The Role of Financial Markets in Incentivising Corporate Social and Environmental Performance

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Abstract

The central topic of this thesis is the role played by financial markets in incentivising firms to alter their impact on society through non-market strategies relating to environmental and social performance. The thesis implements a three-paper format with each paper examining how different elements impact the valuation of environmental and social performance by equity markets. Each paper examines aspects of the relationship between these non-market strategies and various measures of firm performance through a contextualised lens. Contextualising the relationship allows for a better understanding of the circumstances under which firms are rewarded for increased environmental and social performance with increased returns, valuations and/or a lower cost of equity capital.

The use of Refinitiv (formerly Reuter)'s Asset4 ESG data in chapters 2 and 3 and my measure of a firm's industry-relative carbon liability reduction in chapter 4 allows this research to examine the relationship between environmental and social performance, and market-based measures of financial performance using industry-relative measures of performance. The importance of considering industry context through the utilization of an industry-relative measure of environmental and social performance rests on the consideration that if investors believe in an optimal level of environmental and social investment, it is likely to be industry-specific in line with other factors such as cost structures, risk profiles and other financial metrics. I also extend my contextualised analysis to consider how institutional forces in the firm's external environment impact the market valuation of its environmental and social activities, in the third and fourth chapters.

The second chapter investigates the cost of equity capital as one of the possible conduits through which firm value may be impacted by changes in a firm's corporate social performance (CSP) due to its possible effect on a firm's perceived risk and the relative size of its investor base. It investigates the impact of a firm's CSP on its implied cost of equity capital when all aspects of CSP are not uniformly, timely and linearly priced by the market (Ding, Ferreira, & Wongchoti, 2016) given the asymmetric information and opacity around CSP (Cho, Lee, & Pfeiffer, 2013) in addition to investors' heterogeneous ability and desire to price its complexities. Using an estimate of each firms' ex-ante cost of equity derived directly from stock prices and cash flow forecasts and a sample of 21,338 firm-year observations from 50 countries during the period from 2002 to 2017, we find a non-linear and stratified relationship. We find that cost of capital reduces with increasing CSP up to a level, beyond which it starts to increase again, representing a reverse J-shaped relationship.

I propose that this occurs as investors with a primary focus on wealth maximization perceive the costs of CSP investment to outweigh the benefits at this level. The presence of an increase in cost of capital for firms with the highest level of CSP performance negates the possibility of an absolute truth about the relationship and highlights that the nature of the alignment between social and economic investment incentives is an important determinant of financial market outcomes.

The third chapter examines the relationship between CSP and firm value from a contingency perspective by investigating the possible moderating role of country-level institutions. Combining elements of institutional, stakeholder and resource dependency theory, I theorise and test whether markets take an instrumental view of CSP by placing more value on increased performance in relation to a stakeholder group's interests in the presence of institutional forces which increase their salience. Using a sample of 43,171 firm-year observations from 49 countries during the period from 2002 to 2019, we find strong evidence that CSP is more positively related to firm value in countries with strong political, labour and market institutions. This highlights the importance of the presence of institutions which empower societal and environmental stakeholders if market forces are to play a positive supporting role in moving business towards a more sustainable future.

The fourth chapter investigates the EU ETS, a market specifically created with the goal of incentivising firms to increase their environmental performance. Using an event study methodology, it examines the impact of EU ETS verified emissions publications and political events on the market value of 123 publicly traded participating firms during the third phase of its operation (2013-2020). I find that positive firm-specific environmental news is associated with higher returns in the latter years of the EU ETS's third phase (2018-2021) while it had an insignificant impact in earlier years (2014-2017). Furthermore, the impact of institutions on market outcomes is further substantiated by my finding of a significant market reaction to a number of political events relating to the revisions of the system. These findings lend further weight to the argument for considering the relationship between environmental and market-based financial performance through a contextual lens, given the time-variant nature of financial market perceptions of the value relevance of corporate actions by demonstrating the ability of institutions to mould financial market outcomes.

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Acronyms

AR	Abnormal Return
BTM	Book-to-Market ratio
BVPS	Book Value Per Share
C02	Carbon Dioxide
CAAR	Cumulative Average Abnormal Return
CAPM	Capital Asset Pricing Model
CAR	Cumulative Abnormal Return
CC	Control of Corruption
CFP	Corporate Financial Performance
CL	Civil Liberties
CM	Credit Market Development
COEC	Cost of Equity Capital
CSP	Corporate Social Performance
CSR	Corporate Social Responsibility
DLOSS	Financial loss
EEA	European Economic Area
EFA	Exploratory Factor Analysis
EFTA	European Free Trade Association
EFW	Economic Freedom of the World Data from the Heritage Foundation
ENV	Environmental Score
ESG	Environmental, Social and Governance
EU	European Union
EU ETS	European Union's Emissions Trading System
EUA	European Union's Emissions Trading System Allowance
FI	Economic Freedom of the World Data from the Fraser Institute
FOW	Freedom House's Freedom in the World metrics
GDP	Gross Domestic Product
GI	Government Intervention
ICC	Implied Cost of Capital
IF	Investment Freedom
ILLIQ	Illiquidity
ILO	International Labour Organisation
LEV	Leverage
LFR	Linear Reduction Factor
LGDPPC	Log of Gross Domestic Product per Capita
LIS	Labour Income Share
MSR	Market Stability Reserve
NAP	National Allocation Plan
NB	New Business Ease
NIPS	Net Income Per Share
OECD	Organisation for Economic Co-operation and Development
OLS	Ordinary Least Squares
P	Market Price
PR	Property Rights
R&D	Research and Development
RI	Residual Income Earnings Forecasting Model
ROA	Return on Assets

ROE	Return on Equity
ROI	Return on Investment
ROS	Return on Sales
SIC	Stakeholder Influence Capacity
SRI	Socially Responsible Investment
TF	Trade Freedom
TNAC	Total Number of Allowances in Circulation
VIF	Variance Inflation Factor
VOL	Volatility
WBD	World Bank Development Indicators
WBG	World Bank Governance Indicators

Chapter 1 Introduction

1.1 Introduction

This three-paper dissertation investigates the role played by financial markets in incentivising firms to alter their impact on society through its treatment of non-market strategies related to corporate environmental and social performance. Each paper examines aspects of the relationship between these non-market strategies and various measures of firm performance through a contextualised lens. Contextualising the relationship allows for a better understanding of the circumstances under which firms are rewarded for increased environmental and social performance with increased returns, valuations and/or a lower cost of equity capital. Investment decisions related to environmental and social performance are likely to reflect the interplay of two potential drivers of investment allocation decisions: social norms and economic incentives. This research examines whether the alignment or mutually exclusivity of these drivers is contingent on context. Specifically, this research investigates two elements that may impact financial market perceptions of the alignment of social norms and economic incentives; the industry-relative environmental and social performance of firms and the institutional setting in which a firm operates.

We investigate the importance of industry context through the implementation of industry- relative rather than absolute measures of environmental and social performance throughout our research as Flammer (2015) finds that the adoption of Corporate Social Responsibility (CSR) proposals depends on the industry in which the firm is operating, while Ding, Ferreira, & Wongchoti (2016) show that the impact of CSR activities on firm valuation relies heavily on a firm's industry-specific relative position. The use of industry-relative scores is crucial, as the environmental outperformance of, for example, a mining company relative to its industry peers would not be evident if it was measured relative to all firms, including

industries such as financial services, with vastly different environmental exposures. This also mirrors the common practice in finance to judge or benchmark a firm's performance on a certain metric against its industry peers as opposed to all companies, 'comparing apples with apples' as it were, due to industry specific asset composition, cash flows schedules, cost structure, operational structure and risk profile.

Furthermore, this research examines the importance of institutional context on the relationship as the way corporations treat their stakeholders depends on the institutions within which they operate (Fligstein & Freeland, 1995). We examine the role played by political, labour and market institutions which are considered to be critical determinants of corporate behaviour due to their ability to shape the relationships between the firm and its primary stakeholders (Aguilera & Jackson, 2003; J. L. Campbell, 2007). Additionally, we highlight the malleability of market outcomes through an investigation of how changes in institutional context can impact the market's perception of the value relevance of firm specific environmental news.

Finally, this research also accounts for the asymmetric information and opacity around environmental and social performance (Cho et al., 2013) in addition to the heterogeneous ability and desire to price it complexities. The nature of environmental and social performance information may cause market participants to classify firms into different groups with similar performance levels based on their perception of shared characteristic (Ding et al., 2016). In these circumstances a change in the environmental or social performance would only affect investors perception of the firm's risk characteristics or its valuation if the firm moves into another group. This would create something akin to a clientele effect with a stratified non-linear relationship between environmental or social performance and corporate financial performance (Ding et al., 2016). Hence, this research also explores the possible presence of a stratified non-linear relationship between our

variables of interest, with the objective of gaining further insights into the role played by markets in incentivising firms to alter their impact on society through non-market strategies.

The first paper investigates cost of equity capital as one of the possible conduits through which firm value may be impacted by variance in a firm's industry relative corporate social performance[1] (CSP) due to its possible effect on a firm's perceived risk and the relative size of its investor base. It investigates whether the impact of a firm's CSP on its implied cost of equity capital is represented as a stratified non-linear relationship as all aspects of CSP may not be uniformly, timely and linearly priced by the market (Ding et al., 2016). The second paper examines the relationship between industry relative CSP and firm value from a contingency perspective by investigating the possible moderating role of country-level institutions. To investigate the moderating effect of the institutional context we include political, labour market, financial market and business-related institutional forces to examine the proposition that increased performance in relation to a stakeholder group's interests will be valued more by investors in the presence of institutional forces that increase the salience of their claims. Finally, the third paper investigates the impact of positive and negative firm-specific emissions related environmental news on stock returns for firms that are covered by the European Union's emissions trading system (EU ETS) during its third phase (2013-2020). It examines whether the politically agreed changes to the institution (EU ETS) towards the middle of the period impacted the returns of participating firms and altered the markets' treatment of this news.

[1] Corporate social performance is defined as "the principles, practices, and outcomes of businesses' relationships with people, organisations, institutions, communities, societies, and the earth, in terms of the deliberate actions of business towards these stakeholders as well as the unintended externalities of business activity" (Wood, 2016).

1.2 Motivation and research objectives

In recent decades, an increased public awareness of the role of business in society has arisen due to environmental, social and governance issues highlighted by various events and scandals with companies widely perceived to be prospering at the expense of the broader community (Porter & Kramer, 2011). This increased awareness has prompted authorities, Non-Governmental Organisations and consumers to call for more responsible and sustainable ways of doing business (Nollet, Filis, & Mitrokostas, 2016), and has prompted a renewed emphasis on perspectives of business ethics (Singer & Ron, 2020). Concurrently, the idea of corporate social responsibility (CSR) has gradually found its way into business reality with CSR fast becoming a standard business practice throughout the world (KPMG, 2013). This changing perception of the role of business in society is further supported by the release of a statement in August 2019 by America's largest business group, the Business Roundtable, calling for a shift away from a focus on shareholder primacy towards a model of creating value for all stakeholders (Henderson & Temple-West, 2019).

Circumstantial evidence abounds of the possible positive influence of investors on CSR with the increase in CSR activity by business coinciding with an increased trend towards socially acceptable lending and investing by investors (Derwall, Koedijk, & Ter Horst, 2011). The socially responsible investment (SRI) market has experienced phenomenal growth with funds under management in Europe growing from $336 billion in 2003 to $14,075 billion in 2018 and in the US from $2,164 billion to $11,995 billion (Global Sustainable Investment Alliance, 2014, 2018). The addition of environmental, social and governance (ESG) metrics into investment strategies increase the social legitimacy of investment funds and expands the scope of opportunities and risks considered when compared to traditional financial analysis (Nollet et al., 2016). In a survey of the world's largest professional investment managers, 82% reported that ESG information is material to investment performance (Amir & Serafeim, 2018). This indicates that ESG metrics are

gaining importance beyond the realm of SRI, spreading to the wider investment community. One high profile example of the recognition of its increasing importance occurred in 2020 when the CEO of Blackrock, the world's largest asset manager, announced a number of initiatives to place sustainability at the centre of their investment approach and proclaimed his belief that we are on the edge of a fundamental reshaping of finance (Fink, 2020).

Given these developments, financial markets may play a role in encouraging businesses towards a more sustainable path. I am interested in the role played by investors, on aggregate, in encouraging firms to improve their environmental and/or social performance. Has the increased focus by some investors on sustainability had a meaningful impact on firm level incentives and are the incentives consistent across countries and industries?

An affirmative answer would indicate that markets can make a substantial contribution to a more sustainable future by incentivising firms to have a positive impact on society. The question of what role capital markets play in encouraging or discouraging business towards a more sustainable path, as evidenced by their treatment of environmental and social performance, remains a highly contested area of research. Previous empirical research has generated a slew of contradictory findings regarding the business case for CSP and its treatment by market actors (Adamska & Dąbrowski, 2021; Gregory, Tharyan, & Whittaker, 2014; Hang, Geyer-Klingeberg, Rathgeber, & Stöckl, 2018; Hang, Geyer-Klingeberg, & Rathgeber, 2019; J. Margolis, Elfenbein, & Walsh, 2009; Orlitzky, Schmidt, & Rynes, 2003; Peloza, 2009; Renneboog, Ter Horst, & Zhang, 2008; van Beurden & Gossling, 2008). This thesis extends this area of research by examining whether the treatment of environmental and social performance by markets is contingent on contextual factors by considering industry relative measures of environmental and social performance, and the moderating role of institutional factors that may alter the relationship and account

for some of the divergence in previous findings. As such, it contributes to our understanding of the role that markets can play in encouraging increased environmental and social performance. Importantly, it also highlights how market outcomes are shaped by other external factors.

1.3 Overview of three papers and research questions

To examine the relationship of various measures of environmental and social performance with financial performance, each paper in this dissertation considers a possible mediating or moderating factor on the relationship. Table 1.1 presents an overview of the sample, measures of CSP, measures of financial performance, data sources and methods of analysis for each paper.

Table 1.1 Overview of the three papers

	Paper 1	Paper 2	Paper 3
Title	Relative Corporate Social Performance and the Cost of Equity Capital – International Evidence	Context Matters – Evaluating the effect of Corporate Social Performance on Firm Value	The evolving impact of the EU ETS on the value of environmental news during phase 3
Time frame	2002 - 2017	2002-2019	2013-2021
Sample	21,338 firm-year observations 50 countries	43,171 firm-year observations from 49 countries	123 participating listed firms
Measure of Environmental and Social Performance	CSP based on Thomson Reuters Asset4's industry relative Environmental and Social scores (Thomson Reuters, 2018)	CSP based on Thomson Reuters Asset4's industry relative Environmental and Social scores (Thomson Reuters, 2018)	Absolute and industry relative carbon liability reduction performance Emissions reduction
Measure of Financial Performance	Implied Cost of equity capital	Firm Value based on the Ohlson model (1987)	Abnormal returns
Mediating or moderating factors considered	Investors' heterogeneous ability and desire to price CSP	Political, labour, and market institutions	EU ETS
Data Sources	Refinitiv DataStream	Refinitiv DataStream, Freedom House, World Bank, Fraser Institute, Heritage Foundation, International Labour Organisation	Refinitiv DataStream Carbon Market Data
Method of analysis	Regression analysis	Regression analysis	Event study

Note: This table presents an overview of the sample, measures of CSP, measures of financial performance, Data sources and methods of analysis for each paper.

1.3.1 Paper 1 – Relative Corporate Social Performance and the Cost of Equity Capital – International Evidence

In the first paper, I examine the relationship between industry relative corporate social performance and implied cost of equity capital. The effect of increased CSP on the relative size of a firm's investor base (Merton, 1987) and its effect on a firm's perceived risk (Eccles, Ioannou, & Serafeim, 2011; Paul C Godfrey, Merril, & Hansen, 2009; Gregory et al., 2014; Koh, Qian, & Wang, 2014) is proposed to result in an inverse relationship between CSP and the cost of equity capital. However, a firm's level of CSP may affect the relative size of its investor base and perceived risk in a complex non-linear manner due to heterogeneous investor preferences and views of CSP (Ding et al., 2016; Harjoto, Jo, & Kim, 2017).

If investors believe in an optimal level of CSP investment resulting from a dynamic cost-benefit analysis, it is likely to be industry-specific in line with other factors such as cost structures, risk profiles and other financial metrics. Additionally, the asymmetric information and opacity around CSP (Cho, Lee, & Pfeiffer, 2013) in addition to investors' heterogeneous ability and desire to price its complexities, may cause market participants to classify firms into different groups with similar perceived CSP levels (Ding et al., 2016). I construct industry relative CSP peer dummy groups to account for the possibility that all aspects of CSP are not uniformly, timely and linearly priced by the market (Ding et al., 2016) and investigate whether a non-linear and stratified relationship exists between CSP and cost of equity capital. Two research questions are explored in this paper.

RQ1: Is industry relative corporate social performance negatively related to a firm's cost of capital?

RQ2: Is the relationship between industry relative corporate social performance and cost of equity stratified and non-linear?

Chapter 1: Introduction

This research evaluates the costs and benefits of different levels of CSP investment through an empirical examination of the relationship between firms' CSP and their implied cost of equity capital and finds that financial markets provide an incentive for firms to increase their CSP by lowering their cost of equity capital, thereby increasing their value. However, we also find that the inverse relationship between CSP and cost of equity capital is non-linear and stratified, with the negative impact on the firms' cost of capital varying for different levels of CSP. We find that increased CSP reduces a firm's cost of equity capital up until a point, beyond which the marginal benefit of further CSP investments decrease. Our findings support the proposition that the neglected stock hypothesis (Hong & Kacperczyk, 2009) applies to low CSP firms, but we also find evidence that high CSP firms may too face a reduction in their investor base, and that their cost of equity is marginally higher than those with average levels of CSP.

Paper 1 contributes to and extends the body of literature on the link between CSP and cost of equity capital through the use of an extensive, newly available dataset which allows for a more precise industry relative operationalization of the CSP constructs. This research offers international evidence on the relationship between CSP and cost of equity, answering the call of Nollet, Filis, & Mitrokostas (2016) for research on the relationship outside the US. Additionally, the use of peer group dummy variables allows this research to present a more nuanced understanding of the relationship between CSP and cost of equity, highlighting its non-linear and stratified nature.

1.3.2 Paper 2 - Context Matters – Evaluating the effect of Corporate Social Performance on Firm Value

In the second paper, I empirically examine the moderating role of country-level institutional forces on the relationship between CSP and firm value. To investigate the moderating effect of the institutional context I include indicators that are affected by both formal and informal political, labour market, financial market and business-related institutional forces. This research tests the proposition that increased performance in relation to a stakeholder group's interests will be valued more by investors in the presence of institutional forces that increase the salience of their claims.

This contingency-based approach to the CSP-CFP link which considers the direction and strength of the relationship to be reliant on context, contributes a theoretical framework for understanding how the self-interested/instrumental motivations of markets can be moulded by the presence of institutions into serving the interests of non-shareholder stakeholders. Additionally, the use of Reuter's Asset4 ESG data allows this research to examine the relationship using industry-year relative CSP score and also to construct peer group dummy variables to examine whether heterogeneous information constraints and utility functions could lead investors to value CSP differently, inducing groupings along the CSP-CFP continuum similar to a clientele effect (Ding et al., 2016). The following two research questions are investigated.

RQ1: Do investors value CSP more in countries with stronger political, labour or market institutions?

RQ2: Do markets take an instrumental view of corporate social performance?

I find that the presence of strong political, labour and market institutions increase the value relevance of CSP to investors. Our finding that the presence of stakeholder supporting

institutional forces positively moderates the relationship between CSP and CFP, substantiates our theoretical framework, and contributes empirical evidence on cross-country differences in the value relevance of CSP. Additionally, our findings using industry-relative peer groupings demonstrating the presence of groupings along the CSP-CFP continuum similar to a clientele effect (Ding et al., 2016) and the presence of a stratified, non-linear relationship between he constructs.

Our research allows us to directly contribute empirical evidence to the debate between Friedman's (1970) view of CSP as a constraint to creating value and the alternative view held by Freeman (1984) and others that integrating CSP into firm strategy can create value. Our findings corroborate both the theoretical stance taken by stakeholder proponents that CSP is value enhancing, and the stance taken by Freeman (1984) that CSP is value destroying. Our research reconciles these two theories, oft presented as conflicting, through the introduction of a contingency approach with context or the power dynamics between stakeholder groups in the firm's immediate environment defining the relationship between CSP and value. By way of a theoretical explanation for this occurrence, we integrate institutional, stakeholder salience (Mitchell, Agle, & Wood, 1997) and resource dependency (Pfeffer & Salancik, 1978) theory, proposing that investors value CSP more in the presence of institutions which increase the salience of stakeholder groups whose interests CSP represents. This is akin to stating that markets take an instrumental view of CSP, valuing it in relation to its implications on firm performance (Garriga & Melé, 2004). This highlights the fact that the instrumental logic of the marketplace with its consequential orientation is intertwined and shaped by the institutional setting in which it operates.

1.3.3 Paper 3 - The Evolving Impact of the European Union Emissions Trading System on the Value of Environmental News during Phase 3

In the third paper, I investigate the market reaction to news related to the environmental performance of firms that are covered by the European Union Emission's trading system in addition to news about the system itself. Specifically, we use an event study methodology to analyse the market reaction to two distinct categories of events, emissions verification events and political events, during the third phase of the EU ETS over the period 2014-2021 on a sample of 123 participating listed firms.

Emission verification events reveal participating firms' carbon emissions and resultant EU ETS allowance (EUA) demand for the previous year, which are used to investigate the market reaction to news about the environmental performance of firms. We examine whether the market reaction is impacted by the type of firm specific emissions news that is released during the verification events by categorising each firm's reported emissions as positive or negative news using three distinct measures (absolute, industry relative, relative to expectations).

This research identifies two distinct periods during the third phase of the emissions trading system between 2013 and 2021 with an inflection point occurring around the time of the announcement of the revisions to the system for Phase 4 in late 2017. Hence, we examine the market reaction to the series of political events relating to these revisions while also splitting Phase 3 into the period before (Phase 3a: 2013-2017) and after (Phase 3b: 2018-2020) the announcements of these revisions to investigate whether the market reaction to verified emissions data changed. This allows us to directly observe if changes to the institutional setting (EU ETS) have a direct impact on the value placed by markets on the environmental performance of participating firms. In this paper I investigate the following research questions.

RQ1: Did the emissions verification events during the third phase of the EU ETS trigger a significant market reaction in participating firms share price?

RQ3: Did political events related to the revisions of the EU ETS for phase 4 trigger a significant market reaction in participating firms share price?

RQ3: Is there a positive relationship between firm-specific environmental performance news published during Phase 3 verification events and stock returns for EU ETS participating firms?

RQ4: Did changes to the EU ETS during Phase 3 alter the market reaction to firm specific environmental news released during the latter part Phase 3?

I find evidence of a change in the impact of the announcement of the verified emissions between the early and later stages of Phase 3. While the earlier verification announcements (2014-2018) were found to have an insignificant effect on firm returns, similar to the findings of research on previous phases of the ETS (Brouwers, Schoubben, Van Hulle, & Van Uytbergen, 2016), later verification announcements (2019, 2020) resulted in significant market reactions. I also find that positive news of a reduction in both absolute carbon liability, industry-relative carbon liability and emissions reductions are rewarded with increased returns in Phase 3b while it has an insignificant impact in Phase 3a. These findings are consistent with previous finding that the EU ETS was not adequately compensating proactive firms or penalizing those that pollute in the earlier periods (Andreou & Kellard, 2021) but this dynamic was altered in the latter period. However, a lack of symmetry exists with the valuation of an increase in a firm's absolute and relative carbon liability found to have an insignificant effect across all periods.

I also find evidence of a significant market reaction to a number of political events relating to the revisions of the system that occurred over a period of time which we identify as a possible inflection point between the two periods, lending empirical evidence to the

proposition that the stringency and intensity of the regulatory environment impacts investors' expectations of the valuation of carbon liabilities (Clarkson, Li, Pinnuck, & Richardson, 2015).

This research extends previous research on the EU ETS which evaluated its impact on the financial performance of publicly traded participating firms in Phase 1, Phase 2 and the first half of Phase 3 of the ETS (Andreou & Kellard, 2021; Brouwers et al., 2016; Jong, Couwenberg, & Woerdman, 2014). It also contributes to the body of research which examines the stock market reaction to environmental news (Capelle-Blancard & Laguna, 2010; Capelle-Blancard & Petit, 2019; Fisher-Vanden & Thorburn, 2011; Flammer, 2013; Gilley, Worrell, Davidson III, & El–Jelly, 2000; Klassen & McLaughlin, 1996; Lioui & Sharma, 2012; Oberndorfer, Schmidt, Wagner, & Ziegler, 2013; Shane & Spicer, 1983) by examining the publication of verified emissions data in a specific evolving institutional setting. Hence, this research also extends the line of investigation into the link between environmental performance and financial performance with a consideration of the impact of time-variant external pressures. This makes a major contribution to the literature by highlighting the contextually contingent nature of the relationship between environmental and financial performance.

1.4 Literature review

Within the fields of economics, finance and accounting, the primary perspective on environmental and social performance is that firms should only engage in increasing it when it maximizes shareholder value as opposed to the perspective held in other areas of research, such as business ethics and social contract theory, that corporate investments benefiting society should occur even when it decreases shareholder value (Moser & Martin, 2012). From this perspective, the argument for or against environmental and social investments

often rests on a disagreement about the potential positive and negative externalities that are internalised by the firm as a result and the trade-offs involved. There are two contrasting theoretical schools of thought on the nature of the relationship between environmental and social performance, and financial performance, shareholder and stakeholder theory, resulting from their divergent assumptions on the costs and benefits that accrue to firms that increase/reduce their CSP.

Stakeholder theory proponents predict a positive relationship between socially responsible business activity and financial performance, arising from increased revenue generation, lower costs, product differentiation, improved access to customers, suppliers, employees and investors, increased efficiencies, elimination of substantial fines and other potential liabilities (K. Gupta, 2018; Malik, 2015a). Proponents of shareholder theory (Aupperle, Carroll, & Hatfield, 1985; Friedman, 1962; Jiao, 2010) predict a negative relationship arguing that any benefits that will accrue from these investments in CSP are outweighed either directly by upfront costs, or indirectly by second order costs such as the internalization of negative externalities (Pigou, 1920), opportunity costs (Aupperle et al., 1985), and agency costs (Jiao, 2010). My three papers explore literature related to this broad question of the business case for environmental and social performance from a market perspective.

