypothesis as defined below:

Hypothesis H_1: *There is a positive relationship between corporate social performance and corporate financial performance.*

Furthermore, the reasons to engage in CSR can vary depending on the industry that a firm operates in. Firms in different industries have different gaps to bridge between their actions and what society expects from them in terms of values and norms. As Roberts (1992) suggests in his study, high-profile industries are more likely to disclose CSR activities. Roberts' (1992) finding reinforces the legitimacy theory, which assumes that firms in industries that are exposed to higher risk need to disclose their CSR more intensively in order to reduce the negative associations with the firms. Furthermore, based on the version of the stakeholder theory as described by Mitchell et al. (1997), stakeholders in industries that are exposed to higher risk, in terms of environmental or social risk, have a more intense relationship with firms. This implies that these types of industries are more dependent on their stakeholders compared to other industries, resulting in a greater economic damage for the firms if the needs and expectations of aforementioned stakeholders are not considered. Furthermore, building on legitimacy theory, firms that operate in risky industries may have higher incentives to adopt CSR practices in order to reduce the negative associations with the firms. Building on this, we argue that risky industries have more to gain financially from adopting CSR practices related to the risk source they are exposed to. Therefore, we state the following hypotheses:

Hypothesis H_{2a}: *The relationship between environmental performance and corporate financial performance is more positive for firms operating in environmentally risky industries than for firms operating in other industries.*

Hypothesis H_{2b}: *The relationship between social performance and corporate financial performance is more positive for firms operating in socially risky industries than for firms operating in other industries.*

Building on the discussion for *hypotheses* H_{2a}-H_{2b}, we argue that firms operating in industries that are highly exposed to both environmental and social risk have more to gain financially from adopting CSR practices aimed to address both environmental and social issues, compared to firms operating in other industries. Thus, we state the following hypothesis:

Hypothesis H_{2c}: *The relationship between corporate social performance and corporate financial performance is more positive for firms operating in industries that are both environmentally and socially risky than for firms operating in other industries.*

4 Data and Methodology

4.1 Sample

As the aim of this study is to analyze the relationship between CSP and CFP, there is a need of both financial and CSR data. The financial and CSR data was retrieved and prepared separately before the two datasets were matched and merged into a single dataset based on mutual firm-year observations. The limitation of our sample selection was set by our CSR data – GES Risk Rating data – since it is limited to firms listed on Nasdaq Stockholm between 2009 and 2014.

The first step in our sample selection process was to retrieve the financial data. Financial data was obtained from Thomson Reuters Datastream for firms listed on Nasdaq Stockholm for the years 2009-2015. The initial sample included a total of 546 firms, comprising of firms listed on both Nasdaq Stockholm and Nasdaq First North since Datastream did not differentiate between the two in its stock exchange categorization. At this stage, the financial panel data was not yet undergoing further adjustments to achieve a balanced panel data. The next step, to land at a final sample, was to collect the CSR data from the GES Risk Rating database.

GES Risk Rating contains CSR ratings for firms listed on Nasdaq Stockholm for the years 2009-2014, with the number of observed firms ranging between 250-300 firms between the years. The difference in the sample period between the financial and CSR data is due to a one-year time-lag between CFP and CSP in our baseline model. This is in line with previous research studying the relationship between CSP and CFP (Waddock and Graves, 1997). To balance the CSR panel data, firms that were not observed during the whole sample period were dropped. A plausible explanation behind the missing observations could be that the firm either was being listed on or delisted from the stock exchange during the sample period, explaining the abrupt nature of the majority of the missing observations.

By balancing our CSR panel data, our sample was reduced to 206 firms. Thereafter, to match the financial data with the CSR data, firm observations that were non-mutual between the two datasets were excluded, reducing the firm observations to 195 firms.

As the financial and CSR data were matched based on mutual firm-year observations, the datasets were merged into a single dataset taking the form of a balanced panel data. Firm observations that had missing values for any variables used in the baseline regression model were dropped, resulting in a final sample of 161 firms across the years 2009-2014 and 966 firm-year observations. **Table 1** shows an overview of the sample selection process.

Sample selection bias

As we collected our final sample, our data underwent some adjustments throughout the process. A majority of the firm observations that were dropped from our initial sample (351 firms) were excluded due to lack of CSR coverage, since the GES Risk Rating data limits its coverage to Nasdaq Stockholm. Nasdaq First North in general consists of smaller and growing firms compared to the more established and mature firms listed on Nasdaq Stockholm. Since these firms are excluded from our sample collection, it might result in some bias towards more established firms, which are more likely to have well-entrenched corporate sustainability systems and practices in place.

Lastly, the firm observations that were dropped due to a lack of coverage throughout the whole sample period were mostly firms that underwent IPOs during the sample period or firms that were delisted from the Nasdaq Stockholm stock exchange. The exclusion of these firms could potentially create bias to some degree as they are likely to consist of relatively young firms on one hand and economically struggling firms on the other hand.

Overall, it appears to be some bias towards more stable firms in our sample. We argue that this do not necessarily cause any issues for our analysis since this type of sample will facilitate an isolation of the CSP-CFP relationship.

4.2 Corporate Financial Performance (CFP)

Various financial performance measures have been used in previous research analyzing the relationship between CSP and CFP. The financial performance measures that have been used in previous research can be categorized into two groups: (1) *market-based measures* and (2) *accounting-based measures* (Ullman, 1985). Some examples of market-based measures that have been used in previous studies are stock price change (e.g. Moskowitz, 1972), Tobin's Q (e.g. Dowell et al., 2000) and market value added (e.g. Garcia-Castro and Ariño, 2010). Some examples of accounting-based measures are the ROE (e.g. Griffin and Mahon, 1997), ROA (e.g. Waddock and Graves, 1997) and ROS (e.g. Elsayed and Paton, 2005).

Accounting-based measures are backward-looking in the sense that they reflect firms' contemporaneous profitability. On the contrary, market-based measures are forward-looking as they incorporate investors' expectations of firms' future profitability. In line with previous research, we argue that these measures should be considered complements rather than substitutes (Elsayed and Paton, 2005). Therefore, we have decided to use one measure from each category: Tobin's Q and ROA. The definitions of these measures are not always consistent between different studies. Thus, a detailed description of each measure follows below.

Tobin's Q

In its original form, Tobin's Q is defined as the ratio of the market value of a firm to the replacement cost of the firm's assets (Tobin, 1969). In equilibrium, the ratio should be equal to one. A higher value indicates that the firm is overvalued while a lower value indicates that the firm is undervalued. King and Lenox (2001), however, define Tobin's Q as a measure that *"reflects what cash flows the market thinks a firm will provide per dollar invested in assets."* They continue further by stating that a higher value on Tobin's Q signals that future cash flows are expected to be either greater or less risky. Building on this, Tobin's

Q captures different forms of potential benefits deriving from CSR investments and the intangible value of these benefits as assigned by investors (Guenster et al., 2011).

There are different approaches on how to measure Tobin's Q in the literature. We have decided to follow Albuquerque et. al (2013) and their formulation of Tobin's Q. **Table 2** contains definitions and formulations for the main variables used in our regression.

ROA

ROA is an accounting-based measure that is frequently used as a proxy for financial performance in previous research studying the CSP-CFP relationship. ROA reflects the operational profitability of a firm and indicates how efficiently it utilizes its capital. To mitigate distortion and incomparability between firms caused by differences in tax policies and practices, we calculate ROA on a pretax basis.

4.3 Measuring CSR - GES Risk Rating

The environmental and social performance scores used in this study as a proxy for CSR performance were retrieved from GES International. Founded in 1992, GES International has since established themselves globally, providing institutional investors with support and guidance on how to incorporate sustainability in their investment and business processes. GES Risk Rating was introduced in 2005, evaluating firms listed on Nasdaq Stockholm based on how well they perform in regards to CSR related issues.

GES Risk Rating evaluates the risk in firms' methods and management of processes concerning the environment, human rights (social) and corporate governance and is based on international norms on ESG issues. The evaluation uses a dynamic approach in the sense that it takes into account firms' current status and readiness for the future (GES International, 2010). Furthermore, GES

Risk Rating has been used in a previous study by Semenova et al. (2009) which examines the value relevance of environmental and social performance in a Swedish context.

The environmental performance score comprises of two sub-dimensional measures: *performance* and *preparedness*. The performance dimension covers the present aspect of a firm's environmental activities and consists of, among others; assessments of energy and water usage; greenhouse gas emissions; and waste management. The preparedness dimension covers the future aspect of a firm's impact on the environment and takes into account to what extent a firm presents environmental policies and targets, and the level of environmental requirements on suppliers. Furthermore, it evaluates the firm's strategy for renewable energy usage.

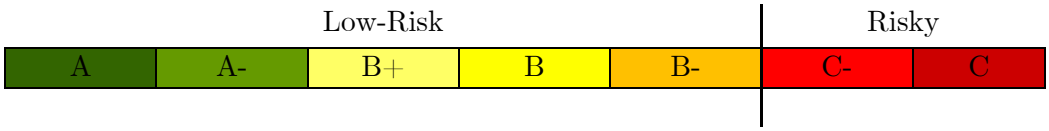
The human rights score, referred to as the social performance score in this study, comprises of three sub-dimensional measures: *employees*, *community* and *suppliers*. The employee dimension covers for example health and safety policies; workplace diversity and discrimination; and to what extent a firm reports on child and forced labor issues. The community dimension take into consideration firms' programs and policies regarding community involvement and corruption, while the supplier dimension evaluates firms' policies on human rights in the supply chain.

