The Influence of Corporate Social Responsibility Components on Financial Performance

An empirical study of the different categories that constitute CSR and their discrete association with both market-based and accounting-based financial performance measures

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Abstract

Currently academia diverges into three main beliefs about the link between CSR and financial performance. Some find a positive relationship, some negative, and some no relationship at all. This paper aims to settle the longstanding debate by analyzing CSR based on the specific categories that it is comprised of. To achieve comprehensive results, the different categories of corporate social responsibility measures are regressed against both market-based and accounting-based measures of financial performance. A dataset of the main components of CSR, namely, environmental, social, and governance aspects are employed for S&P 500 firms across a 13-year period (2000-2013). The results show that the categories of CSR indeed have different a magnitude and direction in their relationship with financial performance. The strongest positive relationship is observed in the governance score of a company, which emphasizes a specific interest in good governance rather than a general interest the entire concept of CSR. These findings help explain the existing discrepancy across existing studies and open a new discussion about which aspects of CSR are most important economically.

Keywords

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1. Introduction

Corporate Social Responsibility (CSR) is a relatively new concept which aims to instil philanthropic qualities into the core practices of businesses. In recent years, especially in the 21st century, public interest in CSR has increased dramatically putting many firms under the spotlight regarding their governance decisions (Eccles & Klimenko, 2019). For decades, the common misconception has been that investing responsibly, for example in firms with ESG labels, meant giving up on performance. However, the evidence now points to the reality that this is not the case. Using an ESG framework can help to avoid companies with bad practices in turn avoiding bigger scandals arising from bad governance or unsustainable operations (Hoi et al., 2013). Unfortunately, a great number of companies today are far from socially responsible and continue to handle business in a purely profit-oriented way. These businesses act in accordance with Milton Friedman's perception that a company's main and only goal should be to serve the financial interests of their shareholders.

Contrary to the views of Friedman's doctrine, Freeman argues that social performance is necessary in attaining business legitimacy. He makes a breakthrough in the history of economic thought with his most famous book titled "Strategic Management: A Stakeholder Approach" (1984). In this literature, Freeman devises a new system by defining stakeholders as any individual or party that is impacted by or is able to impact the realization of the firm's goals. The central idea in stakeholder theory is that the success of an organization depends on the extent to which the organization is capable of managing its relationships with key groups, such as financers and shareholders, but also customers, employees, and even communities or societies. Viewing stakeholders within these compartmentalized groups, allows for businesses to tailor their initiatives to the pressing needs of each individual group as opposed to stakeholders as a single whole (Freeman, 1984). Nowadays, intelligent investors look at companies displaying characteristics such as sustainability and good governance to avoid future financial damage like litigation threats or pollution tax effects. Much of the existing literature surrounding the question whether ethical business leads to financial payoffs stem from the views of Friedman or Freeman.

Increasingly, academia has sought a relevant system by which social practices could be tailored into different areas within firms (Carroll, 1999). The results of existing research studying strength and direction of the relationship between CSR and financial performance has been inconclusive and continues to be, as academics continue to use different definitions of the variables, control for different variables, and apply different empirical models. Whether CSR really pays off financially is too complex a question and the answer changes depending on the above factors, which are defined based on the perspectives of the authors. The aim of this paper is to consolidate these different views in the theoretical framework and dissect the analysis into its deeper categorical aspects, making it more applicable for managerial use. Not only does this enhance the practical application of the findings, it also highlights some of the most important aspects of CSR. By observing the relationships of smaller and more specific components of

CSR this paper explores which components are most relevant in a fast-paced, economic environment. With respect to this, the following research question guides the remainder of this study:

What is the categorical impact of CSR on different financial performance measures?

The remainder of this paper will pursue the following structure: First, an overview of the theoretical background of this topic carefully considers the existing knowledge as well as any potential room for enquiries. The knowledge gap discovered in the theoretical framework is then explored through quantitative research based on a dataset of S&P 500 firms in the 2000 to 2013 timeframe. This time-period is recent enough to be able to make claims about the changing world and the latest demands of the 21st century. Two hypotheses are presented as sub-questions to the main research question of this study. The statistical software program STATA is used to conduct an OLS regression analysis of the variables of interest: the main categories of CSR together with market- and accounting-based measures of financial performance. Next, the findings of the study are mapped out and compared in the results section, followed by a cumulative answer to the research question. Finally, the results are interpreted, and their relevance is discussed in the concluding section. With these comparisons, conclusions are drawn on the two different ends of the cloud-usage spectrum, creating scientific relevance by addressing the previously established knowledge gap as social value by providing more applicability for management.

2. Theoretical Framework

This section constructs the conceptual background necessary to understand the research conducted in this paper. First, the important concepts and theories are introduced to provide readers a basic understanding of the variables integrated in this study. The topics most relevant for this research are corporate social responsibility (CSR), financial performance, and how they tie into each other. To understand the history and background of these conceptions shapes the foundation of this research and is discussed in the first part of this section. This is then expanded by consolidating the two concepts and discussing their two-sided relationship, providing readers with enough knowledge to form their own opinions regarding the discussion. The discussion of this two-way interplay between CSR and financial performance has been a popular topic in the academic world and a trending question throughout existing literature. Thus, the next part of this section formulates a comprehensive overview of the existing and relevant literature. As mentioned in the introduction, prior research regarding this phenomenon has been inconclusive, making it difficult to reach a clear consensus about whether CSR really pays off financially. The various academic perspectives are portrayed in this section to enable comparability and provide a well-rounded, holistic interpretation for readers. Finally, the hypotheses of this paper are developed based on this representation of existing academic perspectives.

2.1. Corporate social responsibility

The complexity in measuring CSR is one of the most significant obstacles when examining its relationship with other factors and this inconsistency in its definition and measurement explains to a large extent the differing conclusions throughout existing research. Though CSR is a widely studied concept, it has still no agreed definition, leading to differing methods and measurements. Before the concept is defined in this paper, existing definitions as well as their motivation are considered. Only after all accounts and academic perspectives have been explored, can one build a clear consensus for the definition that will be used throughout this research. The major discrepancies in the interpretation of CSR began with the emergence of stakeholder theory developed by Freeman in 1984 as the first account to contradict the views of Friedman (1970) which can be considered a sharp contrast to stakeholder theory. While Friedman's doctrine claims that companies need only consider their own material goals and leave social responsibility to governments, Freeman pleads that a firm's responsibility must go beyond its shareholders and encompass all stakeholders, including non-commercial parties.

One of the earlier accounts of corporate social responsibility is that of Archie B. Carrol defining social responsibility as encompassing all "economic, legal, ethical, and discretionary expectations that society has of organizations at a given point in time" (Carroll, 1979). Another account develops this definition as "the continuing commitment by business to behave ethically and contribute to economic development, while improving the quality of life of the workforce

and their families as of the local community at large" was presented at the World Business Council for Sustainable Development by Holme and Watts in 1999.

Donna J. Wood, famously known for her work in measuring and defining corporate social performance (CSP), social responsibility, and sister terms like social responsiveness, or corporate citizenship, defines three principles of CSP each operating on different managerial levels. First, the principle of legitimacy at an institutional level. Second, the principle of public responsibility at an organizational level. And finally, the principle of managerial discretion operating on an individual level. These principles allow us to dissect the notion of CSR and observe it in smaller more digestible parts. Most of Wood's subsequent research revolved around measuring CSP as a set of structural categories, Dahlsrud (2006) develops the context of social responsibility by evaluating up to 37 different definitions of CSR from different academics and different time periods, with the aim to consolidate them into a clear and reliable characterization. Dahlsrud focuses less on "a one size fits all" definition but rather looks at the context-specific social construction of the concept. Through this approach of content analysis, five dimensions of CSR are developed, which can all be analyzed and studied separately. The context of CSR developed by Wood and Dahlsrud among a variety of other authors highlights exactly the views of this paper that CSR is far too complex to be defined by one inflexible term and lumped into one overall score or rating. The best approach thus seems to be dividing CSR into its categories and sub-categories and evaluating firm performances at each level.

Different methods and techniques for measuring CSR can be developed from this notion of categorically defining it. For example, Wood's 1991 model is among many methods utilized in defining and measuring CSR in all its complexity (Wood, 2010). Principal approaches most used in researching CSR and CSP, stem from the ideas of Wood and Dahlsrud, defining a structured point system where a company's overall CSR score can be derived through observations of the specific fields in which the company shows ethical performance, or lack thereof. An environmental, social, governance rating (or ESG rating) is one of the current scoring systems with which a company's social responsibility level is measured and its practical application enforced. ESG is first mentioned in the United Nations (UN) Principles for Responsible Investment (PRI) report published in 2006. Initiated by this publication as part of the greater effort to develop more sustainable investments, ESG criteria was finally mandated as part of the consolidated financial evaluations of companies (UN, 2005). The emphasis on ESG is increasingly growing as major institutional investors are making it clear that they expect the companies they hold to commit strongly to ESG criteria (Atkins, 2020).

2.2. Financial performance

The relevance of financial performance, contrary to social performance, has seldom been questioned and remains a central part of business since the earliest days. While the measurement of financial performance is far more straightforward in comparison to its counterpart CSR, there are several different measures that can be considered and deciding on

the correct one is crucial (Peloza, 2009). Another important factor to consider is the recent dispute whether financial performance measures are indeed the best way of determining a firm's performance or whether it is time to look further at other characteristics such as customer satisfaction, process enhancement, timely delivery, and so on. Management level executives as well as investors are looking further than purely financial performance measures into more modern measurement systems, for example, concepts such as balanced scorecards and rolling forecasts (Barker, 2005). CSR is becoming an important part of these comprehensive performance measures and especially in modern times the public interest in sustainable and clean establishments is greater than ever. For example, an increasing number of mutual funds are beginning to use CSR as a screening device for investment selection (Nelling & Webb, 2009) and this involvement will only increase in the coming decades.

Thus, financial performance can be considered a lagging indicator of the combined success of a company's performance in all its non-financial dimensions. For example, we can consider the concept of a balanced scorecard as a series of non-financial accomplishments leading to eventual financial payoffs. Learning & growth makes way for improved business processes, leading to customer satisfaction, which is in turn observed as increasing financial performance at the end of the period, or in subsequent periods. CSR can be considered one of these non-financial performance indicators as it plays a potentially important role in the financial performance of later periods and could be a factor that benefits a firm's greater success. With this reasoning financial performance remains the most tangible indicator of a firm's overall performance. Therefore, the most apt analysis can be reached by studying the effect of CSR values on the financial performance of future periods.