1.4.1 Paper 1 – Relative Corporate Social Performance and the Cost of Equity Capital – International Evidence

Previous research has shown that firms engage in CSR due to institutional pressures, particularly from stakeholders (Agle, Mitchell, & Sonnenfeld, 1999; Boal, 1985; Sharma & Henriques, 2005) and that the relationship between CSR initiatives and outcomes is stronger as stakeholder salience (power, legitimacy and urgency) increases (Parent & Deephouse,

2007). As shareholders are arguably one of the most important and powerful stakeholders in the current system, a study of their effect on the CSP-CFP relationship through a company's cost of equity capital and whether increased CSP is rewarded is undertaken in the first paper.

Firstly, I explore the two major theoretical arguments as to why the cost of capital could be expected to be lower for firms with higher CSP, which relate to the effect of CSP on the relative size and composition of a firm's investor base (El Ghoul, Guedhami, Kwok, & Mishra, 2011; Merton, 1987) and the effect on the firm's level of perceived idiosyncratic (P. C. Godfrey, Merrill, & Hansen, 2009; Hoepner, Oikonomou, Sautner, Starks, & Zhou, 2016; Jo & Na, 2012) and systemic risk (Eccles et al., 2011; Gregory et al., 2014). The research then discusses how some complexity could be introduced to the relationship by recognising that investors may have heterogenous preferences with respect to their attitude towards CSP (Ding et al., 2016; Harjoto et al., 2017). This includes a discussion of the possible aligned or mutually exclusive drivers, social norms and economic incentives, of investment decisions (Nofsinger, Sulaeman, & Varma, 2019), economically irrational portfolios and how the persistent nature of investor tastes can impact asset prices (Fama & French, 2007).

Having explored social norms and economic incentives as the two main drivers of investment decisions, we then focus on the decision-making process of investors that do not gain utility from investing in socially responsible firms. I consider the relevance of CSP to their investment decisions based on an economic framework that weighs the costs and benefits of varying levels of CSP investment. This includes a discussion of the possible divergent cost and benefits related to negative and positive CSP (Benabou & Tirole, 2010; Cho et al., 2013; H. A. Luo & Balvers, 2017), the non-linear or increasing nature of CSP increasing investment costs, and agency costs (Jiao, 2010; Ng & Rezaee, 2015).

This literature review highlights that an optimal level of CSP investment may be perceived to be present by some economically minded investors and that the asymmetric information and opacity around CSP (Cho et al., 2013) may cause market participants to classify firms into different groups with similar CSP levels (Ding et al., 2016). Therefore, a change in a firm's actual level of CSP would only affect the perception of risk, and by extension, impact the cost of equity, if the firm moves into a different grouping. Hence, in paper one we test for a stratified non-linear relationship between CSP and cost of equity.

1.4.2 Paper 2 - Context Matters – Evaluating the effect of Corporate Social Performance on Firm Value

Campbell (2007) proposes that an extension of institutional theory into the academic discussion on CSP is warranted because of its recognition that the way corporations treat their stakeholders depends on the institutions within which they operate (Fligstein & Freeland, 1995). This follows from the realisation that firms are embedded in a nexus of formal and informal rules emanating from social beliefs, values, relations, constraints and expectations which directly influence their choice of activities, the interpretation of outcomes (Crossland & Hambrick, 2011; North, 1990), and adoption of CSR policy (Rathert, 2016). In the second paper I review the literature that relate to how institutional factors may impact the relationship between CSP and firm value as one possible reason for the divergence in previous findings in the area (Margolis & Walsh, 2003; Margolis, Elfenbein, & Walsh, 2009; Orlitzky, Schmidt, & Rynes, 2003; Renneboog, Ter Horst, & Zhang, 2008; van Beurden & Gossling, 2008, Eccles et al., 2014).

The literature review of the area starts with a discussion of stakeholder theory and its instrumental variant. Instrumental stakeholder theory assumes that the firm is an instrument for value creation with stakeholder management strategies such as CSR investment often

conceived and approached instrumentally in relation to its implications on firm performance (Garriga & Melé, 2004). This is followed by a discussion of the attributes that give stakeholder groups the ability to influence a firm's decision-making process using stakeholder salience (Mitchell et al., 1997) and resource dependence theory (Pfeffer & Salancik, 1978). It highlights how these attributes are fluid and socially constructed, resulting in the ability of institutional forces to shape stakeholder salience (Mitchell et al., 1997). I then review the empirical literature on the relationship between country level institutions and CSP, and the moderating role of institution on the relationship between CSP and financial performance.

I then propose that in the presence of institutional structures that increase the salience of a certain stakeholder group, it is in the financial interest of the firm and shareholders to address the concerns of such groups as failure to do so would produce suboptimal financial consequences for the firm. This is akin to investors on aggregate taking an instrumental view of CSP. To test this proposition, I examine the moderating effect of political, labour, and market institutions which are argued to be critical determinants of corporate behaviour due to their ability to shape the relationships between the firm and its primary stakeholders; customers, suppliers, employees, communities and shareholders (Aguilera & Jackson, 2003; J. L. Campbell, 2007). In the following sections, I review the literature on the role played by political, labour and market institutions in shaping the relationship between stakeholders and develop hypothesis to be tested.

1.4.3 Paper 3 - The Evolving Impact of the European Union Emissions Trading System on the Value of Environmental News during Phase 3

The third paper of this thesis examines the market reaction to firm specific environmental news in a specific yet evolving institutional setting in addition to the market

reaction to changes to that system (EU ETS). As such the literature review is separated into two section with the first analysing the evolution of the EU ETS from its inception to the end of the study's period to gain a greater understanding of the underlying institution and how it had changes over the period. The second section reviews previous research on the relationship between environmental performance and financial performance with particular attention paid to studies related to the release of firm specific environmental news.

The first section of the literature review highlights how the EU ETS has evolved since its creation and that its third phase was marked by a number of major revisions (European Commission, 2015a). However, it also highlights that a lack of market balance (Hintermann, Peterson, & Rickels, 2016), political risk (Salant, 2016) and/or the waterbed effect (Bruninx, Ovaere, Gillingham, & Delarue, 2019) caused a depression of the European Union's Emission trading system allowance (EU ETS EUA) price, which was subdued from the start of the third phase until towards the end of 2017 when the trend began to reverse. The review allows this research to clearly identified the presence of two distinct periods within the third phase and discusses how the announcements of revisions in Phase 4 may have created an inflection point between the period. A common thread throughout was the importance of considering the importance of the context within which the system operated, both political and technological, on market outcomes.

The following sections reviews the literature on the relationship between a firm's environmental and financial performance. It begins with an exploration of the divergent views on the nature of the relationship, its shape and the need for policy intervention to encourage companies to transition to more environmentally friendly business activities (Hang et al., 2019). I then review the empirical literature which applies an event study methodology to identify short term financial impacts caused by environmental performance related announcements and find a lack of consensus due to contradictory findings (Adamska

& Dąbrowski, 2021). I then review the empirical literature on the stock market reaction to the release of both supply and demand related information related to the EU ETS and develop hypothesis to be tested.

1.5 Methodology, methods and data sources

This research is undertaken using a positivist philosophical paradigm and deductive approach. When using this philosophical paradigm, the researcher is independent from the study with his role limited to data collection and interpretation in an objective way (Research Methodology, 2018). The choice of this philosophical paradigm stems from the nature of the study which depends on quantifiable observations and statistical analysis as positivism has "an atomistic, ontological view of the world as comprising discrete, observable elements and events that interact in an observable, determined and regular manner" (Collins, 2010). The remainder of this section will provide a brief description of the quantitative research design used in the three papers. It begins with an outline of the data used in each study before outlining the analysis method.

1.5.1 Paper 1 Methods and Data Sources

1.5.1.1 Data:

This research utilizes Thomson Reuters Asset4's ESG scores as our measure of CSP following recent studies (K. Gupta, 2018; La Rosa, Liberatore, Mazzi, & Terzani, 2018; Liang & Renneboog, 2017; Sassen, Hinze, & Hardeck, 2016). Thomson Reuters compiles these scores from over 400 measures based on information published in annual reports, company websites, non-governmental organisation's websites, stock exchange fillings, CSR reports and news sources. ESG scores measure a company's relative performances across ten themes under the three pillars: Environmental (Resource use, Emissions, Innovation),

Social (Workforce, Human Rights, Community, Product Responsibility) and Governance (Management, Shareholders, CSR strategy) (Thomson Reuters, 2015). The choice of this measure of CSP rests on its uniformity and consistency across time in addition to its widespread use in the investment community. The ability to compare these scores across time stems from their construction as industry-year relative scores for the environmental and social scores and country-year relative scores for the Governance score. This research follows previous studies (e.g., El Ghoul, Guedhami, Kim, & Park, 2018; Ioannou & Serafeim, 2012; Luo, Wang, Raithel, & Zheng, 2015) by excluding the governance score from the overall measure of CSP[2] which consists of an equally weighted-average of environmental and social scores. Additionally, in order to account for the possibility that all aspects of CSP are not uniformly, timely and linearly, this study creates CSP group dummies in which firms are categorised into five quantiles based on their industry year relative CSP score in a given year.

The dependant variable used in this analysis, implied cost of equity capital (COEC), is calculated using the average of four implied cost of capital models. The implied cost of capital (ICC) is the internal rate of return that equates current stock prices to the present value of expected future cash flows. This ex-ante based cost of equity measure, derived directly from stock prices and cash flow forecasts, has been increasingly used in the finance and accounting literature due to its advantages over ex-post measures which rely on backward-looking and noisy measures such as realised returns (K. Gupta, 2018). To estimate each firm's cost of equity capital, this research follows recent studies (Boubakri, Guedhami, Mishra, & Saffar, 2012; K. Gupta, 2018; Hail & Leuz, 2006; Pham, 2019) and uses the average of estimates obtained from four implied cost of capital models including the income

[2] This measure of CSP represents the interests of stakeholders other than shareholders for which the governance measure is most relevant. Additionally, the exclusion of the Governance score from our measure of CSP allows for it to be an entirely industry-relative score.

valuation models implemented by Claus & Thomas (2001) and Gebhardt, Lee, & Swaminathan (2001), and the abnormal growth models used by Easton (2004) and Ohlson & Juettner-Nauroth (2005). This research creates earnings forecasts generated by cross sectional models which have been found to be superior to analysts' forecasts in terms of coverage, forecast bias and earnings response coefficients and that model-based ICC estimates are a more reliable proxy for expected returns (Hou, van Dijk, & Zhang, 2012; Li & Mohanram, 2014).

In order to control for other factors known to affect the cost of equity, I use firm-level variables, including measures of growth (BTM), profitability (ROE, DLOSS), illiquidity (ILLIQ), size (SIZE), leverage (LEV), volatility (VOL), and country-level variables, a measure of the development level of the firm's home country (LGDPPC) and the inflation rate (inflation). The accounting and stock market measures are obtained from Thomson Reuters DataStream. The initial sample consisted of 32,431 firm year observations of publicly traded firms from 50 countries that are part of the Thomson Reuters Asset4 database during the period from 2002 to 2017. Missing control variables have reduced the final sample to 21,338 firm-year observations from 50 countries over the period 2002-2017.

1.5.1.2 Method

To examine the relationship between implied cost of capital and CSP, I employ a multiple regression model that includes a number of control variables consistent with previous literature (Botosan & Plumlee, 2002; Clarkson, Li, & Richardson, 2004; Plumlee, Brown, Hayes, & Marshall, 2015; A. J. Richardson & Welker, 2001). I estimate a regression with implied cost of equity capital (COEC) as the dependent variable and the independent variables; corporate social performance (CSP), book to market ratio (BTM), return on equity (ROE), a dummy variable representing whether or not a firm suffered a financial loss in the

previous year (DLOSS), illiquidity (ILLIQ), size (SIZE), leverage (LEV), volatility (VOL), log of GDP per capita (LGDPPC) and inflation (inflation).

$$COEC_{it} = \beta_1 CSP_{it} + \beta_2 BTM_{it} + \beta_3 ROE_{it} + \beta_4 DLOSS_{it} + \beta_5 ILLIQ_{it} + \beta_6 SIZE_{it} + \beta_7 LEV_{it} + \beta_8 VOL_{it} + \beta_9 LGDPPC_{it} + \beta_{10} inflation_{it} + \mu_i + \mu_t + \varepsilon_{it}$$

This research follows Ding et al. (2016), El Ghoul, Guedhami, & Kim (2017) and Servaes & Tamayo (2013) by including firm fixed effects in order to address concerns about endogeneity resulting from omitted confounding variables correlated with CSP and cost of equity. Additionally, firm fixed effects subsume country and industry fixed effects. I also include time fixed effects to control for the possible presence of time series dependence due to the possible omission of controls for time-invariant unobservable firm characteristics.

1.5.2 Paper 2 Data sources and Methods

1.5.2.1 Data

This paper operationalize CSP through the use of Thomson Reuters Asset4's ESG scores, following recent studies (K. Gupta, 2018; La Rosa et al., 2018; Liang & Renneboog, 2017; Sassen et al., 2016), as they offers a uniform and consistent measure of CSP which is utilized by the investment community as previously discussed. In order to undertake a cross-country comparison, firms are classified into countries based on the home or listing country of a firm's security. This research relies on a number of data sources for our measures of political, labour and market institutional factors including Freedom House's Freedom in the World metrics (FOW) (Freedom House, 2018), World Bank Governance Indicators (WBG) (World Bank, 2018), Economic Freedom of the World Data from the Fraser Institute (FI) (Fraser Institute, 2019), Economic Freedom of the World Data from the Heritage Foundation (EFW) (Heritage Foundation, 2019), data from the International Labour Organisation (ILO) (ILO, 2019) and World Bank Development Indicators (WBD) (World Bank, 2019). These

datasets have been used by a multitude of studies to represent country specific institutional factors (e.g. Cai et al., 2016; El Ghoul & Karoui, 2017; Gupta, 2018; Ioannou & Serafeim, 2012; Law, Kutan, & Naseem, 2018).

In order to control for other factors known to affect firm value, I also include leverage (LEV), size (SIZE), sales growth (Sales Growth), return on assets (ROA), research and development spending (R&D) and GDP per capita (LGDPPC) in the regression model. The accounting and stock market measures are obtained from Thomson Reuters DataStream. The initial sample consisted of 45,399 firm-year observations of publicly traded firms from 56 countries that are part of the Thomson Reuters Asset4 database during the period from 2002 to 2019. Missing control variables and dropping all observations from countries with less than 5 firm observations in a given year have reduced the final sample to an unbalanced panel of 43,171 firm-year observations from 49 countries over the period 2002-2019.

1.5.2.2 Method

To examine the value relevance of CSP, this paper employs a valuation model based on the Ohlson (1995) framework. The choice of the Ohlson (1995) valuation model, which considers market value (P), book value (BVPS) and earnings (NIPS) simultaneously, rests on its extensive usage in the value relevance literature (Gregory et al., 2014; G. Richardson & Tinaikar, 2004; Lev & Sougiannis, 1996; Barth, Clement, Foster, & Lourenço, Branco, Curto, & Eugénio, 2012) and its ability to overcome several drawbacks inherent to the most widely used valuation model in the literature, the Tobin's Q. This model converts the standard valuation model, where the value of a firm is the present value of its future cash flows, discounted at the appropriate cost of equity capital, to one which is based on expected profits and book value (Callen & Segal, 2005; Lundholm & O'Keefe, 2001; Peasnell, 1982). We estimate a regression with share price (P) as the dependent variable and the independent

variables; book value per share (BVPS), net income per share (NIPS), leverage (LEV), size (SIZE), sales growth (Sales Growth), return on Assets (ROA), research and development expenditure (R&D), log of GDP per capita (LGDPPC) plus our variable of interest CSP lagged by one period (CSP_{t-1}).

$$P_{it} = \beta_0 + \beta_1 BVPS_{it} + \beta_2 NIPS_{it} + \beta_3 LEV_{it} + \beta_4 SIZE_{it} + \beta_5 Sales\ Growth_{it} + \beta_6 ROA_{it} + \beta_7 R\&D_{it} + \beta_8 LGDPPC_{it} + \beta_9 CSP_{it-1} + \beta_{10} Institution_{it-1} + \beta_{11} CSP_{it-1} \times Institution_{it-1} + \mu_i + \mu_t + \varepsilon_{it}$$

To investigate the effect of country-level Institutions in explaining the cross-country differences in the value relevance of CSP, I examine how the strength of a country's institutional forces affect or moderate the relation between CSP and firm value, with the addition of an Institution variable (Institution) and an interaction term (CSP_{t-1} x $Institution_{t-1}$). The implementation of an interaction term allows this research to directly observe the moderating effect of country level institutional forces on the CSP-CFP relationship. Each country level institutional metric is used in an individual regression due to the high level of correlation between institutional metrics.

To address concerns about endogeneity resulting from omitted confounding variables and model misspecification arising from the omission of controls for time-invariant unobservable firm characteristics, I include both firm and time fixed effects using two-way clustered robust standard error (Petersen, 2009). Another concern related to the relationship between firm value and CSP is that of causality and simultaneity bias which I address by lagging the CSP and Institutional variables by one period. Additionally, in order to account for the possibility that all aspects of CSR are not uniformly, timely and linearly priced this study will also categorise firms into four quartiles peer groups based on their industry year relative CSP score which is substituted for the CSP variable in further regressions. This follows the observation of Ding, Ferreira, & Wongchoti (2016) who contend that the

assumption that all aspects of CSR are uniformly, timely and linearly priced is undermined by the asymmetric and opaque nature of CSR information (Cho et al., 2013) in addition to the divergent utility functions of investors.

1.5.3 Paper 3 Data sources and Methods

1.5.3.1 Data

In order to investigate how the publication of verified emissions data under the EU ETS affected the stock prices of participating firms during Phase 3, this paper analyses the market reactions on 8 event dates on which the preceding year's verified emissions data for all firms are simultaneously published on the Commissions website. The publication of Phase 3 emissions data took place on the 1st (2014, 2015, 2016, 2019, 2020, 2021) or 3rd (2017, 2018 of April each year, corresponding to 8 event dates. In order to investigate how the politically agreed EU ETS affected stock prices of participating firms during Phase 3, I analyse the market reaction on 6 political event dates related to the Phase 4 revisions legislative process which occurred during the period from 28.02.2017 to the 27.02.2018. This includes 6 event dates during the process which begins with the European council agreeing its negotiating position for the review of the EU ETS (28.02.2017), a deal being reached in the trilogue process (09.11.2017), endorsement of the deal by the council (22.11.2017), European parliament agreement on their position (06.02.2018), the parliament voting in favour (15.02.2018) and its formal approval (27.02.2018).

As this study seeks to explore the stock market reaction to EU ETS verification and political events during the third phase of the system, it contains European listed firms with installations covered by the EU ETS during the period. I matched the emissions data from the Union registry, provided by the Carbon Market Data database[3], to financial data from

[3] Carbon Market Data is a carbon market research company and data vendor

Refinitiv DataStream. The installation level emissions and allowance allocation data provided on the Community Independent Transaction Log by the European Commission was matched to firms which resulted in a sample of 123 publicly traded firms covering 4,139 installations in our sample which accounted for 45.43% of the total verified emissions in the entire EU ETS for 2020.

15.3.2 Method

This research uses an event study methodology to analyse the impact of the 8 EU ETS emissions verification announcements and the 6 selected political events during the third phase of the system. An event study methodology assumes efficient capital markets in which stock prices fully reflect any changes in the information set for investors on any day (Fama, 1991). This implies that all available information which impacts a firm's future cash flows and profitability is incorporated into the stock price and event-induced changes in stock prices allow for the possible extraction of the returns related to that event.

I derive the expected returns for the event period using a single factor market model (MacKinlay, 1997) estimated over 200 trading days ending 20 days prior to the event date for the 8 emissions verification events. In the case of the 6 political events, many events are clustered around the same period, so we reduce the estimation period to 150 trading days ending 20 days prior to the first event date where the events are within 170 days of each other.

I assess the event date abnormal returns for statistical significance relative to the distribution of abnormal returns in the estimation period. As verified emissions and political dates are simultaneous across all firms, we mitigate the impact of cross-sectional correlation and event induced volatility (Corrado & Zivney, 1992) in addition to reducing the possibility of misspecification from the presence of non-normally distributed data by using the non-

parametric rank test adjusted for cross-sectional variance in Corrado & Zivney (1992) to test the significance of the event in this study.

In order to examine the impact of firm specific environmental news (Positive and Negative) released during the emission verification events, I categorise the firm specific information released on the verification event date as positive or negative news using four methods; the change in a firm's allowance surplus/deficit or the increase or reduction in their uncovered carbon liability (Absolute performance), the change in a firm's industry relative allowance surplus/deficit, the change in a firm's verified emissions compared to the previous year's change in emissions and the change in a firm's verified emissions relative to expectations (Expectations).

In order to examine the impact of the changing dynamics of the market between Phase 3a and Phase 3b, I also examine the impact of our measures of performance having split the sample into two periods as changes in the structure of the EU ETS system may alter investors perception of the future cost of emissions and benefits (drawbacks) of good (poor) environmental performance. The first sub period is classified as the Phase 3a and include the publication of data for the years 2013 to 2016 which were release in the years from 2014 to 2017. The second subperiod is classified as Phase 3b and include the publication of data for the years 2017 to 2020 which were release in the years from 2018 to 2021.

When this research examines the market reaction to political events it is not possible to use the same measure of the change in a firm's carbon liability or emissions as no new firm level information is revealed during the event. As the information revealed on the event date is common across the entire sample of firms, I instead investigate whether the importance and impact of this information is perceived to impact firms differently depending on their level of carbon efficiency. The size of a firms allowance surplus/deficit is used as a proxy measure of their carbon efficiency as freely allocated carbon allowances are

benchmarked to the performance of the most carbon efficient firms undertaking an activity. I categorise firms based on their absolute and relative allowance surplus to examine whether the carbon efficiency of firms impacts the market reaction to political events.

1.6 Organisation of the dissertation

The remainder of this dissertation is structured as follows. In Chapter 2, I present Paper 1 – 'Relative Corporate Social Performance and the cost of Equity capital – International evidence'. Chapter 3 contains Paper 2 – 'Context Matters – Evaluating the effect of Corporate Social Performance on Firm Value'. Chapter 4 presents Paper 3 – 'An Analysis of the Valuation Effect of Phase 3 of The European Union Emissions Trading System'. I conclude with Chapter 5, which provides a discussion of the main findings of the thesis, the implications for policy and practice, the limitations of the research and areas for future research.

Chapter 2 - Relative Corporate Social Performance and the Cost of Equity Capital – International Evidence

Abstract

This research examines the relationship between firms' Corporate Social Performance (CSP) and the implied cost of equity capital using a sample of 21,338 firm-year observation from 50 countries during the period from 2002 to 2017. Using estimates of the firms' ex ante cost of equity capital and industry-relative measures of the firms' corporate social performance (CSP), we find that increased CSP reduces a firm's cost of equity capital up until a point, beyond which the marginal benefits of further CSP investment decrease. Our findings support the proposition that the neglected stock hypothesis (Hong & Kacperczyk, 2009) applies to low CSP firms, but we also find evidence that high CSP firms may too face a reduction in their investor base, and that their cost of equity is marginally higher than those with average levels of CSP.

Keywords:

Corporate Social Responsibility, Corporate Social Performance, ESG, Cost of Equity, financial performance

2.1 Introduction

In recent years, increased focus has been placed on the non-financial performance of firms by the investment community as evidenced by the growth and proliferation of sustainable investment strategies such as ESG integration[4] (Global Sustainable Investment Alliance, 2018). While the integration of environmental, social and governance metrics into investment decisions was once primarily the purview of socially responsible investors operating at the margins, it has now gained acceptance among a broad swath of the investment community with 82% of the world's largest professional investment managers surveyed reporting its importance to investment performance (Amir & Serafeim, 2018). One high profile example of the recognition of its increasing importance occurred in 2020 when the CEO of Blackrock, the world's largest asset manager, announced a number of initiatives to place sustainability at the centre of their investment approach and proclaimed his belief that we are on the edge of a fundamental reshaping of finance (Fink, 2020).

Although socially responsible investors may take non-financial metrics into consideration based on a desire to increase the positive impact of firms on society, rising interest by the wider investment community may be the result of an increased awareness of the risk implications of poor performance on these metrics. An increase in sustainable investment may provide an avenue through which capital markets can provide a financial incentive for firms to improve their Corporate Social Performance,[5] reducing the potential negative impacts and improving the positive impacts of business on society. However, the extent to which this exists may be contingent on the perceived trade-off between the costs and benefits of CSP at varying levels of performance.

[4] ESG integration involves including all material factors including financial, Environmental, Social, and Governance metrics in the investment decision making process (Principles for Responsible Investment, 2019).

[5] Corporate social performance is defined as "the principles, practices, and outcomes of businesses' relationships with people, organisations, institutions, communities, societies, and the earth, in terms of the deliberate actions of business towards these stakeholders as well as the unintended externalities of business activity" (Wood, 2016).

Chapter 2: Relative CSP and the cost of equity capital – International Evidence

The impact of increased CSP on a firm's financial performance is the subject of many academic research papers with contradictory theoretical stances and empirical evidence supporting what are often presented as diametrically opposed positions. Stakeholder theory proponents predict a positive relationship between socially responsible business activity and financial performance, arising from increased revenue generation, lower costs, product differentiation, improved access to customers, suppliers, employees and investors, increased efficiencies, elimination of substantial fines and other potential liabilities (K. Gupta, 2018; Malik, 2015a). Proponents of shareholder theory (Aupperle et al., 1985; Friedman, 1962; Jiao, 2010) predict a negative relationship arguing that any benefits that will accrue from these investments in CSP are outweighed either directly by upfront costs, or indirectly by second order costs such as the internalization of negative externalities (Pigou, 1920), opportunity costs (Aupperle et al., 1985), and agency costs (Jiao, 2010).

This research contributes to this ongoing debate but re-orientates the investigation away from a straightforward 'black box' approach to the relationship between Corporate Social Performance (CSP) and Corporate Financial Performance (CFP) by disentangling its specific dimensions in order to gain a deeper understanding of the mechanisms that drive the relationship. The effect of CSP on firm value, the ultimate measure of success according to shareholder theory, has two possible primary conduits: the firm's expected cash flows and it's cost of capital. We focus on the second conduit, the firm's cost of capital, as it is the required rate of return demanded by investors based on their perception of a firm's risk, and the discount rate for its future cash flows. The cost of capital therefore directly affects two major decisions faced by financial managers, financing and investment. Our examination of the possible mediating effect of a firm's cost of capital on the CSP-CFP link, answers the call of previous research (Barnett, 2007; Jeffrey & Freeman, 1999; Peloza, 2009; Surroca, Tribó, & Waddock, 2010).