Moreover, the environmental score is measured on a scale of 0-3, while the social score is measured on a scale of 0-2. To make the scores more comparable, we transformed them to a scale ranging from 0 to 100. Thereafter, since GES Risk Rating does not include an aggregate CSP score, an equally-weighted CSP score, based on the environmental and social scores, was created.

Furthermore, GES Risk Rating provides ratings that evaluate the general risk level of an industry, from an environmental and human rights (social) perspective, on a 7-point scale. The scale is illustrated in **Figure 1**. The industry classification used in GES Risk Rating is based on the Global Industry Classification Standard by MSCI and S&P which will be used throughout this study. The industry risk

assessment is based on general characteristics of each industry, related to environmental and social sustainability. This means that rating criteria used to evaluate the environmental and social risk in industries are adjusted based on the relevance for the specific industry. The industry risk ratings are used when investigating hypotheses H_{2a}-H_{2c}.

Figure 1: Industry risk rating by GES Risk Rating



This figure illustrates a 7-point scale by GES Risk Rating which is used to rate the general risk level of an industry, from an environmental and social perspective. The industry risk ratings are used to classify low-risk and risky industries in hypotheses H_{2a}-H_{2c}. We define risky industries as industries that have received the rating C or C+.

Lastly, due to our research scope being geographically delimited to the Swedish market, an important aspect is to obtain a sufficient coverage in terms of CSR ratings. GES Risk Rating stands out in this aspect, by providing an extensive coverage on firms listed on Nasdaq Stockholm.

4.4 Control variables

To control for other factors that might influence the financial performance, and cause biased estimators if left out, we include several control variables in our regression model. Our set of control variables include proxies for firm size, financial risk, growth and advertising intensity.

In our research, we have decided to use total assets as a proxy for firm size. Previous studies suggest that firm size may affect the financial performance of firms (Waddock and Graves, 1997). A possible rationale behind this relationship could be that larger firms might experience benefits deriving from the possibility to capitalize on large scale operations, e.g. bargaining power and economies of scale. Another important aspect is that firm size is argued to be linked with

corporate social performance in terms of social and environmental performance respectively (Ullman, 1985). Waddock and Graves (1997) argue that this might be due to smaller firms not exhibiting as many overt socially responsible behaviors as larger firms. A possible explanation could be that larger firms may face higher external pressure to act responsibly than smaller firms. Given this, not controlling for firm size will likely result in biased estimators due to omitted variable bias. In accordance with previous studies, we logarithmically transform the variable in our regression model. This is done since the distribution of firm total assets is unlikely to be normally distributed.

As a proxy for financial risk, we use the long-term debt to assets ratio. Established corporate finance literature, addressing agency theory, concludes that the level of debt at a firm can influence the actions of managers, potentially affecting the financial performance. Furthermore, we have decided to include revenue growth as a proxy for firm growth as it has been argued that there is a positive relationship between revenue growth and firm valuation which is captured by Tobin's Q in this context (Guenster et al., 2011).

Lastly, in line with McWilliams and Siegel (2000) we have decided to include a proxy for advertising intensity. The aim at first was to follow the methodology of McWilliams and Siegel (2000) by using the advertising costs to sales ratio. Unfortunately, due to a lack of advertising data, this was not possible. Therefore, we have decided to follow Chapple et al. (2001) and Elsayed and Paton (2005) and use intangible assets to sales ratio to capture the effect of advertising.

4.5 Model specification and statistical tests

Baseline model and hypothesis H_1

$$CFP_{it} = \beta_1 CSP_{i(t-1)} + \beta_2 SIZE_{i(t-1)} + \beta_3 RISK_{i(t-1)} + \beta_4 GROWTH_{i(t-1)} + \beta_5 ADV_{i(t-1)} + \delta_{jt} + \theta_i + u_{it}$$

Where:

CFP_{it}	is measured as Tobin's Q or ROA for firm i at time t
$CSP_{i(t-1)}$	is the aggregate CSR performance score as measured by GES Risk Rating for firm i at time t-1
$SIZE_{i(t-1)}$	is measured as the natural logarithm of total assets for firm i at time t-1
$RISK_{i(t-1)}$	is measured as long-term debt to total assets for firm i at time t-1
$GROWTH_{i(t-1)}$	is measured as the yearly sales growth for firm i at time t-1
$ADV_{i(t-1)}$	is measured as intangible asset to sales ratio for firm i at time t-1
δ_{jt}	is a set of dummy variables that capture the industry-year fixed effects
θ_i	is a set of dummy variables that capture the firm fixed effects
u_{it}	is the error term

Our baseline model is a fixed effects model controlling for firm- and industry-year fixed effects respectively. Initially, we will test hypothesis H_1 using the aggregate CSP score. Next, we will test the same hypothesis on a disaggregated level, to analyze the relationship between certain dimensions of CSR, as represented by the environmental and social performance scores, and CFP. In previous literature, it is often assumed that investments in CSR take time to translate into improved financial performance. A common approach to address this has been to introduce lagged independent variables. In our case, we have followed Waddock and Graves (1997) by implementing a one-year lag between CFP and CSP as well as for the control variables.

Fixed effects

Endogeneity is a general cause of concern in regression analysis. Endogeneity occurs when the explanatory variable is correlated with the error term and may arise as a result of reverse causality or omitted variables. A consequence of endogeneity is biased estimators and unreliable regression results. Since we use panel data in our regression analysis, we will be able to effectively control for some endogeneity – in the form of unobserved heterogeneity – through the fixed effects model. A common approach in previous research, to control for time-invariant unobserved heterogeneity, has been to include fixed effects at the industry or firm-level, frequently in combination with year fixed effects to control for time-specific effects (e.g. the state of the economy). In our regression models, we have decided to implement firm- and industry-year and fixed effects. By using industry-year fixed effects, we describe the variation across firms within industries at a specific time t. As a result, we will be able to control for unobserved effects across industries and within industries over time. In other words, we will be able to control for time-varying industry dynamics that might affect both the financial performance and CSP of firms within industries and simultaneously remove variation across industries that may be the result of unobserved heterogeneity.

As previously discussed, industry-specific characteristics and industry and time-specific events, such as the industry stakeholder environment and the industry business cycles, are likely to have an impact on the CFP and CSP of firms respectively as well as on the relationship between them. Time-specific events in the form of major scandals may shake the dynamics of the affected industry and have a negative spillover effect on the financial performance of firms across the industry. These types of events might also make firms in the affected industry more willing to invest in CSR. Thus, it might appear that better CSP is associated with inferior CFP. By implementing industry-year fixed effects, we will be able to control for this.

Through the firm fixed effects, we will be able to control for unobserved heterogeneity that is associated with time-invariant firm-specific characteristics that might influence both the CFP and CSP of firms. The management and the corporate culture in a firm are two examples of such firm-specific characteristics and can be considered relatively time-invariant over a short time horizon.

Given the above rationale leading to the use of firm- and industry-year fixed effects, the unobserved heterogeneity is unlikely to be uncorrelated with the independent variables which is the main assumption in the random effects model. If this assumption does not hold, the random effects model produces inconsistent estimators. In this case, the fixed effects model would be the preferable choice.

To statistically substantiate our application of the fixed effects model in favor of the random effect model, a heteroskedasticity-robust version of the Hausman test was performed to determine whether the fixed effects model is the preferable choice of model in our regression analysis. The Hausman test was performed for both versions of the baseline model. For our baseline model where Tobin's Q is used as a dependent variable, the null hypothesis – that the random effects model is preferred to the fixed effects model – can be rejected at a 1 % significance level. The null hypothesis can be rejected at a 5 % significance level for our second baseline model where ROA is used as a dependent variable. The same test was performed for the adjusted baseline models, used to test hypothesis H_{2a}-H_{2c}, with results concluding that the fixed effects model is preferred to the random effects model. Therefore, we unanimously conclude that the fixed effects model is the most appropriate model for our baseline regressions.

Hypothesis H_2

In our second hypothesis, we will investigate whether risky industries show a stronger link between CSP and CFP compared to other industries. To test hypothesis H_{2a}-H_{2c}, we will introduce marginal adjustments to our baseline models.

The first step will be to define risky and low-risk industries. As previously mentioned, GES Risk Rating includes ratings that evaluate the level of environmental and social risk for each industry. For a more detailed description of the industry risk ratings, see **section 4.3**. We have grouped industries based on their risk ratings within each CSR dimension. Industries that have received the ratings C or C+ are defined as risky industries. Dummy variables are used to identify risky industries within each dimension. Three types of risky industries are recognized; environmentally risky industries (ER industries), socially risky industries (SR industries) and industries that are both environmentally and socially risky (ESR industries). **Table 3** describes the sample distribution across industries and shows which risk-type category, as defined above, each industry belongs to.

The second step is to create interaction variables that will be used to test hypotheses H_{2a}-H_{2c}. Firstly, to test hypothesis H_{2a}, we will interact the environmental performance score variable (ENV) with the dummy variable that is used to identify ER industries. Secondly, to test hypothesis H_{2b}, the social performance score variable (SOC) will be interacted with the dummy variable that is used to identify SR industries. Lastly, we will apply the same methodology to hypothesis H_{2c} where the aggregate CSP score (CSP) will be interacting with the dummy variable that is used to identify ESR industries.