The question remains: what is the best measure of financial performance? Nunn (2015) distinguishes between four main types of financial performance measures in his consolidated review of the different literature. This subdivision is presented below in Table 1. The oversupply of different financial performance measures reduces comparability among the existing literature and the lack of a repeated use of the same financial metrics has made it difficult to validate their reliability (Griffin and Mahon, 1997).

Most of the existing papers introduce their financial performance variables without having considered other potential options leading to a significant knowledge gap in their analysis. This paper evaluates the prospective variables in relation to four types of performance measures presented by Nunn (2015) before making the decision on the most representative variable for this analysis. This discussion takes place in Section 3.2.

Table 1: subcategories of financial performance measures

Type of measure	Variables employed in different papers
Market based	Daily abnormal returns (excess market valuation)
	Market share
	MCPE (mean cumulative prediction errors)
	Price to book ratio
	Price to earnings ratio (P/E)
	Return to portfolio
	Stock price
	(Change in price + dividends)/original price
Accounting based	Return on assets (ROA)
	Return on equity (ROE)
	Return on sales (ROS)
	Profit margin
	Operating cash flow to sales ratio
	Standard deviation of operating income
	Assets to sales ratio
	Return on investments (ROI)
	Earnings per share (EPS)
	Beta
Risk based	Debt ratio
	Leverage ratio
	Alpha ratio
	Altman's Z score
	Debt to equity ratio
	Quick ration
	Current ratio
	Interest coverage
	Industry concentration ratio
Other	Firm growth rate
	Firm size
	Capital intensity
	R&D intensity
	Advertising intensity
	Sales growth
	Tobin's Q
	Perceptual measures
	Total assets or logarithm of total assets
	Operating income growth
	Import consumption ratios
	Total sales
	Long term debt to assets ratio

2.3. Corporate social responsibility and financial performance: relationship

As previously mentioned, a clear consensus about whether CSR pays off financially has not been reached since the origin of the CSR-profitability debate. This debate has continued for decades among academics and due to the different methods, variables, and criteria used in the research, results are seldom the same among different papers. An important phenomenon within CSR research is the two-directional relationship between CSR and financial performance. In general, a correlation established between these two factors incorporates both the effect of financial success on CSR investment as well as the effect of CSR on financial success.

Waddock and Graves (1997) find CSP to be positively associated with prior financial performance, while also finding it to be positively associated with future financial performance. This supports the theory that a two-way interplay is present. The authors refer to the first relationship as a "slack resource" availability leading to more investment in CSP, while the latter relationship represents that good management and CSP are positively related (Waddock & Graves, 1997). Nelling and Webb (2009) refer to this interplay between CSR and financial performance as a "virtuous circle" exploring in their paper two phenomena (1) whether doing good socially leads to doing well financially, and (2) whether financially stronger firms devote more resources to social activities. An important aspect of this study is that it explores not only the existence but also the direction of the relationship between the two variables of interest. The authors apply several models, each indicating different outcomes. All the different models point to a positive influence of financial wellbeing on CSR investments, however the vice versa effect is inconclusive. When lagged values of CSR are regressed against financial performance (proxied by stock price and earnings) in a simple OLS model the results confirm a 'virtuous circle' with financial performance having a positive effect on CSR and vice versa (Nelling & Webb, 2009). Finally, in the research of McGuire et al. (1988) the authors examine the association between financial performance and social responsibility for 98 firms during the 1977-1984 period. The findings suggest that it may be more fruitful to consider financial performance as a variable influencing social responsibility rather than the reverse (McGuire et al., 1998). A study of the exact direction and magnitude of the causality is a foundation for further research.

The existing academic perspectives can be characterized into three main views, namely, studies that find a positive relationship, studies who find a negative relationship, and finally studies who reach no significant conclusion or observe no relationship. Out of the three groups, most existing studies fall under the first view (Pava & Krausz, 1996; van Beurden & Gössling, 2008; Allouche & Laroche, 2014).

The most popular findings surrounding this topic show a positive relationship of the variables - even if weak. Pava and Krausz (1996) are one of the first authors to conduct an extensive literature review on the existing academic perspectives of their time. Their study finds

traditional capitalist beliefs to be outdated and sheds light on the increasing stakeholder interest in "socially-responsible" companies. Since 1996, CSR has gained more popularity and public interest. In 2008 a similar study is conducted by van Beurden and Gössling reviewing the existing literature of their time. They present clear evidence of a positive relationship between CSR and financial performance. Out of the 31 papers considered in this review, only 2 find a negative relationship while 6 find no influence of CSR on the financial performance, the remaining 23 papers were all in support of the positive relationship gaining popularity with each passing year (van Beurden & Gössling, 2008). An even more recent study by French authors Allouche and Laroche (2014) establishes the strongest positive payoff of CSR, based on a meta-analysis of the existing research up until their time. Based on dozens of international studies the authors document that corporate social performance is strongly related to corporate financial performance, warning for the fact that the measurement and methods characterizing some of the research is often found to moderate the relationship strength between corporate social performance and corporate financial performance (Allouche & Laroche, 2014).

Like suggested by Allouche and Laroche (2014), the variation among the positive correlations is largely due to differing controls used in the different methodologies. Cochran and Wood (1984) for example argue that the average age of firm assets is highly correlated with its social responsibility ranking with older assets indicating lower social responsibility ratings. After controlling for this factor, the correlation between CSR and financial decreases though remaining positive. Another study focuses on CSR's relationship with the stock market performance to study the phenomenon through a market-based lens. Once adjusted for risk the results indicate a low insignificant correlation between risk-adjusted performance and degree of social responsibility (Alexander & Buchholz, 1978). Emilsson et al. (2012) use economic value added as an indicator for profitability. The EVA shows a low positive correlation while other papers discussed in the research have shown a strong positive correlation between CSR and other measures of profitability (Emilsson et al., 2012). For example, a study of the top 56 largest companies in the UK display results in line with the majority of preceding literature that economic performance shows empirical association with increasing financial performance (Balabanis et al., 1998). These results suggest that relationships are weaker for market-based measures of financial performance.

A great number of the positive relationships discussed in the academic world are weak or insignificant (Aupperle et al., 1985; Surroca et al., 2010). In this spectrum of the different levels of association, a potential source of the weakness or insignificance of results is the complexity in measuring CSR discussed in the beginning of this section. A discrete focus on the unique components that together constitute the concept of corporate social responsibility is a potential solution. Some studies focus on the social component of CSR, for example, Choi and Wang (2009) show evidence that well-maintained stakeholder relations can be crucial in helping firms in times of crisis. Similarly, Schnietz and Epstein (2005) indicate that a positive reputation, more specifically "a reputation for CSR" can really support firms during times of crisis. Other studies focus on customer satisfaction and quality management as discrete components of CSR (Luo & Bhattacharya, 2006; Ferreira et al., 2008; Ali et al., 2019). A number of studies focus purely on environmental indicators such as air and water pollution measures, pollution control

disclosures, or different pollution indices (Bragdon & Marlin, 1972; Chugh et al., 1978; Shane & Spicer, 1983; Chen & Metcalf, 1984; Freedman & Jaggi, 1982, 1986). Differing magnitudes of relationships among the different aspects of CSR can be an important reason why studies using an umbrella CSR valuation reach inconclusive results.

Though most of the existing research establishes some sort of positive link between social and financial performance, a series of papers in fact reach the opposite conclusion. An interesting dynamic to highlight among the critics of CSR is that each argues their own unique control variable, changing the structure of the outcome entirely when applied. The claim is that existing results concerning the direct influence of CSR on financial performance lack reliability due to possible mediation or moderation mechanisms. The papers suggest that these are neglected in most studies, leading to biased results by overestimating the effect of social performance on financial performance (McWilliams & Siegel, 2000; Margolis & Walsh, 2003). The article 'correlation or misspecification' by McWilliams and Siegel (2000) finds a positive association between CSR and the firm's financial performance however highlight that this relationship diminishes when controlling for investments in research and development (R&D) expenses. This paper is a particularly important one to note because of its unique decision to control for the effects of R&D investments. Controlling for this variable has significant effects and must be well thought through before its effects can be neglected. Contrary to McWilliams and Siegel's study, this paper incorporates R&D expenditure as a factor in the determinants of CSR and financial performance relationship. More discussion on the application and motivation of the variables and dataset is elaborated further in Section 3.

2.4. Hypothesis development

Based on the conceptual framework, this research makes several assumptions while also rejecting some assumptions of the prior literature. So far, the existing research has discussed one umbrella term for CSR and one overall score in the economic models. Whether it be acquired from the KLD Socrates Database (Nelling & Webb, 2009), the New Consumer Group (Balabanis et al., 1998), or Fortune magazine's ratings (McGuire et al., 2017), these measures oversimplify CSR and its unique characteristics, narrowing its definition to a single broad concept. Thus, the outcomes of these studies have limited applicability for management and real-world business decisions. That dozens of academic papers have established a positive relationship between financial performance and CSR does not provide the necessary level of detail for managers who want to establish an optimal level of CSR investment for their company. Considering the different aspects of CSR autonomously, however, provides more clarity about which investments bring most prosperity for the firm and which cause losses. The different relationships demonstrated by the different categories may be a significant explanation as to why no or negative relationships are established in some of the prior literature. The four branches of CSR discussed in this research are namely, environmental indicators, social indicators, governance indicators, and controversial business involvement. The first part of this research explores the question: do the different categories of CSR each show a different

relationship to financial performance? To answer this sub-question, the following hypothesis is tested:

H1: The different categories of CSR each demonstrate a different correlation to financial performance.

This hypothesis leads to a more advanced discussion of the exact categorical effects. Perceptibly, each category has its own magnitude and direction of relationship with financial performance. For example, a high positive score for controversial business involvement will have a negative coefficient when regressed against financial performance, while a positive score for social indicators is more likely to show a positive relationship. This research suggests and supports the idea that the environmental component of CSR will have the strongest positive relationship to financial performance. This idea is supported by three main reasons.