Chapter 2: Relative CSP and the cost of equity capital – International Evidence

The effect of increased CSP on the relative size of a firm's investor base and its effect on a firm's perceived risk is proposed to result in an inverse relationship between CSP and the cost of equity capital. Firstly, according to Merton's (1987) capital equilibrium model a decrease (increase) in the relative size of a firm's investor base will result in a higher (lower) cost of capital due to information asymmetries and opportunities for risk diversification. The presence of this cost of capital premium for firms with smaller investor bases, known as the Neglected Stock Hypothesis (Hong & Kacperczyk, 2009), is proposed by El Ghoul et al. (2011) to apply to firms with low CSR due to investor preference and information asymmetry. The second interconnected reason for the negative relation between CSP and cost of capital is its effect on the perceived risk of the firm. Previous research has found that CSP can reduce both a firms idiosyncratic risk (Godfrey, Merrill, & Hansen, 2009; Hoepner, Oikonomou, Sautner, Starks, & Zhou, 2016; Jo & Na, 2012) and systematic risk exposure (Eccles et al., 2011; Paul C Godfrey et al., 2009; Gregory et al., 2014; Koh et al., 2014). The presence of a negative and linear relationship between elements of CSR and cost of equity capital has been found in a number of studies (El Ghoul et al., 2011; Gupta, 2018).

However, the recognition that investors have heterogeneous preferences and views of CSP (Ding et al., 2016; Harjoto et al., 2017) should allow for the possibility of a more complex relationship between these two variables. The incorporation of CSP into investors' decision-making process would reflect the interplay between two potential drivers of investment decisions, social norms and economic incentives. These may be aligned or mutually exclusive at different levels of investment. While some investors engaged in socially responsible investment (SRI) may consistently prioritise social returns over economic returns (Riedl & Smeets, 2017), other wealth maximizing investors' decision-making process is based on an economic framework that weighs the perceived costs and benefits of varying levels of CSP in a dynamic manner. The asymmetric risk reduction consequences of under and over performance on CSP metrics, due to the tangible risks of

negative performance (Benabou & Tirole, 2010; H. A. Luo & Balvers, 2017) and the intangible future risk reduction benefits of positive performance, may further complicate the relationship. Some evidence of the asymmetric importance of CSP to investors is present in the findings that institutional investors underweight firms with negative performance while firms with superior performance are not over weighted (Nofsinger et al., 2019).

Furthermore, the level and type of CSP investment that a firm undertakes may contribute to investors' perception of risk in relation to agency problems (Krüger, 2015). Low levels of CSP may indicate a lack of long term investment and an indication of myopic management behaviour (Stein, 2003), while high levels may represent private benefits that managers extract at the expense of shareholders (Jiao, 2010). As a firm's level of CSP may affect the relative size of its investor base and perceived risk in a complex non-linear manner, resulting in an optimal level of CSP investment with regards to cost of capital reduction, this research extends previous research by investigating the presence of a non-linear relationship between CSP and cost of equity capital.

Given the implications of the costs and benefits of CSP in relation to the cost of capital as discussed above, we argue that whether firms with a given levels of CSP have a lower (higher) cost of equity capital compared to firms with higher (lower) levels of CSP is ultimately an empirical issue. The cost of equity will be higher for firms if the marginal costs of CSP exceed the marginal benefits at a given level of CSP.

To evaluate our research question, we construct an international sample of 21,338 firm-year observations from 50 countries during the period from 2002-2017. Conventional aggregation of CSR raw/absolute scores and its interpreted impact on financial performance has provided mixed evidence (Ding et al 2016). If investors believe in an optimal level of CSP investment resulting from a dynamic cost-benefit analysis, it is likely to be industry-specific in line with other factors such as cost structures, risk profiles and other financial

metrics. The use of industry-relative CSP scores in this research allows us to examine whether firms that distinguish themselves from their peers are associated with changes in their cost of equity capital. Additionally, given the asymmetric information and opacity around CSP (Cho, Lee, & Pfeiffer, 2013) in addition to investors' heterogeneous ability and desire to price its complexities, may cause market participants to classify firms into different groups with similar perceived CSP levels (Ding et al., 2016). Using industry- year relative CSP scores we construct peer dummy groups to account for the possibility that all aspects of CSP are not uniformly, timely and linearly priced by the market (Ding et al., 2016).

To estimate cost of equity capital we follow recent research (Ben-Nasr, Boubakri, & Cosset, 2012; D. Dhaliwal, Heitzman, & Li, 2006; D. Dhaliwal, Judd, Serfling, & Shaikh, 2016; Hail & Leuz, 2006, 2009; Hou et al., 2012) and use the average of four implied cost of equity models, namely, the residual income valuation models proposed by Gebhardt et al. (2001) and Claus and Thomas (2001) and the abnormal growth models proposed by Easton (2004) and Ohlson and Juetter-Nauroth (2005). This ex-ante cost of equity measure, derived directly from stock prices and cash flow forecasts presents numerous advantages over ex-post measures such as the capital asset pricing model which rely on backward-looking and noisy measures such as realised returns (K. Gupta, 2018). We use the Residual Income Earnings Forecasting Model (Feltham & Ohlson, 1996) to derive our cash flow forecasts which has been shown to outperform analyst forecasts and other cross sectional models on a number of dimensions including forecast accuracy, forecast bias, earnings response coefficients and correlation with risk factors (Li & Mohanram, 2014).

We evaluate the costs and benefits of different levels of CSP investment through an empirical examination of the relationship between firms' CSP and their implied cost of equity capital and find that financial markets provide an incentive for firms to increase their CSP by lowering their cost of equity capital, thereby increasing their value. However, we

also find that the inverse relationship between CSP and cost of equity capital is non-linear and stratified, with the negative impact on the firms' cost of capital varying for different levels of CSP. While the cost of capital is a conduit through which financial markets provide an incentive for firms to increase their CSP, the largest reduction in cost of capital is achieved by firms who move out of the bottom 20% of performers. This is consistent with previous propositions that low CSP firms are neglected stocks (Hong & Kacperczyk ,2009; Hillman & Keim, 2001; El Ghoul et al., 2011). By increasing CSP, firms attract a wider range of investors and greater demand for their assets. We find that cost of capital reduces with increasing CSP up to a point, beyond which it starts to increase again, representing a reverse J-shaped relationship. We propose that this occurs as investors with a primary focus on wealth maximization perceive the costs of CSP investment to outweigh the benefits at this level.

This study contributes to and extends the body of literature on the link between CSP and CFP through the use of an extensive, newly available dataset which allows for a more precise operationalization of the CSP constructs and an investigation into the mediating role of the cost of equity capital on the relationship between CSP and CFP. This research offers international evidence on the relationship between CSP and cost of equity, answering the call of Nollet, Filis, & Mitrokostas (2016) for research on the relationship outside the US. Additionally, the use of peer group dummy variables allows this research to present a more nuanced understanding of the relationship between CSP and cost of equity, highlighting its non-linear and stratified nature.

The finding of a non-linear relationship between a firm's industry relative CSP and its cost of equity capital has practical applications for financial managers due to its implications for both financing and investment decisions. While one of the benefits of CSP investment is a reduced cost of equity capital, each investment in improving a firm's CSP at each level of performance has to be considered based on its merits as opposed to a simplistic

view that more is always better in relation to cost of equity benefits. The implications of these findings for policy makers are twofold. Firstly, they indicate that firms with poor CSP relative to their industry peers pay a higher cost of equity capital meaning that capital markets can play a role in promoting business towards a more sustainable path as the worst performers are incentivised to improve their CSP. Secondly, the reverse J-shaped relationship implies that this incentivisation has limits, encouraging firms towards average performance. As the level of average performance may often be dictated by regulatory frameworks and technological constraints, a role exists for regulators and policy makers to shift the middle or acceptable average performance through regulation and technological investment if a more sustainable business sector is the desired outcome.

The remainder of this paper is structured as follows. In the next section we review the prior literature on the relationship between CSP and cost of equity which generates hypotheses to be tested. In the section that follows, we describe our dataset and provide details of our methodological approach used to test our hypothesis. We then present our results, followed by a discussion of the findings, limitations, and implications of our study.

2.2 Literature review and hypothesis development

Within the fields of economics, finance and accounting, the primary perspective on CSR is that firms should engage in CSR only when it maximizes shareholder value as opposed to the perspective held in other areas of research, such as business ethics and social contract theory, that corporate investments benefiting society should occur even when it decreases shareholder value (Moser & Martin, 2012). Within this seemingly common perspective, the argument for or against CSR investments often rests on a disagreement about the potential positive and negative externalities that are internalised by the firm as a result and the trade-offs involved. There are two contrasting theoretical schools of thought

on the nature of the relationship between CSP and financial performance, shareholder, and stakeholder theory, resulting from their divergent assumptions on the costs and benefits that accrue to firms that increase/reduce their CSP.

Stakeholder theory advocates that improving CSP translates to revenue generation, lower costs, product differentiation, improved access to customers, suppliers, employees and investors, increased efficiencies, elimination of substantial fines and other potential liabilities (K. Gupta, 2018; Malik, 2015a). They argue that these benefits outweigh the cost involved in improving CSP and hence a positive relationship should exist between CSP-CFP. Stakeholder theory (R. E Freeman, 1984) takes a long-term view of the firm and encourages managers to extend their focus beyond short term shareholder profits by considering the impact of its operations on the benefits accruing to all stakeholders. Benabou & Tirole, (2010) argue that CSR, as a long-term investment, is value enhancing as it makes a firm more profitable over the long run by reducing agency costs and perceived risk. Hillman & Keim (2001) investigate whether stakeholder management represents a competitive advantage to firms and contributes to shareholder value. They find that activities focused on primary stakeholders can increase shareholder wealth whereas participating in purely social issues has the opposite effect, implying a level of complexity to the relationship between CSP and financial performance. The asymmetric treatment of different types of CSP or components of CSP in the eyes of investors is also highlighted by Khan, Serafeim, & Yoon (2016) who report that the type of sustainability performance matters, finding that firms with higher ratings on sustainability issues with evidence of wide interest from a variety of user groups and evidence of financial impact (material sustainability issues) resulting in out-performance while higher ratings on immaterial sustainability issues does not.

From a shareholder wealth maximization perspective, acting in a socially responsible manner is considered a cost, with limited or no benefit, and its minimization is

considered to be in the best interest of the firm and its shareholders, leading to the minimum level of compliance with regulations and disincentives to act in a socially responsible manner (Aupperle et al., 1985; Friedman, 1962; Jiao, 2010). Shareholder theory states that shareholder are the owners of the firm and that managers have a fiduciary duty to create shareholder value by investing in projects that have a positive net present value. From this perspective, CSP like any other investment should be judged using a cost-benefit analysis approach. There are a number of proposed costs which from a shareholder theory perspective are argued to outweigh the benefits involved in improved CSP including the initial cost of the investment, the internalization of negative externalities (Pigou, 1920), opportunity costs (Aupperle et al., 1985) and agency costs (Jiao, 2010). The empirical evidence on the relationship is mixed with contradictory evidence on whether and to what extent CSP affects a firm's financial performance (J. D. Margolis & Walsh, 2003; J. Margolis et al., 2009; Orlitzky et al., 2003; Renneboog et al., 2008; van Beurden & Gossling, 2008).

This study contributes to and extends this body of literature on the link between CSP and CFP by examining whether cost of equity capital acts as a conduit through which industry-relative CSP could affect a firm. A firm's cost of capital is fundamental to a variety of corporate decisions which influences its operations and profitability, from determining the hurdle rate for investment projects to influencing the composition of a firm's capital structure (Easley & O'Hara, 2004). A firm's cost of capital is constructed by combining its cost of debt and equity. In this research we focus on the cost of equity as equity markets are more liquid, contain more active investors and are hence more efficient and informationally complete. A firm's cost of equity could have a mediating effect and contribute to the proposed positive (negative) outcome through lowering (increasing) a firm's overall cost of capital. Such lowered (increased) cost of capital should in turn increase (decrease) the firm's overall financial performance as it increases (reduces) the firm's ability to generate return for a given level of revenue. Previous research has shown that firms engage in CSR due to

institutional pressures, particularly from stakeholders (Agle et al., 1999; Boal, 1985; Sharma & Henriques, 2005) and that the relationship between CSR initiatives and outcomes is stronger as stakeholder salience (power, legitimacy and urgency) increases (Parent & Deephouse, 2007). As shareholders are arguably one of the most important and powerful stakeholders in the current system, a study of their effect on the CSP-CFP relationship through a company's cost of equity capital and whether increased CSP is rewarded is warranted. The cost of capital could be a channel through which capital markets provide an incentive for firms to become more socially responsible (Heinkel, Kraus, & Zechner, 2001).

There are two major theoretical arguments as to why the cost of capital could be expected to be lower for firms with higher CSP, which relate to the effect of CSP on the relative size and composition of a firm's investor base and the effect on the firm's level of perceived risk. The first argument proposes that firms with lower levels of CSP will be similar to neglected stocks and will attract a reduced investor base, which will cause greater levels of information asymmetry between a firm and its investors, which in turn will increase its cost of capital. Merton (1987) proposes an inverse relationship between the number of investors who are informed about a firm and the rate of return of that stock, reasoning that a higher number of informed investors cause the stock price to become more informationally complete. This model is based on the basic intuition that information about securities is costly to acquire and therefore it is neither optimal nor plausible for investors to track every security in the market (Chichernea, Ferguson, & Kassa, 2015). It is implied by Merton's (1987) capital market equilibrium model that increasing the relative size of a firm's investor base will result in a lower cost of capital and higher market value. Conversely, a reduction in the number of investors willing to hold a stock results in an increase in the cost of capital because the remaining investor base is more concentrated which leads to a reduction in opportunities for risk diversification (Heinkel et al., 2001). There is ample empirical support for this neglected stock hypothesis with event studies indicating that increases in investor

recognition due to listings on exchanges (Foerster & Karolyi, 1999; Kadlec & McConnell, 1994), initiation of analyst coverage (Irvine, 2003), addition to stock indices (H. Chen, Noronha, & Singal, 2004), and hiring of investor relations firms (Bushee & Miller, 2012) all lead to increases in security values.

Applying Merton's (1987) model to CSR, El Ghoul, Guedhami, Kwok, & Mishra (2011) propose that low CSR firms are neglected stocks, tending to have a smaller investor base due to investor preference and information asymmetry. The reluctance of socially responsible investment (SRI) funds to invest in low CSR firms is proposed to lead to a narrowing of their investment base (Heinkel et al., 2001). Low CSP firm's investor base is also likely to be further reduced as a result of increased information asymmetry due to disadvantages in the three parts of the information transmission process; signalling by firms due to lower levels of disclosure (D. S. Dhaliwal, Li, Tsang, & Yang, 2011), coverage by the media and analysts (R. B. Durand, Koh, & Limkriangkrai, 2013; Hong & Kacperczyk, 2009) and reception by investors. As a result of the decreased size of these firm's investor bases, they may be forced to offer higher expected returns in order to compensate investors for a lack of risk sharing. Higher required return by investors due to a reduction in investor base is evident in 'sin' stocks as shown by Hong & Kacperczyk (2009), yet whether this extends to low CSR firms remains an empirically open question (Hillman & Keim, 2001).

The second interconnected reason proposed for the negative relationship between CSP and cost of capital relates to the potential reduction in both idiosyncratic and systematic risk. Firstly, firms with strong CSR typically have above average risk control and compliance standards, lowering business risk and resulting in less frequent severe incidents such as fraud, embezzlement, corruption or litigation cases (P. C. Godfrey et al., 2009; Hoepner et al., 2016; Jo & Na, 2012). Hoepner et al. (2016) observed that high ESG-rated firms also demonstrated lower financial risk, with statistically significant lower downside risk measures such as volatility, lower partial moments and worst-case loss. Merton's (1987)

model demonstrates that idiosyncratic risks can be priced in equilibrium if some investors are under diversified and do not hold the market portfolio. The additional premium earned by stocks, in the presence of incomplete information, reflects the interaction of three separate stock characteristics: idiosyncratic risk, relative size and breath of the shareholder base (Chichernea et al., 2015). As CSP has been found to affects both the level of idiosyncratic risk and size of a firm's shareholder base, it may have an effect on the premium/discount earned by stocks through its relationship with the cost of capital.

Additionally, Eccles, Ioannou, & Serafeim (2011) and Gregory, Tharyan, & Whittaker (2014) argue that firms with strong CSP have higher valuation as they are less vulnerable to systematic market shocks. This systematic risk reduction is proposed to occur for reasons related to improved resource utilisation and intangible assets. For example, firms that are more resource efficient due to CSP are less exposed to input price changes than their less efficient competitors. Firms with good customer relations can reduce their elasticity of demand, making sales more durable in an economic downturn (Albuquerque, Durnev, & Koskinen, 2010). Godfrey et al. (2009) and Koh, Qian, & Wang (2014) have provided some evidence that good relationships with stakeholders build goodwill, and thereby reduce the cash flow shock, offering "insurance-like" protection in market downturns. Oikonomou, Brooks, & Pavelin (2012) measured the relation between systematic risk and CSR, finding a weak negative association with high CSP and a strong positive association with low CSP. Hence, if investors perceive a firm's level of risk to differ depending on their level of CSP, cost of equity capital should also vary systematically with CSP. With the objective of gaining further insight into the mechanisms that drive the CSP-CFP relationship, we test the hypotheses:

H_1: *Corporate social performance is negatively related to a firm's cost of equity capital.*

While the findings above predict a linear and negative relationship between CSP and cost of equity, some complexity could be introduced by recognising that investors may have heterogenous preferences with respect to their attitude towards CSP (Ding et al., 2016; Harjoto et al., 2017). The presence of investors with heterogenous preferences and views of CSP and its value relevance could lead to a non-linear relationship between CSP and the cost of equity capital. There are a wide variety of motives that may underly an investor's judgement of what constitutes an important metric to be included in their investment decision. Due to the diverse range of beliefs and concerns underlying investment decisions, different investor types make investment judgements (Luther, Matatko, & Corner, 1992) and implement their investment decisions in divergent ways (Sparkes & Cowton, 2004). When it comes to ESG investing and the treatment of firms with varying degrees of CSP, the heterogeneous nature of investor judgement can be further complicated by tastes (Fama & French, 2007), cultural and ideological differences (Sandberg, Juravle, Hedesström, & Hamilton, 2009), time horizon (Gloßner, 2019) and perceptions of risk.

Investor holdings with respect to CSP are likely to reflect the interplay of two potential drivers of investment decisions: social norms and economic incentives. These drivers may be aligned or mutually exclusive depending on context. Some investors such as socially responsible mutual funds that gain utility from the social impact of their investments may give preference to social norms, and hence invest in companies with high CSP regardless of the economic incentives (Nofsinger et al., 2019). Conventional economic theory assumes that market prices are a function of expected future cash flows (Lintner, 1965; Varian, 1990) arising from the investment portfolio choices of utility maximizing rational investors that maximizes expected payoffs having taken into account their risk tolerance and budget constraints. However, in certain cases some investors may choose to hold economically irrational portfolios as they get direct utility from their holding of some assets above the utility from general consumption that the payoff on the asset provide (Fama

& French, 2007). The presence of such investors is theorised by Fama & French, (2007) to alter the pricing of these assets which cannot be fully arbitraged away due to the persistent nature of investor tastes. Hence the over weighting or underweighting of certain firms' stock in these economically irrational portfolios due to investors beliefs about CSP, could lead to a change in price through its effect on the cost of equity capital. The sticky nature of investors choice with positive beliefs about CSP (ESG investors) has been found by a number of studies which show that ESG fund flows are more stable than conventional funds (Bollen, 2007; Peifer, 2011) and more loyal to their choices (Benson & Humphrey, 2008; El Ghoul & Karoui, 2017). Riedl & Smeets (2017) also find that individual investors in socially responsible funds are willing to forgo financial returns to invest according to their social preference.

For investors that do not gain utility from investing in socially responsible firms, their decision-making process when considering the relevance of CSP to their investment decision must be based on an economic framework that weighs the costs and benefits of varying levels of CSP investment. When doing so, it is conceivable that investors weigh negative and positive CSP's economic costs and benefits differently. Cho, Lee, & Pfeiffer (2013) stresses the importance of separately considering the impact of responsible and irresponsible behaviour as the market's ability to process and evaluate information differs between positive and negative behaviours. The economic costs of negative CSP are tangible risks to the firm that could include lawsuits, strikes, and consumer boycotts (Benabou & Tirole, 2010; H. A. Luo & Balvers, 2017), while positive CSP offers intangible future benefits such as reputation and employee engagement which may be hard to quantify in terms of risk reduction and cash flow benefits. Additionally, the non-linear or increasing nature of investment costs may complicate the value of CSP investment as increasing a firm's CSP from a low base to average performance using widely available technology and processes is conceivably less costly in relative terms when compared to the cost of

innovating to become the market leader in an area such as environmental performance. Hence, each component of CSP at each level of performance may pose a unique cost-benefit trade off that has implications for shareholder value and the firm's cost of capital. This asymmetric impact of CSP investment is reflected in the preference of institutional investors not to invest in stocks with CSP weaknesses as indicated by their underweighting of these stocks. This is likely driven by an alignment between economic incentives and social norms as the presence of negative indicators reflect downside risks (Nofsinger et al., 2019). The presence of a corresponding overweighting of firms with positive CSP indicators or strengths by institutional investors was not found which indicates that an economic incentive may be lacking or in conflict with social norms (Nofsinger et al., 2019). This may indicate that when it comes to higher levels of CSP, social norms and economic incentives are perceived to be mutually exclusive goals by some investors. This in turn may lead to a reduction in the number of investors willing to hold high CSP firms due to economic incentives resulting in reduction in the opportunities for risk diversification and a subsequent increase in the cost of equity capital.

A further compounding complication with regards to the views of investors regarding the cost-benefit payoffs of CSP investment exists due to the presence of agency problems. When ownership and control are separated in a corporation, shareholders have less information about what is going on inside the firm. The presence of this asymmetric information allows managers to act in their own self-interest as opposed to that of the owners (shareholders). These agency problems are proposed to manifest themselves with regards to CSP in two opposing ways. Firstly, CSP could represent private benefits such as prestige that managers extract at the expense of shareholders (Jiao, 2010). Secondly, the temporal nature of CSP investments which often involves substantial upfront costs that generate uncertain long-term intangible benefits may reduce current profits but generate much higher long-term profits through channels such as establishing a better work environment and/or

creating good will and reputation with consumers and society (Ng & Rezaee, 2015). As such CSP investments are long term in nature and may suffer from another strain of agency problems related to long term investments. Stein (2003) argue that managers may increase short term profits by underinvesting in long term assets because shareholders cannot distinguish such myopic behaviour from other more positive shocks that also increase short-term profits. This preference for short over long term assets emanates from the propensity for long term assets to be mispriced for longer as arbitrage is cheaper for short term assets (Shleifer & Vishny, 1990). Managers with an eye to their job security and the possibility of a hostile takeover, will be less likely to invest in long term projects as this could lead to an under-pricing of the firm's equity and increase the managers personal downside risk. The preference for short termism among managers is highlighted by Graham, Harvey, & Rajgopal (2005) in their survey of 401 managers with nearly 80% claiming that they would sacrifice long-term value in order to meet short term targets. Krüger (2015) demonstrates that investors display an ability to recognise CSR which results in agency concerns in their reaction to different news announcements about CSR. Hence from an investor's perspective, both too much and too little or the wrong type of investment in CSP could be evidence of the existence of agency problems and increased risk, impacting firms' cost of equity capital nonmonotonically.

It is common practice in finance to judge or benchmark a firm's performance on a certain metric against its industry peers as opposed to all companies, 'comparing apples with apples' as it were, due to industry specific asset composition, cash flows schedules, cost structure, operational structure and risk profile. In the realm of non-financial information such as CSP, the use of an industry-relative score follows the same logic with good or bad, too little, or too much being a relative judgment. If an optimal level of CSP investment is perceived to be present by investors, it is likely to be industry specific in line with cost structures and risk profiles. The use of industry relative CSP scores in this research allows

us to examine whether firms that distinguish themselves from their peers are associated with changes in the cost of equity capital. Additionally, the asymmetric information and opacity around CSP (Cho et al., 2013) in addition to the heterogeneous ability and desire to price it complexities, may cause market participants to classify firms into different groups with similar CSP levels based on their perception (Ding et al., 2016).

Therefore, a change in a firm's actual level of CSP would only affect the perception of risk, and by extension, impact the cost of equity, if the firm moves into a different grouping. This would imply a stratified relationship between CSP and cost of equity. With the objective of gaining further insights into the mechanisms that drive the CSP-CFP relationship and the possible presence of a stratified non-linear relationship, we test the second hypotheses:

H_2: The relationship between corporate social performance and cost of equity is stratified and non-linear.

2.3 Data and Research Methodology

2.3.1 Measuring CSP

This research utilizes Thomson Reuters Asset4's ESG scores as our measure of CSP following recent studies (K. Gupta, 2018; La Rosa et al., 2018; Liang & Renneboog, 2017; Sassen et al., 2016). However, the Asset4 scoring system was changed from an absolute relative to an industry-year relative score in 2017, making our CSP measure different to that used in previous studies. The choice of this measure of CSP rests on its uniformity and consistency across time in addition to its widespread use in the investment community. The ability to compare these scores across time stems from their construction as industry-year relative scores for the environmental and social scores and country-year relative scores for

the Governance score. Thomson Reuters compiles these scores from over 400 measures based on information generated by the firms and published in annual reports and on company websites. Additionally, in order to increase the objectivity of the measures, additional information for its construction is also gathered from non-governmental organisation's websites, stock exchange fillings, CSR reports and news sources. ESG scores measure a company's relative performances across ten themes under the three pillars: Environmental (Resource use, Emissions, Innovation), Social (Workforce, Human Rights, Community, Product Responsibility) and Governance (Management, Shareholders, CSR strategy) (Thomson Reuters, 2015). We follow previous studies (e.g., El Ghoul, Guedhami, Kim, & Park, 2018; Ioannou & Serafeim, 2012; Luo, Wang, Raithel, & Zheng, 2015) by excluding the governance score from our overall measure of CSP[6] which consists of an equally weighted-average of environmental and social scores. Table 2.1 provides an outline of the ES measurements used.

[6] This measure of CSP represents the interests of stakeholders other than shareholders for which the governance measure is most relevant. Additionally, the exclusion of the Governance score from our measure of CSP allows for it to be an entirely industry-relative score.