Lastly, separate regressions will be run to test hypotheses H_{2a}-H_{2c}. Hypothesis H_{2a} and H_{2b} will be tested by running regressions with the disaggregated CSP scores, ENV and SOC, in combination with their respective interaction variables to analyze whether risky industries show a more positive relationship between ENV-CFP (hypothesis H_{2a}) and SOC-CFP (hypothesis H_{2b}) respectively. In contrast, hypothesis H_{2c} will be regressed with the aggregated CSP score, CSP, to analyze whether industries that are both environmentally and socially risky show a more positive relationship between CSP and CFP. All our regressions include a one-year lag between CFP and the independent variables, control for

firm- and industry-year fixed effects and use standard errors clustered at the industry-level.

Diagnostic tests

Heteroskedasticity

To test for heteroskedasticity, a Breusch-Pegan/Cook-Weisberg test was carried out for our two baseline models. The results of the tests strongly indicate that our data sample is heteroskedastic as the null hypothesis of the test – that the data is homoscedastic – can be rejected at a 0.01 % significance level. To address the presence of heteroskedasticity, robust standard errors will be used.

Serial correlation

The presence of serial correlation, meaning that residuals are correlated over time, causes bias in the standard errors. Most importantly, serial correlation is a violation of the Gauss-Markov assumptions leading to OLS estimators no longer being the best linear unbiased estimators (Wooldridge, 2009). To test for serial correlation in our baseline models, a Wooldridge test has been performed (Wooldridge, 2002; Drukker, 2003). The null hypothesis, that no first order autocorrelation is present, can be rejected at the 5 % significance level for our baseline model where Tobin's Q is used as proxy for CFP. To address this, we have used clustered standard errors in all our regressions. We have decided to cluster at the industry-level since it produces standard errors that are more conservative compared to standard errors clustered at the firm-level.

Winsorization

To mitigate the effect from outliers, the variables ROA, Q and GROWTH were winsorized to the 1st and 99th percentile. A relatively conservative level of winsorization were chosen as the level of winsorization could potentially affect our results.

5 Empirical Results and Analysis

5.1 Descriptive statistics

Descriptive statistics and an overview of the Pearson's correlation coefficients for the main variables used in our regression can be found in **table 4** and **table 6** respectively. In **table 5**, descriptive statistics for the main variables divided between low-risk industries – defined as industries that are not considered risky in either CSR dimension – and the three types of risky industries can be found.

Table 5 adds some interesting insights regarding the differences in the CSR performance scores across industries based on their risk-types. The level of risk that an industry is associated with – in terms of exposure to environmental and social issues – seems to drive the CSR performance scores. In other words, risky industries seem to be associated with higher CSR performance scores. This is an interesting finding since this may indicate that firms operating in risky industries are aware of the increased risk they are exposed to through industry association and invest more intensively in CSR. This could be interpreted as a form of risk management by firms to mitigate against the increased risk level. Furthermore, this could also serve as an indicator of our hypothesis that firms operating in risky industries face higher expectations to act responsibly and will therefore, to avoid repercussions from the various stakeholders, invest more intensively in CSR.

That firms operating in risky industries are associated with higher CSR performance scores appears to be systematic. Risky industries seem to perform better within the CSR dimension in which they are exposed. To concretize, ER industries have a higher average environmental performance score than do SR industries; while SR industries have a higher average social performance score than do ER industries. Logically, it follows that ESR industries maintain the highest scores in all three CSR performance scores.

Moreover, in comparison with low-risk industries, risky industries – on average – seem to be associated with higher financial risk, larger firms, lower intangible assets to sales ratio and lastly a lower Tobin's Q. Given that firms in risky

Table 5: Summary statistics divided by industry risk-types

	Industry risk-type											
	Low-Risk			*ER*			*SR*			*ESR*		
Variable	Obs	Mean	SD	Obs	Mean	SD	Obs	Mean	SD	Obs	Mean	SD
Q	636	1.83	1.63	246	1.56	0.79	186	1.70	1.20	102	1.42	0.94
ROA	636	0.05	0.15	246	0.07	0.08	186	0.07	0.11	102	0.05	0.09
CSP	636	28.53	16.12	246	42.16	20.67	186	41.17	19.53	102	46.15	18.99
ENV	636	26.44	19.74	246	47.64	23.73	186	43.81	22.80	102	51.20	22.39
SOC	636	30.62	16.04	246	36.67	18.90	186	38.54	18.20	102	41.10	16.96
SIZE	636	8.22	2.34	246	9.01	1.90	186	8.84	1.64	102	9.51	1.52
RISK	636	0.16	0.17	246	0.19	0.14	186	0.17	0.17	102	0.20	0.16
GROWTH	636	0.06	0.26	246	0.04	0.23	186	0.06	0.25	102	0.05	0.28
ADV	636	0.38	0.56	246	0.20	0.21	186	0.16	0.23	102	0.13	0.22

This table presents descriptive statistics including number of firm-year observations (Obs), means and standard deviations for the main variables divided by industry risk-types. *Low-risk industries* are defined as industries that are not considered risky in regards to neither environmental or social issues. *ER* industries are defined as industries that are considered risky in terms of their exposure to environmental issues. *SR* industries are defined as industries that are considered risky in terms of their exposure to social issues. *ESR* industries are defined as industries that are considered risky in terms of their exposure to both environmental and social issues. *Q* is the Tobin's Q, one of two corporate financial performance (CFP) measures used in this study. *ROA* is the return on assets and is used as a CFP measure together with Q. *CSP* is a proxy for corporate social performance and is an equally-weighted score based on the environmental (ENV) and social performance (SOC) scores from GES Risk Rating. *SIZE* is measured as the natural logarithm of total assets. *RISK* is measured as long-term debt to total assets. *GROWTH* is measured as the annual revenue growth. *ADV* is measured as the intangible assets to sales ratio.

industries seem to act more responsibly than firms in low-risk industries it may seem counterintuitive that they are associated with a lower intangible assets to sales ratio as CSR performance is considered an intangible asset as a constituent of the goodwill of firms (Semenova et al., 2009). Important to take into consideration, however, is that the accounting valuation process of intangible assets is complex, and therefore the value of the CSR performance may not be fully reflected in the book value of intangible assets. A revisit to the definition of Tobin's Q, presented by King and Lenox (2001),[2] provides an intuition on how to interpret the differences in Tobin's Q ratio between the industry-types. The lower average Tobin's Q ratio for risky industries may reflect that firms that operate in industries that are chronically associated with environmental and social issues, a familiar example being the oil industry, are expected by investors to face difficulties in the future to stay relevant and maintain their ability to generate positive cash flows.

Table 6 depicts the Pearson's pairwise correlations between the main variables used in the baseline regression. The two financial performance measures, Tobin's Q and ROA, are positively correlated with each other as anticipated. The two dimensions of CSP – ENV and SOC – show a strong correlation with each other (ρ=0.7110). This indicates that firms performing well in one dimension are more likely to perform well in the other dimension as well. A reasonable explanation is that firms have a broad approach towards achieving sustainability and not only aims to achieve sustainability within a certain dimension of CSR. Furthermore, the highest correlation is found between CSP and ENV (ρ=0.9446). This is expected since ENV is one of two constituents in the CSP variable together with SOC, which also has a high correlation with CSP (ρ=0.9023).

The extremely high correlations between the disaggregated CSP scores – ENV and SOC – and CSP may cause concerns for potential multicollinearity. This is

[2] King and Lenox (2001) define Tobin's Q as a measure that "*reflects what cash flows the market thinks a firm will provide per dollar invested in assets.*"

not an issue since ENV and SOC are never used in conjunction with CSP in any regression model. Therefore, multicollinearity will not pose any issues in this context. Variance inflation factors (VIF) were used to detect and measure the level of multicollinearity. **Table A1** shows that all our independent variables have VIF values that are far below 10, which is used as a general rule of thumb to detect severe multicollinearity. Thus, we conclude that the presence of severe multicollinearity is not probable.

Lastly, the strong positive correlations between SIZE and the CSR performance scores imply that larger firms are adopting CSR practices to a larger extent than do smaller firms. This is consistent with the prior presented logic that larger firms will more actively adopt CSR practices as they are facing higher external pressure to act responsibly than do smaller firms.

5.2 Regression results

Hypothesis H_1

Table 7 shows the regression results for our baseline model where hypothesis H_1 – that there is a positive relationship between CSP and CFP – is tested. The regressions are run with both the aggregated CSR performance score – CSP – shown in regression (1) and (3) and the disaggregated performance scores – ENV and SOC – shown in (2) and (4). The regression results for the baseline model where Tobin's Q is used are shown in regression (1) and (2) while regression (3) and (4) show the results for the baseline model where ROA is used. All our regressions include a one-year lag between CFP and the independent variables, control for firm fixed effects and industry-year fixed effects and use standard errors clustered at the industry-level.