First, pollution taxes are a growing reality of today's world. As more and more summits and conferences are held internationally addressing the pressing concern of climate change, one of the most effective solutions for the rapid destruction of the environment is to economically punish those who are responsible. If companies refuse to act environmentally cautious because it is more expensive for them, what better way to make them do so than making the counterpart more expensive? Nowadays, environmental taxation has become common practice in most of Europe, Australia, and India as of 2010 (OECD, 2011). The US levies lower environmental taxes relative to other advanced countries, although this number has only been increasing in recent years (Metcalf, 2009). The growing concern for the environment has begun to manifest itself in the economic world and consequences for irresponsible actions are becoming more and more tangible. In many places businesses are beginning to realize that it pays to be environmentally cautious and costs money not to.

The second reason relates to the idea that no firm can succeed in a failing world. Investors today know this and look towards innovative and resourceful business models (Eccles & Klimenko, 2019). There is a newfound interest in cleaner energy due to the relevance and urgency of clean, sustainable resources in the 21st century (Esty & Karpilow, 2019). This also ties into the first reason that slowly but surely; it becomes detrimental for everyone - including the firm itself - to continue reckless corporate practices. Resources are limited and the world has become aware of it, new policies are rising and will begin to affect all industries, both nationwide and internationally. For example, the automobile industry may find itself restricted to only electric cars, legally. Smart/intelligent investors are aware of this and already look at companies that are capitalizing in this market - hence the stock price of tesla in recent years (Liu & Meng, 2017).

The third reason stems from the surging increase in public awareness of environmental problems. The last century has been the century of movements, protests, boycotts, as well as countless trends and twitter hashtags. With the power of social media, Millennials have broken down countless outdated practices and the next generations continue to do so. What this means is that in a day and age where communication time has been decreased to milliseconds, all it

takes is the click of a button to take an incident global. Companies are losing the possibility of covering up their mistakes and are forced to act in accordance with the expectations of growingly conscious societies. According to Sogari et al. (2017) in the coming years social media will have a crucial role in environmental involvement and in encouraging sustainable behaviors. In recent years social media technologies have gained increased attention for their potential to amplify environmental concerns and encourage sustainable behaviors among people (Sogari et al., 2017). Orji et al. (2020) study the effects of social media communication on supply chain sustainability in the freight logistics industry and identify social media as a significant factor that influences corporate decisions. The authors emphasize the crucial role of social media in consumer behavior and hence for the sustainability of supply chains globally, highlighting that the relationship is currently understudied in the academic world (Orji et al., 2020). Note that the references are both recent academic papers. The newfound public awareness of global issues shines light on the fact that the world is changing rapidly and previously established relationships from the 70s or 80s may no longer be relevant. This exposes a significant knowledge gap in some of the papers discussed in the conceptual framework and allows for the CSR-financial performance link to be observed from a more contemporary point of view. Studying the effects of CSR on financial performance through an environmental lens could lead to diverging results from older established literature and potentially provide more applicability for stakeholders at a management level.

The second part of this research will answer the following sub-question: which category of CSR has the most positive relationship to financial performance? Based on the three main reasons argued above, the idea that the environmental category of CSR demonstrates the strongest relationship to financial performance and thus the following prediction is made:

H2: The environmental component of CSR has the strongest positive relationship to financial performance out of the four categories considered in the research.

3. Methodology

This section explains the methodology of the empirical research, of which the results are discussed in the fourth section. Before diving into the regression analysis, the datasets for CSR (ESG data) and financial performance (stock price and EPS) are described, followed by an explanation of the variables and introduction of the controls. This is followed by the construction of the econometric models and reasoning for the need for two different regressions. First CSR values are regressed on stock price to observe the relationship with a market-based measure of financial performance. This is followed by an accounting-based measure, EPS, to provide the best possible representation of reality. The reasons for divergence between the two financial performance measures are discussed in Section 3.2. The answers to the hypotheses will become clear through each of the regressions and the implications of the results will be discussed in Section 4.

3.1. Dataset corporate social responsibility

A difficult dataset to acquire is that of corporate social responsibility due to the complexity in its definition and measurement. Varying descriptions of the concept create opportunities for manipulation and lead to an excessively large array of data availability, making it difficult to filter out the relevant from the irrelevant. When answering the central question of this research: which categories of CSR most affect a firm's financial performance, the ESG rating of a company serves as the most comprehensive independent variable. ESG score, as mentioned earlier, is the closest proxy for corporate social responsibility and rates firms based on their performance in environmental, social, and governance aspects and the MSCI record of company specific ESG scores is the most suitable source of ESG data for this research. As a finance company aiming to stimulate better investment decisions globally, MSCI collects the most relevant data from thousands of sources and considers company specific cases to ensure that their ratings pinpoint the most significant risks of a company (MSCI, 2018). Furthermore, unlike other sources of ESG data, MSCI provides scores for different categories of ESG of which the cumulative sum comprises the total ESG score. Based on this dataset, this study is able to separate the model into four main categories as indicated by the 2018 MSCI ESG stats methodology. Each of these categories are made up of different strengths and weaknesses which sum up to a total score per category and for the entire ESG rating. Namely these categories as well as some of their designated strengths and concerns are displayed below in Table 2:

Table 2: chosen CSR categories and related items

Category of ESG	Strengths/Concerns
1. Environmental indicators	Environmental opportunities (+)
	Environmental management systems (+)
	Natural capital (+/-)
	Climate change (+/-)
	Pollution & waste (+/-)
	Supply challenge management (-)
	Water stress (-)
2. Social indicators	Community (+/-)
	Human rights (+/-)
	Employee relations (+/-)
	Diversity (+/-)
	Product (+/-)
3. Governance indicators	Corruption & political instability (+)
	Financial system instability (+)
	Governance structures (-)
	Controversial investments (-)
	Bribery & fraud (-)
4. Controversial business involvement indicators	Alcohol (-)
	Firearms (-)
	Gambling (-)
	Nuclear power (-)
	Tobacco (-)

3.2. Dataset financial performance

The measurement of financial performance is luckily much more straightforward and precise in the business world. Thanks to an abundance of data availability the variable for financial performance can be chosen optimally. However, this abundance also creates difficulty in comparability across the existing research and correctly deciding the most relevant and representative measure for the research of interest becomes crucial. Section 2.2 presents a table by Nunn (2015) consolidating the existing array of financial performance measures used in the academic papers. Prior to this table, van Beurden and Gössling (2008) identify market-based measures and accounting-based measures as the main factors that represent all the dimensions of financial performance. The results of market- and accounting-based measures can diverge significantly and is one of the causes of discrepancies across studies. Because each type of measure portrays a different side of the coin, incorporating both enhances the interpretation of the results.

Accounting-based measures are considered more accurate in comparison to market measures and are less sensitive to fluctuations. However, financial performance recorded through the books can be prone to manipulation which makes it totally defective in comparison to market

measures. Financial performance determined by the market does not have this shortfall, however like mentioned before can be less accurate due to asymmetric information of market participants. The chosen variables are earnings per share (EPS) as an accounting measure and stock price (SP) as a market measure. EPS and SP are chosen in combination because they both measure the same aspect of a company, namely the stock value, while one is an accounting measure and the other a market measure. This makes them work well together as a holistic measure of financial performance. These datasets are acquired from the Wharton university research and data services (wrds) and provide a magnitude of detail surrounding both variables. Earnings per share can be measured in different ways, more specifically, Wharton offers the variable as basic or diluted and including or excluding extraordinary items. The chosen form of EPS used in the models is explained in Section 3.3.1.1. Table 3: Variables in the panel data regression

3.3. The variables

Table 3 shows a consolidation of all the variables used in the regression conducted in this research. As can be seen, a number of independent variables are necessary in answering the hypotheses. The dependent variables consist of the market- and accounting-based measures of financial performance. The control variables are separated into fixed effects that differ across firms but remain constant over time and characteristics that vary over time such as the size and risk of a company.

Table 3: panel data variables used in the regressions

Dependent variables		Independent variables	Control variables
Market-based	Accounting-based	CSR categories	Industry fixed effects
Stock Price	(Diluted) earnings per share (including extraordinary events)	Environmental score Social score Governance score Controversial score	Year fixed effects Return on assets Return on equity Leverage ratio Current ratio Size R&D expenses Sales growth Tobin's q

All the data for this research is acquired from the Wharton university research data services. The continuous variables are winsorized at 1% and 99% to reduce the effect of possibly spurious outliers. Appendix A shows the distributions of the continuous variables, before and after winsorization. The variable controversial score (one of the categories of CSR) is completely dropped from the dataset due to a significant shortage of observations. The variable SIC represents the Standard Industrial Classification of each of the S&P 500 companies in the dataset, which are then categorized into broader industries - more detail in subsection 3.3.3.1. The missing values for the variable R&D expense are replaced with a zero because these

missing values arise from the absence of disclosures which occur when firms have little or no R&D investments to report. Based on these amendments, the sample is summarized in Table 4. See Appendix B for the descriptive statistics of the raw data.