Table 2. 1 Description of ESG Measurements (Thomson Reuters, 2018)

Pillar	Theme	Definition
Environmental	Resource Use Score	The Resource Use Score reflects a company's performance and capacity to reduce the use of materials, energy or water, and to find more eco-efficient solutions by improving supply chain management.
	Emissions Score	The Emissions Reductions Score measures a company's commitment and effectiveness towards reducing environmental emission in the production and operational processes.
	Innovation Score	The Innovation Score reflects a company's capacity to reduce the environmental costs and burdens for its customers, thereby creating new market opportunities through new environmental technologies and processes or eco-designed products.
Social	Workforce score	The Workforce Score measures a company's effectiveness towards job satisfaction, a healthy and safe workplace, maintaining diversity and equal opportunities, and development opportunities for its workforce.
	Human Rights Score	The Human Rights Score measures a company's effectiveness towards respecting the fundamental human rights conventions.
	Community Score	The Community Score measures the company's commitment towards being a good citizen, protecting public health and respecting business ethics.
	Product Responsibility Score	The Product responsibility Score reflects a company's capacity to produce quality goods and services integrating the customer's health and safety, integrity and data privacy.

Notes: This table provides a description of each of the Environmental and Social Metrics and their sub-categories used by Thomson Reuters in their Asset4 Database.

2.3.2 Implied Cost of Equity

Recent accounting and finance literature has adopted implied cost of capital for the purpose of estimating cost of equity capital or expected returns (Ben-Nasr et al., 2012; D. Dhaliwal et al., 2006, 2016; Hail & Leuz, 2006, 2009; Hou et al., 2012). The implied cost of capital (ICC) is the internal rate of return that equates current stock prices to the present value of expected future cash flows. This ex-ante based cost of equity measure, derived directly from stock prices and cash flow forecasts, has been increasingly used in the finance and accounting literature due to its advantages over ex-post measures which rely on backward-looking and noisy measures such as realised returns (K. Gupta, 2018).

Factor models using realised returns, including the capital asset pricing model (CAPM), are claimed to generate imprecise estimates of the cost of capital as realised returns, affected by cash flow news and shocks (J. Campbell, 1991; Vuolteenaho, 2002), are argued to be a poor proxy of expected returns (Blume & Friend, 1973; Elton, 1999). The implied cost of capital method is claimed to be of particular use as it makes an implicit attempt to isolate cost of capital effects from growth and cash flow effects (K. C. W. Chen, Chen, & Wei, 2009; Hail & Leuz, 2006, 2009). This makes it an economically more robust and less noisy measure as compared to traditional realized returns based measures (Lee, Ng, & Swaminathan, 2009). To estimate each firm's cost of equity capital, we follow recent studies (Boubakri et al., 2012; K. Gupta, 2018; Hail & Leuz, 2006; Pham, 2019) and use the average of estimates obtained from four implied cost of capital models including the income valuation models implemented by Claus & Thomas (2001) and Gebhardt, Lee, & Swaminathan (2001), and the abnormal growth models used by Easton (2004) and Ohlson & Juettner-Nauroth (2005).

Table 2. 2 Implied Cost of Capital Estimation Models

We follow previous research (K. C. W. Chen, Chen, & Wei, 2009; El Ghoul et al., 2011; Gupta, 2015; Harjoto & Jo, 2015; Hou, van Dijk, & Zhang, 2012) and estimate the four different models below, taking the average of the four models as an overall estimate of implied cost of equity.

Common notation
FEPS= Forecasted earnings per share
B = Book value
DPR = forecasted dividend payout ratio (firm-specific 3-year median dividend pay-out ratio)
g = Expected (long-run) earnings growth
DIV = Dividend
P = Average annual market price of equity

1. Claus & Thomas (2001)	This model assumes clean surplus accounting (Ohlson, 1995), allowing share price to be expressed in terms of forecasted residual earnings and book values. $$P_t = B_t + \sum_{\tau=1}^{5} \frac{ae_{t+\tau}}{(1+R_{CT})^{\tau}} + \frac{ae_{t+5}(1+g)}{(R_{CT}-g)(1+R_{CT})^{5}}$$ Where: $$ae_{t+\tau} = FEPS_{t+t} - R_{CT}B_{t+\tau-1}$$ $$B_{t+\tau} = B_{t+\tau-1} + FEPS_{t+\tau}(1-DPR_{t+\tau})$$ $$B_{t+1} = B_t + FEPS_{t+1} - DIV_{t+1}$$
2. Gebhardt, Lee, & Swaminathan (2001)	This model also assumes clean surplus accounting, allowing share price to be expressed in terms of forecasted earnings per share and book value. $$P_t = B_t + \sum_{\tau=1}^{12} \frac{FEPS_{t+\tau} - (R_{GLS} * B_{t+\tau-1})}{(1+R_{GLS})^{\tau}} + \frac{FEPS_{t+12} - (R_{GLS} * B_{t+11})}{R_{GLS}(1+R_{GLS})^{12}}$$ This model uses a two-stage approach to estimate the intrinsic value of the stock. • The first stage considers EPS forecasts for the first 3 years ahead • The second stage assumes that from the 4th to 12th year, EPS will grow linearly to the industry-specific median ROE. The terminal value beyond the 12th year assumes 0 incremental profits, Residual income does not change.
3. Ohlson & Juettner-Nauroth (2005)	This model uses short-term growth computed from 1-year ahead earnings forecasts which gradually declines to long run growth rate (g). $$R_{oj} = A + \sqrt{A^2 + \frac{FEPS_{t+1}}{P_t}\left(\frac{FEPS_{t+2} - FEPS_{t+1}}{FEPS_{t+1}} - g\right)}$$ Where: $A = \frac{1}{2}\left(g + \frac{DPR*FEPS_{t+1}}{P_t}\right)$ The model requires positive earnings for the period t+1 and t+2 for numerical approximation to converge. The long-term growth rate equals country specific inflation rate.
4. Easton (2004)	This model is a special case of the OJ model where the abnormal returns are assumed to exist in perpetuity after the initial period. $$P_t = \frac{FEPS_{t+2} - FEPS_{t+1} + (R_{ES} * FEPS_{t+1} * DPR)}{R_{ES}^2}$$ It uses one and to year ahead earnings forecasts combined with dividend pay-out to estimate abnormal earnings. This model requires positive changes in forecasted earnings for numerical approximation to converge

Note: This tables provides a description of the implied cost of capital measures used in this study.

As individual models can exhibit different associations with a given risk proxy, it is important to use the average of these four models to reduce the possibility of spurious results stemming from a particular cost of equity capital model (D. Dhaliwal et al., 2006). Descriptions of these models can be found in Table 2.2.

An extensive literature has shown that implied cost of capital measures derived from analyst forecasted earnings are unreliable (Easton & Monahan, 2005) and that analyst forecasts are biased (Hou, van Dijk, & Zhang, 2012; Li & Mohanram, 2014). Earnings forecasts generated by cross sectional models have been found to be superior to analysts' forecasts in terms of coverage, forecast bias and earnings response coefficients and that model-based ICC estimates are a more reliable proxy for expected returns (Hou et al., 2012; Li & Mohanram, 2014). Hou et al. (2012) was the first to present a cross sectional model to generate forecasts in order to compute ICC but the forecasts from their model perform worse than those from a naive random walk model and showed anomalous correlation with risk factors (Li & Mohanram, 2014). Due to these shortcomings we follow the recommendations of Li & Mohanram (2014) and implement the Residual Income earnings forecasting model (RI) based on the residual income model from Feltham & Ohlson (1996). This RI model which incorporates book value and accruals in addition to earnings has been shown to outperform analyst forecasts in addition to the Hou et al. (2012) model and earnings persistence models on a number of dimensions including forecast accuracy, forecast bias, earnings response coefficients and correlation with risk factors (Li & Mohanram, 2014). A description of this model can be found in Table 2.3.

Table 2. 3 Cross-sectional forecasted earnings per share (FEPS) estimation model

We use the cross-sectional Residual Income model proposed by Li & Mohanram (2014) to estimate forecasted Earnings per share. The model is estimated by running a regression on 10 years of lagged data using all firms with available data, before applying the regression coefficients to firm-specific data to estimate the expected value for each firm.

Formula:

$$FEPS_{j,\,t+i} = \alpha_0 + \alpha_1 NegE_{j,t} + \alpha_2 E_{j,t} + \alpha_3 Neg\ E_t * E_{j,t} + \alpha_4 B_{j,t} + \alpha_5 TACC_{j,t} + \varepsilon_{j,t+i}$$

Where:

FEPS = Forecasted earnings per share

NegE = dummy variable for negative earnings

E = Earnings per share

B = book value of equity divided by the total number of outstanding shares

TACC = Total accruals (sum of change in net working capital, change in non-current operating assets, and change in net financial assets) divided by total number of shares outstanding.

2.3.3 Control Variables

In order to control for other factors known to affect the cost of equity, we use firm-level variables, including measures of growth, profitability, illiquidity, size, leverage, volatility, and country-level variables, a measure of the development level of the firm's home country and the inflation rate. We calculate our measure of expected growth as the ratio of book to market value (BTM). Our measure of profitability includes two variables, the return on equity (ROE) and a dummy variable representing whether or not a firm suffered a financial loss in the previous year (DLOSS). Our measure of illiquidity (ILLIQ) is calculated using Lesmond, Ogden, & Trzcinka's (1999) model where a stock with no change in price over a time period is considered illiquid. Hence, we calculate the illiquidity as the ratio of zero trading days to the total number of trading days during the year. We measure size (SIZE) as the natural log of total assets and leverage (LEV) as the ratio of total debt to total assets. Volatility (VOL) is our chosen measure of risk and is calculated as the annualised standard deviation of daily total returns in a given year. We include a control for the level of economic development using the log of gross domestic product per capita (LGDPPC) in each year evaluated in constant (year 2018) $US. Finally, to account for the nominal terms of these inputs we follow Hail & Leuz (2006), Chen et al. (2009) and Gupta (2018) by including the annualised country specific realised monthly inflation rate. Accounting and stock market measures are obtained from Thomson Reuters DataStream while LGDPPC and inflation rates are obtained from the World Bank. All applicable variables are dollarized to allow for cross-country comparison in addition to financial variables being winsorized at 1 and 99 percentiles to minimize the effect of outliers.

The initial sample consisted of 32,431 firm year observations of publicly traded firms from 50 countries that are part of the Thomson Reuters Asset4 database during the period from 2002 to 2017. Missing control variables have reduced the final sample to 21,338 firm-

year observations from 50 countries over the period 2002-2017. Table 2.4 shows a breakdown of the sample by country over the period.

Table 2. 4 Sample broken down by country and year

	2002 - 2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	Total
AUSTRALIA	104	48	43	70	100	110	135	131	151	161	170	186	1409
AUSTRIA	26	13	9	10	10	8	11	10	7	9	7	5	125
BAHRAIN	0	0	0	0	0	0	0	0	0	5	5	5	15
BELGIUM	17	13	10	9	10	10	11	13	8	14	11	8	134
BRAZIL	5	6	10	17	32	35	43	44	44	47	36	45	364
CANADA	96	74	76	90	71	81	102	95	91	81	84	91	1032
CHINA	3	3	21	40	61	65	59	71	83	86	81	226	799
COLOMBIA	0	0	0	3	7	8	10	11	10	8	13	18	88
CZECH REPUBLIC	0	1	1	0	0	1	0	0	1	1	1	2	8
DENMARK	33	11	13	10	9	9	8	7	7	8	3	2	120
EGYPT	0	0	1	2	8	7	7	6	7	7	7	4	56
FINLAND	35	14	9	12	6	10	8	12	9	11	11	8	145
FRANCE	84	53	51	35	34	42	48	40	41	33	26	26	513
GERMANY	80	39	31	28	21	29	36	26	32	27	22	22	393
GREECE	14	7	5	6	7	7	6	5	7	5	6	6	81
HONG KONG	123	53	56	67	104	118	117	127	132	129	130	153	1309
HUNGARY	0	0	1	3	2	3	3	3	2	4	2	1	24
INDIA	0	6	17	24	39	54	60	61	70	64	55	59	509
IRELAND	8	3	4	3	3	3	7	5	6	7	2	6	57
ISRAEL	1	1	1	7	6	8	8	8	8	8	7	7	70
ITALY	73	27	29	25	28	22	21	23	29	32	24	30	363
JAPAN	618	305	291	197	257	286	284	286	303	301	261	234	3623
JORDAN	0	0	1	1	1	1	1	1	1	1	1	1	10
KUWAIT	0	0	3	3	3	3	3	3	3	9	9	9	48
LUXEMBOURG	4	2	2	1	1	1	1	3	3	1	1	1	21
MALAYSIA	0	0	10	15	34	36	38	40	40	40	36	39	328
MEXICO	5	5	10	12	12	15	17	22	24	24	29	27	202
MOROCCO	0	1	1	0	1	1	2	2	1	2	1	1	13
NETHERLANDS	24	12	7	10	9	6	7	10	11	10	11	5	122
NEW ZEALAND	18	9	9	5	7	8	9	11	13	36	41	44	210
NORWAY	41	13	7	10	5	11	10	12	8	7	10	11	145
OMAN	0	0	0	1	1	1	1	1	1	8	9	8	31
PERU	0	0	1	0	0	1	1	1	1	0	18	20	43
PHILIPPINES	0	0	0	4	13	17	18	21	21	21	21	22	158
POLAND	0	0	3	5	11	14	15	17	16	18	14	12	125
PORTUGAL	13	7	4	5	5	4	5	4	3	6	5	8	69
QATAR	0	0	0	0	0	0	0	0	4	3	5	4	16
RUSSIA	5	5	11	14	13	13	14	13	12	4	14	11	129
SAUDI ARABIA	0	0	3	3	1	2	3	2	2	9	7	7	39
SINGAPORE	64	28	30	36	32	34	36	35	34	33	34	31	427
SOUTH KOREA	8	6	12	12	25	38	60	55	50	52	42	36	396
SPAIN	51	19	17	16	14	18	22	25	24	27	22	19	274
SRI LANKA	0	0	0	0	1	1	1	1	1	1	1	1	8
SWEDEN	96	30	21	26	19	23	29	27	26	37	27	26	387
SWITZERLAND	43	24	14	16	13	18	29	26	22	16	16	15	252
THAILAND	0	2	5	8	12	13	21	20	26	24	26	26	183
TURKEY	0	0	12	14	17	18	20	18	22	21	17	24	183
UNITED ARAB EMIRATES	0	0	0	1	1	1	1	1	8	10	9	11	43
UNITED KINGDOM	373	145	120	137	123	141	164	147	128	168	164	174	1984
UNITED STATES	505	326	282	302	217	284	342	309	248	405	545	490	4255
Total	2570	1311	1264	1315	1406	1639	1854	1811	1801	2041	2099	2227	21338

Notes: This table displays the distribution of firm observations in our sample by country and year.

2.3.4 Descriptive Statistics

We calculated the implied cost of capital using the average of the four models described above and found the mean implied cost of equity was highest during the global financial crisis, reaching 11.7% in 2008 and follows a trend through the years as expected, capturing exogenous shocks to the economic system. Table 2.5 reports the descriptive statistics for the variables used in our main regression models. It shows that the mean scores for CSP and its constituent parts are close to 50 which is expected as the environmental and social measures are percentile rank scores benchmarked against Thomson Reuters Business Classification Industry Groups for all environmental and social categories in a given year (Thomson Reuters, 2018). The average firm in our sample has an implied cost of equity of 10.8% with a book to market ratio of 0.74 and return on equity of 12.76%. In addition, the average firm has an illiquidity measure of 0.063, leverage ratio of 23.2%, and its total returns have an annualised volatility of 34.35%. The average GDP per capital in our sample is $34,372, implying that our sample is biased towards high income countries. The average annualised inflation rate across the countries and years in our sample is 2.045%.

We present Pearson pairwise correlation coefficients between all variables in Table 2.6. Return on equity, leverage and volatility are all found to be positively correlated with our implied cost of equity measures at a 1% level of significance as expected. Conversely, our CSP variables, book to market, log of GDP per capita and size are all found to be negatively related to our implied cost of equity estimates at a 1% level of significance as expected.

Table 2. 5 Descriptive statistics

Statistic	N	Mean	St. Dev.	Min	Pctl(25)	Pctl(75)	Max
Cost of Equity	21,338	10.830	6.330	4.059	6.863	12.371	44.266
CSP	21,338	50.414	20.430	4.609	33.616	66.931	97.949
Environmental Score	21,338	51.078	22.681	2.630	31.963	69.647	99.420
Social Score	21,338	49.750	21.644	3.563	32.732	66.679	98.717
Resource Use	21,338	50.841	27.850	0.090	25.000	75.490	99.920
Emissions	21,338	51.408	28.614	0.080	27.440	76.590	99.920
Environmental Innovation	21,338	50.954	24.591	0.130	31.700	71.570	99.820
Workforce	21,338	51.075	28.880	0.080	25.932	76.287	99.850
Human rights	21,338	49.797	24.092	4.170	31.430	72.000	99.810
Community Score	21,338	46.572	28.863	0.150	20.670	70.930	99.850
Product Responsibility	21,338	50.322	27.752	0.090	26.367	74.670	99.920
BTM	21,338	0.740	0.664	-0.036	0.396	0.930	49.099
ROE	21,338	12.756	11.119	-73.394	6.490	15.820	99.794
DLOSS	21,338	0.069	0.253	0	0	0	1
ILLIQ	21,338	0.063	0.088	0.004	0.015	0.069	0.858
SIZE	21,338	15.796	1.674	9.213	14.686	16.818	19.875
LEV	21,338	0.232	0.166	0.000	0.097	0.336	2.671
VOL	21,338	34.350	14.777	13.246	24.418	40.427	130.937
LGDPPC	21,338	10.370	0.800	6.899	10.451	10.791	11.689
Inflation	21,338	2.045	2.064	-4.478	0.732	2.812	29.502

Notes: This table displays preliminary statistics for all of the variables used in our regression models.

Table 2. 6: Pearson Correlation Matrix

	Variable	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
1	Cost of Equity																			
2	CSP	-0.144***																		
3	Environmental Score	-0.133***	0.926***																	
4	Social Score	-0.133***	0.918***	0.699***																
5	Resource Use	-0.107***	0.86***	0.882***	0.699***															
6	Emissions	-0.146***	0.828***	0.891***	0.63***	0.738***														
7	Environmental Innovation	-0.072***	0.614***	0.721***	0.403***	0.445***	0.435***													
8	Workforce	-0.038***	0.821***	0.628***	0.892***	0.636***	0.576***	0.34***												
9	Human Rights	-0.104***	0.671***	0.581***	0.658***	0.579***	0.515***	0.346***	0.507***											
10	Community Score	-0.219***	0.551***	0.369***	0.654***	0.373***	0.327***	0.215***	0.352***	0.361***										
11	Product Responsibility	-0.119***	0.647***	0.509***	0.689***	0.484***	0.446***	0.337***	0.449***	0.41***	0.359***									
12	BTM	0.279***	0.002	0.029***	-0.026***	0.012*	0.032***	0.028***	-0.027***	0.007	-0.039***	0.003								
13	ROE	0.091***	-0.02***	-0.044***	0.008	-0.012*	-0.038***	-0.063***	0.044***	-0.009	-0.023***	-0.039***	-0.322***							
14	DLOSS	0.035***	-0.002	-0.001	-0.003	-0.004	-0.001	0.003	-0.022***	-0.002	0.031***	0.007	0.094***	-0.096***						
15	ILLIQ	0.536***	-0.133***	-0.119***	-0.126***	-0.099***	-0.126***	-0.069***	-0.074***	-0.078***	-0.149***	-0.1***	0.05***	0.06***	-0.012*					
16	SIZE	-0.046***	0.39***	0.386***	0.333***	0.353***	0.346***	0.261***	0.265***	0.316***	0.222***	0.245***	0.2***	-0.195***	-0.066***	-0.007				
17	LEV	0.068***	0.077***	0.061***	0.08***	0.056***	0.051***	0.046***	0.059***	0.077***	0.069***	0.052***	0.028***	-0.017**	0.041***	0.046***	0.156***			
18	VOL	0.17***	-0.081***	-0.076***	-0.074***	-0.073***	-0.073***	-0.041***	-0.05***	-0.048***	-0.061***	-0.073***	0.112***	0.014**	0.163***	-0.052***	-0.114***	-0.002		
19	LGDPPC	-0.303***	0.03***	0.032***	0.022***	0.023***	0.039***	0.015**	-0.01	-0.014**	0.115***	-0.016**	0.014**	-0.098***	0.07***	-0.403***	-0.133***	-0.078***	-0.047***	
20	Inflation	0.214***	-0.034***	-0.075***	0.013*	-0.034***	-0.084***	-0.067***	0.016**	0.013*	0.018***	-0.014**	-0.03***	0.19***	-0.066***	0.198***	0.03***	0.046***	0.154***	-0.488***

Notes: This tables shows the pairwise correlation coefficients between the variables used in our regression models. P-values are indicated as follows: *p<0.1; **p<0.05; ***p<0.01

2.3.5 Method of Analysis

To examine the relationship between implied cost of capital and CSP, we employ a multiple regression model. We use the following model to test both our hypothesis relating to the relationship between CSP and cost of equity capital which includes a number of control variables consistent with previous literature (Botosan & Plumlee, 2002; Clarkson et al., 2004; Plumlee et al., 2015; A. J. Richardson & Welker, 2001).

$$COEC_{it} = \beta_1 CSP_{it} + \beta_2 BTM_{it} + \beta_3 ROE_{it} + \beta_4 DLOSS_{it} + \beta_5 ILLIQ_{it} + \beta_6 SIZE_{it} + \beta_7 LEV_{it} + \beta_8 VOL_{it} + \beta_9 LGDPPC_{it} + \beta_{10} inflation_{it} + \mu_i + \mu_t + \varepsilon_{it} \quad (2.1)$$

The dependant variable used in our analysis, COEC, the implied cost of equity capital, is calculated using the average of four implied cost of capital models as described in the data section. The variable of interest, CSP, will take a number of forms, CSP calculated as the average of the environmental and social scores, the environmental score (ENV), the social score (Social) and CSP group dummies. In order to account for the possibility that all aspects of CSP are not uniformly, timely and linearly priced, this study creates CSP group dummies in which firms are categorised into five quantiles based on their industry year relative CSP score in a given year. Other variables are as previously defined.

We follow Ding et al. (2016), El Ghoul, Guedhami, & Kim (2017) and Servaes & Tamayo (2013) by including firm fixed effects in order to address concerns about endogeneity resulting from omitted confounding variables correlated with CSP and cost of equity. Additionally, firm fixed effects subsume country and industry fixed effects. We also include time fixed effects to control for the possible presence of time series dependence due to the possible omission of controls for time-invariant unobservable firm characteristics.

2.4 Empirical Results

2.4.1 Main Results

Table 2.7 reports the results of our regression model which investigates the possible relationship between a firm's cost of equity capital and CSP while controlling for firm and year fixed effects. Models 1 to 3 report our findings when CSP and its constituent parts (environmental and social scores) are investigated. In Model 1 we find that the coefficient on CSP is negative and statistically significant at a 1% level, indicating that firms with better CSP have a significantly lower cost of capital. Economically, the estimated coefficient in Model 1 implies that a one standard deviation increase in CSP leads firms' cost of equity to decrease, on average by 0.102%.[7] These findings suggest that firms with high CSP have lower perceived risk and are consistent with CSP investment decreasing firm risk and increasing the firm's investor base.

Due to this finding we fail to reject our first hypothesis that corporate social performance is negatively related to a firm's cost of capital which provides further evidence that the cost of capital is an important channel through which market prices reflect the value of CSP.

[7] Calculated as -0.005, the coefficient for CSP x 20.43, the standard deviation of CSP in Table 3.

Table 2. 7 Fixed Effects Regression of Implied Cost of Equity Capital on CSP

	Dependent variable: Implied cost of equity capital					
	(1)	(2)	(3)	(4)	(5)	(6)
CSP	-0.005***					
	(0.002)					
Env		-0.002*				
		(0.001)				
Social			-0.005***			
			(0.001)			
Grouped by				CSP	ENV	Social
Group 2				-0.334***	-0.205***	-0.255***
(20-40%)				(0.091)	(0.078)	(0.073)
Group 3				-0.367***	-0.222**	-0.287***
(40-60%)				(0.100)	(0.087)	(0.081)
Group 4				-0.412***	-0.250***	-0.340***
(60-80%)				(0.109)	(0.095)	(0.089)
Group 5				-0.378***	-0.249**	-0.404***
(80-100%)				(0.129)	(0.110)	(0.109)
BTM	3.668***	3.670***	3.667***	3.667***	3.669***	3.662***
	(0.048)	(0.048)	(0.048)	(0.048)	(0.048)	(0.048)
ROE	0.026***	0.026***	0.026***	0.026***	0.026***	0.026***
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
DLOSS	0.305***	0.308***	0.303***	0.312***	0.311***	0.305***
	(0.063)	(0.063)	(0.063)	(0.063)	(0.063)	(0.063)
ILLIQ	23.515***	23.509***	23.506***	23.494***	23.514***	23.522***
	(0.493)	(0.493)	(0.493)	(0.493)	(0.493)	(0.493)
SIZE	-1.413***	-1.418***	-1.417***	-1.412***	-1.416***	-1.416***
	(0.054)	(0.054)	(0.053)	(0.054)	(0.054)	(0.053)
LEV	2.541***	2.540***	2.545***	2.545***	2.542***	2.549***
	(0.224)	(0.224)	(0.224)	(0.224)	(0.224)	(0.224)
VOL	0.026***	0.026***	0.026***	0.026***	0.026***	0.026***
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
LGDPPC	-0.387***	0.399***	-0.398***	-0.389***	-0.392***	-0.401***
	(0.146)	(0.146)	(0.146)	(0.146)	(0.146)	(0.146)
Inflation	0.033**	0.034**	0.033**	0.034**	0.035**	0.033**
	(0.014)	(0.014)	(0.014)	(0.014)	(0.014)	(0.014)
Observations	21,338	21,338	21,338	21,338	21,338	21,338
R2	0.417	0.416	0.417	0.417	0.417	0.417
Adjusted R2	0.276	0.275	0.276	0.276	0.275	0.276
F Statistic	1,227.326*** (df = 10; 17184)	1,226.157*** (df = 10; 17184)	1,227.743*** (df = 10; 17184)	944.730*** (df = 13; 17181)	943.688*** (df = 13; 17181)	944.866*** (df = 13; 17181)

Notes: The dependent variable, implied cost of capital for firm i in year t (calculated using forecasts of earnings per share generated by the residual income model) is regressed on our main dependent variables as well as firm-level and country-level control variables; book to market (BTM), return on equity (ROE), loss dummy (DLOSS), illiquidity (ILLIQ), the natural log of total assets (SIZE), the ratio of total debt to total assets (LEV) volatility of returns (VOL), log of gross domestic product per capita (LGDPPC) and country inflation (Inflation). CSP is an equally weighted-average of environmental and social scores, ENV is the environmental score and Social is the social score. Groups 1-5 are dummy variables constructed by grouping firms into 5 quantiles based on their CSP, ENV and Social scores (CSP Group 2, 3 ,4,5). P values are indicated as follows: $^{*}p<0.1$; $^{**}p<0.05$; $^{***}p<0.01$

In Model 2 of Table 2.7, we investigate the effect of a firm's environmental performance on its cost of equity capital and find that increased performance in relation to this metric reduces a firms' cost of equity capital at a 10% level of significance. Economically, the estimated coefficient in Model 2 implies that a one standard deviation increase in environmental performance leads firms' cost of equity to decrease, on average by 0.045%[8]. In Model 3 of Table 2.7, the social score displays a negative relationship with cost of equity at a 1% level of significance. The economic significance of the social score is equivalent to that of the overall CSP score which may indicate it as the main driver in the overall relationship. These findings suggest that firms with high environmental or social performance have lower perceived risk and are consistent with the expectation that environmental or social performance investment can decrease firm risk and increase a firm's investor base.