The four baseline regressions (1)-(4) mainly show no statistically significant relationship between CSP and CFP. Regression (4) shows a negative relationship between ENV and ROA (-0.0011, $p<0.05$). This result implies that an increase in the environmental performance score of 10 units is associated with a ROA

decrease of 1.1 percentage points, ceteris paribus. Thus, our baseline regressions show no support for hypothesis H_1. These results are consistent with the findings of McWilliams and Siegel (2000) and Elsayed and Paton (2005) who suggest a neutral relationship. An interesting side note is that even though Elsayed and Paton (2005) suggest a neutral relationship between environmental performance and CFP in general, their results indicate a weak negative relationship between environmental performance and ROA, which is in line with our results.

A potential explanation to our insignificant coefficients could be that the variation within firms for the CSR performance scores is low over time. This would indicate that the CSR ratings are relatively time-invariant. If this is the case, firm fixed effects should not be used as they will remove any firm-specific time-invariant components. To estimate the level of variation within firms over time, we have created dummy variables that identify firm-year observations that are constant between at least two years for the three CSR performance scores CSP, ENV and SOC. The results are shown in **table 9**. Approximately 15-30 % of the firm-year observations are constant across at least two years for CSP, ENV and SOC. This indicates that the variation within firms is relatively low which may affect our results. To address this, we will perform complementary regressions in which firm fixed effects are excluded.

Table 10 includes the regression results for our baseline model where hypothesis H_1 is tested without firm fixed effects. These results are a bit different compared to our previous regression results in which firm fixed effects were included. In regression (14) we see that the statistically significant negative relationship between ENV and ROA turns insignificant even though the coefficient remains negative. In contrast to our previous regressions, we find a weak significant positive relationship between SOC and Q (0.0129, $p<0.1$). Beyond these findings, we identify no real differences between our regressions regarding the CSP-CFP relationship.

In order to assess the economic significance of this finding and put it into perspective, we compare the standard deviations of Tobin's Q and the social performance score from **table 4**, which are based on all the firms in the sample. One standard deviation increase in the social performance score is associated with a 0.1539 standard deviations increase in Tobin's Q.

Hypothesis H_2

In **table 8** the regression results for hypotheses H_{2a}-H_{2c} are shown. The results show no support for neither of the hypotheses H_{2a}-H_{2c} – that risky industries show a more positive relationship between CSP and CFP compared to other industries. These results imply that whether an industry is considered risky or not, in terms of their exposure to environmental and social issues, do not affect the relationship between CSP and CFP. As discussed in the previous section, the insignificant coefficients could be the result of time-invariance within firms in the CSR performance scores. Therefore, we run regressions without firm fixed effects as well. The results of these regressions are shown in **table 11**.

In table 11 we see that even though all the interaction variables have positive coefficients, a majority of them remain insignificant. Nevertheless, a statistically significant positive coefficient (0.0410, $p<0.05$) is shown for the interaction variable SOC*SR in regression (17), indicating that SR industries show a more positive relationship between SOC and Q compared to other industries. This is consistent with hypothesis H_{2b} and implies that investors in firms that operate in industries that are more exposed to social issues, value social efforts to a higher degree compared to investors in firms that operate in other industries.

We use the same methodology as previously to assess the economic significance of this result. For firms that operate in socially risky industries, one standard deviation increase in the social performance score is associated with a 0.5269 standard deviations increase in Tobin's Q.

5.3 Robustness tests

To test the validity of our results and to evaluate our statistical model's sensitivity to alterations in some of its assumptions, we will perform a number of robustness tests. The robustness tests will be based on our baseline regressions that do not include firm fixed effects.

Firstly, to analyze to what extent our results are affected by different levels of winsorization, we run regressions with winsorization to the 5^{th} and 95^{th} percentile and without winsorization as well. Secondly, ROA is replaced with ROE as proxy for CFP. This robustness test will help address any potential bias deriving from the low ROA associated with financial services firms due to their distinct capital structure. Thirdly, we follow Waddock and Graves (1997) in their encouragement to use different time-lags other than one-year lags. We introduce two-year lags and also run our regressions without lags as well. Lastly, we run our baseline regressions with CSR ratings from Thomson Reuters ASSET4 to see if and to what extent our results differ between the two CSR rating frameworks.

Table A2 and **table A3** illustrate the results of our baseline regressions for the different levels of winsorization. It appears that the statistically significant positive relationship between SOC and Q turns insignificant when we winsorize to the 5^{th} and 95^{th} percentile and when no winsorization is used. Nevertheless, the p-values remain close to the 10 % significance level ($p=0.102$ for winsorization to the 5^{th} and 95^{th} percentile and $p=0.115$ with no winsorization). Thus, we conclude that our results are relatively unaffected by different levels of winsorization.

The results from our regressions comparing ROE to ROA show that there are no major differences between using ROE and ROA as proxy for CFP.

Our model is mostly unaffected by the use of different time-lags. A clear majority of the coefficients of our explanatory variables do not change signs and those that do are statistically insignificant in all scenarios. The positive relationship between SOC and Q that is found in our baseline regression is amplified and show a higher statistical significance when no time-lags are used.

In contrast, using 2-year lags weakens the relationship as it turns insignificant. This pattern is illustrated in **table 12**. This may capture that CSR is reflected more immediate in market-based measures, since investors are able to incorporate the effects of CSR practices into their valuation directly. Furthermore, the diminishing nature of the relationship between SOC and Q as longer time-lags are used, may reflect that the positive effects of CSR practices have are time diminishing. For hypothesis H_{2b}, we find that the statistically significant positive coefficient for the interaction variable SOC*SR is amplified when longer time-lags are used. This implies that the positive effects deriving from adopting CSR practices, that attempt to address different social issues, last longer for firms that operate in SR industries. This finding can be observed in table 12.

In **table 13**, the results of our baseline regressions for the different CSR rating frameworks are presented. Unfortunately, a relatively small sample – containing 41 firms – can be used to compare ASSET4 to GES Risk Rating. Regression (27) and (28) show the results using GES Risk Rating for our full sample (161 firms). To make the results more comparable, regressions were run using GES Risk Rating with the same sample as for ASSET4. These results are presented in (29) and (30). Important to point out is that the CSP score from ASSET4 is based on all three ESG dimensions – environmental, social and corporate governance – in contrast to GES Risk Rating which do not cover corporate governance in our sample. To increase the comparability, we create an equally-weighted CSP score for ASSET4 based on its environmental and social performance scores. Regression (31) and (32) show regression results for ASSET4. As table 13 illustrates, there are major differences in our results between the two CSR rating frameworks. These results should be taken with great caution, however, as the reliability of these results is questionable due to the small sample size that is used. Even though, the results may to some extent illustrate the complexity of measuring CSR and underscore how the lack of standardization complicates any attempts to establish an unambiguous relationship between CSP and CFP.

6 Discussion and Conclusion

In this study, the relationship between CSP and CFP is analyzed in a Swedish context. A lot of emphasis has been put to try to isolate the relationship between CSP and CFP. Therefore, panel data methods have been used to control for unobserved heterogeneity that may cause bias if not controlled for.

Overall, our results indicate that there is a neutral relationship between CSP and CFP. A main finding, however, suggest that there is a weak positive relationship between social performance and the market-based financial performance measure Tobin's Q. This finding indicates that investors value efforts that aim to address social issues related to the operations of the firm. In their study, Hillman and Keim (2001) conclude that activities related to the management of relations with customers, employees, suppliers and communities are value-creating. They argue that since these stakeholders are more integrated with the operations of the firm, managing and investing into these relationships will translate into operational benefits and competitive advantages that the firm will be able to capitalize on financially. Applying this reasoning to our results, the positive relationship between social performance and Tobin's Q could indicate that investors may view the efforts to address social issues, as activities that generate value to the firm in terms of human capital, improved firm reputation and supplier loyalty to name a few. This could also help explain why environmental performance show no significant relationship with CFP, as environmental sustainability may be viewed as purely discretionary and is not considered to generate any real value for the firm.

The use of different time-lags reveal that the positive relationship weakens as longer time-lags are used. The strongest relationship is found when no time-lags are used and the positive relationship turns insignificant when 2-year lags are implemented. This suggests that the positive effects deriving from social performance diminish over time. For firms that operate in SR industries, we find that the suggested positive effect appears to last longer.

Furthermore, we find that the positive relationship between social performance and Tobin's Q is amplified for SR industries. Building on the previous interpretation, this indicates that investors in firms that operate in SR industries, value the adoption of CSR practices that aim to address social issues, to a higher degree than investors in other industries.

Important to point out is that our results diverge as firm fixed effects are included in addition to the industry-year fixed effects. This illustrates the importance of having an appropriate empirical approach that takes into account the characteristics of the data on hand. In our case, as the variation within firms is considered to be relatively low for the CSR performance scores, we argue that the inclusion of firm fixed effects is not appropriate in this context.

Even though a majority of our results indicate that there is a neutral relationship between CSP and CFP, one should not underestimate the long-term value and need of CSR for the society as a whole. Activities related to CSR contribute with value to society that despite their financial implications for firms should be given recognition. Building on this, the neutral relationship may illustrate that CSR has become such an integral part of society and the code of business conduct, that the inclusion of it does not necessarily lead to improved financial performance while the exclusion of it could potentially have indirect negative implications.

7 Limitations and Suggestions for Further Research

This study aims to provide valid results and great effort has been put in the empirical approach in order to analyze the relationship between CSP and CFP thoroughly. Although, before drawing any generalized conclusions from our results, there are limitations in this study that need to be addressed.