Table 4: summary statistics

Variables	Obs.	Mean	Std. dev.	Min	Max
Stock price	3297	48.63	34.25	5.93	228.70
EPS	3297	2.25	2.38	-5.10	10.470
Environmental score	3297	0.15	1.27	-5.00	6.00
Social score	3297	0.99	2.79	-7.00	14.00
Governance score	3297	-0.44	0.80	-4.00	2.00
Total CSR	3297	0.67	3.70	-11.00	19.00
Mining	3297	0.04	0.19	0.00	1.00
Construction	3297	0.01	0.11	0.00	1.00
Manufacturing	3297	0.40	0.49	0.00	1.00.
Transport	3297	0.13	0.34	0.00	1.00
Wholesale	3297	0.03	0.16	0.00	1.00
Retail	3297	0.06	0.24	0.00	1.00
Financial	3297	0.20	0.40	0.00	1.00
Service	3297	0.12	0.33	0.00	1.00
Other	3297	0.01	0.07	0.00	1.00
Size	3297	3.87	0.63	2.38	5.95
Leverage ratio	3297	0.20	0.17	0.00	0.80
ROA	3297	0.07	0.08	-0.26	0.24
ROE	3297	0.15	0.30	-1.38	1.38
Current ratio	3297	1.93	1.23	0.39	7.56
R&D Expense	3297	1.20	1.20	0.00	3.71
Sales growth	3297	0.10	0.28	-1.00	1.93
Tobin's Q	3297	2.26	1.32	0.36	7.88

3.3.1. Dependent variables

Stock price is used as the market-based measure of financial performance in this paper and is tracked as the closing stock price at the end of the fiscal year. Yearly values of the stock price are used to coincide with yearly values of CSR that were available. The distribution of this variable has large outliers on the right side reaching $1120.71 (see Appendix B). After being winorized, the distribution resembles normality although still skewed slightly to the left (see Appendix A). Earnings per share is the accounting-based measure of financial performance used in this paper. Data is available for diluted and basic earnings per share. Diluted earnings per share includes outstanding preference share in the earnings calculation of a company. This provides a more realistic picture of actual performance which is why diluted EPS is chosen for this study. Extraordinary items are a relatively newer concept that is only considered by some records of financial performance. Extraordinary items are events outside of a company's usual sequence of operations, for example the sale of a warehouse that has gained value over the years. This sale brings a profit for the company, though it is only a one-time cash inflow and most likely will not happen in the subsequent years (Fernando, 2021). Corporate social

responsibility investments are also outside of a company's usual operations which is why including extraordinary items in the company's earnings per share stipulates a most realistic picture. To summarize, this study uses diluted earnings per share including extraordinary items as the variable for accounting-based financial performance.

3.3.2. Independent variables

The main independent variable used in the regression is the benchmark CSR score that is comprised of several different parts. What makes this study unique in comparison to other academic papers is that the total CSR score is dissected into its smaller components and these components are categorized into main categories that constitute a company's CSR score. Each of these categories also have a unique score, and the financial performance of companies are analyzed in relation to these categorical scores to see if they show a different association and significance in comparison to the overall benchmark score. These categories as well as their relevant strengths and concerns are shown by Table 2 in Section 3.1. After dropping controversial business involvement score due to insufficient observations, the categories of CSR observed in this research are environmental score, social score, and governance score. The total CSR score nevertheless consists of all components discussed in Section 3.1.

3.3.3. Control variables
3.3.3.1. Industry fixed effects

First, industry fixed effects are regressed together with the variable of interest to show how the results can change according to industry. Of course, there are up to 10,000 different types of industries which makes the interpretation near impossible. To ease the process of interpretation and allow for simplicity of the results, each unique SIC (Specific Industry Classification) code is grouped into one of 9 broader categories. These categories and their range of SIC codes are portrayed in Table 5. A dummy variable is created for each category which is then incorporated in all the regressions. The industry category "other" which only has one observation is used as the reference category in the regression. The coefficients of the dummies represent by how much each industry increases or decreases the stock price or EPS of a company in comparison to "other" industries. Controlling for industry prevents the over- or understatement of CSR's relationship to financial performance due to the effects of industry.

Table 5: SIC industry categories

Industry category	SIC code range	Number of observations
Mining	1000 - 1499	5 companies, 205 observations
Construction	1500 - 1799	2 companies, 64 observations
Manufacturing	2000 - 3999	86 companies, 2107 observations
Transport	4000 - 4999	20 companies, 710 observations
Wholesale	5000 - 5199	6 companies, 137 observations
Retail	5200 - 5999	12 companies, 333 observations
Financial	6000 - 6799	13 companies, 1060 observations
Service	7000 - 8999	20 companies, 644 observations
Other	100 - 199, 1800 - 1999, 9000+	1 company, 28 observations
Total	100 - 9999	160 companies, 5288 observations

3.3.3.2. Year fixed effects

Year fixed effects control for the potential variation of a company's financial performance over the years. The economic environment of companies evidently changes over time. The models in this paper consist of data ranging from the year 2000 to 2013. If the year 2000 is considered as the reference category, the coefficients of each year (2001-2013) will represent how much time has influenced the firm's financial performance. To isolate the effect of time from the coefficients of interest, this variable must control for using a fixed effects regression analysis.

3.3.3.3. Size

Size of a company is correlated with both its financial performance and level of CSR investment. A study by Fry and Hock (1976) has established that size and similar variables like total assets or total sales are the most important explanatory variables of a company's level of social disclosures. Size is also directly related to financial performance. Controlling for this variable prevents the overstatement of the correlation between CSR and financial performance (van Beurden & Gössling, 2008). The size of a company in this research is expressed as the logarithm of the company's total assets. The variable is very close to normally distributed. After the variable is winsorized in order to discard any extreme outliers, the distribution does not change significantly with values ranging from a minimum of 2.38 to a maximum of 5.95 (Table 4).

3.3.3.4. Leverage ratio

To represent the level of risk in this research the leverage ratio is used which is computed by dividing total debt by total assets. Debt poses risks for the stakeholders of a company for two main reasons. The first reason is that debt can force firms into making harmful decisions for debtholders and non-financial stakeholders. Secondly, financial distress weakens a company's economic condition giving competitors the opportunity to steal market share (Choi & Wang, 2009). Thus, a company's level of risk could be negatively correlated with financial performance and must be controlled for when studying correlations of financial performance. Firm risk is also correlated with ESG factors based on Sassen et al. (2016). The models control for risk to avoid omitted variable bias in the coefficients. In this paper the variable leverage ratio represents this risk in the regression models. The variable is skewed to the left with significant outliers on the right side distorting the dataset. After the variable is wisnorized it resembles a normal distribution, though a high frequency of observations remains at zero.

3.3.3.5. ROA & ROE

Return on assets (ROA) is very highly correlated with financial performance and is used in many studies as a financial performance measure (Choi & Wang, 2009; Griffin & Mahon, 1997; Chen & Metcalf, 1984). At the same time, due to the slack resource theory by Waddock and Graves (1997) the investment in corporate social responsibility may increase as a result of higher income or a higher ROA ratio, similarly, decreasing significantly due to lack of resources. Thus, as a variable highly correlated with both a company's financial performance and CSR level ROA must be controlled for and will significantly overstate the positivity of the CSR and financial relationship if not. Return on equity (ROE) shows how well a company is managing its income arising from shareholder investments rather than its own assets. Similarly,

it is a good representation of a company's available resources of which they can choose to invest part in activities such as CSR. Return on equity is also highly correlated with financial performance thus must be incorporated in the regression to isolate its effect from the CSR coefficients. To avoid omitted variable bias both ROA and ROE must be controlled for in the regression analyses.

3.3.3.6. Current ratio

The current ratio is another one of the values effecting financial performance and is known as the ratio of current assets to current liabilities. This ratio shows a company's financial stability through its ability to settle its immediate debts or payables, thus is directly correlated with financial performance. At the same time, a higher value means that a company has a higher surplus of assets on hand to invest in philanthropic activities such as environmental, social, or governance goals. This means the current ratio could be correlated with CSR and needs to be controlled for in the analysis. The variable is winsorized to discard extreme values distorting the dataset. After being winsorized the outliers reaching a value of 15.28 (Appendix B) are dropped and the data ranges from 0.39 to 7.56 (Table 4).

3.3.3.7. R&D expenses

McWilliams and Siegel (2000) are one of the first impactful papers to identify research and development expenses to be an important determinant of financial performance. They claim that existing models failing to include R&D expenses as a control variable are "misspecified" leading to largely overstated estimates of the financial impact of CSR (McWilliams & Siegel, 2000). R&D expenses is thus included as a variable in the models conducted in this paper so as to avoid upwardly biased results. This data is available in Wharton however comes with an excessive number of missing values (over 3000). These values are changed to a zero because companies who lack R&D disclosures have no or very insignificant amounts expenditure, which can be regarded as a zero in the dataset. The variable R&D expense is then calculated as the logarithm of total R&D expenditures which essentially turns it into a percentage value rather than extremely large cumbersome numbers and automatically deletes deforming outliers.

3.3.3.8. Sales growth

The sales growth for each year is calculated as (sales of the current year - sales of the past year) divided by the sales of the past year. The distribution of sales growth shows extreme outliers on the right side reaching the value 3701.47 - which is unrealistic for a percentage value. Therefore, after being winsorized the distorting outliers are discarded and distribution changes significantly becoming almost fully normally distributed with a minimum value of -1 and maximum value of 1.93 (Table 4).

3.3.3.9. Tobin's Q

Tobin's Q is also known as the Q ratio and is sometimes also referred to as a company's market-to-book value. The value can be computed in different ways, but its most common, simplified definition is "the market value of assets divided by the replacement cost of capital" (Fu et al., 2016). This basic form can be then expanded into different versions like (equity market value + liabilities market value) / (equity book value + liabilities market value) or value of the stock

market / corporate net worth (CFI, 2020). Due to the limitation of data sources, not all of these components were attainable in order to easily calculate the Q ratio. Therefore, in order to be able to work with the available data from Wharton's Compustat data services, a different formula first coined by Guan (2011) is used. Guan derives the simple version of Tobin's Q to be calculated as the total common (shares outstanding × end of (fiscal) year stock price - book value of equity + total assets) / total assets (Guan, 2011). This formula comes as close to Tobin's Q as possible given the available variables. The distribution of this variable is skewed to the left with the most significant outliers reaching 21.27 (Appendix B), although it is still slightly skewed to the left after being winsorized, the range of the dataset becomes more realistic with a minimum value of 0.36 and a maximum of 7.88 (Table 4).

3.4. The models

Hypothesis 1: The different categories of CSR each demonstrate a different relationship to financial performance.

To find the answer to this hypothesis, it is necessary to compare the coefficients of the total CSR score with those of its individual components. If the results show that each categorical variable shows a different magnitude and direction of coefficient, the hypothesis will be partially accepted. To be able to fully accept the first hypothesis, the results of each discrete category must show different coefficients to each other. To test this, two regressions are necessary: first testing solely the effect of the total benchmark CSR score and second testing the categorical effects by regressing the three chosen categories of CSR. Thus, comparing regressions (1) and (2) with regressions (3) and (4) will bring the desired answer to the first sub-question of this research.