In order to increase the robustness of our findings and to account for a possible divergence in the treatment of CSP by different investor groups, we substitute our CSP variables with peer group dummy variables based on 5 quantiles in Model 4 of Table 2.7. Firms in group 1 have CSP scores in a range from 0-20 and this group is the base case against which others are measured. The results of this analysis demonstrate that a more complex relationship may exist between CSP and cost of equity capital than implied in the previous linear tests. Firms that are members of group 2, ranging from the 20th to 40th percentile of CSP performers in their industry, demonstrate a statistically and economically significant difference in cost of equity capital when compared to the bottom 20 % of performers in Group 1. Implementing the estimates from this model, a firm that moved from group 1 to group 2 would on average experience a reduction in their cost of equity capital of 0.334% which is more than three time the reduction expected for a 20% change in relative CSP using

[8] Calculated as -0.002, the coefficient for Env x 22.681, the standard deviation of Env in Table 2.7.

the estimates from Model 1. This severe drop in the cost of equity or perceived risk of firm's moving out of the bottom group could possibly be attributed to a reduction in the idiosyncratic risk of adverse shocks to cash flows stemming from fines, lawsuits, strikes or other tangible repercussions of poor performance (Benabou & Tirole, 2010; H. A. Luo & Balvers, 2017), systematic risk (Oikonomou et al., 2012) in addition to the risks of agency problem indicated by an deficiency in long-term investment such as CSP. Additionally, these findings provide some evidence that group 1 firms are neglected stocks (Hong & Kacperczyk, 2009) suffering from a reduced shareholder base which increases expected returns. Due to the risk reduction involved in moving out of the bottom group of performers, economic incentives and social norms (Nofsinger et al., 2019) could arguably be said to align in the eyes of investors, leading to the substantial drop in the cost of equity capital.

Membership of group 3, ranging from the 40^{th} to 60^{th} percentile of CSP performers in their industry, as opposed to group 1 also results in a reduction in the cost of equity by an estimated 0.367% at a 1% level of significance. This middle group while displaying a large reduction in their cost of capital in comparison to group 1, show relatively little reduction as compared to group 2 with an additional reduction in their cost of equity capital of 0.033% which is close to a third of the expected reduction using Model 1 estimates. This may indicate a slight decrease in the perceived risk profile and increased investor base for firms that move from group 2 to group 3.

Membership of Group 4, ranging from the 60^{th} to 80^{th} percentile of CSP performers in their industry, is also found to entail a reduction in the cost of equity by 0.412% at a 1% level of significance as compared to group 1. A further reduction in the cost of capital of 0.045% as compared to the middle group (Group 3) of performers which again is less of a reduction than implied by Model 1 results. As the risk profile of firm in the middle and above average groups could conceivable be of a similar nature, the further reduction in the cost of equity capital may be attributable to an increase in investor base as socially responsible

investors, due to their tastes (Fama & French, 2007), are more likely to buy and hold firms in the above average group.

Interestingly, this above average group (group 4) displays the largest reduction in cost of equity capital of any group which may indicate that it represents the optimal level of CSP investment with regards to cost of equity. The top group of performers (group 5) ranging from the 80th to 100th percentile of CSP performers in their industry, is also found to entail a reduction in the cost of equity by 0.378% at a 1% level of significance as compared to group 1. This represents an increase in the cost of capital of 0.034% as compared to the above average group (Group 4) of performers but still a greater reduction than other groups. An explanation for this reduction could possibly be that the additional investors attracted to firms with top CSP performance is counteracted by the reduction in economically focused investors willing to hold these stocks due to their perception of the costs and benefits of high level of CSP investment. At each level of CSP investment, further investment in increasing a firms' CSP involves a trade of between non-constant costs and benefits. Hence, some investors with purely wealth maximization objectives may view firms with CSP that is too high as engaging in investments that reduce the value of the firm or transfer it to insiders due to agency problems (Jiao, 2010). Due to this belief, they may reduce their holdings of the firm, narrowing the firm's investor base and increasing its cost of capital as found in the data.

When the CSP score is disaggregated into its two constituent parts and placed into groups based on their score, similar but non-identical patterns are found. In relation to the environmental groupings, moving from the bottom 20% percent of performers will on average reduce a firm's cost of capital by 0.205% at a 1% level of significance. A firm in the middle grouping (40-60) would receive a reduction of 0.222% at a 1% level of significance which is a greater reduction than Group 2 receives by 0.017%. While the final two groups' coefficients are almost identical and represent a reduction of their cost of equity

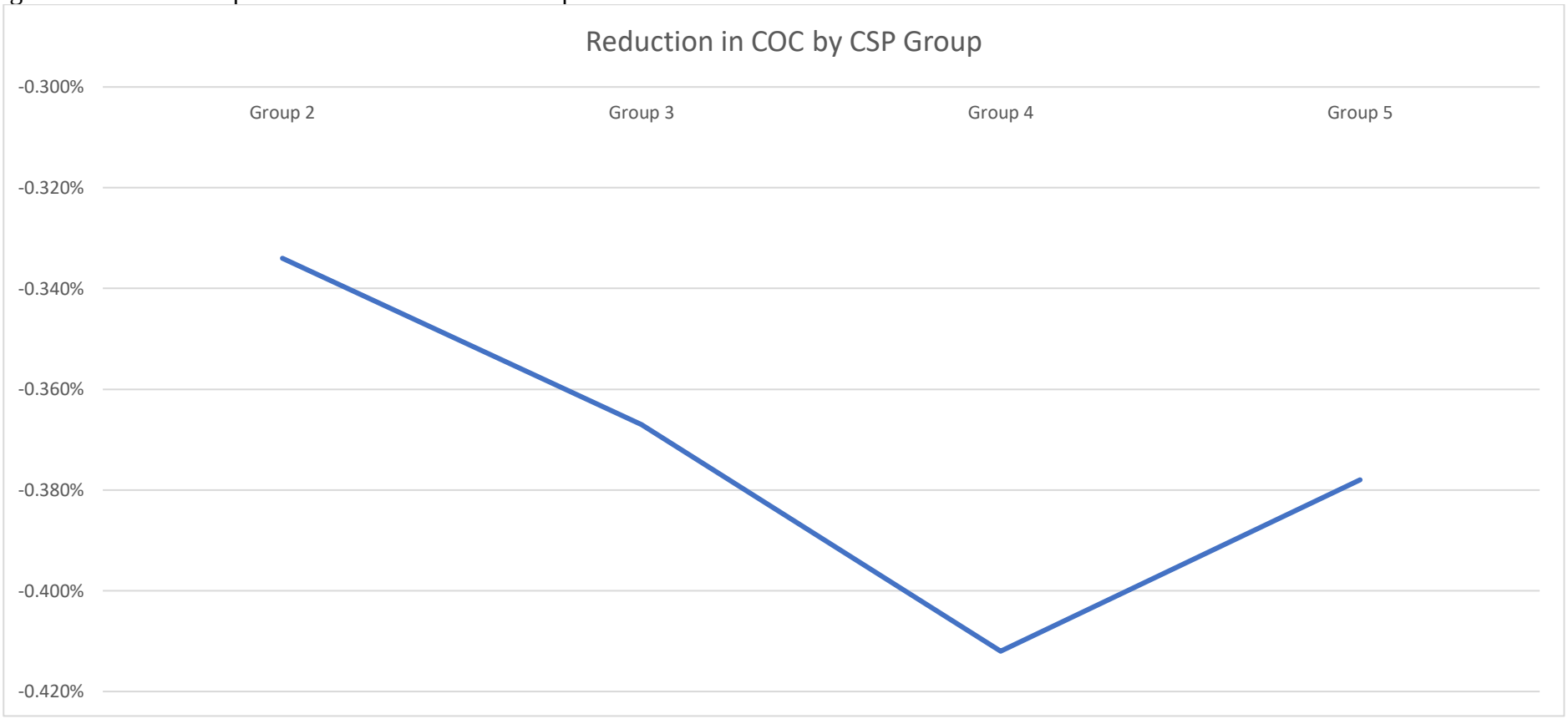
capital of 0.25% (group 4) and 0.249% (group 5) at a 1% level of significance. This is a further reduction of 0.028% as compared to the middle group (group 3) and indicates the optimal level of environmental performance with regards to cost of equity is to be a member of the above average group (group 4) but also that the major reduction in the perceived risk of a firm occurs when the firm moves out of the bottom group of environmental performers.

Finally, the social score grouping demonstrates a slightly different relationship with cost of equity. Similarly, to the overall CSP and Environmental performance scores, the largest reduction in cost of equity occurs when a firm moves from the bottom group to group 2. On average, a firm that moves from group 1 to group 2 with regards to their social score, would be rewarded with a 0.225% reduction in their cost of capital at a 1% level of significance. After, this the additional reduction received as a result of a firm increasing their industry-relative social score grouping from group 2 to 3, group 3 to 4 and group 4 to 5 is 0.032%, 0.053% and 0.064% respectively. This may indicate that when it comes to the groupings based on the social score, the optimal level of performance is to be a top performer as the stakeholder benefits such as the attraction of the high-quality employees and loyal customers may act as insurance like protection and hence reduce perceived risk (Paul C Godfrey et al., 2009; Koh et al., 2014).

We find that the signs of the control variables are consistent with our expectations and previous research (D. Dhaliwal et al., 2006; El Ghoul et al., 2018; Gode & Mohanram, 2003; K. Gupta, 2018). Book to market (BTM), Return on equity (ROE), a dummy if the firm made a loss in the previous period (DLOSS), a measure of illiquidity (ILLIQ), leverage (LEV), volatility (VOL) and inflation (INFLATION) are all highly significant and positively related to the cost of equity capital. Additionally, a measure of firm size (SIZE) and the affluence of a firms' home country were both found to be negatively related to cost of equity capital. Our models explain between 41.6% and 41.7% of the total variance (R^2). These findings on the control variables lend credibility to the accuracy of our implied cost of capital

measures as a proxy for expected returns by exhibiting the expected relation with common risk factors. It also implies that the market prices a firm's CSP along with other risk factors.

Figure 2. 1 Relationship between CSP and Cost of Capital



Notes: This figure illustrates the reduction in the cost of capital for each group of firms ranked by their level of CSP, relative to Group 1, firms with the lowest levels of CSP.

These findings point to a more complex non-linear relationship between CSP and cost of equity with the largest reduction resulting from moving out of the bottom performer group and a somewhat smaller decrease in cost of equity capital accruing to improving CSP after this point until the optimal point of CSP is surpassed after which a slight increase in cost of equity occurs, as illustrated in Figure 2.1. These findings allow us to fail to reject our second hypothesis that the relationship between CSP and cost of equity is stratified and non-linear. These findings also lend evidence to the claim by El Ghoul et al. (2011) and Heinkel et al. (2001) that firms with low levels of CSP (Group 1) are neglected stocks, due to investor preference and information asymmetry, forcing them to offer higher expected returns to compensate investors for a lack of risk sharing. The largest drop in the cost of equity accruing to firms that move out of this neglected group indicates that it is only the worst performers that suffer this status. Our results may also indicate that investors or a group of investors with a sole focus on wealth maximization as opposed to socially responsible investor's view investment in CSP as a trade-off between its non-constant costs and the diminishing returns of CSP investment. This results in an optimal level of CSP existing after which the costs outweigh the benefits in the eyes of some investors. Hence, once the optimal point is breached, investors with these preferences may reduce their holding of such stocks, resulting in a narrowing of the investor base and increase in the cost of equity capital relative to firms with optimal levels of CSP.

2.4.2 Individual Components of Environmental and Social Scores

In order to extend our analysis, we examine the association between cost of equity capital and individual components of the overall industry-relative environmental and social score in Table 2.8. This further disaggregation is motivated by previous research (El Ghoul et al., 2018; Galema, Plantinga, & Scholtens, 2008) which explains that aggregating various dimensions of CSP may lead to confounding effects and that not all items may be relevant

to the cost of equity. In Models 1 to 3 in Table 2.8 we investigate whether the three sub-pillars of the environmental score (Resource Use score, Emissions score, Environmental Innovation score) exhibit a linear relationship with a firm's cost of equity capital. Both the Resource Use and Environmental Innovation scores are found to be non-significant while the emissions score is negative and significant at a 5% level. Economically, the estimated coefficient in Model 2 in Table 2.8 implies that a one standard deviation increase in a firm's emissions score leads on average to a decrease in cost of equity of 0.057%. This indicates that firms with relatively lower emissions have a lower cost of capital.

Table 2. 8 Fixed Effects Regression of Implied Cost of Equity on sub pillars of CSP

	Dependent variable: Implied cost of equity calculated using residual income model forecasts						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Resource Use	-0.001						
	(0.001)						
Emissions		-0.002**					
		(0.001)					
Environmental Innovation			0.0002				
			(0.001)				
Workforce				-0.003***			
				(0.001)			
Human Rights					-0.002*		
					(0.001)		
Community Score						-0.001	
						(0.001)	
Product Responsibility							-0.002*
							(0.001)
BTM	3.670***	3.671***	3.670***	3.667***	3.670***	3.670***	3.670***
	(0.048)	(0.048)	(0.048)	(0.048)	(0.048)	(0.048)	(0.048)
ROE	0.026***	0.026***	0.026***	0.026***	0.026***	0.026***	0.026***
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
DLOSS	0.309***	0.308***	0.309***	0.301***	0.308***	0.309***	0.310***
	(0.063)	(0.063)	(0.063)	(0.063)	(0.063)	(0.063)	(0.063)
ILLIQ	23.500***	23.502***	23.495***	23.504***	23.487***	23.499***	23.504***
	(0.493)	(0.493)	(0.493)	(0.493)	(0.493)	(0.493)	(0.493)
SIZE	-1.419***	-1.414***	-1.425***	-1.418***	-1.423***	-1.424***	-1.424***
	(0.054)	(0.054)	(0.053)	(0.053)	(0.053)	(0.053)	(0.053)
LEV	2.540***	2.544***	2.542***	2.537***	2.545***	2.545***	2.544***
	(0.224)	(0.224)	(0.224)	(0.224)	(0.224)	(0.224)	(0.224)
VOL	0.026***	0.026***	0.026***	0.026***	0.026***	0.026***	0.026***
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
LGDPPC	-0.402***	-0.399***	-0.417***	-0.396***	-0.414***	-0.418***	-0.409***
	(0.146)	(0.146)	(0.146)	(0.146)	(0.146)	(0.146)	(0.146)
Inflation	0.035**	0.034**	0.035**	0.035**	0.034**	0.034**	0.034**
	(0.014)	(0.014)	(0.014)	(0.014)	(0.014)	(0.014)	(0.014)
Observations	21,338	21,338	21,338	21,338	21,338	21,338	21,338
R2	0.416	0.417	0.416	0.417	0.416	0.416	0.416
Adjusted R2	0.275	0.275	0.275	0.276	0.275	0.275	0.275
F Statistic	1,225.990*** (df = 10; 17184)	1,226.618*** (df = 10; 17184)	1,225.658*** (df = 10; 17184)	1,227.526*** (df = 10; 17184)	1,226.256*** (df = 10; 17184)	1,225.784*** (df = 10; 17184)	1,226.247*** (df = 10; 17184)

Notes: The dependent variable, implied cost of capital for firm i in year t (calculated using forecasts of earnings per share generated by the residual income model) is regressed on our main dependent variables, the sub pillars of CSP, as well as firm-level and country-level control variables; book to market (BTM), return on equity (ROE), loss dummy (DLOSS), illiquidity (ILLIQ), the natural log of total assets (SIZE), the ratio of total debt to total assets (LEV) volatility of returns (VOL), log of gross domestic product per capita (LGDPPC) and country inflation (Inflation). Resource Use, Emissions and Environmental are sub-pillars of a firm's environmental score while Workforce, Human rights, community score and product Responsibility are sub-pillars of a firm's social score. P values are indicated as follows: *p<0.1; **p<0.05; ***p<0.01

Table 2. 9 (continued) Fixed Effects Regression of Implied Cost of Equity on sub pillars of CSP

Dependent variable: Implied cost of equity calculated using residual income model forecasts							
	(8)	(9)	(10)	(11)	(12)	(13)	(14)
Grouped by	Resource Use	Emissions	Environmental Innovation	Workforce	Human Rights	Community Score	Product Responsibility
Group 2	-0.026	-0.104*	0.050	-0.088	-0.199*	-0.073	-0.149**
(20-40%)	(0.058)	(0.061)	(0.087)	(0.055)	(0.115)	(0.054)	(0.060)
Group 3	-0.019	-0.055	0.116	-0.091	-0.298**	-0.108*	-0.091
(40-60%)	(0.067)	(0.067)	(0.090)	(0.061)	(0.124)	(0.064)	(0.064)
Group 4	-0.073	-0.136*	0.078	-0.202***	-0.212*	-0.052	-0.177**
(60-80%)	(0.072)	(0.072)	(0.094)	(0.065)	(0.126)	(0.070)	(0.069)
Group 5	-0.059	-0.149*	0.078	-0.217***	-0.301**	-0.104	-0.171**
(80-100%)	(0.082)	(0.081)	(0.097)	(0.073)	(0.128)	(0.077)	(0.074)
	3.671***	3.672***	3.671***	3.667***	3.667***	3.670***	3.668***
BTM	(0.048)	(0.048)	(0.048)	(0.048)	(0.048)	(0.048)	(0.048)
	0.026***	0.026***	0.026***	0.026***	0.026***	0.026***	0.026***
ROE	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
	0.309***	0.308***	0.310***	0.301***	0.310***	0.309***	0.311***
DLOSS	(0.063)	(0.063)	(0.063)	(0.063)	(0.063)	(0.063)	(0.063)
	23.493***	23.502***	23.485***	23.505***	23.486***	23.486***	23.486***
ILLIQ	(0.493)	(0.493)	(0.493)	(0.493)	(0.493)	(0.493)	(0.493)
	-1.421***	-1.417***	-1.424***	-1.418***	-1.427***	-1.424***	-1.424***
SIZE	(0.054)	(0.054)	(0.053)	(0.053)	(0.053)	(0.053)	(0.053)
	2.542***	2.541***	2.541***	2.539***	2.549***	2.550***	2.539***
LEV	(0.224)	(0.224)	(0.224)	(0.224)	(0.224)	(0.224)	(0.224)
	0.026***	0.026***	0.026***	0.026***	0.026***	0.026***	0.026***
VOL	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
	-0.410***	-0.403***	-0.418***	-0.402***	-0.421***	-0.416***	-0.402***
LGDPPC	(0.146)	(0.146)	(0.146)	(0.146)	(0.146)	(0.146)	(0.146)
	0.035**	0.035**	0.035**	0.035**	0.033**	0.034**	0.035**
Inflation	(0.014)	(0.014)	(0.014)	(0.014)	(0.014)	(0.014)	(0.014)
	21,338	21,338	21,338	21,338	21,338	21,338	21,338
Observations	0.417	0.416	0.417	0.417	0.416	0.417	0.416
R2	0.275	0.275	0.276	0.275	0.275	0.276	0.275
Adjusted R2	943.430*** (df = 13; 17181)	942.956*** (df = 13; 17181)	944.282*** (df = 13; 17181)	943.805*** (df = 13; 17181)	943.175*** (df = 13; 17181)	943.852*** (df = 13; 17181)	1,225.990*** (df = 10; 17184)

Notes: The dependent variable, implied cost of capital for firm i in year t (calculated using forecasts of earnings per share generated by the residual income model) is regressed on our main dependent variables, the sub pillars of CSP, as well as firm-level and country-level control variables; book to market (BTM), return on equity (ROE), loss dummy (DLOSS), illiquidity (ILLIQ), the natural log of total assets (SIZE), the ratio of total debt to total assets (LEV) volatility of returns (VOL), log of gross domestic product per capita (LGDPPC) and country inflation (Inflation). Resource Use, Emissions and Environmental are sub-pillars of a firm's environmental score while Workforce, Human rights, community score and product Responsibility are sub-pillars of a firm's social score. Groups 1-5 are dummy variables constructed by grouping firms into 5 quantiles based on each sub-pillar score (Group 2, 3 ,4,5). P values are indicated as follows: *p<0.1; **p<0.05; ***p<0.01

In Models 4 to 7 in Table 2.8 we investigate whether the four sub-pillars of the social score (Workforce score, Human rights score, Community score, Product responsibility score) exhibit a negative linear relationship with a firm's cost of equity capital. The workforce score is found to be negatively related to cost of equity capital at a 1% level of significance with a one standard deviation increase in the workforce score resulting in a reduction in a firms' cost of equity by 0.087%. Both the Human rights and Product responsibility scores are found to be negatively related to cost of equity at a 10% level of significance while the community score is found to be non-significant. These findings for workforce and product responsibility mirror the finding of El Ghoul et al. (2011) and their importance could be attributed to the important of primary stakeholders to the level of risk of a firm. The significance of emissions and human rights as a recognised risk factor by investors could possibly be attributed to the ever-growing awareness of climate change and human rights issues as important factors affecting business.

In order to increase the robustness of our findings and to account for a possible divergence in the treatment of the individual components of the environmental and social score by different investor groups, we substitute our variables with peer group dummy variables based on 5 quantiles in Model 8-14 of Table 2.8. Of the sub pillars of the environmental score, the emissions score groupings are the only groups that are statistically significant. Similar to the overall scores, moving from group 1 to group 2 results in a large drop of -0.104 in cost of equity capital at a 10% level of significance which may be attributed to the risk reduction and investor base expansion entailed by such a move. However, unlike with the overall scores, group 3 or average performance on the emissions score which was found to be insignificant doesn't entail a cost of capital reduction as compared to group 1 while membership in groups 4 and 5 resulted in further reductions in cost of equity as opposed to lower groups at a 10% level of significance. This may indicate that when it comes to emissions both bottom performers and average performer are treated in a similar fashion

with regards to cost of capital but possibly for different reasons. While the initial reduction in the cost of capital from moving from group 1 to 2 is most likely attributable to risk reduction, the non-significance of average performance (group 3) may stem from group 3 membership's effect on the composition and size of a firm's investor base due to the interplay between conflicting economic and social incentives at this level of investment. The cost of investments required to move from group 2 to group 3 may be perceived to outweigh the benefits by economically focused investors while the average performance level may also not be high enough to attract socially minded investors. This may result in a contraction of the firm's investor based and hence increase in the cost of equity. The reduction in cost of equity from membership of groups 4 and 5 could then be attributed to increases in the number of socially minded investors outweighing the reduction in economically focused investors.

An examination of the social score's sub-pillars displays a diversity of relationships between them and cost of equity capital. Firstly, a reduction in cost of equity only occurs once a firm moves into group 4 or above average performance for the Workforce score and is further reduced when firms move into the group of top performers. This indicates that the benefits from managing this primary stakeholder group accrue to firms with above average relative performance which is somewhat intuitive as the risk reduction benefits attributable to the attraction and retention of human capital by firms is most likely applicable to firm's with above average performance. This may indicate that economic and social incentives are aligned at higher levels of performance with regards to a firm's workforce.

The human rights score also displays a complex relationship with cost of equity. Membership of group 2 as opposed to group 1 results in a 0.199 cost of capital reduction at a 10% level of significance. This is followed by a further substantial decrease of a further 0.099% from moving into group 3 and then an increase in cost of capital by 0.086% as a result of moving from group 3 to 4 before a final reduction in the cost of capital of 0.089%

for firms that move from group 4 to 5. The risk reduction involved in a firm increasing its human rights score could explain the initial consecutive reductions in cost of equity up to average performance as economic and social incentives are aligned. The subsequent increase and then decrease may be attributed to a misalignment of these incentives. At above average (group 4), the cost benefit analysis of economically focused investors might disincentivise them to invest in the firm, while the level of performance is not high enough to attract enough socially inclined investors to offset the reduction in investor base. As firms move into the group of top performers, this would entail their inclusion in best in class indexes and increase the number of socially responsible investors holding the firm's equity, offsetting any reduction in economically minded investors. For the community score only average performance (group 3) results in a reduction in the cost of equity. Too much investment in community may indicate agency problems due to their immaterial nature while too little may reduce the good will towards a firm so investors may judge the optimal level of community investment to be lower than other sub pillars. Finally, the product responsibility score displays a relationship with cost of equity that is similar the emissions score, with an initial fall in the cost of equity from moving into group 2, a non-significant coefficient for group 3 and a further decrease in the cost of capital for firms in group 4. However, unlike the emissions score, firms that move from group 4 to group 5 face an increase in their cost of equity capital which may indicate that the optimal level of investment in product responsibility has been passed.

This examination of CSP's sub-pillars has further highlighted the divergent treatment of CSP's various elements at different levels of investment by investors. It has further displayed the importance of considering the implications of investors' perceptions in relation to risk reduction in addition to the conflicting or harmonious economic and social incentives entailed at multiple levels of performance on various dimensions of CSP.