There are shortcomings in our model specification. Previous research has highlighted the importance of controlling for investments in R&D as it has been shown to be an important determinant of firm performance (McWilliams and Siegel, 2000). Due to lack of data, we are not able to control for it. Our recommendation for future research in this field is to control for investments in R&D as it could have implications on the outcome. Furthermore, McWilliams and Siegel (2000) also emphasize the importance of controlling for industry advertising intensity. As in the case with R&D, we do not have enough data to control for it in our sample. To address this issue, we have decided to follow Chapple et. al (2001) and Elsayed and Paton (2005) and use intangible assets to sales ratio to capture the advertising effect. Nevertheless, this is to be considered a limitation in our model specification.

The potential presence of endogenous explanatory variables – in this case CSP, ENV and SOC respectively – could have implications on our results. A lot of emphasis has been put to control for some endogeneity – in the form of unobserved heterogeneity – through the fixed effects model. Although, fixed effects are not able to capture potential endogeneity to a full extent. A relatively common approach to detect potential endogeneity in the explanatory variables is called *instrumental variable estimation*. This study has not implemented this approach which may be viewed as a limitation.

Furthermore, there are limitations related to the general measurement complexity of CSR. It is not clear what type of activities that are covered by the CSR concept. Whether the scope is limited to include purely discretionary

activities, or whether it should include activities that is the result of legislative requirements in the country a firm operates in, could have implications on the measurement of CSR and complicate research on the CSP-CFP link. This highlights the importance of coherence regarding the scope and definitions of CSR to achieve consistency in this research field.

There may be limitations due to potential deficiencies in the empirical data used in this study – GES Risk Rating. A limitation in our data is related to the exclusion of corporate governance which restricts us to only cover the environmental and social dimension of CSR in our analysis. Any potential implications of corporate governance on the corporate financial performance is therefore not investigated in this study. Furthermore, since CSR is difficult to measure, the CSR ratings used in this study may not fully capture CSR, which could have implications on the CSP-CFP link. Ullman (1985) points out that these types of deficiencies could help explain the inconsistency in this research field.

Moreover, we would like to address potential limitations with the sample used in this study. Our data is limited to firms listed on Nasdaq Stockholm, implying that mainly Sweden-based firms were studied in this sample. Therefore, the generalizability outside of Sweden is limited. Another potential consequence of this limited scope is a sample size that may not be sufficiently large. To address this in future research aiming to study the CSP-CFP link in Sweden, markets that are institutionally very similar to Sweden, e.g. Norway and Denmark, could be included to increase the sample size without introducing issues with comparability. Also, this study only covers the time period 2009-2014 which could potentially be insufficient to fully capture the relationship between CSP and CFP. This is a limitation set by the GES Risk Rating data used in this study. Therefore, it is important that future research considers the limitations set by different databases in the empirical approach.

Finally, although this study indicates that industry risk to some degree affects the relationship between CSP and CFP, our recommendation for further research

is to continue the analysis on risky industries. This could be done by examining the different risk sources on a more detailed level to provide further insights on industry-specific mechanisms and their implications on the CSP-CFP link. For example, future studies may investigate whether firms operating in industries that are highly exposed to supply chain risk, gain more financially from adopting practices aimed to address supply chain issues, than do firms operating in industries that do not experience the same exposure. Thus, further research may provide more concrete evidence on which CSR activities that will provide the most value for firms based on which industry it belongs to and the risk dynamics of that industry.

8 Tables

Table 1: Sample selection

Sample selection process	Observations	Firms
Firms covered by Thomson Reuters Datastream with all firm and year observations	3276	546
Firms not covered by GES Risk Rating + adjustments to balance panel data	-2106	-351
Final adjustments for missing values for variables used in baseline regressions	-204	-34
Final sample	966	161

This table describes the sample selection process. The financial data for our financial performance and control variables are retrieved from Thomson Reuters Datastream. The CSR data for our corporate social performance variables are collected from the GES Risk Rating database. Firstly, firms that are not overlapping between the financial dataset and the CSR dataset are excluded from the sample. Secondly, firms that are not observed during the whole sample period, 2009-2014 for the CSR data and the financial data used for the control variables; and 2010-2015 for the financial data used for the financial performance measures, are dropped to achieve a balanced panel data. Lastly, firms that have missing values for any variables used in the baseline regressions are also dropped.

Table 2: Variable definitions

Key variables	**Definition**
Dependent variables	
Tobin's Q	[Market Capitalization + Total Liabilities]/[Total Assets]
Return on Assets (ROA)	EBT/Average Total Assets, where average total assets are calculated as the average of ingoing and outgoing balance
Explanatory variables	
CSP	[0.5 x ENV + 0.5 x SOC]
ENV	Environmental Performance proxy retrieved from GES Risk Rating[a]
SOC	Social Performance proxy retrieved from GES Risk Rating[b]
Control variables	
Size	Natural logarithm of firm total assets
Risk	Long-Term Debt/Total Assets
Growth	$[Revenues_t - Revenues_{(t-1)}]/Revenues_{(t-1)}$
Adv	Intangible Assets/Revenues

This table includes definitions of the main variables used in our baseline regressions. [a] [b] *See* ***section 4.3*** *for a more comprehensive definition.*

Table 3: Sample distribution across industries including risk-type categorization of each industry

Industry	Firms	%	Risk-type	Industry	Firms.	%	Risk-type
Aerospace & Defense	2	1.24	ER	IT Services	8	4.97	Low-risk
Airlines	1	0.62	ER	Independent Power Producers & Energy Traders	1	0.62	Low-risk
Biotechnology	5	3.11	Low-risk	Industrial Conglomerates	2	1.24	ER
Building Products	7	4.35	ER	Internet Software & Services	2	1.24	Low-risk
Capital Markets	5	3.11	Low-risk	Leisure Equipment & Products	1	0.62	Low-risk
Chemicals	1	0.62	Low-risk	Life Sciences Tools & Services	1	0.62	Low-risk
Commercial Banks	4	2.48	Low-risk	Machinery	11	6.83	ER
Commercial Services & Supplies	9	5.59	Low-risk	Media	2	1.24	Low-risk
Communications Equipment	4	2.48	Low-risk	Metals & Mining	3	1.86	ER, SR & ESR
Computers & Peripherals	1	0.62	Low-risk	Oil, Gas & Consumable Fuels	2	1.24	ER, SR & ESR
Construction & Engineering	4	2.48	ER, SR & ESR	Paper & Forest Products	4	2.48	ER, SR & ESR
Diversified Financial Services	6	3.73	Low-risk	Personal Products	1	0.62	Low-risk
Diversified Telecommunication Services	4	2.48	Low-risk	Pharmaceuticals	2	1.24	Low-risk
Electrical Equipment	1	0.62	ER	Professional Services	4	2.48	Low-risk
Electronic Equipment, Instruments & Components	10	6.21	Low-risk	Real Estate Management & Development	14	8.70	Low-risk
Food & Staples Retailing	2	1.24	SR	Software	1	0.62	Low-risk
Food Products	3	1.86	ER, SR & ESR	Specialty Retail	8	4.97	SR
Health Care Equipment & Supplies	4	2.48	Low-risk	Textiles, Apparel & Luxury Goods	1	0.62	Low-risk
Health Care Providers & Services	1	0.62	Low-risk	Tobacco	1	0.62	ER, SR & ESR
Health Care Technology	12	1.24	Low-risk	Trading Companies & Distributors	7	4.35	Low-risk
Hotels, Restaurants & Leisure	4	2.48	SR				
Household Durables	5	3.11	Low-risk	**Total**	**161**	**100**	

This table describes the sample distribution across industries. The industry classification is based on the Global Industry Classification Standard by MSCI and S&P. *ER* classifies industries considered risky in terms of their exposure to environmental issues. *SR* classifies industries considered risky in terms of their exposure to social issues. *ESR* classifies industries considered risky in terms of their exposure to both environmental and social issues. *Low-risk industries* are defined as industries that are not considered risky in regards to neither environmental or social issues.

Table 4: Summary statistics

Variable	Obs	Mean	SD	Min	Max	p25	Median	p75
Q	966	1.78	1.45	0.54	9.81	1.02	1.32	1.94
ROA	966	0.06	0.13	-0.56	0.43	0.02	0.07	0.11
CSP	966	32.58	18.54	0	80.5	18	30.5	46
ENV	966	32.57	22.73	0	94	15	28	49
SOC	966	32.58	17.30	0	85	18	31	45
SIZE	966	8.40	2.19	3.60	15.67	6.75	8.13	10.14
RISK	966	0.16	0.16	0	0.72	0	0.13	0.27
GROWTH	966	0.06	0.25	-.55	1.36	-0.045	0.04	0.12
ADV	966	0.32	0.48	0	4.18	0.05	0.20	0.36

This table presents descriptive statistics including number of firm-year observations (Obs), means, standard deviations, minimum values, maximum values and percentiles for the main variables. *Q* is the Tobin's Q, one of two CFP measures used in this study. *ROA* is the return on assets and is used as a CFP measure together with Q. *CSP* is a proxy for corporate social performance and is an equally-weighted score based on the environmental (ENV) and social performance (SOC) scores from GES Risk Rating. *SIZE* is measured as the natural logarithm of total assets. *RISK* is measured as long-term debt to total assets. *GROWTH* is measured as the annual revenue growth. *ADV* is measured as the intangible assets to sales ratio.