Equation 1: stock price & total CSR score

$$stock\ price_{i,t} = \beta_0 + \beta_1 \cdot total\ CSR_{i,t} + \beta_2 \cdot construction_{i,t} + \beta_3 \cdot financial_{i,t} + \beta_4 \cdot manufacturing_{i,t} + \beta_5 \cdot mining_{i,t} + \beta_6 \cdot retail_{i,t} + \beta_7 \cdot service_{i,t} + \beta_8 \cdot transport_{i,t} + \beta_9 \cdot wholesale_{i,t} + \beta_{10} \cdot i.year_{i,t} + \beta_{11} \cdot size_{i,t} + \beta_{12} \cdot leverage\ ratio_{i,t} + \beta_{13} \cdot ROA_{i,t} + \beta_{14} \cdot ROE_{i,t} + \beta_{15} \cdot current\ ratio_{i,t} + \beta_{16} \cdot R\&D\ expense_{i,t} + \beta_{17} \cdot sales\ growth_{i,t} + \beta_{18} \cdot Tobin's\ Q_{i,t} + \varepsilon_{i,t}$$

Equation 2: earnings per share & total CSR score

$$EPS_{i,t} = \beta_0 + \beta_1 \cdot total\ CSR_{i,t} + \beta_2 \cdot construction_{i,t} + \beta_3 \cdot financial_{i,t} + \beta_4 \cdot manufacturing_{i,t} + \beta_5 \cdot mining_{i,t} + \beta_6 \cdot retail_{i,t} + \beta_7 \cdot service_{i,t} + \beta_8 \cdot transport_{i,t} + \beta_9 \cdot wholesale_{i,t} + \beta_{10} \cdot i.year_{i,t} + \beta_{11} \cdot size_{i,t} + \beta_{12} \cdot leverage\ ratio_{i,t} + \beta_{13} \cdot ROA_{i,t} + \beta_{14} \cdot ROE_{i,t} + \beta_{15} \cdot current\ ratio_{i,t} + \beta_{16} \cdot R\&D\ expense_{i,t} + \beta_{17} \cdot sales\ growth_{i,t} + \beta_{18} \cdot Tobin's\ Q_{i,t} + \varepsilon_{i,t}$$

Hypothesis 2: the environmental component of CSR has the strongest positive relationship to financial performance out of the categories considered in this research.

Hypothesis 2 makes a more specific suggestion about the environmental aspect of CSR. The most straightforward way to test if a company's environmental CSR score has the highest relationship to financial performance is to use the regressions as seen in equation (3) and (4). Based on the same results used for hypothesis two. The coefficients of the three categories: environmental score, social score, governance score can be compared to determine which one has the strongest positive relationship to financial performance. If environmental score does not demonstrate the strongest positive relationship, the hypothesis is rejected.

Equation 3: stock price & CSR categories

$$\begin{aligned}
\textit{\textbf{stock price}}_{\textbf{i,t}} = {} & \beta_0 + \beta_1 \cdot \textit{\textbf{environmental score}}_{\textbf{i,t}} + \beta_2 \cdot \textit{\textbf{social score}}_{\textbf{i,t}} + \beta_3 \cdot \textit{\textbf{governance score}}_{\textbf{i,t}} \\
& + \beta_4 \cdot \textit{construction}_{i,t} + \beta_5 \cdot \textit{financial}_{i,t} + \beta_6 \cdot \textit{manufacturing}_{i,t} + \beta_7 \cdot \textit{mining}_{i,t} + \beta_8 \cdot \textit{retail}_{i,t} \\
& + \beta_9 \cdot \textit{service}_{i,t} + \beta_{10} \cdot \textit{transport}_{i,t} + \beta_{11} \cdot \textit{wholesale}_{i,t} + \beta_{12} \cdot \textit{i.year}_{i,t} + \beta_{13} \cdot \textit{size}_{i,t} + \beta_{14} \cdot \textit{leverage ratio}_{i,t} \\
& + \beta_{15} \cdot \textit{ROA}_{i,t} + \beta_{16} \cdot \textit{ROE}_{i,t} + \beta_{17} \cdot \textit{current ratio}_{i,t} + \beta_{18} \cdot \textit{R\&D expense}_{i,t} + \beta_{19} \cdot \textit{sales growth}_{i,t} \\
& + \beta_{20} \cdot \textit{Tobin's Q}_{i,t} + \varepsilon_{i,t}
\end{aligned}$$

Equation 4: earnings per share & CSR categories

$$\begin{aligned}
\textit{\textbf{EPS}}_{\textbf{i,t}} = {} & \beta_0 + \beta_1 \cdot \textit{\textbf{environmental score}}_{\textbf{i,t}} + \beta_2 \cdot \textit{\textbf{social score}}_{\textbf{i,t}} + \beta_3 \cdot \textit{\textbf{governance score}}_{\textbf{i,t}} \\
& + \beta_4 \cdot \textit{construction}_{i,t} + \beta_5 \cdot \textit{financial}_{i,t} + \beta_6 \cdot \textit{manufacturing}_{i,t} + \beta_7 \cdot \textit{mining}_{i,t} + \beta_8 \cdot \textit{retail}_{i,t} \\
& + \beta_9 \cdot \textit{service}_{i,t} + \beta_{10} \cdot \textit{transport}_{i,t} + \beta_{11} \cdot \textit{wholesale}_{i,t} + \beta_{12} \cdot \textit{i.year}_{i,t} + \beta_{13} \cdot \textit{size}_{i,t} + \beta_{14} \cdot \textit{leverage ratio}_{i,t} \\
& + \beta_{15} \cdot \textit{ROA}_{i,t} + \beta_{16} \cdot \textit{ROE}_{i,t} + \beta_{17} \cdot \textit{current ratio}_{i,t} + \beta_{18} \cdot \textit{R\&D expense}_{i,t} + \beta_{19} \cdot \textit{sales growth}_{i,t} \\
& + \beta_{20} \cdot \textit{Tobin's Q}_{i,t} + \varepsilon_{i,t}
\end{aligned}$$

4. Results

This section presents and discusses the results after running the regressions described above. The empirical research and regression analyses are conducted using the statistical program STATA. As mentioned earlier, the distributions of the variables are presented in Appendix A. First the coefficients of the dependent and relevant independent variables are presented. The results of these tables are explained and provide the necessary information on whether the hypotheses are accepted or rejected. Afterwards, the full regression tables are shown, and the implications of the control variables are discussed. The results are interpreted and the potential reasons for the results are explored using theoretical and qualitative evidence. Limitations of this research and potential changes for future research are discussed in the conclusion.

4.1. Regression tables

It can be seen through Table 6 that a company's overall CSR rating effects its profitability measures negatively. This result is significant at a 5% significance level and is true for both market- and accounting-based measures. With an increase of 1 CSR point, the stock price decreases by \$0.80 while earnings per share decreases by \$0.05, on average. The relationship is significantly more negative when looking at the correlation between financial performance and stock price. This indicates that CSR and financial performance show a more positive relationship for accounting-based financial measures, while it is more detrimental for a company's market value.

Table 6: OLS regression coefficients of financial performance & total CSR

	Total CSR	
	Coef.	$P > \lvert t \rvert$
Stock price	-0.80 **	(0.019)
EPS	-0.05 **	(0.013)

The first hypothesis is tested by comparing the coefficients of the three main CSR categories of interest. It also brings more depth to the analysis to compare these coefficients with those of total CSR in Table 6. The second hypothesis explores which of the three CSR categories have the strongest positive relationship with financial performance, which again requires comparing the three components of CSR. In order to pursue the hypotheses, the categories were regressed in a separate regression as shown in equations (3) and (4) in Section 3. The results of the second set of regressions are shown in Table 7.

Table 7: OLS regression coefficients of financial performance & the CSR categories

	Environmental score		Social score		Governance score	
	Coeff.	P > |t|	Coeff.	P > |t|	Coeff.	P > |t|
Stock price	-1.47	(0.110)	-0.80 *	(0.088)	0.52	(0.608)
EPS	-0.15 ***	(0.009)	-0.04	(0.126)	0.11 **	(0.048)

It can be seen through Table 7 that a company's environmental score decreases its stock price by an average of 1.47 dollars while decreasing its earnings per share by 0.15 dollars. Social score also decreases financial performance with an average negative effect of $-0.80 on stock price and $-0.037 on earnings per share. Contrary to its counterparts, the governance score of a company has a positive effect on financial performance meaning that a 1-point increase in its governance score increases a company's stock price by $0.52 and EPS by $0.11. These coefficients are different from each other, indicating that the first hypothesis could be accepted. However, not all coefficients can be interpreted since some of them are insignificant. Only the correlations between (1) environmental score and EPS, (2) social score and stock price, (3) governance score and EPS are significant at a 1%, 10% and 10% significance level respectively. Recalling that the correlation between total CSR and EPS is -0.05, it can be said that the relationship of environmental score to EPS and governance score to EPS differ significantly from each other and from that of total CSR.

Only at a significance level of 10% a statement about the relationship between a company's social score and its stock price can be made. A potential way to fully interpret hypothesis 1, is by grouping together the two types of financial performance measures and viewing them as two parts of the same measure. This would allow for a comparison among all coefficients and is feasible since a company's earnings per share are directly related to its stock price. With this assumption, the coefficients of the following relationships can be compared: (1) environmental score and EPS, (2) social score and stock price, (3) governance score and EPS, thus concluding that each of them differs at a 10% significance level.

To summarize, hypothesis 1 which states that the different categories of CSR each demonstrate a different relationship to financial performance, can be accepted at a significance level of 5% with respect to the relationship of total CSR, environmental score, and governance score to EPS (see Table 7). Hypothesis 1 can be accepted at a 10% significance regarding all variables, on the condition that stock price and EPS can be used interchangeably as financial performance measures. If the results are observed at a significance level of 10% the coefficient of social score and stock price become significant and interpretable. To interpret all three categories together a significance level of 10% and the assumption of interchangeable stock price and EPS is necessary. Of course, there are several control variables and fixed effects that also play a role in this relationship and have a meaning. These results are shown in Table 8 and 9 the results of the full regressions are presented for (8) total CSR and (9) the CSR categories.