2.4.3 Robustness checks

An alternative specification of the model in which all the CSP variables are lagged by one year in order to account for the possible presence of reverse causality yielded similar but non-identical results as is shown in Table 2.9. Models 1 and 3 display a similar strength at a 5% level of significance while the coefficient on the environmental variable becomes insignificant. With regards to Models 4 to 6 which split the sample into quantiles based on their CSP and sub pillar scores, we find that the overall CSP groupings displays a slightly different relationship with cost of equity with the initial substantial drop in cost of equity capital occurring at a higher level when firm's move into the middle grouping which represents firms with a CSP score of between 40 and 60, with little statistical difference found between groups one and two. Additionally, the optimal grouping to be a member of is group 5 as opposed to group 4 in the unlagged model which offers less cost of capital reduction than both groups 3 and 5. While these finding allow us to discount the possible presence of reverse causality, the forward looking nature of our cost of capital estimates, which assume a level of market efficiency that implies the incorporation of all current year data into the calculation, results in unlagged CSP scores giving a better representation of the relationship between CSP and cost of equity or expected future returns.

Table 2. 10 Fixed Effects Regression of Implied Cost of Equity on CSP lagged by one year

	Dependent variable: Implied cost of equity calculated using residual income model forecasts					
	(1)	(2)	(3)	(4)	(5)	(6)
CSP Lag	-0.004**					
	(0.002)					
Env Lag		-0.002				
		(0.001)				
Social Lag			-0.003**			
			(0.001)			
Grouped by				CSP lag	Env lag	Social lag
Group 2				-0.119	-0.182**	-0.071
(20-40%)				(0.093)	(0.079)	(0.073)
Group 3				-0.222**	-0.168*	-0.078
(40-60%)				(0.102)	(0.088)	(0.081)
Group 4				-0.215*	-0.232**	-0.106
(60-80%)				(0.111)	(0.096)	(0.089)
Group 5				-0.245*	-0.160	-0.155
(80-100%)				(0.133)	(0.110)	(0.109)
BTM	3.664***	3.664***	3.663***	3.663***	3.664***	3.662***
	(0.049)	(0.049)	(0.049)	(0.049)	(0.049)	(0.049)
ROE	0.027***	0.027***	0.027***	0.027***	0.027***	0.027***
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
DLOSS	0.298***	0.300***	0.297***	0.299***	0.302***	0.299***
	(0.064)	(0.064)	(0.064)	(0.064)	(0.064)	(0.064)
ILLIQ	22.849***	22.852***	22.834***	22.831***	22.853***	22.846***
	(0.535)	(0.536)	(0.535)	(0.535)	(0.536)	(0.536)
SIZE	-1.302***	-1.304***	-1.304***	-1.301***	-1.302***	-1.305***
	(0.057)	(0.057)	(0.057)	(0.057)	(0.057)	(0.057)
LEV	2.562***	2.556***	2.568***	2.565***	2.571***	2.560***
	(0.230)	(0.230)	(0.230)	(0.230)	(0.230)	(0.230)
VOL	0.027***	0.027***	0.027***	0.028***	0.027***	0.028***
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
LGDPPC	-0.316**	-0.317**	-0.323**	-0.311**	-0.308**	-0.326**
	(0.155)	(0.155)	(0.155)	(0.155)	(0.155)	(0.155)
Inflation	0.025*	0.026*	0.025*	0.025*	0.027*	0.025*
	(0.015)	(0.015)	(0.015)	(0.015)	(0.014)	(0.015)
Observations	18,867	18,867	18,867	18,867	18,867	18,867
R2	0.419	0.419	0.419	0.419	0.419	0.419
Adjusted R2	0.279	0.279	0.279	0.279	0.279	0.279
F Statistic	1,096.446*** (df = 10; 15211)	1,095.920*** (df = 10; 15211)	1,096.596*** (df = 10; 15211)	843.505*** (df = 13; 15208)	843.683*** (df = 13; 15208)	842.937*** (df = 13; 15208)

Notes: The dependent variable, implied cost of capital for firm i in year t (calculated using forecasts of earnings per share generated by the residual income model) is regressed on our main dependent variables as well as firm-level and country-level control variables book to market (BTM), return on equity (ROE), loss dummy (DLOSS), illiquidity (ILLIQ), the natural log of total assets (SIZE), the ratio of total debt to total assets (LEV) volatility of returns (VOL), log of gross domestic product per capita (LGDPPC) and country inflation (Inflation). CSP Lag is an equally weighted-average of environmental and social scores lagged by one year, ENV Lag is the environmental score Lagged by one year and Social Lag is the social score lagged by one year. Groups 1-5 are dummy variables constructed by grouping firms into 5 quantiles based on their lagged CSP, ENV and Social scores (CSP Group 2, 3 ,4,5). P values are indicated as follows: $^{*}p<0.1$; $^{**}p<0.05$; $^{***}p<0.01$

2.5 Discussions and Conclusion

In this paper we empirically examine the mediating role played by financial markets in the CSP-CFP link through an examination of the relationship between a firm's CSP and its implied cost of equity capital with the utilization of an extensive international dataset consisting of 21,338 firm-year observation from 50 countries during the period from 2002 to 2017. Our use of Reuter's Asset4 ESG data allows this research to not only examine the relationship using industry-year relative CSP scores but also to construct peer group dummy variables to examine whether heterogeneous information constraints and utility functions could lead investors to value CSP differently, inducing groupings along the CSP-CFP continuum similar to a clientele effect (Ding et al., 2016). A CSP clientele effect would involve investors grouping firms based on their CSP score and investing in the group which they deemed to have an optimal CSP policy based on investor's preferences. A change from one CSP grouping to another would result in a change in the group of investors willing to invest in a firm due to their preferences and their perception of the costs and benefits that accrue to firms with that level of CSP. This could result in an expansion or contraction in the firm's investor base and affect its cost of equity capital.

Our research allows us to directly observe evidence of this CSP clientele effect through the use of peer group dummies which enables this research to fail to reject the hypothesis that the relationship between CSP and cost of equity capital is stratified and non-linear. The largest reduction in a firm's cost of equity was found to occur when a firm moved from the bottom 20% of performers in their industry in a given year which lends substantial support to the claim that the neglected stock hypothesis extends to low CSP firms (El Ghoul et al., 2011; Heinkel et al., 2001). Another explanation for this reduction in a firm's cost of equity capital when moving out of the bottom performing group may rest on the reduction in risk related to low performance such as fines and other liabilities and the fact that these idiosyncratic risks are priced due to the reduced relative size and breath of their shareholder

base (Chichernea et al., 2015). Hence, the large reduction in a firm's cost of capital when they move may be the result of an alignment between economic and social incentives as low CSP performance relative to industry peers in a given year reflects the presence of downside risks.

Additionally, our research also suggests that an optimal point of CSP investment may exist after which the benefits of increased performance are perceived to be outweighed by the costs for some investors, as an economic incentive is perceived to be lacking or at odds with social incentives at higher levels of CSP investment. This leads to an increase in the cost of equity for high performing CSP firms in comparison to firms with above average performance, albeit still considerably lower than the most poorly performing firms. This may result from the neglected stock hypothesis applying to a lesser extent; if firms with the highest level of CSP are avoided by investors who believe that the optimal level of CSP has been exceeded. This reduction in economically incentivised investors may be of less consequence as the overweighting of these top CSP firms by socially responsible investors could counteract the reduction in investor base and its impact on the cost of capital.

Our findings that CSP and the cost of equity capital have a non-linear and stratified relationship reveals a more nuanced understanding of the role that financial markets can play in incentivising firms to increase their sustainable practices through a reduced cost of equity. While at the low end of the CSP spectrum there is a clear alignment between economic and social incentives, once the initial reduction has occurred, the marginal reductions in the cost of capital for increasing levels CSP are far more modest, eventually increasing beyond a certain level of CSP. Hence, the market offers decreasing incentives via cost of equity capital reduction to firms that increase their CSP until an optimal level is reached after which further investment increases a firm's cost of equity capital. For policy makers, this complex picture of the role markets play in incentivising firms to increase their CSP highlights the importance of other forces. If markets primarily encourage firms to increase their CSP from

low to mid-range performance, regulation or technological change may be required to incentives further CSP investment beyond this point, if the goal is to move business to a more sustainable footing.

Although our sample contains a large number of publicly traded firms from multiple countries, the spread of firms is uneven and concentrated in higher income countries and hence suffers from a prosperous country bias in addition to a large firm bias due to data availability. Future research which may have access to a more diverse sample of firms could test the generalizability of our findings with regards to smaller and a greater variety of firms. Further research could also investigate other possible channels, such as estimated future cash flows, through which industry-relative CSP could influence the financial performance of a firm and whether a complex non-linear relationship also exists in these areas due to heterogeneous investor tastes in addition to divergent or aligned incentives at different levels of CSP performance.

Chapter 3 - Context Matters – Evaluating the Effect of Corporate Social Performance on Firm Value

Abstract

As we witness an increasing shift by business from shareholder primacy towards a focus on delivering value to multiple stakeholders, we examine the link between the value delivered to these stakeholders and the financial performance of the firm. In particular, we investigate the moderating role of country-level institutions on the relationship between a firm's value and its level of corporate social performance (CSP) relative to industry peers as recorded by Thomson Reuters Asset 4. Using a sample of 43,171 firm-year observations from 49 countries, we find strong evidence that CSP is more positively related to firm value in countries with strong political, labour and market institutions, highlighting the importance that context plays in moderating the relationship. This highlights the importance of the presence of institutions which empower societal and environmental stakeholders if market forces are to play a positive supporting role in moving business towards a more sustainable future.

Keywords:

Corporate Social Responsibility, Corporate Social Performance, Firm Value, Institutional theory, Stakeholder theory, financial performance

3.1 Introduction

An increased public awareness of the role of business in society has arisen in recent years due to environmental, social and governance issues highlighted by various events and scandals with companies widely perceived to be prospering at the expense of the broader community (Porter & Kramer, 2011). This increased awareness has prompted authorities, Non-Governmental Organisations and consumers to call for more responsible and sustainable ways of doing business (Nollet et al., 2016). An increase in sustainable activity by business has coincided with an increased trend towards socially acceptable lending and investing by investors (Derwall et al., 2011), which has led to phenomenal growth in the socially responsible investment (SRI) market (Global Sustainable Investment Alliance, 2018). Although some investors will make investment decisions aligned with their ethical concerns, other institutional investors such as pension funds have a fiduciary duty to meet their financial liabilities. We are interested in whether the renewed emphasis on the impact of business on society, reflected by the addition of environmental, social and governance (ESG) metrics, a proxy for corporate social performance[9] (CSP), into investment strategies, has a meaningful impact on the financial valuation of firms. An affirmative answer would indicate that financial markets can incentivise firms to increase their positive impact on society.

This research contributes to our understanding of the validity of the different perspectives offered by proponents of shareholder theory, typified by Friedman (1970), who regard CSP as a constraint to maximising shareholder value and the perspective offered by proponents of stakeholder theory (Freeman, 1984; Freeman & McVea, 2001; Garriga & Melé, 2004) who believe that the firm is best served by integrating CSP into its core strategy

[9] Our research follows Wood (2016) and defines CSP as "the principles, practices, and outcomes of businesses' relationships with people, organisations, institutions, communities, societies, and the earth, in terms of the deliberate actions of business towards these stakeholders as well as the unintended externalities of business activity".

to direct its future course and achieve long term value creation. As stakeholder theory is one of the primary pillars upon which the business case for CSP is made, an examination of how the relevance of CSP to investors is shaped by the divergent power dynamics between stakeholders in different countries is warranted.

Framing the value relevance of CSP in terms of the perceptions of investors of the ethical responsibility of the firm, Singer & Ron (2020) discuss how business ethics can be viewed as a set of moral constraints that can be imposed both internally and externally. While shareholder theory and stakeholder theory adopt an internalist approach, viewing business ethics primarily in terms of managers' moral obligations towards one or several stakeholder groups, they argue that a firm cannot generate its own legitimacy, but rather that this is conferred by external institutions and social norms. An externalist approach should recognise that business ethics determinations are not derived statically but are reflective of a dynamic political environment, and that the ethical implications of business activity are a product of the prevailing political and institutional environment. We examine the role played by political, labour and market institutions which are considered to be critical determinants of corporate behaviour due to their ability to shape the relationships between the firm and its primary stakeholders (Aguilera & Jackson, 2003; J. L. Campbell, 2007). Through a comparison of the valuation of corporate behaviour across different institutional environments, our research highlights the conditions under which firms are encouraged to act in socially responsible ways by financial markets.

While prior literature has investigated the relationship between the institutional environment in which firms operate and firm performance (Hall & Soskice, 2001; Whitley, 1999), institutional context and CSR practices (Jain & Jamali, 2016; Rathert, 2016) and CSR practices and firm performance (Eccles et al., 2011; Nollet et al., 2016), few papers examine the interplay between all three of these mechanisms; the Institutional Environment in which

the firm operates, CSP and Corporate Financial Performance (CFP). El Ghoul, Guedhami, & Kim (2017) conduct a large cross-country study to examine the CSP-CFP relationship, analysing the moderating effect of the institutional context, and find that institutional forces negatively moderate the relationship. However, the institutional forces included are 'market-supporting', which while relevant do not adequately capture the salience[10] of other stakeholders.

To investigate the moderating effect of the institutional context we include indicators that are affected by both formal and informal political, labour market, financial market and business-related institutional forces to examine the proposition that increased performance in relation to a stakeholder group's interests will be valued more by investors in the presence of institutional forces that increase the group's power, legitimacy or the urgency of their claims. This contingency-based approach to the CSP-CFP link which considers the direction and strength of the relationship to be reliant on context, contributes a theoretical framework for understanding how the self-interested/instrumental motivations of markets can be moulded by the presence of institutions into serving the interests of non-shareholder stakeholders. We find that a stakeholder supporting institutional context positively moderates the relationship between CSP and CFP, which substantiates our theoretical framework, and contributes empirical evidence on cross-country differences in the value relevance of CSP which is rare in the literature.

Our findings indicate that politically created formal and informal institutional forces which alter the balance of power between stakeholders can mould the value placed on CSP by markets, calling into question the proposition of market neutrality or the "implicit morality of the market" (McMahon, 1981). Hence, in considering the normative values that

[10] Mitchell, Agle, & Wood (1997) propose that the ability of a stakeholder group to influence a firm's decision-making process rests on their salience, which is comprised of their degree of power, legitimacy and urgency.

guide market participants actions and incentivise certain business actions or approaches, it is important to not only consider the individual agents' actions but also the structure of the system that shapes the relative power of these actors to impact the resources and competitive advantage of firms.

The chapter is structured as follows. In the next section we review prior literature on the relationship between CSR and financial performance and develop hypotheses to be tested. In the section that follows, we describe our dataset and provide details of the methodological approach used to test our hypothesis. We then present our results, followed by a discussion of the findings, limitations, and implications of our study.

3.2 Literature review and hypothesis development

3.2.1 CSR and Performance

The business case for CSR has been the focus of over four decades of research into the role and responsibility of business yet it still remains highly controversial. According to shareholder theory, the main goal for a corporation is to maximise profits and shareholder value in ways that are permitted by law or social values (Friedman, 1970). As acting in a socially responsible manner is considered as a constraint, its minimization is considered in the interest of the firm and its shareholders, leading to the minimum level of compliance with regulations and disincentives to act in a socially responsible manner. From this perspective the business case against CSR is made on a number of grounds. Firstly, it is suggested that firms should not engage in CSR as it leads to an internalization of the negative externalities firms exert on non-shareholding stakeholders (Pigou, 1920) and a subsequent increase in costs. Secondly, it is claimed that CSR represents an additional cost to firms as it diverts scarce resources away from more value-generating investment opportunities, putting the firm at a competitive disadvantage (Aupperle et al., 1985). Other commentators,

relying on agency theory, propose that CSR initiatives have a negative effect on CFP as they represent private benefits that managers extract at the expense of shareholders (Jiao, 2010).

However, two theories contradict this view and propose a positive relation between CSP and CFP. Firstly, stakeholder theory (Freeman, 1984) has emerged as the primary pillars upon which the business case for CSR has been made, highlighting the importance of adopting a broader perspective to obtain a better understanding of the performance consequences of CSR measures. According to stakeholder theory (Donaldson & Preston, 1995; R Edward Freeman, 1984) the adoption of CSR practices is in a firm's best interest, creating long term value through the development of stronger abilities to manage stakeholders' expectations and respond to stakeholders' requests. This helps firms to achieve social legitimacy, increased social acceptance and prestige (Garriga & Melé, 2004). Eccles et al. (2014) find that CSR can reduce agency costs, through improved stakeholder engagement, governance, longer-term decision making and reporting. Malik (2015) categorises the possible benefits from CSR as product market benefits (loyal customers, product differentiation, extended market share, the creation of brand equity), capital market benefits (increased market returns, lowered cost of capital, decreased information asymmetry and risk), employee benefits (increased employee morale, job satisfaction and employee productivity), regulatory benefits (reduced litigation costs, positive media coverage and favourable treatment from regulators) and operational benefits (better managerial skills, enhanced operational efficiency, enhanced profitability, improved corporate branding and reputation). Stakeholder theory argues that these benefits, which have the propensity to reduce risk and increase returns, outweigh the costs of attaining them and hence increase the value of a firm.

Secondly, the resource-based view of the firm has been integrated with stakeholder theory to further enrich the explanation for the positive relationship between CSP and CFP. The resource-based view implies that firms are rewarded with a higher stock price if they

achieve and attain a competitive advantage through creating resources that are valuable, rare and costly to imitate (Barney, 1991). Perrini, Russo, Tencati, & Vurro (2011, p.68) conclude that "*CSR supports the process of intangible assets' accumulation, strengthening company ability to identify, protect and give value to inimitable resources, such as skills and competences, knowledge and innovation, values, legitimacy, trust, and reputation in the stakeholder network*". This is of particular importance as intangible assets now account for the greatest proportion of market value for S&P 500 companies, increasing from 17% in 1975 to 84% in 2015 (Business Intangibles, 2015). From these interconnected perspectives, socially responsible behaviour is consistent with the wealth-maximizing interests of shareholders due to the relatively smaller costs incurred in comparison to the potential competitive benefits that result from the creation or access granted to valuable resources by increased performance.

An element of conditionality is added to the relationship by Barnett & Salomon, (2006, 2012) who propose a curvilinear relationship, integrating the argument of the two previously described theoretical stances related to the costs and benefits of CSR. Barnett & Salomon (2006) theorises that as firms engage in socially responsible practices, they accrue stakeholder influence capacity (SIC) or credibility, which once adequately accrued, enables the firm to assimilate and exploit stakeholder favour and thereby profit from its social investment. Conversely, firms that haven't accrued the required level of SIC are unable to gain the financial advantage from their investments, resulting in a negative relationship between the constructs (Barnett & Salomon, 2012). A non-linear relationship would imply that CSR engagement does not pay off immediately but only after a crucial point of CSR investment is crossed (Nollet et al., 2016).

The theoretical development of the link between CSP and CFP has resulted in a large number of empirical studies with contradictory evidence on whether and to what extent CSR strategies affect a firm's financial performance (Margolis & Walsh, 2003; Margolis,

Elfenbein, & Walsh, 2009; Orlitzky, Schmidt, & Rynes, 2003; Renneboog, Ter Horst, & Zhang, 2008; van Beurden & Gossling, 2008, Eccles et al., 2014). We find three major sources of inconsistencies in previous empirical findings; differences in contextual factors such as time, country or industry, differences in the measurement of CFP and differences in the measurement of and dimensions observed of CSR, in addition to methodological variation (H. Chen et al., 2004). Peloza (2009) uncovered that 36-different metrics have been used to assess CSR and 39 different measures have been used to assess financial performance. A prime driver for the level of inconsistencies in findings from previous empirical research on the link can be attributed to the ever-changing definition and subsequent measurement of CSR. Aguinis & Glavas (2012) note that the difference in measurement often goes beyond semantics to deeper construct level differences. This has led to multiple substantially different ways of operationalising CSR including as philanthropy, ethics, safety issues, and more composite measures assessed by external rating agencies. Carroll (1999, p. 280) notes this ambiguity when he states that *"The term [social responsibility] is a brilliant one; it means something, but not always the same thing, to everybody".* To address this issue we focus on the observable outcomes of a firm's CSR policy by using measures of its Corporate Social Performance, which incorporates the outcomes of both implicit and explicit CSR policies (Matten & Moon, 2008).

3.2.2 Contextual Factors and Institutional Theory

Additional divergence in the findings of previous CSP-CFP research may stem from a lack of contextualization as context may act as a moderating force. This sentiment is echoed by Amir & Serafeim (2018) who postulate that the extent to which ESG information is material to firm value most likely varies systematically among countries and that these systematic differences could be the result of the differing institutional structures in which firms operate across the globe. Campbell (2007) proposes that an extension of institutional

theory into the academic discussion on CSP is warranted because of its recognition that the way corporations treat their stakeholders depends on the institutions within which they operate (Fligstein & Freeland, 1995). This follows from the realisation that firms are embedded in a nexus of formal and informal rules emanating from social beliefs, values, relations, constraints and expectations which directly influence their choice of activities, the interpretation of outcomes (Crossland & Hambrick, 2011; North, 1990), and adoption of CSR policy (Rathert, 2016).

Stakeholder theory proposes that the composition of a firm's stakeholders, their values, their relative influence on decisions and the nature of the situation are all relevant information for predicting firm behaviours and outcomes (Frooman, 1999; Gioia, 1999; Jamali, 2008). Firms are proposed to possess both explicit and implicit contracts with various stakeholder groups which are expected to be honoured (Bulow & Rogoff, 2002; Donaldson & Preston, 1995; T. M. Jones, 1995). Firms that comply with these contracts are rewarded with an increased reputation for trustworthiness which pays dividend when determining the terms of trade it can extract in negotiations with other stakeholders (Bull, 1987; Cornell & Shapiro, 1987; T. M. Jones, 1995; Preston, 1998) to access resources under their control. From this perspective, the objectives of a corporation can only be achieved through a process of managing, balancing and prioritizing the interests of stakeholder groups (Clarkson, 1995; Gioia, 1999).

Instrumental stakeholder theory assumes that the firm is an instrument for value creation with stakeholder management strategies such as CSR investment often conceived and approached instrumentally in relation to its implications on firm performance (Garriga & Melé, 2004). This branch of stakeholder theory takes a more practical approach to stakeholder management, allowing for a prioritization of stakeholder interest according to instrumental considerations (Galbreath, 2006; Vos & Achterkamp, 2006). Hence, the theory

centres on the question of which stakeholder requires management attention and the stakeholder attributes required to activate management action (Jeffrey & Freeman, 1999; Mitchell et al., 1997). Mitchell, Agle, & Wood (1997) propose that the ability of a stakeholder group to influence a firm's decision-making process rests on their salience, which is comprised of their degree of power, legitimacy, and urgency. A stakeholder that demonstrates both power and legitimacy is classed as a member of the firm's dominant stakeholder coalition resulting in their influence being assured while the addition of urgency to their claim gives managers a clear and immediate mandate to attend and give priority to that stakeholders claim (Mitchell et al., 1997). These attributes are claimed to be fluid and socially constructed, resulting in the ability of institutional forces to shape stakeholder salience (Mitchell et al., 1997). It is also proposed that stakeholder coalitions can be created to gain the required attributes, such as power, that a stakeholder group may be lacking in order to have their claims addressed (Mitchell et al., 1997).

Resource dependence theory (Pfeffer & Salancik, 1978) has also been used to explain the relative importance of stakeholder groups to an organisation (Frooman, 1999; Jawahar & McLaughlin, 2001) and is based on the observation that organisations are open systems, neither self-contained nor self-sufficient, that rely on external groups and organisations in the environment for resources. The possibility that conditionality is placed on such resources makes external constraints and control of organisational behaviour both possible and almost inevitable (Pfeffer & Salancik, 1978). Hence, managers must make strategic choices subject to the resource constraints they face due to their dependence on financial, physical, or informational resources in the environment. The level of dependence of a firm on a stakeholder group is determined by the importance of their particular resources to the organisation, the degree to which they control the resource, and the discretion they have over its allocation (Frooman, 1999; Mitchell et al., 1997; Pfeffer & Salancik, 1978). A central tenant of this theory is that organisations will be concerned with, pay more attention to, and

deal with sources of critical resources to ensure continued survival (Jawahar & McLaughlin, 2001). The dependence of firms on stakeholders for resources results in varying degrees of stakeholder power with power defined as "the structurally determined potential for obtaining favoured payoffs in relations where interests are opposed" (Willer, Lovaglia, & Markovsky, 1997:573). Hence, the level of resource dependence is structurally determined with the more concentrated, controllable, nonmobile, non-substitutable or essential the resource, the greater the stakeholder power (Barney, 1991; Emerson, 1962; Jacobs, 1974; Pfeffer & Salancik, 1978). The idea of resource dependence is not an uni-directional concept and the level of dependence of a stakeholder on the resources of a firm also affects the power relationship between the two with an asymmetry in the relationship granting relative power (Kramer, Messick, Lawler, & Yoon, 2014).

Building on resource dependency theory, Frooman (1999) and Frooman & Murrell (2005) describe how the nature of the resource relationship determines which of the four types of influence strategies stakeholders can engage in to try to change the behaviour of a firm. They broadly define these strategies as manipulation strategies which relate to the nature of the influence and pathway strategies relating to who is doing the influence. There are two basic kinds of manipulation strategy, coercive and compromise, which involve a focus on the leveraging of resource flowing into the firm. Coercion strategies aim to withdraw a resource or increase its cost while compromise strategies aim to either increase a benefit or reduce a cost. Pathway strategies relate to who does the actual resource manipulation, being direct if the stakeholder does the manipulation themselves and indirect if it's an ally of the stakeholder (Frooman & Murrell, 2005). Stakeholders that are dependent on a firm would opt for compromise strategy while non-dependent stakeholders would opt for a coercive strategy with each group aiming to maximize the ratio of benefits obtained to costs expended (Frooman & Murrell, 2005). When the firm is dependent on the stakeholder, they can act directly against the firm while an indirect strategy which relies on an ally whom

the firm is dependent on is required if no dependent relationship exists (Frooman & Murrell, 2005). For example, the environment is a stakeholder that has no power to influence a firm unless it can rely on the power of government or other groups to incentivise/disincentivise environmentally friendly activities. In turn, the impetus for government to act in such a manner to safeguard the environment is influenced by the competing influences of different societal stakeholder groups. As institutions shape the social and political processes of how stakeholders' interests are defined, aggregated and represented (Aguilera & Jackson, 2003), they can alter the power dynamics between different stakeholders, the stakeholder influence strategies available to them and the value of attending to their needs.

The importance of considering institutional structure is highlighted by Ioannou & Serafeim's (2012) and Cai, Pan, & Statman's (2016) empirical research examining the explanatory power of national level institutions on CSP variation. Ioannou & Serafeim (2012) find that political, labour, educational and cultural systems have a significant impact on firm's level of CSP while financial systems appears to have a relatively less significant impact. Cai et al. (2016) find that country factors such as the stage of economic development, culture and political institutions account for a significant proportion of variation in CSP ratings across countries while firm level characteristics such as return on assets, market to book ratios, research & development expenses, assets and leverage explain relatively little. While these studies focus on cross country variation of CSP as a result of the presence of institutional forces, they do not examine whether financial market forces are shaped by their presence, acting as a possible parallel or secondary conduit through which firms are encouraged to adjust their CSP.