Table 6: Pearson's pairwise correlation analysis

	Q_t	ROA_t	$CSP_{(t-1)}$	$ENV_{(t-1)}$	$SOC_{(t-1)}$	$SIZE_{(t-1)}$	$RISK_{(t-1)}$	$GROWTH_{(t-1)}$	$ADV_{(t-1)}$
Q_t	1								
ROA_t	0.1963***	1							
$CSP_{(t-1)}$	-0.0955**	0.0974**	1						
$ENV_{(t-1)}$	-0.0983**	0.0872**	0.9446***	1					
$SOC_{(t-1)}$	-0.0755*	0.0941**	0.9023***	0.7110***	1				
$SIZE_{(t-1)}$	-0.2602***	0.1212***	0.6440***	0.6122***	0.5759***	1			
$RISK_{(t-1)}$	-0.2181***	-0.0914**	0.1529***	0.2018***	0.0627	0.3713***	1		
$GROWTH_{(t-1)}$	0.1477***	0.1098***	-0.1181***	-0.1110***	-0.1074***	-0.0460	0.0135	1	
$ADV_{(t-1)}$	-0.0227	-0.2008***	-0.0942**	-0.1176***	-0.0473	0.0028	0.0273	0.0537	1

This table depicts the Pearson's pairwise correlation coefficients between the main variables used in the regressions. *Q* is the Tobin's Q and *ROA* is the return on assets, which are used as measures of corporate financial performance. *CSP* is a proxy for corporate social performance and is an equally-weighted score based on the environmental (ENV) and social performance (SOC) scores from GES Risk Rating. *SIZE* is measured as the natural logarithm of total assets. *RISK* is measured as long-term debt to total assets. *GROWTH* is measured as the annual revenue growth. *ADV* is measured as the intangible assets to sales ratio. *** $p<0.001$, ** $p<0.01$, * $p<0.05$.

Table 7: Baseline regression - Hypothesis H_1

Dependent variables	Q_t		ROA_t	
Regression	(1)	(2)	(3)	(4)
Explanatory variables				
$CSP_{(t-1)}$	**-0.00116**		**-0.000739**	
	(0.00564)		(0.000683)	
$ENV_{(t-1)}$		**0.00162**		**-0.00110****
		(0.00625)		(0.000428)
$SOC_{(t-1)}$		**-0.00283**		**0.000381**
		(0.00452)		(0.000671)
Control variables				
$SIZE_{(t-1)}$	-0.114	-0.118	-0.0500**	-0.0487**
	(0.126)	(0.126)	(0.0241)	(0.0235)
$RISK_{(t-1)}$	-0.594*	-0.607*	-0.0791	-0.0748
	(0.307)	(0.311)	(0.0722)	(0.0724)
$GROWTH_{(t-1)}$	0.151	0.150	0.0321	0.0321
	(0.100)	(0.0997)	(0.0238)	(0.0235)
$ADV_{(t-1)}$	0.120	0.118	-0.0417**	-0.0410**
	(0.244)	(0.244)	(0.0194)	(0.0187)
Regression details				
Industry-Year FE	YES	YES	YES	YES
Firm FE	YES	YES	YES	YES
Firms	161	161	161	161
Observations	966	966	966	966
R^2	0.361	0.362	0.462	0.465

This table shows the regression results for hypothesis H_1 where a fixed effects model is used to examine the relationship between corporate social performance (CSP) and corporate financial performance (CFP). To measure corporate social performance, we use ratings from the GES Risk Rating database. Two CFP measures are used: *Tobin's Q* as shown in regression (1) and (2) and the *return on assets (ROA)* as shown in regression (3) and (4). The CSP-CFP link is examined on both an aggregated CSP level, shown in regression (1) and (3), and a disaggregated CSP level where the two dimensions of CSP, *environmental (ENV)* and *social (SOC)* performance, are examined as shown in regression (2) and (4). *CSP* is an equally-weighted score based on ENV and SOC. In all our regressions, we control for *SIZE* as measured by the natural logarithm of total assets; *RISK* as measured by long-term debt to total assets; *GROWTH* as measured by the annual revenue growth and *ADV* as measured by the intangible assets to sales ratio. A one-year lag between CFP and the independent variables is used. Robust standard errors (clustered at the industry-level) are in parentheses. *** $p<0.01$, ** $p<0.05$, * $p<0.1$.

Table 8: Baseline regression - Hypothesis H_{2a}-H_{2c}

Hypotheses	Hypothesis H_{2a}		Hypothesis H_{2b}		Hypothesis H_{2c}	
Dependent variables	Q_t	ROA_t	Q_t	ROA_t	Q_t	ROA_t
Regression	(5)	(6)	(7)	(8)	(9)	(10)
Explanatory variables						
$CSP_{(t-1)}$*ESR					**0.00803**	**-0.00249**
					(0.0101)	(0.00200)
$ENV_{(t-1)}$*ER	**-0.00837**	**0.000273**				
	(0.00989)	(0.000586)				
$SOC_{(t-1)}$*SR			**0.000643**	**0.00208**		
			(0.00830)	(0.00249)		
$CSP_{(t-1)}$					**-0.00160**	**-0.000606**
					(0.00594)	(0.000680)
$ENV_{(t-1)}$	**0.00350**	**-0.00117****	**0.00163**	**-0.00108****		
	(0.00772)	(0.000511)	(0.00624)	(0.000439)		
$SOC_{(t-1)}$	**-0.00321**	**0.000393**	**-0.00292**	**0.0000867**		
	(0.00460)	(0.000676)	(0.00481)	(0.000526)		
Control variables						
$SIZE_{(t-1)}$	-0.113	-0.0488**	-0.119	-0.0514**	-0.120	-0.0483*
	(0.129)	(0.0236)	(0.123)	(0.0242)	(0.129)	(0.0241)
$RISK_{(t-1)}$	-0.605*	-0.0748	-0.608*	-0.0772	-0.593*	-0.0794
	(0.315)	(0.0723)	(0.312)	(0.0767)	(0.307)	(0.0720)
$GROWTH_{(t-1)}$	0.155	0.0319	0.151	0.0327	0.147	0.0332
	(0.0995)	(0.0235)	(0.0996)	(0.0238)	(0.101)	(0.0241)
$ADV_{(t-1)}$	0.118	-0.0410**	0.118	-0.0408**	0.118	-0.0413**
	(0.245)	(0.0186)	(0.244)	(0.0186)	(0.245)	(0.0197)
Regression details						
Industry-Year FE	YES	YES	YES	YES	YES	YES
Firm FE	YES	YES	YES	YES	YES	YES
Firms	161	161	161	161	161	161
Observations	966	966	966	966	966	966
R^2	0.362	0.465	0.362	0.467	0.361	0.463

This table shows the regression results for hypotheses H_{2a}-H_{2c} where a fixed effects model is used to examine the relationship between corporate social performance (CSP) and corporate financial performance (CFP) for industries that are risky in terms of their exposure to environmental and social issues respectively. *ER* is an indicator variable for whether an industry *j* in year *t-1* is considered risky in terms of its exposure to environmental issues. *SR* is an indicator variable for whether an industry *j* in year *t-1* is considered risky in terms of its exposure to social issues. *ESR* is an indicator variable for whether an industry *j* in year *t-1* is considered risky in terms of its exposure to both environmental and social issues. To measure corporate social performance and the risk-level of an industry, we use ratings from the GES Risk Rating database. The risk-level of an industry is based on a 7-point scale (C-A, where C indicates high risk and A indicates low risk). Industries that have the rating C or C+ are defined as risky industries. Two CFP measures are used: *Tobin's Q* as shown in regression (5), (7) and (9) and the *return on assets (ROA)* as shown in regression (6), (8) and (10). *ENV* measures the environmental performance and *SOC* measures the social performance of firms. *CSP* is an equally-weighted score based on ENV and SOC. In all our regressions, we control for *SIZE* as measured by the natural logarithm of total assets; *RISK* as measured by long-term debt to total assets; *GROWTH* as measured by the annual revenue growth and *ADV* as measured by the intangible assets to sales ratio. A one-year lag between CFP and the independent variables is used. Robust standard errors (clustered at the industry-level) are in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Table 9: Variation within firms over time for CSR performance measures

	Firm-year observations that do not vary in relation to the directly previous firm-year observation		Firm-year observations that vary in relation to the directly previous firm-year observation indicating variation within firms over time	
	N	% of sample	N	% of sample
CSP	158	16.36 %	808	83.64 %
ENV	278	28.78 %	688	71.22 %
SOC	276	28.57 %	690	71.43 %

This table presents results from a test which aims to assess the variation within firms over time for the three CSR performance measures. Indicators were used to detect firm-year observations that did not change value between two years, i.e. were constant across two years. This test is used as a reference point to determine whether firm fixed effects are appropriate to include in our regressions or not.