Table 8: full regression results for financial performance & total CSR

	Stock price		EPS	
	Coef.	Std. Err.	Coef.	Std. Err.
Total CSR	-0.80 **	[0.34]	-0.05 **	[0.02]
Construction	-17.32 ***	[5.31]	-1.40 ***	[0.28]
Financial	17.95 **	[11.75]	-1.68 ***	[0.30]
Manufacturing	4.44	[3.34]	0.02	[0.18]
Mining	8.93	[5.75]	0.34	[0.39]
Retail	-2.48	[7.97]	-0.72 *	[0.37]
Service	-6.17	[5.23]	-0.91 ***	[0.29]
Transport	-13.92 ***	[5.19]	-1.09 ***	[0.29]
Wholesale	-0.24	[8.78]	-0.46	[0.46]
Size	14.65 ***	[2.53]	0.80 ***	[0.13]
Leverage ratio	-7.35	[8.60]	-0.12	[0.43]
ROA	60.77 ***	[17.70]	17.24 ***	[1.47]
ROE	1.33	[3.46]	0.61 ***	[0.23]
Current ratio	-1.49	[1.03]	-0.10 *	[0.05]
R&D expense	-2.76 *	[1.58]	-0.18 *	[0.08]
Sales growth	0.04	[4.20]	0.57 ***	[0.17]
Tobin's Q	7.55 ***	[1.29]	-0.24 ***	[0.07]
β_0	-32.44 **	[15.41]	-0.57	[1.18]
Industry fixed effects	Yes	--	Yes	--
Year fixed effects	Yes	--	Yes	--
R^2	26.20%	--	49.81%	--
N	3297	--	3297	--

This table shows the results after running a robust OLS model regressing the total CSR score with two financial performance measures (1) stock price and (2) earnings per share of S&P 500 companies. The dataset holds panel data consisting of yearly values for a company's CSR score, industry classification, and a series of financial data like size or ROA for a period ranging from the year 2000 to 2013. A fixed effects model for panel data is applied checking for the fixed effects of year and industry - which are both present in this regression. To observe the effects of industry 8 dummies representing a company's broader industry category are regressed with one reference category. The remaining coefficients belong to the CSR score and the list of financial data used as the controlling variables of this model. All the coefficient's in the second and fourth columns represent the Beta's (β) of equations (1) and (2) presented in Section 3. The significance levels of the coefficients are represented as follows: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. The standard deviation from the coefficients is the robust standard error shown in the third and fifth columns from which the confidence intervals can be calculated as: $\beta \pm 2 \cdot$ Std. Err.

Some industries have a significant effect on the stock price and earnings per share of companies. For example, the construction and transport industries negatively effect both stock price and earnings at a significance level of 1%. Operating in the construction industry decreases a company's stock price by an average of $17.32 and EPS by an average of $1.40 in comparison to other industries. A company in the transport industry will decrease its stock price by an average of $13.92 and EPS by an average of $1.09 in comparison to other industries

(Table 8). Thus, the presence of industry effects is most substantial in the construction and transport industries, indicating that a financial disadvantage in comparison to other industries.

Adding year fixed effects into the regression increases the r-squared of the results though there is no specific year which stands out in relation to the others - hence why they have been omitted from the results table. It is sufficient here to control for the effects of year that may distort the coefficient of the independent variables.

Out of the control variables, the most significant results are those of size, ROA, and Tobin's Q. Size increases stock price significantly with a 1% increase in company size leading to a $14.80 increase in the stock price on average. A $1 increase in ROA leads to an increase of $60.62 in stock price and an increase of $17.24 in earnings per share on average. An increase in the Tobin's Q of a company leads to an average increase of $7.55 in stock price and average decrease of $0.24 in EPS (Table 8). These controls are all significant at a level of 1% and each suggest that a greater size and availability of resources increases financial as well as social measures. In summary, variables that represent the magnitude and resources of companies, like size and ROA are correlated positively with their financial performance while Tobin's Q indicating a company's market-to-book ratio is positively correlated to market-based financial performance and negatively to accounting-based financial performance. Table 9 below shows the same results for the categorical independent variables regressed against financial performance measures.

Table 9: full regression results for financial performance & CSR categories

	Stock price		EPS	
	Coef.	Std. Err.	Coef.	Std. Err.
Environmental score	-1.47	[0.92]	-0.15 ***	[0.06]
Social score	-0.80 *	[0.47]	-0.04	[0.02]
Governance score	0.52	[1.00]	0.11 **	[0.06]
Construction	-15.74 **	[5.09]	-1.15 ***	[0.30]
Financial	19.03 *	[11.83]	-1.50 ***	[0.31]
Manufacturing	5.41	[3.28]	0.19	[0.21]
Mining	8.88	[5.65]	0.37	[0.38]
Retail	-1.20	[8.03]	-0.50	[0.40]
Service	-4.95	[5.14]	-0.71 **	[0.31]
Transport	-13.07 ***	[4.99]	-0.93 ***	[0.30]
Wholesale	1.10	[8.99]	-0.24	[0.48]
Size	14.80 ***	[2.59]	0.80 ***	[0.14]
Leverage ratio	-6.83	[8.84]	-0.03	[0.43]
ROA	60.62 ***	[17.70]	17.24 ***	[1.48]
ROE	1.37	[3.45]	0.62 ***	[0.23]
Current ratio	-1.49	[1.03]	-0.10 *	[0.05]
R&D expense	-2.57	[1.58]	-0.16 *	[0.08]
Sales growth	-0.04	[4.20]	0.56 ***	[0.17]
Tobin's Q	7.54 ***	[1.30]	-0.24 ***	[0.07]

β_0	-32.27 **	[15.04]	-0.75	[1.16]
Industry fixed effects	Yes	--	Yes	--
Year fixed effects	Yes	--	Yes	--
R^2	26.20%	--	49.81%	--
N	3297	--	3297	--

This table presents the results for the OLS regression checking the effects of the three main categories of CSR: (1) environmental score, (2) social score, and (3) governance score on the two financial performance measures (1) stock price and (2) earnings per share of S&P 500 companies over a period of 13 years (2000-2013). The model tests for the fixed effects of year and industry - both present in this regression. To observe the effects of industry 8 dummies representing a company's broader industry category are regressed with one reference category. The remaining coefficients belong to the CSR score and the list of financial data used as the controlling variables of this model. All the coefficient's in the second and fourth columns represent the Beta's (β) of equations (1) and (2) presented in Section 3. The significance levels of the coefficients are represented as follows: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. The standard deviation from the coefficients is the robust standard error shown in the third and fifth columns from which the confidence intervals can be calculated as: $\beta \pm 2 \cdot$Std. Err.

The results are very similar when financial performance is regressed against the individual categories of CSR. The construction industry has an average effect of $-15.74 on stock price and $-1.15 on EPS. The transport industry has negative effects of, on average, $-13.07 and $-0.93 on stock price and EPS respectively. Similarly, the most noteworthy control variables are size, ROA, and Tobin's Q with similar effects as in Table 8. All results are significant at 1% leading to the same conclusions drawn regarding Table 8.

4.2. Interpretation of the results

First, based on the results above the idea that CSR brings positive payoffs financially is rejected. When the relationship of CSR is categorically observed in relation to financial performance the results differ little from the original regression, however, differ significantly from each other. Out of the three categories only a company's governance score is positively associated with both financial indicators, thus this component of CSR is demonstrating a different relationship to the total CSR score. The other categories are both negative however they are still notably different from each other. Environmental score effects financial performance almost twice as negatively as social score.

To answer hypothesis 2, the coefficients of the categorical variables in the second set of regressions are compared to each other. Putting the categories in order it seems that a company's environmental score is in fact most poorly related to its financial performance while it's governance score is most positively related. Looking at the results at a significance level of 10% we can reject the second hypothesis as environmental score not only hinders financial performance, it also shows the strongest negative relationship to the financial measures. Environmental score effects financial performance almost twice as negatively as social score. The independent variable most positively correlated with financial performance is in fact a

company's governance score. This result means that the global significance of environmental goals was significantly overestimated by this paper and puts good governance at the forefront of investor interests. This is theoretically in line with the claims made in this paper regarding the risk aversion and preference for long-term value of investors, and the relevant sources discussed in this paper. Many articles and sources on smart investing suggest that over 75% of investors look towards companies with good governance before financially backing a company (PwC, 2017). Academia also supports this notion with Newell & Wilson's findings from 2002 that better governed had significantly higher price-to-book ratios indicating that investors are willing to pay a premium for shares in a well-governed company. Hoi et al. (2013) analyzes whether CSR is associated with tax avoidance and finds that a lower CSR score as well as lower levels of CSR disclosures are associated with more tax avoidance, which further supports the idea that governance is most relevant for financial backers along with several other contemporary sources (Gürbüz et al., 2010; Aggarwal, 2013; Rossi et al., 2015; Iqbal et al., 2019).

Some of the control variables have implications for the validity of this study. Namely, among the industries controlled for in these models, some cause significant biases on the resulting coefficients. This could mean that different conclusions may have been reached had the study been conducted through an industry-specific lens. The relevance of the financial industry in relation to stock price for example could mean that if only firms in the financial industry had been observed, the coefficients of could have been much higher. Because of these effects, comparability between the sample set is limited and it may serve more useful to estimate coefficients for companies with similar total assets, which is a factor in both its size and return on assets. This opens a potential topic for future academics to conduct an industry-specific study on the CSR-financial performance link.

To summarize, based on the results displayed above the first hypothesis can be accepted as the coefficients differ with enough significance - with the condition that stock price and EPS can be interchanged as the hypothesis is supported by all CSR categories. The second hypothesis is rejected as environmental score has the worst effect on financial performance rather than the best. Out of the three categories governance score is most positively correlated with financial performance, showing that the highest density of economic interest goes to a company's business practices and the transparency by which an entity operates. Thus, the assumptions made in this paper about society's growing demand for environmental consciousness and turn out to be weaker than expected, while stronger attention should have been guided to the importance of good governance in a company.

5. Conclusion

The purpose of this paper was to observe the unique effects of each CSR category on financial performance and explore whether the relationships were different for the different categories. This section concludes this process by summarizing the findings of the research and providing an overview of the purpose and results of the empirical study. After a comprehensive review of the entire process of this thesis, the concluding statements are made about the hypotheses. This is followed by an explanation of the limitations faced while conducting all aspects of the research and an exploration of different ideas for future research.