From the results of these studies (Cai et al., 2016; Ioannou & Serafeim, 2012), markets would be expected to value CSP more in the presence of stronger institutions. However, El Ghoul et al. (2017) test whether the value of corporate social responsibility

initiatives is greater in countries where an absence of market supporting institutions increases transaction costs and limits resources. Using Tobin's q as their measure of value and a non-relative measure of CSP with stock market efficiency, credit market efficiency, business freedom, legal system, and property rights as their measures of institutional context, they find supportive evidence that CSP is more positively related to firm value in countries with weaker market institutions due to its ability to reduce transaction costs and improve access to valuable resources that provide competitive advantage. They note that other types of institutions may affect the strategic value of CSR and call for more research in the area. This paper extends that research with three main empirical differences. Firstly, we include a number of additional institutional measures, such as political and labour institutions, which capture the salience of a broader range of stakeholders which control resources other than capital which firms may rely on. Secondly, the measure of CSP that we use is industry-relative rather than relative to the universe of all firms. Flammer (2015) highlights the importance of using industry-relative measures in her finding that the adoption of CSR proposals depends on the extent to which the firm is operating in a 'stakeholder sensitive' industry. Thirdly, due to greater data availability as the Asset4 database is expanded over time, we use a substantially larger dataset over a longer time period which allows for a greater range of countries and variation in institutional forces to be examined. Additionally, we extend their theoretical contribution by considering how institutional strength and CSP interact to alter access to valuable resources, other than external financing, that provide competitive advantage and resultant higher firm value.

In this paper we propose that markets take an instrumental view of CSP, rewarding increased performance only when performance or non-performance in that area could affect a firm's financial performance by restricting its access to valuable resources. While some investors may invest for reasons other than financial gain and view CSP as an end in itself, other investors may have alternative negative or instrumental views of the value of CSP. As

the market represents the combined judgement of these different investment groups, we propose that in aggregate markets take an instrumental view of CSP. This instrumental approach can be observed in the increasingly popular socially responsible investment strategy, ESG integration. ESG integration entails including all material factors including financial and ESG metrics in the investment decision making process (Principles for Responsible Investment, 2019). Only ESG issues that are considered highly likely to affect corporate and/or investment performance are included in the ESG integration decision-making process. An assessment of which issues are relevant is based on an understanding of the top ESG issues affecting a particular country or sector (Principles for Responsible Investment, 2019).

We propose that in the presence of institutional structures that increase the salience of a certain stakeholder group, it is in the financial interest of the firm and shareholders to address the concerns of such groups as failure to do so would produce suboptimal financial consequences for the firm. Suboptimal financial consequences may result from disgruntled salient stakeholders adopting strategies which withhold or limit the flow of resources to the firm in addition to taking indirect action which cause reputational damage (Frooman, 1999). In addition, governmental stakeholder in response to pressure from other stakeholder groups can have a direct influence on the financial performance outcomes for a firm depending on the activities it promotes through subsidies and discourages with fines. Hence, from this reasoning we develop our central proposition to be examined:

In the presence of institutional forces which increase the salience of a stakeholder group, increased performance in relation to the stakeholder group's interests will be more highly valued by investors.

In order to test the above proposition, we examine the moderating effect of political, labour, and market institutions which are argued to be critical determinants of corporate

behaviour due to their ability to shape the relationships between the firm and its primary stakeholders; customers, suppliers, employees, communities and shareholders (Aguilera & Jackson, 2003; J. L. Campbell, 2007). Although both formal and informal institutional forces shape the extent to which stakeholders command power, legitimacy and urgency to influence corporate behaviour, in this study we focus on the contextual outcomes in the three above categories which correspond to the three structural elements examined in national business systems research (Whitley, 1999). These outcomes result from the interaction and combination of not only the formal organisation of government and corporations but also norms, incentives, rules, and ideas. Our measures of institutional forces represent the dynamic nature of societal forces with institutional forces theorised to be far from created behind a Rawlsian "veil of ignorance" (Rawls, 1971) resulting in institutionalised moral theory but instead the result of ongoing disagreements and contests between societal stakeholders and hence political in nature (Singer & Ron, 2020). As such, the size of a governance gap/void or the perception of whether prices adequately reflect the social value of a good is a politically contested and historically contingent judgement (Eberlein, 2019).

Matten & Moon (2008) investigate the different types of CSR that are present in different institutional contexts and highlight the importance of institutional context. While our interest is in CSP, the observable outcome of CSR, and not whether socially responsible corporate actions are implicitly or explicitly incentivised or articulated, we note that Matten & Moon (2008) make a number of assumptions about the basic institutional prerequisites for CSR, similar to the conditions that Rawls calls "background justice" (Heath, Moriarty, & Norman, 2010). In our study we examine the value relevance of CSP in the presence of varying levels of a number of these political, labour and market institutional prerequisites. Stronger institutions are proposed to ensure a more balanced playing field and hence empower a greater variety of stakeholders making their interests relevant to the financial

performance of firms. Hence, to examine the moderating effect of institutional factors on the relationship between CSP and value we test the following hypothesis:

H_1: Investors value CSP more in countries with stronger political, labour, and market institutions.

3.2.2.1 Political Institutions

Lasswell's (1959) definition of politics as "who gets what, when, how" points to its primacy when it comes to distributional issues between societal stakeholders and hence informs our focus on political institutions as one of the primary moderating factors in this research. The role of government in the shaping of business conduct is often downplayed with the assumption that globalisation erodes nation-state power and regulatory capacity, resulting in a focus on a zero-sum notion of regulatory share that is either held by business or the state and a resultant focus on 'institutional voids'(Eberlein, 2019; Khanna & Palepu, 1997; Scherer & Palazzo, 2011). This perspective overlooks the historical enmeshment of business and politics (Djelic & Etchanchu, 2017; Mäkinen & Kasanen, 2016) and the observation that the boundaries between the private and public spheres are constantly negotiated (Davis, Whitman, & Zald, 2008; Djelic & Etchanchu, 2017). Eberlein (2019) emphasise a shift towards new forms of engagement, as opposed to a loss in governmental power, by highlighting the multiple ways in which private and public authorities interact including substitution, support, shadow of hierarchy and soft steering. Boghossian & Marques (2019) show that states may use less overt methods of power through the infiltration and manipulation of private and multi-stakeholder platforms to both advance their regulatory purposes and conceal their intervention in a context where state intervention is opposed on ideological grounds.

While this points to the continuing multimodal power of government, it also highlights that government may suffer from a legitimacy deficit due to a prevailing dominant discourse about the efficiency of markets and conception of the role of government in business affairs. Government actions which are continuously contested and historically contingent, are shaped by their interactions with other societal stakeholder groups from which it can gain legitimacy to intervene in the affairs of business. In times of crisis, coalitions of dispersed societal stakeholder groups may form to contest the regulatory landscape by entering a symbiotic relationship with government, trading legitimacy for power. The Dodd-Frank Wall Street Reform and Consumer Protection Act 2010 could be used as an example of new regulations that were introduced after the 2007 financial crisis, which delegitimised the previously dominant societal stakeholder coalition that had spearheaded financial deregulation using the efficiency argument.

Hence, Government, far from being an impartial arbiter of fairness, is itself shaped by the competing forces in society leading to a divergence of institutions across countries which could moderate the relationship between CSP and firm value by altering the salience of different stakeholder groups. In order to examine the moderating roles of political institutions, this research will examine the effect of civil liberties, corruption, property rights and government intervention.

The first political institutional force to be examined is civil liberties which relates to the level of freedom of expression and belief, associational and organisational rights (Freedom House, 2018). The ability of stakeholders to organise and voice their opinions is important as stakeholder theory, corporate governance and CSR scholars have intimated that the monitoring of corporate performance by stakeholders is an important factor that increases the likelihood firms will behave in socially responsible ways (Aguilera & Jackson, 2003; Driver & Thompson, 2002; Mitchell et al., 1997). Additionally, Campbell (2007) notes that

the creation and enforcement of effective state regulation partially rests on the capacity of external actors, such as environmentalists, non-governmental organisations, unions, consumers, and other stakeholders, to participate in and monitor these regulatory processes. Higher levels of civil liberties imply more power for citizen and groups within society to form coalitions and put pressure on firms to address their interests via indirect stakeholder salience strategies. Hence, we propose that increased civil liberties increase employee, consumer, societal and environmental stakeholder's power due to their increased ability to monitor firms' behaviour and, when necessary, mobilize to change it. This mobilization may include convincing other stakeholders on which the firm is dependent to act on their behalf to achieve their desired aims.

Neoclassical economic theory assumes that individuals and by extension the firms they run may act opportunistically in pursuit of shareholder value maximisation (Demsetz, 1968; North, 1990; Stigler, 1971; Williamson, 1985). Hence, from this perspective, firms may engage in corruption to tilt the playing field to their advantage unless institutional forces exist to restrain them. In addition, corruption may constrain the ability of stakeholder groups to implement indirect stakeholder salience strategies by forming coalitions with government to effect change. As corruption and capture entails the capture of power and influence by those who have ample monetary resources, we equate an increase in corruption to a decrease in power for societal, environmental, employee and consumer stakeholder groups. We propose that the reduced power of these stakeholder groups through their inability to form coalitions with government in the presence of high levels of corruption will reduce the value of CSP to investors.

As legal recourse is often one of the main avenues through which stakeholders' groups influence firms' behaviour and gain recourse for misdeeds, lack of enforcement of property rights would lead to the disempowerment of financiers, suppliers, customers, and

employees through their inability to enforce contracts and communities through their inability to enforce regulation and make attending to their interests through CSP less valuable. As with government, the court system can be an ally through which stakeholders with legitimate issues gain the coercive power to impact firm's behaviour.

Finally, as a counterpoint we also test whether an increased willingness of government to intervene in economic matters in a redistributive manner impacts the relationship. We propose that a willingness to act or intervene in economic affairs by government would increase the likelihood that other stakeholder groups could count on them as an ally in an indirect stakeholder strategy. As such, an increase in government intervention, would empower societal, environmental, employee and consumer stakeholder groups. In order to examine the moderating effect of political institutions on the relationship between CSP and value we test the following hypotheses:

H_2 Investors value CSP more in countries with higher civil liberties.

H_3: Investors value CSP more in countries with lower levels of corruption.

H_4: Investors value CSP more in countries with strong property rights enforcement.

H_5: Investors value CSP more in countries with higher levels of government intervention.

3.2.2.2 Labour Institutions

In addition to the important influence of the political system on corporate behaviour, the labour system is also identified as one of its key drivers as it shapes the power dynamics between the firm and one of its primary stakeholders (R. Edward Freeman, Harrison, & Wicks, 2007; McWilliams & Siegel, 2001). Whitley (1999) describes the labour system as the system for developing and controlling skills, which he argues consists of two inter-related sets of institutions. The first set being the education system which certifies

competences and skills and the second being the labour market which are the institutions that determine the terms on which the owners of those skills can sell them (Whitley, 1999).

The education system may be an important moderator of the relationship between CSP and value as it changes the composition of one of the main stakeholder groups in an organisation and the incentives for firms to priorities their claims. In areas with highly skilled workers, competition between firms to attract the most valuable, rare and costly to imitate human capital would be higher. Jones, Willness, & Madey, (2010) and Wang (2013) show that CSR can act as a recruitment mechanism to lure valuable employees to firms in industries with skills shortages. Strong CSP credentials have been found to be a useful signalling tool to attract and retain higher quality employees (Greening & Turban, 2000; Turban & Greening, 1997). In contrast, in areas where workers are deemed to be expendable interchangeable commodities (Radin, 2004), the incentives for firms to engage in CSP is reduced. Hence from an instrumental perspective, investors will value CSP more when it is required to attract and retain a more educated workforce. The level of resources dependence and hence power of stakeholder relative to an organisation is greater the more concentrated, controllable, nonmobile, non-substitutable or essential the resource. As increased human capital could be argued to increase a number of these factors, it increases the power of workers. New growth theory (Cortright, 2001) emphasises the knowledge spillovers to the economy as a whole from higher levels of human capital, therefore educational attainment in a country will also be expected to affect the knowledge base of the company's suppliers, consumers and communities in which they operate (Popescu, Mihaela, & Sabie, 2016), and the resultant expectations of those stakeholders and their knowledge of their ability to hold the firm to account.

Additionally, the structure of the labour market and the relative bargaining power of labour could act as a moderating force. The labour share of income can be utilized to measure

the power of labour in the wage bargaining process or its relative strength, reflecting the salience of a firm's employees. As increased labour power should increase its ability to extract monetary and non-monetary benefits such as increased CSP, investors will value CSP more in its presence. In order to examine the moderating effect of labour institutions on the relationship between CSP and value we test the following hypotheses:

H_6: Investors value CSP more in countries with a more skilled workforce.

H_7: Investors value CSP more in countries with higher levels of labour power.

3.2.2.3 Market Institutions

The final set of institutions to examine as possible moderating forces are market institutions, the financial and business institutions that directly affect the actions of investors and businesses. While El Ghoul et al., (2017) find empirical evidence that the value of CSR initiatives is greater in countries with an absence of market-supporting institutions, we investigate an expanded set of business and financial institutions to investigate their impact..

The first financial institution under investigation is the stock market which acts as a provider of capital to firms, a larger and more liquid stock market indicates an increased supply or availability of capital. From a resource dependence perspective, this would reduce the power of shareholders relative to other stakeholders and increase the value of CSP. Additionally, the size and liquidity of stock markets will impact the informational efficiency of financial markets which will affect the ability of prices to accurately reflect the effect of CSP on firm valuation. Signalling theory suggests that increased CSR disclosure reduces agency costs (Hahn & Kühnen, 2013) and will result in higher firm valuation (D. S. Dhaliwal et al., 2011), and this effect will be more accurately priced in the presence of larger and more liquid stock markets.

The second financial institution under investigation is the development of credit market institutions in a given country. More developed credit markets may affect the resource dependence relationship between firms and stakeholders in a number of ways. Firstly, as with the stock market, an increase in the availability of credit will reduce the power of credit suppliers. Secondly, increasingly sophisticated credit markets may lead to better credit risk management strategies that recognise the risks involved with non-performance in regard to CSP. Finally, it may empower employees who wish to withdraw their resources from firms by giving them the opportunity to create their own business ventures.

The final financial institution we investigate is investment freedom. As noted by Scalet & Kelly (2010), CSP is a method of differentiating the firm to satisfy investor demand for socially responsible investments, therefore increased competition due to a greater flow of investment capital, both domestic and international, in the case of greater investment freedom, will increase the value of differentiation through CSP. Additionally, an increase in the availability of international capital will further reduce the power of capital providers due to competitive forces. The availability of foreign capital may have an impact on our previous two financial measures, the size of capital markets and development of credit markets, but we include it to capture the international element of capital flows which may also be important in presents of underdeveloped financial markets.

The business institutional environment in which a firm operates could also have an effect on the nature of its relationship with stakeholders and the value relevance of attending to their issues. In order to investigate the moderation effect of business institutions we examine two institutional forces that relate to competition: Trade freedom and the ease of starting a new business. Increased trade freedom and competition from domestic start-ups will increase competition among firms due to lower barriers to entry, which can empower

customers through an expanded opportunity set when making their purchasing decisions. In addition, fewer constraints to starting, operating, and closing a business should increase mobility for employees, allowing them to move jobs with greater ease if their needs are not met. Greater salience of employees and customers would be expected to increase the valuation of CSP in the presence of greater international and domestic start up competition.

In order to examine the moderating effect of financial and business institutions on the relationship between CSP and value we test the following hypotheses:

H_7: Investors value CSP more in countries with larger and more liquid stock markets.

H_8: Investors value CSP more in countries with larger credit markets.

H_9: Investors value CSP more in countries with greater investment freedom.

H_{10}: Investors value CSP more in countries with greater trade freedom.

H_{11}: Investors value CSP more in countries where it's easier to start a new business.

3.3 Data and Research Methodology

3.3.1 Measurement of Corporate Social Performance and the Asset4 Dataset

In order to overcome definitional difficulties associated with CSR, our research focuses on the observable outcomes or impact of firms' CSR policy through an examination of CSP. Our research follows Wood's (1991) definition of CSP as a *"composite, multidimensional construct capturing a business organisations' configuration of principles of social responsibility, processes of social responsiveness, and policies, programs, and observable outcomes as they relate to the firm's social relationship".*[11] We operationalize CSP through the use of Thomson Reuters Asset4's ESG scores, following recent studies (K.

[11] An updated definition of CSP by Wood remains true to the core concept while further refining it as "the principles, practices, and outcomes of businesses' relationships with people, organisations, institutions, communities, societies, and the earth, in terms of the deliberate actions of business towards these stakeholders as well as the unintended externalities of business activity" (Wood, 2016).

Gupta, 2018; La Rosa et al., 2018; Liang & Renneboog, 2017; Sassen et al., 2016), as they offers a uniform and consistent measure of CSP which is utilized by the investment community. Thomson Reuters compiles ESG scores, from over 400 measures, based on information gathered from annual reports, company websites, non-governmental organisation's websites, stock exchange fillings, CSR reports and news sources. Their ESG scores are designed to transparently and objectively measure a company's relative performances across ten themes under the three pillars: Environmental (Resource use, Emissions, Innovation), Social (Workforce, Human Rights, Community, Product Responsibility) and Governance (Management, Shareholders, CSR strategy) (Thomson Reuters, 2015). The environmental and social measures are percentile rank scores benchmarked against Thomson Reuters Business Classification Industry Groups for all environmental and social categories while the Governance measures are benchmarked against the firm's home country (Thomson Reuters, 2018). In constructing our measure of CSP, we exclude the governance measure as its inclusion may lead to spurious findings in cross country analysis due to its normalisation by country. Table 2.1 provides an outline of the ES measurements used. Following recent studies (e.g., El Ghoul, Guedhami, Kim, & Park, 2018; Ioannou & Serafeim, 2012; Luo, Wang, Raithel, & Zheng, 2015), we capture a firm's overall CSP using a combined measure consisting of the equally weighted-average of environmental and social scores. This measure of CSP also represent the interests of stakeholders other than shareholders for which the governance measure is most highly related.

The Asset4 scoring system was changed to an industry-relative score in 2017, making our CSP measure different to that used in previous studies, for example El Ghoul et al. (2017). Flammer (2015) finds that the adoption of CSR proposals depends on the industry in which the firm is operating, while Ding, Ferreira, & Wongchoti (2016) show that the impact of CSR activities on firm valuation relies heavily on a firm's industry-specific

relative position. The use of industry-relative scores is crucial, as the environmental outperformance of, for example, a mining company relative to its industry peers would not be evident if it was measured relative to all firms, including industries such as financial services, with vastly different environmental performances. The industry-based ranking allows our combined measure of CSP to be utilized for a direct cross-country comparison of firm's CSP relative to its peers in the same industry and year.

3.3.2 Measurement of Corporate Financial Performance

A further source of inconsistency in previous empirical findings relates to the operationalisation of financial performance with both accounting and market-based measures used to represent CFP. Socially responsible firms have been found to outperform less socially responsible firms in terms of various accounting based measures including Return on investment (ROI), return on assets (ROA), return on sales (ROS) and return on equity (ROE) (Cochran & Wood, 1984; J. Margolis et al., 2009; Nehrt, 1996; Orlitzky et al., 2003; Michael E Porter & Linde, 1995). While these measures have represented the relationship as positive, their objectivity and information value has been questioned due to their backward-looking nature (Benston, 1982). Conversely, stock market measures are forward looking with expectations of future cash flows embedded within the stock price making them more relevant for considering the actions of and implications for investors (Gregory, Tharyan, & Whittaker, 2014). There are a number of measures that can be used in this category, with the most commonly used being stock market returns (J. Margolis et al., 2009).

However, the use of stock market returns has two major drawbacks. Firstly, if market efficiency is assumed, only changes in CSP would be reflected and not the underlying relation between the two constructs (Gregory, Tharyan, & Whittaker, 2014). As Gregory &

Whittaker (2013) found that CSP scores are sticky by nature, the use of stock market returns could lead to the wrong impression that CSP does not affect financial performance because CSP remains unchanged or changes incrementally (Gregory et al., 2014). Secondly, Sharfman & Fernando (2008) and El Ghoul, Guedhami, Kwok, & Mishra (2011) suggest that firms with a high level of CSP may enjoy a lower cost of capital due to systematic risk reduction. Consequently, the long run returns to a firm with high CSR could be lower for a given expected future cash flow simply because they are subject to less market risk (Gregory et al., 2014).

Our research uses firm value as a proxy for financial performance to overcome the drawbacks of other previously used measures, investigating directly whether CSP add or detracts from shareholder value while concurrently illuminating the perceived value of CSP to markets in various contexts. Our choice of valuation model rests on its extensive usage in the value relevance literature (Gregory et al., 2014; G. Richardson & Tinaikar, 2004; Lev & Sougiannis, 1996; Barth, Clement, Foster, & Lourenço, Branco, Curto, & Eugénio, 2012) and its ability to overcome several drawbacks inherent to the most widely used valuation model in the literature, the Tobin's Q. The Tobin's Q or a proxy of the Tobin's Q, often calculated as the ratio of total market value of assets to book value of assets, has been implemented by various authors to represent firm value (El Ghoul et al., 2017; Guenster et al., 2011; Kim & Statman, 2012). As Tobin's Q is a ratio based on a firm's book value of assets, regressions undertaken to discover its predictors are likely to produce biased estimates due to omitted assets such as intangibles. Further distortions may arise due to firm specific details that can systematically alter book value, including the disparate asset composition and cost structures of firms in the same industry resulting from each firms choice of operational form or accounting policy (Gregory & Whittaker, 2013). Finally, regression tests based on Tobin's Q may suffer from an omitted variable bias if both book value and earnings affect price as is expected in an efficient market (Feltham & Ohlson,

1995; Peasnell, 1982). The valuation model implemented in this research, discussed in the methods section below, is based on the Ohlson (1987) framework which overcomes these distortions by considering market value, earnings and book value simultaneously.

Our accounting and stock market measures are obtained from Thomson Reuters DataStream. In order to control for other factors known to affect firm value, we include leverage, size, sales growth, return on assets, research and development spending and gross domestic Product (GDP) per capita in our regression model. As highly levered firms are likely to incur agency costs of debt and financial distress costs (Jensen & Meckling, 1976; Myers, 1977), we include a control for leverage measured as the ratio of long term debt to total assets (LEV). We measure size as the natural logarithm of total assets (SIZE) and include it in our model as larger firms have been found to suffer more from a diversification discount (Claessens, Djankov, Fan, & Lang, 2002). As growing firms have been found to have higher valuations (Klapper & Love, 2004), we control for growth opportunities using year-on-year sales growth (Sales Growth).

We also include a control for profitability, return on assets (ROA), as increased profitability is associated with higher valuation. We include a measure of research and development expenditure (R&D), calculated as the ratio of research and development to total sales, which are typically expensed and not capitalized but may create value (Servaes & Tamayo, 2013).[12] We also control for the level of economic development of the country in which firms are located using the natural logarithm of GDP per capita (LGDPPC) in each year evaluated in constant (year 2019) $US. The inclusion of an economic development control stems from previous research which has indicated that firms in economically developed countries have higher valuations (Griffin, Guedhami, Kwok, Li, & Shao, 2014).

[12] We follow (El Ghoul et al., 2017) and set all missing research and development expenses being set to zero. In order to increase the robustness of our results, we also ran further regression where all observations with missing R&D observations were dropped which reduced the sample size but didn't result in any significant changes in the strength, direction and significance of our variables.

All applicable variables are dollarized to allow for cross country comparison in addition to financial variables being trimmed at 1 and 99 percentiles to minimize the effect of outliers.

In order to undertake a cross-country comparison, firms are classified into countries based on the home or listing country of a firm's security. We rely on a number of data sources for our measures of institutional factors including Freedom House's Freedom in the World metrics (FOW) (Freedom House, 2018), World Bank Governance Indicators (WBG) (World Bank, 2018), Economic Freedom of the World Data from the Fraser Institute (FI) (Fraser Institute, 2019), Economic Freedom of the World Data from the Heritage Foundation (EFW) (Heritage Foundation, 2019), data from the International Labour Organisation (ILO) (ILO, 2019) and World Bank Development Indicators (WBD) (World Bank, 2019). These datasets have been used by a multitude of studies to represent country specific institutional factors (e.g. Cai et al., 2016; El Ghoul & Karoui, 2017; Gupta, 2018; Ioannou & Serafeim, 2012; Law, Kutan, & Naseem, 2018). Descriptions of the institutional metrics can be found in table 3.1.

The initial sample consisted of 45,399 firm-year observations of publicly traded firms from 56 countries that are part of the Thomson Reuters Asset4 database during the period from 2002 to 2019. Missing control variables and dropping all observations from countries with less than 5 firm observations in a given year have reduced the final sample to an unbalanced panel of 43,171 firm-year observations from 49 countries over the period 2002-2019. Table 3.2 shows a breakdown of the sample by country with average Institutional scores for each country over the period.