Table 10: Baseline regression without Firm FE – Hypothesis H_1

Dependent variables	Q_t		ROA_t	
Regression	(11)	(12)	(13)	(14)
Explanatory variables				
$CSP_{(t-1)}$	**0.00268**		**-0.000655**	
	(0.00898)		(0.000747)	
$ENV_{(t-1)}$		**-0.00801**		**-0.000276**
		(0.00506)		(0.000624)
$SOC_{(t-1)}$		**0.0129***		**-0.000392**
		(0.00722)		(0.000817)
Control variables				
$SIZE_{(t-1)}$	-0.0623	-0.0654	0.0197**	0.0197**
	(0.104)	(0.106)	(0.00939)	(0.00949)
$RISK_{(t-1)}$	-1.486**	-1.391**	-0.214***	-0.214***
	(0.615)	(0.534)	(0.0791)	(0.0792)
$GROWTH_{(t-1)}$	0.751**	0.756**	0.0696**	0.0696**
	(0.300)	(0.296)	(0.0288)	(0.0288)
$ADV_{(t-1)}$	-0.229	-0.245	-0.0215	-0.0214
	(0.311)	(0.311)	(0.0164)	(0.0163)
Regression details				
Industry-Year FE	YES	YES	YES	YES
Firm FE	NO	NO	NO	NO
Firms	161	161	161	161
Observations	966	966	966	966
R^2	0.528	0.391	0.534	0.391

This table shows the regression results for hypothesis H_1 where a fixed effects model is used to examine the relationship between corporate social performance (CSP) and corporate financial performance (CFP). No firm fixed effects are used in these regressions as the CSR performance scores show relatively low variation within firms over time. To measure corporate social performance, we use ratings from the GES Risk Rating database. Two CFP measures are used: *Tobin's Q* as shown in regression (11) and (12) and the *return on assets (ROA)* as shown in regression (13) and (14). The CSP-CFP link is examined on both an aggregated CSP level, shown in regression (11) and (13), and a disaggregated CSP level where the two dimensions of CSP, *environmental (ENV)* and *social (SOC)* performance, are examined as shown in regression (12) and (14). *CSP* is an equally-weighted score based on ENV and SOC. In all our regressions, we control for *SIZE* as measured by the natural logarithm of total assets; *RISK* as measured by long-term debt to total assets; *GROWTH* as measured by the annual revenue growth and *ADV* as measured by the intangible assets to sales ratio. A one-year lag between CFP and the independent variables is used. Robust standard errors (clustered at the industry-level) are in parentheses. *** $p<0.01$, ** $p<0.05$, * $p<0.1$.

Table 11: Baseline regression without Firm FE – Hypothesis H_{2a}-H_{2c}

Hypotheses	Hypothesis H_{2a}		Hypothesis H_{2b}		Hypothesis H_{2c}	
Dependent variables	Q_t	ROA_t	Q_t	ROA_t	Q_t	ROA_t
Regression	(15)	(16)	(17)	(18)	(19)	(20)
Explanatory variables						
$CSP_{(t-1)}$*ESR					**0.0222**	**0.000483**
					(0.0157)	(0.00195)
$ENV_{(t-1)}$*ER	**0.0130**	**0.000181**				
	(0.0150)	(0.00127)				
$SOC_{(t-1)}$*SR			**0.0410****	**0.00194**		
			(0.0159)	(0.00150)		
$CSP_{(t-1)}$					**0.000841**	**-0.000695**
					(0.00952)	(0.000755)
$ENV_{(t-1)}$	**-0.0123**	**-0.000336**	**-0.00855**	**-0.000302**		
	(0.00886)	(0.000933)	(0.00560)	(0.000654)		
$SOC_{(t-1)}$	**0.0123***	**-0.000400**	**0.00316**	**-0.000853**		
	(0.00707)	(0.000798)	(0.00780)	(0.000819)		
Control Variables						
$SIZE_{(t-1)}$	-0.0754	0.0195*	-0.0548	0.0202**	-0.0651	0.0196**
	(0.106)	(0.0102)	(0.105)	(0.00943)	(0.103)	(0.00945)
$RISK_{(t-1)}$	-1.386**	-0.214***	-1.278**	-0.209**	-1.428**	-0.213**
	(0.520)	(0.0787)	(0.506)	(0.0775)	(0.605)	(0.0800)
$GROWTH_{(t-1)}$	0.725**	0.0691**	0.784***	0.0709**	0.751**	0.0696**
	(0.296)	(0.0299)	(0.284)	(0.0281)	(0.297)	(0.0288)
$ADV_{(t-1)}$	-0.242	-0.0213	-0.216	-0.0200	-0.233	-0.0216
	(0.303)	(0.0165)	(0.297)	(0.0167)	(0.308)	(0.0164)
Regression details						
Industry-Year FE	YES	YES	YES	YES	YES	YES
Firm FE	NO	NO	NO	NO	NO	NO
Firms	161	161	161	161	161	161
Observations	966	966	966	966	966	966
R^2	0.538	0.391	0.558	0.397	0.532	0.391

This table shows the regression results for hypotheses H_{2a}-H_{2c} where a fixed effects model is used to examine the relationship between corporate social performance (CSP) and corporate financial performance (CFP) for industries that are risky in terms of their exposure to environmental and social issues respectively. No firm fixed effects are used in these regressions as the CSR performance scores show relatively low variation within firms over time. *ER* is an indicator variable for whether an industry *j* in year *t-1* is considered risky in terms of its exposure to environmental issues. *SR* is an indicator variable for whether an industry *j* in year *t-1* is considered risky in terms of its exposure to social issues. *ESR* is an indicator variable for whether an industry *j* in year *t-1* is considered risky in terms of its exposure to both environmental and social issues. To measure corporate social performance and the risk-level of an industry, we use ratings from the GES Risk Rating database. The risk-level of an industry is based on a 7-point scale (C-A, where C indicates high risk and A indicates low risk). Industries that have the rating C or C+ are defined as risky industries. Two CFP measures are used: *Tobin's Q* as shown in regression (15), (17) and (19) and the *return on assets (ROA)* as shown in regression (16), (18) and (20). *ENV* measures the environmental performance and *SOC* measures the social performance of firms. *CSP* is an equally-weighted score based on ENV and SOC. In all our regressions, we control for *SIZE* as measured by the natural logarithm of total assets; *RISK* as measured by long-term debt to total assets; *GROWTH* as measured by the annual revenue growth and *ADV* as measured by the intangible assets to sales ratio. A one-year lag between CFP and the independent variables is used. Robust standard errors (clustered at the industry-level) are in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Table 12: Robustness test – Regressions with different time-lags

Hypotheses	Hypothesis H_1			Hypothesis H_{2b}		
Dependent variables	Q_t			Q_t		
Lag	No lag	1-year lag	2-year lag	No lag	1-year lag	2-year lag
Regression	(21)	(22)	(23)	(24)	(25)	(26)
Explanatory variables						
SOC*SR				**0.0396****	**0.0410****	**0.0434****
				(0.0163)	(0.0159)	(0.0173)
ENV	-0.00876	-0.00801	-0.00534	-0.00929	-0.00855	-0.00574
	(0.00549)	(0.00506)	(0.00508)	(0.00586)	(0.00560)	(0.00588)
SOC	**0.0139****	**0.0129***	**0.00962**	0.00454	0.00316	-0.00101
	(0.00669)	(0.00722)	(0.00724)	(0.00699)	(0.00780)	(0.00841)
Control variables						
SIZE	-0.0551	-0.0654	-0.0622	-0.0449	-0.0548	-0.0495
	(0.0971)	(0.106)	(0.100)	(0.0966)	(0.105)	(0.0988)
RISK	-0.750	-1.391**	-1.680***	-0.641	-1.278**	-1.625***
	(0.641)	(0.534)	(0.523)	(0.631)	(0.506)	(0.515)
GROWTH	0.493	0.756**	0.901**	0.520	0.784***	0.932**
	(0.398)	(0.296)	(0.401)	(0.391)	(0.284)	(0.387)
ADV	-0.371	-0.245	-0.203	-0.344	-0.216	-0.173
	(0.342)	(0.311)	(0.246)	(0.327)	(0.297)	(0.232)
Regression details						
Industry-Year FE	YES	YES	YES	YES	YES	YES
Firm FE	NO	NO	NO	NO	NO	NO
Firms	161	161	161	161	161	161
Observations	966	966	805	966	966	805
R^2	0.538	0.391	0.535	0.563	0.558	0.369

This table shows the regression results of our robustness test where different time-lags are used between corporate financial performance (CFP) and the independent variables to see the implications on our results. Only regression results for hypothesis H_1 and H_{2b} are shown in this table as there were no major differences for hypothesis H_{2a} and H_{2c}. The same applies to our regression results in which *return on assets (ROA)* is used to measure corporate financial performance (CFP). *SR* is an indicator variable for whether an industry *j* in year *t-1* is considered risky in terms of its exposure to social issues. *Q* is defined as *Tobin's Q* and measures CFP in these regressions. To measure corporate social performance and the risk-level of an industry, we use ratings from the GES Risk Rating database. The risk-level of an industry is based on a 7-point scale (C-A, where C indicates high risk and A indicates low risk). Industries that have the rating C or C+ are defined as risky industries. *ENV* measures the environmental performance and *SOC* measures the social performance of firms. In all our regressions, we control for *SIZE* as measured by the natural logarithm of total assets; *RISK* as measured by long-term debt to total assets; *GROWTH* as measured by the annual revenue growth and *ADV* as measured by the intangible assets to sales ratio. Robust standard errors (clustered at the industry-level) are in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Table 13: Robustness test – Regressions comparing ASSET4 and GES Risk Rating