5.1. Overview

Based on the extensive literature review of Section 2, no clear outcome on the relationship of CSR and financial performance could be reached. Though most papers did report a positive relation between the two, a significant amount of these relationships were weak or insignificant, while some of the stronger research established no or negative correlations (McWilliams & Siegel, 2000; Margolis & Walsh, 2003; Emilsson, 2012). Due to the lack of a clear consensus, this thesis chose to take a different approach and dissect CSR into its smaller components in hopes of reaching a more comprehensive analysis. The central research question of this study was:

What is the categorical impact of CSR on different financial performance measures?

To be able to provide a comprehensive answer, this broad question was then divided into the following two sub-questions: (1) do the different CSR categories show different relationships to financial performance measures and (2) which CSR category shows the strongest (most positive) relationship to financial performance?

The methodology consists of selecting the relevant categories of corporate social responsibility and finding a model to generate and compare their relationship to the financial performance measures. All the data were obtained from Wharton university research and data services. Three components of the overall CSR score were chosen. These categories are environmental score, social score, and governance score. First, an OLS model regressing the total CSR score against financial performance measures and several controls tests hypothesis 1 by observing the correlation between total CSR and the financial performance measures. Second, the same OLS model is used to regress the three CSR categories against the same financial performance measures and control variables. The financial performance measures are stock price as a market-based financial performance measure and earnings per share (EPS) as an accounting-based measure. Industry and year fixed effects are controlled for as well as company size, leverage ratio, return on assets (ROA), return on equity (ROE), current ratio, R&D expenses, sales growth, and Q ratio, to avoid any omitted variable bias. The 9 dummy variables indicating industry categories revealed that the construction and transport industries had relevant negative

effects on both market- and accounting-based financial performance measures, suggesting that an industry-specific study may provide more insights for practical application. In short, the first hypothesis is accepted at a significance level of 10% and under the assumption that stock price and EPS can be substituted for each other. The second hypothesis is rejected showing that the ideas of this thesis regarding environment-oriented CSR are not supported by the sample used in the empirical investigation.

5.2. Discussion

Hypothesis 1 testing whether the relationship between financial performance and CSR categories would differ per category is accepted for environmental and governance categories, and for all categories under the assumption that the two financial measures can be used interchangeably. The implications of this empirical analysis confirm the ideas of this thesis regarding the discrepancies across existing CSR-financial performance literature. This highlights a knowledge gap in academia surrounding the topic and calls attention to a need for more exploration of CSR in its distinguished categories. More focus on this area is likely to resolve several incongruities among the existing literature and initiate better possibilities for applicability at a management level.

Hypothesis 2, checking for which category of CSR demonstrated the strongest positive relationship to financial performance, made the claim that the environmental component of CSR would demonstrate this. This hypothesis is tested through the same regression. At a 10% significance level, a company's governance score showed the most favorable relationship to financial performance while environmental score demonstrated the least. Based on this result, it appears that the claims made by this thesis about the importance of climate change and the growing awareness of investors, were too strong. The sample of S&P 500 firms over the year 2000 to 2013 does not support the idea that the environmental practices of firms are most relevant for their financial performance. More specifically, results show that this thesis over-stated the effects of pollution taxes, investor interests in innovation and sustainability, and the growing public awareness of the realities of the environment discussed in Section 2.4. If the severe consequences of climate change are envisioned, it is disappointing to see that the empirical evidence places a higher importance on corporate governance. In the long run, even the most decent firm cannot succeed in a failing world. Although there is substantial theoretical evidence for why good governance is financially valued (Newell & Wilson, 2002; Gürbüz et al., 2010; Aggarwal, 2013; Hoi et al., 2013; Rossi et al., 2015; Iqbal et al., 2019), this thesis stands by the claim that recent years have increased and will continue to increase the relevance of environmental responsibility and sustainability, stressing that environmental concerns carry more economic relevance than what is currently believed. This urges readers, academics, and company managers to draw more attention to the relationship of a company's sustainability and financial performance. The results of the second hypothesis could potentially differ for a different industry, time-period or firm size. Exploring these areas raises several opportunities to go beyond the findings of this paper.

5.3. Ideas for future research

It is important to consider and point out to the readers of this paper any setbacks that were faced throughout the research process, so that future researchers can avoid these issues and reach a more valid scientific result stemming from the suggestions of this paper. Several limitations were faced when conducting this study. The first limitation regards the sample selection. S&P 500 firms were studied in this research as a proxy for the average firm, however there is no real evidence that S&P 500 provide an accurate picture of the average economy. Furthermore, the question of US firms' ability to represent the rest of the world, potentially discredits the external validity of this paper. Another setback was caused by the restricted availability of financial data in Wharton research and data services. Several variables were adjusted because of the lack of necessary financial data. For example, the formula used for Tobin's Q was just an alternative derived by Guan (2011) and deviates slightly from the actual formula. Furthermore, one of the independent variables were omitted due to an excessive number of omitted variables.

An interesting idea for future research that would increase the validity of the results would be to conduct the analysis on companies of the same size. This could be done several times for samples of different sizes and would increase the validity of the results. To compare companies of different sizes, the study could be conducted on multiple different indexes. Future research could also study more countries and focus on both listed and non-listed companies. This would decrease the presence of large countries in the dataset and would increase observations by adding different types of companies. Another recommendation for further research that has already been mentioned is an industry-specific study. This would increase applicability even more by specifying the most important relationships and influences based on each industry. Studying the discrete categories of CSR for different industries would provide even more guidance at a management-level for which CSR indicators to focus on with regard to their industry. Finally, a study of the exact direction and magnitude of the causality is one of the most important foundations for further research and has been understudied as most academics choose to look at correlations. This research would shed more light on the real relevance of CSR and whether it plays a distinguishable role in the profit-making of firms.

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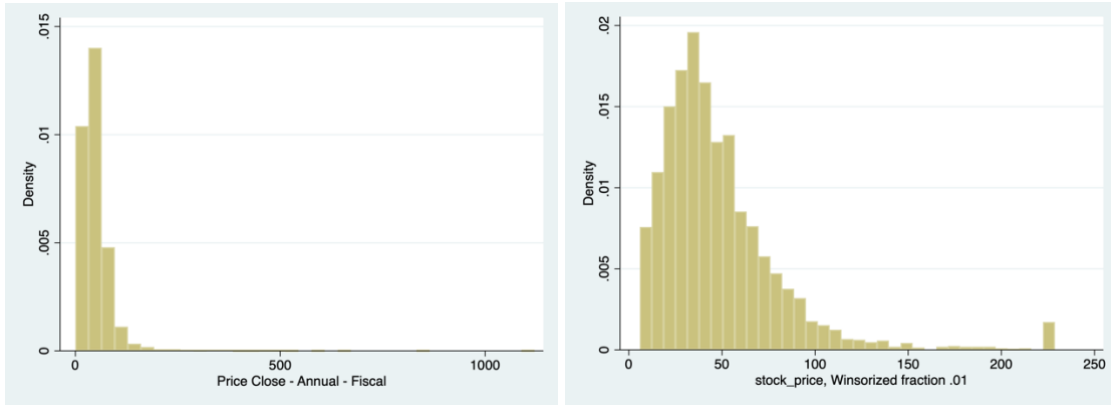
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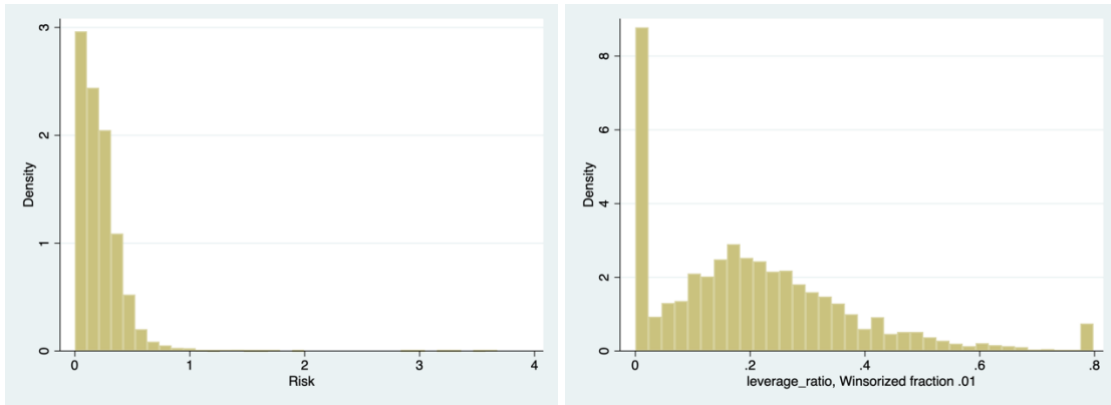
Appendix