	GES Risk Rating				**ASSET4**	
Dependent variables	Q_t	ROA_t	Q_t	ROA_t	Q_t	ROA_t
Regression	(27)	(28)	(29)	(30)	(31)	(32)
Explanatory variables						
$CSP_{(t-1)}$	**0.00268**	**-0.000655**	**-0.00982**	**-0.000601**	**0.00223**	**0.00193****
	(0.00898)	(0.000747)	(0.00871)	(0.000786)	(0.00735)	(0.000848)
Control variables						
$SIZE_{(t-1)}$	-0.0623	0.0197**	-0.0633	-0.000691	-0.187**	-0.0227**
	(0.104)	(0.00939)	(0.108)	(0.0106)	(0.0745)	(0.00983)
$RISK_{(t-1)}$	-1.486**	-0.214***	-0.867	-0.144	-0.150**	-0.0208**
	(0.615)	(0.0791)	(0.832)	(0.107)	(0.0662)	(0.00796)
$GROWTH_{(t-1)}$	0.751**	0.0696**	0.417	0.0655	-1.045	-0.150
	(0.300)	(0.0288)	(0.270)	(0.0481)	(0.813)	(0.0880)
$ADV_{(t-1)}$	-0.229	-0.0215	-0.169	-0.0273	0.385	0.0454
	(0.311)	(0.0164)	(0.230)	(0.0531)	(0.284)	(0.0316)
Regression details						
Industry-Year FE	YES	YES	YES	YES	YES	YES
Firm FE	NO	NO	NO	NO	NO	NO
Firms	161	161	41	41	41	41
Observations	966	966	246	246	246	246
R^2	0.528	0.534	0.943	0.792	0.942	0.816

This table shows the regression results of our robustness test where the two CSR rating frameworks – Thomson Reuters ASSET4 and GES Risk Rating – are compared to see if our results are sensitive to the use of different CSR rating frameworks. The sample size from the ASSET4 database only includes 41 firms. To make the results more comparable, complementary regressions with the same sample size as ASSET4 are made with the corporate social performance (CSP) proxy from GES Risk Rating shown in (29) and (30). Two corporate financial performance (CFP) measures are used: *Tobin's Q* as shown in regression (27), (29) and (31) and the *return on assets (ROA)* as shown in regression (28), (30) and (32). *ENV* measures the environmental performance and *SOC* measures the social performance of firms. *CSP* is an equally-weighted score based on ENV and SOC for both ASSET4 and GES Risk Rating. The original CSP measure from ASSET4 includes corporate governance in contrast to GES Risk Rating in this study. To make the CSP measures from each CSR rating framework more comparable, an equally-weighted CSP score was created based on the environmental and social performance scores from ASSET4. In all our regressions, we control for *SIZE* as measured by the natural logarithm of total assets; *RISK* as measured by long-term debt to total assets; *GROWTH* as measured by the annual revenue growth and *ADV* as measured by the intangible assets to sales ratio. A one-year lag between CFP and the independent variables is used. Robust standard errors (clustered at the industry-level) are in parentheses. *** $p<0.01$, ** $p<0.05$, * $p<0.1$.

9 References

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10 Appendix

Table A1: VIF-tests to detect severe multicollinearity

(1)			(2)		
Variable	VIF	1/VIF	Variable	VIF	1/VIF
CSP	3.53	0.2835	ENV	5.17	0.1934
SIZE	4.52	0.2212	SOC	4.18	0.2390
RISK	2.35	0.4253	SIZE	4.53	0.2210
GROWTH	1.50	0.6675	RISK	2.37	0.4215
ADV	1.63	0.6127	GROWTH	1.50	0.6675
			ADV	1.64	0.6109

This table presents variance inflation factors (VIF) for the main independent variables used in our regressions. Test (1) show VIFs for the regression model that includes the aggregated CSR performance score, CSP. Test (2) show VIF values for the regression model that includes the disaggregated CSR performance scores, environmental performance (ENV) and social performance (SOC). A general rule of thumb is that VIF values above 10 signal that there is a presence of severe multicollinearity.

Table A2: Robustness test – Winsorization to the 5th and 95th percentile

Dependent variables	Q_t		ROA_t	
Regression	(33)	(34)	(35)	(36)
Explanatory variables				
$CSP_{(t-1)}$	**0.00356**		**-0.000182**	
	(0.00711)		(0.000634)	
$ENV_{(t-1)}$		**-0.00501**		**-0.000118**
		(0.00394)		(0.000455)
$SOC_{(t-1)}$		**0.0102**		**-0.0000578**
		(0.00608)		(0.000552)
Control variables				
$SIZE_{(t-1)}$	-0.0356	-0.0377	0.0107*	0.0107*
	(0.0758)	(0.0772)	(0.00611)	(0.00619)
$RISK_{(t-1)}$	-1.283**	-1.215***	-0.169***	-0.169***
	(0.507)	(0.441)	(0.0531)	(0.0532)
$GROWTH_{(t-1)}$	1.128***	1.121***	0.103***	0.103***
	(0.330)	(0.327)	(0.0352)	(0.0352)
$ADV_{(t-1)}$	-0.137	-0.148	-0.0134	-0.0134
	(0.167)	(0.166)	(0.00923)	(0.00917)
Regression details				
Industry-Year FE	YES	YES	YES	YES
Firm FE	NO	NO	NO	NO
Firms	161	161	161	161
Observations	966	966	966	966
R^2	0.570	0.577	0.424	0.424

This table shows the regression results of our robustness test where ROA, Q and GROWTH are winsorized to the 5th and 95th percentile to see if our results are sensitive to winsorization at different levels. In our baseline models, we winsorize ROA, Q and GROWTH to the 1st and 99th percentile. To measure corporate social performance, we use ratings from the GES Risk Rating database. Two corporate financial performance (CFP) measures are used: *Tobin's Q* as shown in regression (33) and (34) and the *return on assets (ROA)* as shown in regression (35) and (36). The CSP-CFP link is examined on both an aggregated CSP level, shown in regression (33) and (35), and a disaggregated CSP level where the two dimensions of CSP, *environmental (ENV)* and *social (SOC)* performance, are examined as shown in regression (34) and (36). *CSP* is an equally-weighted score based on ENV and SOC. In all our regressions, we control for *SIZE* as measured by the natural logarithm of total assets; *RISK* as measured by long-term debt to total assets; *GROWTH* as measured by the annual revenue growth and *ADV* as measured by the intangible assets to sales ratio. A one-year lag between CFP and the independent variables is used. Robust standard errors (clustered at the industry-level) are in parentheses. *** $p<0.01$, ** $p<0.05$, * $p<0.1$.

Table A3: Robustness test – No winsorization

Dependent variables	Q_t		ROA_t	
Regression	(37)	(38)	(39)	(40)
Explanatory variables				
$CSP_{(t-1)}$	**0.00214**		**-0.000981**	
	(0.0102)		(0.000803)	
$ENV_{(t-1)}$		**-0.00771**		**-0.000443**
		(0.00585)		(0.000694)
$SOC_{(t-1)}$		**0.0119**		**-0.000549**
		(0.00741)		(0.000870)
Control variables				
$SIZE_{(t-1)}$	-0.0926	-0.0954	0.0234**	0.0234**
	(0.125)	(0.127)	(0.0106)	(0.0107)
$RISK_{(t-1)}$	-1.166	-1.077	-0.211**	-0.211**
	(0.861)	(0.807)	(0.0800)	(0.0798)
$GROWTH_{(t-1)}$	0.0518	0.0523	-0.000963	-0.000965
	(0.0580)	(0.0577)	(0.00337)	(0.00340)
$ADV_{(t-1)}$	-0.258	-0.273	-0.0261	-0.0261
	(0.350)	(0.348)	(0.0195)	(0.0193)
Regression details				
Industry-Year FE	YES	YES	YES	YES
Firm FE	NO	NO	NO	NO
Firms	161	161	161	161
Observations	966	966	966	966
R^2	0.456	0.459	0.315	0.315

This table shows the regression results of our robustness test where no winsorization is used. This robustness test is used to assess the sensitivity of our results to different levels of winsorization. In our baseline models, we winsorize ROA, Q and GROWTH to the 1st and 99th percentile. To measure corporate social performance, we use ratings from the GES Risk Rating database. Two corporate financial performance (CFP) measures are used: *Tobin's Q* as shown in regression (37) and (38) and the *return on assets (ROA)* as shown in regression (39) and (40). The CSP-CFP link is examined on both an aggregated CSP level, shown in regression (37) and (39) and a disaggregated CSP level where the two dimensions of CSP, *environmental (ENV)* and *social (SOC)* performance are examined, shown in regression (38) and (40). *CSP* is an equally-weighted score based on ENV and SOC. In all our regressions, we control for *SIZE* as measured by the natural logarithm of total assets; *RISK* as measured by long-term debt to total assets; *GROWTH* as measured by the annual revenue growth and *ADV* as measured by the intangible assets to sales ratio. A one-year lag between CFP and the independent variables is used. Robust standard errors (clustered at the industry-level) are in parentheses. *** $p<0.01$, ** $p<0.05$, * $p<0.1$.