Appendix A
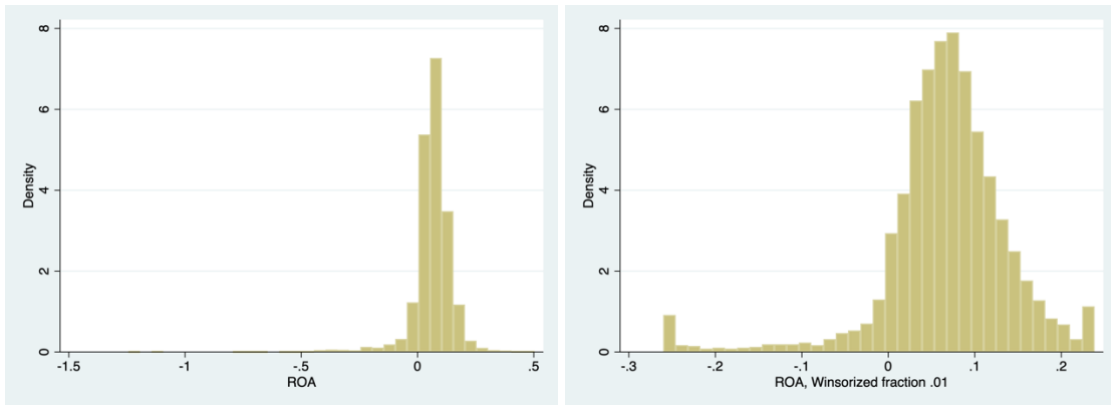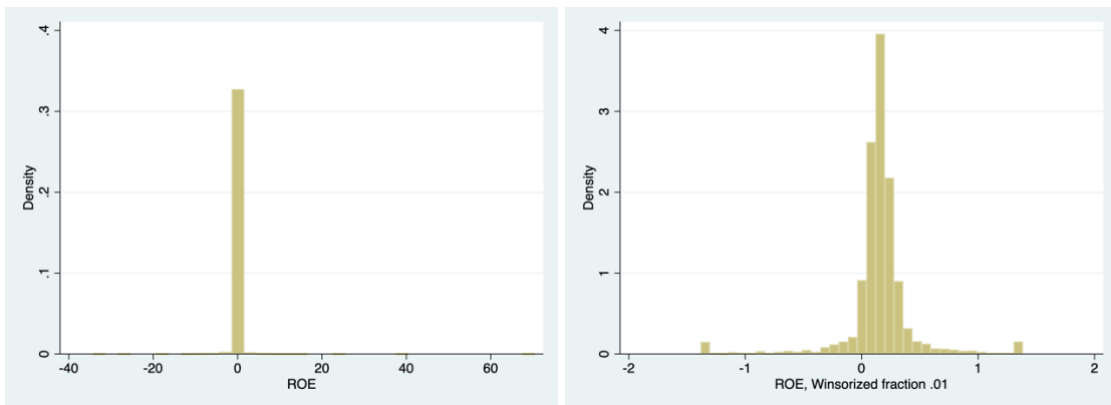
Stock price

EPS
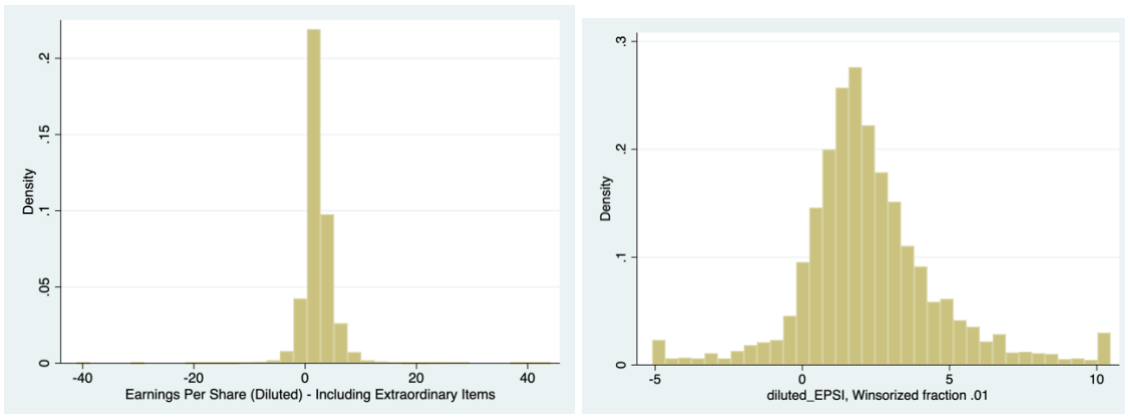
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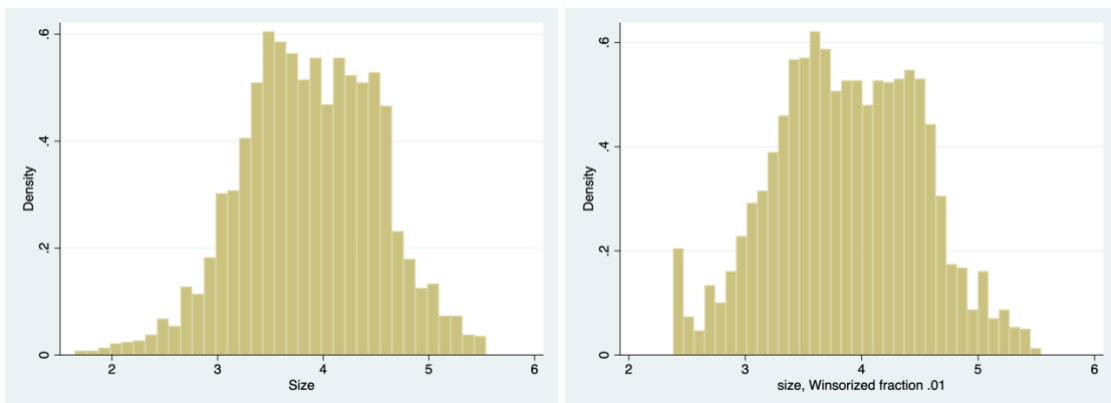
Leverage ratio

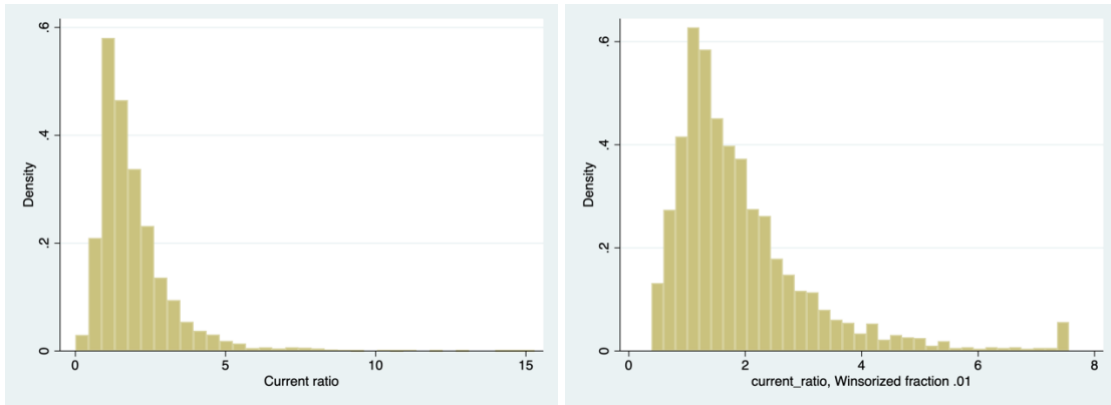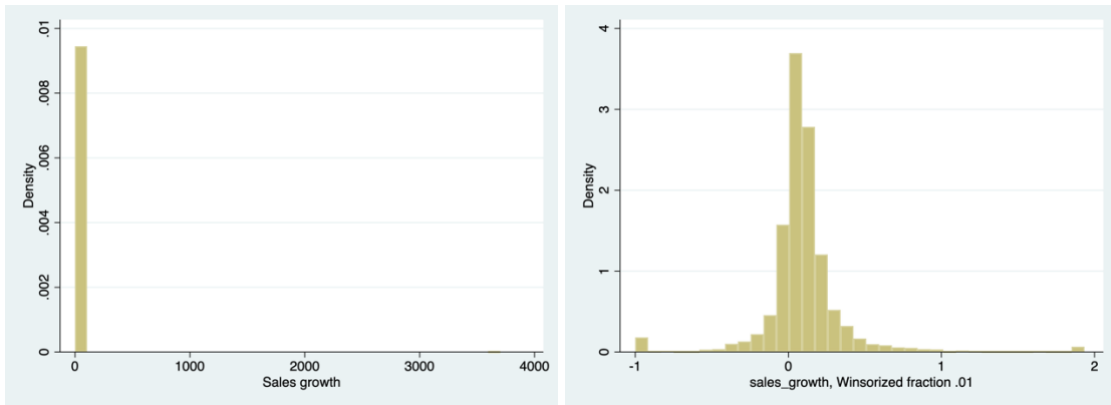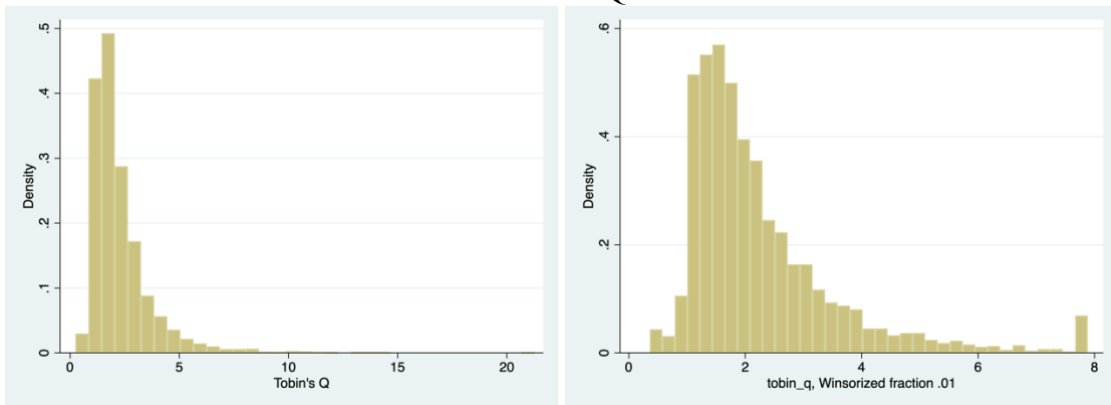
ROA

ROE

Current ratio

Sales growth

Tobin's Q

Appendix B

Appendix table 1: raw data summary statistics

Variable	Observations	Mean	Std. dev.	Min	Max
EPS	5152	1.84	4.17	-68.45	89.61
Stock price	5152	50.28	54.39	0.00	1120.71
Environmental score	5288	0.15	1.27	-5.00	6.00
Social score	5288	0.99	2.79	-7.00	14.00
Governance score	5288	-0.44	0.81	-4.00	2.00
Controversial score	499	0.27	0.54	0.00	3.00
Total CSR	5288	0.67	3.70	-11.00	19.00
SIC	--	--	--	--	--
Year	5288	2007,16	3.91	2000	2013
Size	5167	4.02	0.72	1.65	6.38
Leverage ratio	5167	0.17	0.22	0.00	3.68
ROA	5151	0.05	0.93	-2.07	0.50
ROE	3872	0.15	1.68	-34.33	70.38
Current ratio	4129	1.88	1.37	0.00	15.29
RD expense	5288	0.91	1.16	-0.82	4.09
Sales growth	5148	0.70	51.62	-1.00	3701.47
Tobin's Q	5151	1.98	1.45	0.04	21.27