Table 3. 1 Description of Institutional Measures

Category	Theme	Description
Political Institutions	civil liberties (CL)	Freedom House's Freedom in the World civil liberties Score measures the level of freedom of expression and belief, associational and organisational rights, rule of law and personal autonomy and individual in a country in a given year, which ranges from 1 to 7. The score ranges from one to seven with one representing the greatest degree of freedom and seven representing a country with little or no civil liberties (Freedom House, 2018). In order to increase the comparability of the civil liberties variable with our other moderators we reverse its order making seven represent the greatest degree of civil liberties and one representing a country with little or no civil liberties.
	control of corruption (CC)	The World Bank's Governance indicators, control of corruption (CC) captures perceptions of the extent to which public power is exercised for private gain, including both petty and grand forms of corruption, as well as "capture" of the state by elites and private interests (World Bank, 2018). It is measured in percentile rank terms ranging from 0 to 100.
	property rights (PR)	Economic freedom of the world's property rights Metric from the Heritage Foundation grades countries on a scale of 0 to 100 and assesses the extent to which a country's legal framework allows individuals to acquire, hold, and utilize private property, secured by clear laws that the government enforces effectively (Heritage Foundation, 2019a, 2019b)
	government intervention (GI)	Government intervention is used as a proxy for the government's willingness and ability to intervene in economic matters and is obtained from the Fraser institute of Economic freedom of the world's Size of Government Metric (Fraser Institute, 2019). It is a sub-component of the Government metric that measures the general government transfers and subsidies as a share of GDP. The rating for this measure is equal to: $(V_{max} - V_i)/ (V_{max} - V_{min})$ multiplied by 10. The Vi is the country's ratio of transfers and subsidies to GDP, while the V_{max} and V_{min} values are set at 37.2 and 0.05, respectively. The 1990 data were used to derive the maximum and minimum values for this measure. The formula generates lower ratings for countries with lower transfers and ranges from 1 to 10. In order to increase the comparability of the variable with our other moderators we reverse its order making 10 represent the greatest degree of government intervention and one representing a country with little intervention in the way od transfers and subsidies.
Labour Institutions	educational attainment	The educational attainment of a country's workforce (EA), is measured as the percentage of the labour force that has achieved an advanced or tertiary level of education (OECD, 2020).
	labour income share (LIS)	labour income share (LIS) is used as a proxy for the power of labour and is calculated as the total compensation of employees as a percent of GDP in nominal terms (ILO, 2019).
Financial Institutions	stock market size and liquidity (SM)	The relative size and liquidity of a country's stock market (SM) is measured by the value of stocks traded in a given year as a percentage of GDP sourced from the World Federation of Exchange database and retrieved from the WBD databank (World Bank, 2019).
	credit market development (CM)	This metric is used as measure of credit market development and the availability of credit in an economy. It is measured as domestic credit to the private sector as a percentage of GDP and retrieved from the WBD databank (World Bank, 2019).
	investment freedom (IF)	Investment Freedom (IF), measures the absence of constraints on the flow of investment capital, such as different rules for foreign and domestic investment, access to foreign exchange, restrictions on payments, transfers, and capital transactions, or restrictions on

	foreign investment, measured on a scale of 0 to 100 (Heritage Foundation, 2019b).
new business ease (NB)	This measure is used as a proxy for the threat of domestic competition from start-up companies and is based on the World Bank's doing business data on the amount of time and money it takes to start a new limited-liability business and retrieved from the Fraser Institute (Fraser Institute, 2019). Countries where it takes longer or is more costly to start a new business are given lower ratings. Zero to 10 ratings are constructed for the three variables (1) time necessary to comply with regulations when starting a limited liability company; (2) money cost of the fees paid to regulatory authorities (measured as a share of per capita income); and (3) minimum capital requirements, that is, funds that must be deposited into a company's bank account (measures as a share of per-capita-income). These ratings are then averaged to arrive at the final rating for the metric. The formula used to calculate zero to 10 ratings was $(V_{max} - V_i)/ (V_{max} - V_{min})$ multiplied by 10. V_i represents the variable value and the values for V_{max} and V_{min} were set at 104 days, 317% and 1.017% (1.5 standard deviations above average in 2005) and 0 days, 0% and 0%, respectively.
trade freedom (TF)	Trade Freedom (IF) measures the extent of tariff and nontariff barriers that affect imports and exports of goods and services. Its calculation is based on the trade weighted average tariff rate and a qualitative evaluation of nontariff barriers. It is retrieved from the Heritage Foundations Freedom of the world index and measured on a scale of 0 to 100 (Heritage Foundation, 2019b).

Notes: This table provides a description of each of the Institutional Measures.

Table 3. 2 Sample Broken Down by Country with each Country's Average Institutional Scores

Country	Obs.	GDPPC ($)	civil liberties	control of corruption	property rights	government intervention	educational attainment	labour income share
Argentina	82	9,456	6.0	47.4	29.4	6.2	21.4	59.3
Australia	2035	47,984	7.0	94.9	88.8	6.8	37.2	57.9
Austria	232	44,930	7.0	92.7	89.4	2.8	28.0	58.5
Bahrain	27	20,938	2.0	56.9	61.6	8.0	NA	30.1
Belgium	304	41,946	7.0	90.9	83.2	2.7	33.8	64.0
Brazil	620	8,415	5.8	53.9	50.5	7.0	13.3	58.9
Canada	2362	42,905	7.0	95.1	89.8	7.2	49.9	60.7
Chile	211	11,688	7.0	88.6	84.6	7.9	20.7	58.7
China	1186	5,238	2.0	41.1	25.0	8.3	9.7	49.5
Colombia	102	5,534	4.3	44.7	52.7	7.9	22.2	52.8
Denmark	292	55,074	7.0	99.5	90.4	4.1	33.9	59.6
Egypt	77	2,354	2.9	31.2	30.9	6.8	NA	34.8
Finland	361	44,668	7.0	99.2	90.3	4.0	38.5	57.6
France	1088	38,479	6.9	89.3	75.8	2.8	29.1	61.4
Germany	1066	40,943	7.0	93.6	89.1	2.7	26.2	60.1
Greece	182	22,570	6.0	60.7	48.5	4.5	24.8	54.1
Hong Kong	1488	35,221	6.0	93.2	90.4	9.1	NA	54.6
India	745	1,278	5.0	41.3	51.9	8.5	10.6	53.4
Indonesia	177	2,699	4.5	33.2	33.8	9.1	9.2	39.9
Ireland	100	56,114	7.0	92.1	89.0	6.2	37.4	47.9
Israel	120	30,652	5.9	78.2	72.5	7.1	47.7	53.0
Italy	508	33,575	6.8	64.2	58.0	3.8	14.5	58.1
Japan	5091	39,101	6.3	88.9	76.2	4.5	44.1	55.8
Kuwait	42	37,229	3.0	48.1	49.4	6.9	NA	29.2
Malaysia	425	8,542	4.0	61.2	58.6	8.6	NA	40.1
Mexico	289	9,211	5.0	36.6	51.4	6.8	15.4	35.1
Netherlands	354	47,744	7.0	96.2	89.7	3.6	32.1	63.3
New Zealand	287	34,271	7.0	99.4	93.7	6.5	35.9	50.9
Norway	310	78,947	7.0	97.2	89.6	5.0	38.2	48.6
Oman	38	16,079	3.0	64.9	57.6	8.1	NA	53.9
Peru	65	4,914	5.0	41.1	51.7	9.6	NA	45.9
Philippines	194	2,259	5.0	34.5	33.4	9.2	NA	29.1
Poland	250	11,613	6.8	72.7	58.4	5.3	25.0	47.7
Portugal	105	20,747	7.0	81.6	70.2	4.3	17.8	59.9
Qatar	69	62,984	3.0	78.7	70.0	9.6	NA	18.5
Russia	195	9,621	2.7	16.5	28.9	5.5	52.1	51.3
Saudi Arabia	107	18,707	1.3	59.0	45.0	9.4	23.4	24.8
Singapore	536	46,200	4.0	97.5	91.0	9.3	NA	47.8
South Africa	834	5,856	6.0	59.0	53.2	8.3	6.1	51.8
Korea, Rep.	740	24,169	6.0	70.1	71.9	7.7	41.7	54.2
Spain	508	28,193	7.0	81.0	70.3	5.1	30.9	62.5
Sweden	757	50,732	7.0	98.3	90.4	4.3	35.0	54.7
Switzerland	500	71,505	7.0	96.8	89.5	6.0	33.8	68.9
Taiwan	1111	22,363	6.3	76.0	72.8	9.3	NA	52.6
Thailand	254	4,890	3.6	43.1	45.9	9.3	NA	49.4
Turkey	261	9,430	4.1	56.8	50.1	6.3	15.7	35.9
UAE	39	39,201	2.0	83.2	60.4	8.7	NA	34.0
UK	3361	41,919	7.0	93.5	89.8	5.9	37.1	59.1
United States	13084	50,799	7.0	89.7	85.9	6.3	41.8	59.8
Total/Mean	43171	$28,569	5.5	71.5	66.1	6.5	28.7	50.4

Table 3. 3 Continued

Country	Stocks traded (% of GDP)	domestic credit (% GDP)	investment freedom	new business ease	Trade freedom
Argentina	NA	NA	55.0	9.4	68.0
Australia	78.5	121.3	78.1	9.9	84.6
Austria	15.0	90.9	81.1	9.0	85.8
Bahrain	NA	73.9	75.0	9.7	82.4
Belgium	24.5	61.5	85.6	9.5	85.9
Brazil	31.7	58.8	51.0	7.0	68.7
Canada	78.7	121.8	71.7	9.9	87.1
Chile	15.5	106.5	84.5	9.7	85.8
China	133.7	136.5	25.0	8.8	72.3
Colombia	7.8	43.5	76.7	9.5	78.4
Denmark	45.1	170.8	85.8	9.7	85.8
Egypt	18.6	34.1	55.6	9.6	71.4
Finland	105.6	82.1	80.0	9.5	85.9
France	61.5	91.0	64.7	9.8	81.9
Germany	49.4	91.7	85.0	9.2	85.8
Greece	16.8	92.4	55.9	9.0	81.8
Hong Kong	217.3	175.0	89.4	9.8	91.5
India	46.0	50.5	36.5	8.4	67.1
Indonesia	10.6	37.4	39.1	8.4	77.5
Ireland	7.9	102.1	90.4	9.7	87.0
Israel	24.6	66.8	78.5	9.4	85.8
Italy	51.9	81.5	77.5	9.5	84.9
Japan	91.9	166.5	63.3	9.2	81.4
Kuwait	NA	97.9	55.0	8.5	78.3
Malaysia	40.4	114.6	52.9	9.5	80.5
Mexico	9.4	34.6	67.9	9.5	82.0
Netherlands	89.0	113.0	90.0	9.6	85.9
New Zealand	NA	153.6	77.8	9.9	86.6
Norway	38.8	122.5	65.3	9.7	87.1
Oman	NA	72.3	65.0	9.8	85.0
Peru	NA	43.1	75.0	9.1	87.3
Philippines	11.8	41.3	55.0	8.7	77.3
Poland	12.1	51.1	70.9	8.8	87.2
Portugal	24.0	134.3	70.0	9.7	87.0
Qatar	15.9	71.4	56.0	9.6	82.6
Russia	28.9	47.3	28.9	9.3	71.5
Saudi Arabia	63.0	44.5	41.4	9.4	78.2
Singapore	98.1	106.7	81.9	9.9	90.6
South Africa	79.5	145.4	46.3	9.0	75.7
Korea, Rep.	131.2	133.9	69.6	9.5	74.8
Spain	84.5	137.6	78.8	8.6	85.9
Sweden	106.9	116.4	86.2	9.5	85.6
Switzerland	124.4	157.8	78.9	9.4	87.8
Taiwan	NA	NA	65.9	9.6	86.0
Thailand	62.9	133.6	46.8	9.2	78.4
Turkey	38.6	58.6	70.9	9.6	82.9
UAE	20.2	84.7	41.3	9.6	83.8
UK	90.5	151.6	87.8	9.7	85.8
United States	216.8	184.2	76.1	9.8	85.0
Total/Mean	60.0	98.0	67.1	9.3	82.1

Notes: This table displays the distribution of firm observations in our sample by country. It also contains the average country-level institutional factors over the sample period from 2002 to 2019.

3.3.3 Descriptive Statistics

Table 3.3 reports the descriptive statistics for our variables. It shows that the mean score for CSP is slightly skewed towards poor performers with a mean value of 36.76 but ranges from a minimum score of 0.02 to a maximum of 97.3, which is unsurprising as the score is calculated on a relative industry basis in each year. The average firm in our sample has a price of 28.67 with book value per share of $14.27 and net income per share of $1.66. The average firm has a leverage ratio of 24.8%, size of 15.61, sales growth of 7.64% and return on assets of 5.9%. Calculating the average GDP per capita in our sample highlights a bias towards high income countries with the mean GDP per capita of our sample (calculated as an average of all of our firm-year observations) at $35,397 which is significantly above the world mean GDP per capita of $11,433 in 2019 (World Bank, 2019) but just above the OECD average over the period of $46,484 (OECD, 2019). Country-Level Institutional Indicators also display a positive skew with a high average sample score for civil liberties (6.4/7), control of corruption (84.09%), property rights (78.43/100), government intervention (6.12/10), educational attainment (39.71%), labour income share (56.62%), stock traded as a percentage of GDP (stock market:128.90%), domestic credit (credit market: 146.99%), investment freedom (71.52/100), new business ease (9.59/10) and trade freedom (83.9/100).

Table 3. 4 Descriptive Statistics of Variables used in Regressions

Grouping	Variable	N	Mean	St. Dev.	Min	Pctl(25)	Pctl(75)	Max
Main Variables	Price	43,171	28.672	35.064	0.196	5.036	38.418	274.645
	BVPS	43,171	14.269	18.096	-0.501	2.501	18.781	157.447
	NIPS	43,171	1.661	2.535	-4.299	0.170	2.349	22.263
	Leverage	43,171	24.837	17.346	0.000	10.739	36.255	77.515
	Size	43,171	15.618	1.484	11.793	14.602	16.589	19.644
	Sales growth	43,171	7.635	20.124	-50.423	-3.474	16.001	123.258
	ROA	43,171	5.895	5.927	-26.160	2.360	8.775	29.210
	R&D	43,171	1.769	4.338	0	0	1.3	35
	LGDPPC	43,171	10.474	0.749	7.005	10.475	10.908	11.542
	CSP_{t-1}	43,171	36.693	23.778	0.025	16.197	55.452	97.31
	Environmental $Score_{t-1}$	43,171	32.335	28.567	0.000	3.585	56.190	99.040
	Social $Score_{t-1}$	43,171	41.051	22.999	0.050	22.905	57.950	98.640
Institutional Variables	civil $liberties_{t-1}$	43,134	6.427	1.171	1	6	7	7
	control of corruption $_{t-1}$	43,171	84.088	16.608	11.005	85.782	93.269	100.000
	property $rights_{t-1}$	43,171	78.428	15.491	15	73.1	90	98
	government intervention $_{t-1}$	43,160	6.116	1.739	1.940	5.112	6.942	10.000
	educational attainment $_{t-1}$	36,490	39.709	10.457	5.058	36.881	46.357	57.888
	labour income share $_{t-1}$	43,166	56.615	5.989	18.400	54.500	59.800	70.800
	stock $traded_{t-1}$ (% GDP)	37,154	128.901	78.420	7.353	65.784	211.115	313.716
	domestic $credit_{t-1}$ (% GDP)	39,122	146.994	44.779	33.434	123.858	182.614	219.929
	investment freedom $_{t-1}$	43,171	71.523	15.388	20	70	80	95
	new business $ease_{t-1}$	43,160	9.593	0.445	6.433	9.557	9.824	9.982
	Trade $freedom_{t-1}$	43,171	83.900	5.317	44.200	81.800	87.000	95.000

Notes: This table displays preliminary statistics for all of the variables used in our regression models.

We present Pearson correlation coefficients between all variables in Table 3.6; firm, CSP and country level variables. Regarding firm level variables, a high degree of positive correlation and significance is found between our dependent variable price and the two integral independent variables, book value per share and net income per share, of the Ohlson valuation model demonstrating the importance of including both. Our composite variable industry relative CSP is found to have positive and statistically significant correlation with the dependent variable. Size, sales growth, return on assets (ROA), and R&D show a positive and statistically significant correlation with Price, while leverage is found to be negative and significantly related to value. Regarding country level variables there is a positive significant correlation between Price and log of GDP per capita in addition to all country level institutional variables.[13] Due to a high level of correlation between the institutional variable and the possible presence of multicollinearity, we test the model with each institution separately. We also conduct exploratory factor analysis to discover whether these institutions factors are driven by common underlying factors, reported in a later section.

[13] A variance inflation factor analysis was implemented to detect whether multicollinearity was present. The variance inflation factors (VIFs) are well below the threshold of ten with all scores found to be under 3 (Hair, Black, Babin, & Anderson, 2010) except in the case of Control of corruption and GDP per capita with a VIF of 4.31. In order to increase the robustness of our findings, we reran the regressions that contained control of corruption having dropped the LGDPPC variable and found comparable results. Results are available on request.

Table 3. 5 Pearson Correlation Matrix

	Variables	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1	Price																				
2	BVPS	0.65***																			
3	NIPS	0.605***	0.498***																		
4	Leverage	-0.037***	-0.061***	-0.092***																	
5	Size	0.145***	0.299***	0.228***	0.139***																
6	Sales growth	0.065***	-0.002	0.096***	-0.014**	-0.044***															
7	ROA	0.156***	-0.12***	0.35***	-0.124***	-0.197***	0.137***														
8	R&D	0.106***	-0.042***	-0.029***	-0.154***	-0.11***	0.046***	0.002													
9	LGDPPC	0.25***	0.162***	0.145***	-0.001	-0.049***	0.07***	-0.033***	0.12***												
10	CSP_{t-1}	0.062***	0.049***	0.073***	0.101***	0.411***	-0.135***	0.018***	0.037***	-0.099***											
11	civil $liberties_{t-1}$	0.159***	0.08***	0.119***	-0.02***	-0.062***	0.036***	0.015***	0.064***	0.637***	-0.012**										
12	control of corruption $_{t-1}$	0.131***	0.09***	0.098***	-0.059***	-0.044***	0.044***	-0.017***	0.097***	0.816***	-0.073***	0.737***									
13	property $rights_{t-1}$	0.118***	0.074***	0.122***	-0.054***	-0.045***	0.052***	0.051***	0.077***	0.742***	-0.056***	0.741***	0.859***								
14	government intervention $_{t-1}$	0.057***	0.152***	0.084***	-0.013**	0.167***	-0.063***	-0.112***	0.073***	0.24***	0.153***	0.155***	0.303***	0.133***							
15	educational attainment $_{t-1}$	0.201***	0.155***	0.06***	-0.023***	-0.039***	-0.001	-0.069***	0.116***	0.728***	-0.126***	0.319***	0.532***	0.496***	0.101***						
16	labour income share $_{t-1}$	0.19***	0.131***	0.171***	0.029***	-0.003	0.033***	0.034***	0.07***	0.49***	0	0.63***	0.502***	0.52***	0.153***	0.169***					
17	stock $market_{t-1}$ (% GDP)	0.275***	0.134***	0.141***	0.037***	-0.008	0.045***	0.02***	0.115***	0.461***	-0.143***	0.348***	0.253***	0.326***	-0.301***	0.47***	0.304***				
18	domestic $credit_{t-1}$ (% GDP)	0.181***	0.068***	0.051***	-0.017***	-0.059***	0.027***	-0.003	0.114***	0.523***	-0.152***	0.398***	0.448***	0.429***	-0.22***	0.598***	0.328***	0.76***			
19	investment freedom $_{t-1}$	0.077***	0.018***	0.067***	0	-0.121***	0.008	0.04***	0.035***	0.581***	0.023***	0.585***	0.544***	0.643***	0.099***	0.285***	0.364***	0.22***	0.213***		
20	new business $ease_{t-1}$	0.182***	0.087***	0.095***	-0.015**	-0.072***	0.024***	0.027***	0.061***	0.621***	-0.081***	0.411***	0.459***	0.549***	-0.069***	0.546***	0.187***	0.43***	0.411***	0.448***	
21	Trade $freedom_{t-1}$	0.162***	0.039***	0.067***	0.004	-0.093***	0.003	-0.013**	0.062***	0.708***	0	0.55***	0.589***	0.547***	0.154***	0.449***	0.299***	0.397***	0.377***	0.635***	0.577***

Notes: This tables shows the pairwise correlation coefficients between the variables used in our regression models. P-values are indicated as follows: *p<0.1; **p<0.05; ***p<0.01

3.3.4 Method of Analysis

To examine the value relevance of CSP, we employ a valuation model based on the Ohlson (1995) framework. This model converts the standard valuation model, where the value of a firm is the present value of its future cash flows, discounted at the appropriate cost of equity capital, to one which is based on expected profits and book value (Callen & Segal, 2005; Lundholm & O'Keefe, 2001; Peasnell, 1982). In the standard valuation model expected cash flows are often estimated using forecasts by analysts and investors, which can present many challenges. The Ohlson model is based on the notion of 'normal profit' with the value of a firm based on the present value of its future 'residual income' plus its opening asset value. If we assume constant long run growth rates in abnormal earnings, this can be restated as the weighted sum of a firm's book value and its current earnings (J. Ohlson, 1995; Strong, 1997). Following Ohlson (1995), an "other information" parameter is added to this new specification, reflecting information that is not captured in current earnings or book values but affects market value (Ohlson, 1995). This model will be the basis of the model used to test the association between CSP and firm value.

The general form of the model is: $P_t = \beta_0 + \beta_1 BVPS_{it} + \beta_2 NIPS_{it} + \beta_3 v_{it} + \varepsilon_{1it}$ (3.1)

Where P is the share price acting as an indicator of firm value, BVPS is book value per share, NIPS is earnings (net income per share) and v is the other information vector. This type of approach has been widely implemented in the accounting and finance literature to determine whether additional information including other intangibles influences stock prices (Gregory et al., 2014; Richardson & Tinaikar, 2004). Examples of its implementation include an examination of the value added by research and development (Lev & Sougiannis, 1996), brands (Barth, Clement, Foster, & Kasznik, 1998) and the value relevance of CSR (Lourenço, Branco, Curto, & Eugénio, 2012).

Standard control variables which are expected to influence firm value are also added to the model to create our specific valuation model (2).

We estimate a regression with share price (P) as the dependent variable and the independent variables; book value per share (BVPS), net income per share (NIPS), leverage (LEV), size (SIZE), sales growth (Sales Growth), return on Assets (ROA), research and development expenditure (R&D), log of GDP per capita (LGDPPC) plus our variable of interest CSP lagged by one period (CSP_{t-1}).

$$P_{it} = \beta_0 + \beta_1 BVPS_{it} + \beta_2 NIPS_{it} + \beta_3 LEV_{it} + \beta_4 SIZE_{it} + \beta_5 Sales\ Growth_{it} + \beta_6 ROA_{it} + \beta_7 R\&D_{it} + \beta_8 LGDPPC_{it} + \beta_9 CSP_{it-1} + \beta_{10} Institution_{it-1} + \beta_{11} CSP_{it-1} \times Institution_{it-1} + \mu_i + \mu_t + \varepsilon_{it} \quad (3.2)$$

To investigate the effect of country-level Institutions in explaining the cross-country differences in the value relevance of CSP, we examine how the strength of a country's institutional forces (CL, CC, PR, GI, EA, LIS, SM, CM, IF, NB, TF) affect or moderate the relation between CSP and firm value, with the addition of an Institution variable (Institution) and an interaction term (CSP_{t-1} x $Institution_{t-1}$). The implementation of an interaction term allows us to directly observe the moderating effect of country level institutional forces on the CSP-CFP relationship. Each country level institutional metric is used in an individual regression due to the high level of correlation between institutional metrics.

To address concerns about endogeneity resulting from omitted confounding variables correlated with CSP and firm value, we follow Ding et al. (2016), El Ghoul et al. (2017) and Servaes & Tamayo (2013) by including firm fixed effects. As Servaes & Tamayo (2013) argue that the contradictory findings in the literature on the link between CSR and firm value may be partly due to model misspecification arising from the omission of controls for time-invariant unobservable firm characteristics, we also include time fixed effects to account for the possible presence of time series dependence. All of the above fixed effects

regression analysis are conducted using the two-way clustered robust standard error of Petersen (2009) which Gow, Ormazabal, & Taylor (2010) show to be the best method to yield well-specified standard errors in the presence of both cross-sectional and serial correlation. As CSP has been found to be 'sticky' for firms over time, these types of dependences call for our standard errors to be clustered on both firm and year. Another concern related to the relationship between firm value and CSP is that of causality and simultaneity bias which we address by lagging the CSP and Institutional variables by one period.[14] As a robustness check, we also implement two stage least squared regression analysis using lagged country year average CSP as our instrument in order to increase the robustness of our study and investigate the role play by endogeneity in our results and report the finds in our robustness section. As a further robustness check, we also repeat our analysis using the commonly used Tobin's Q as our measure of value to increase the robustness of our study and make our findings comparable to previous research.

We also explore the effect of the institutional context on the relationship between a firm's CSP and CFP with regards to each stakeholder group by disaggregating the CSP score into its component parts. We rerun the regression model, replacing our overall measure of CSP with the firm's environmental and social score, and with each sub-theme of these measures.

Additionally, in order to account for the possibility that all aspects of CSR are not uniformly, timely and linearly priced this study will also categorise firms into four quartiles peer groups based on their industry year relative CSP score which is substituted for the CSP variable in further regressions. This follows the observation of Ding, Ferreira, & Wongchoti (2016) who contend that the assumption that all aspects of CSR are uniformly, timely and

[14] In order to increase the robustness of this study, two alternative specifications of the model in which no variables are lagged and in which all independent variables are lagged by one period was implemented. Th results of these models are similar in terms of significance and strength of the variables of interest. Results available on request.

linearly priced is undermined by the asymmetric and opaque nature of CSR information (Cho et al., 2013) in addition to the divergent utility functions of investors. This practice mirrors the common SRI strategy of creating best/worst in class groups and the construction of SRI indexes such as the MSCI ESG leaders and MSCI World index which have a positive screening threshold of 50% and 25% respectively (MSCI, 2019). The use of industry-relative CSP scores and grouping offers another avenue through which the challenge of endogeneity is mitigated as observations of this manner reduce the absolute impact of a change in CSP, in so doing, some of the endogeneity (Ding et al., 2016).

The reliance of a firm on domestic stakeholder groups for access to resources and its resulting exposure to stakeholder pressure may differ based on the level of embeddedness of the firm in its home country. To address these issues and to increase the robustness of our study, we divide the sample into domestic and multinational firms to examine whether there is a divergence in the value relevance of CSP between these groups. Following Cai et al. (2016), firms are classified into each group based on their amount of foreign assets with firms that have at least 10% of their assets in host countries categorised as multinational firms and the remaining firms as domestic. Hence, we also rerun the panel regression including the institutional moderators separately for domestic and multinational firms.

3.4 Empirical Results

3.4.1 The Relationship Between CSP and Firm Value: The Role of Institutional Factors

Table 3.5 reports the results of regression model (2) which investigates the possible moderating force of country-level political and labour Institutional factors on the relationship between CSP and firm value. The evidence based on these regressions suggests that CSP is more positively related to firm value in the presence of stronger political and labour institutional factors, providing support for our central proposition and Hypothesis 1. The models in Table 3.5, without interaction terms display most of the institutional forces to have a significantly negative effect on firm value. This is to be expected as these stakeholder supporting institutions have been chosen to represent forces that would empower other stakeholder groups and require resources be used to attend to their issues. These models also represent the relationship between CSP and firm value to be positive and significant at a 5% level. However, the inclusion of the interaction terms is justified by the increased explanatory power of the models as represented by their R squared and adjusted R squared and their high levels of significance.

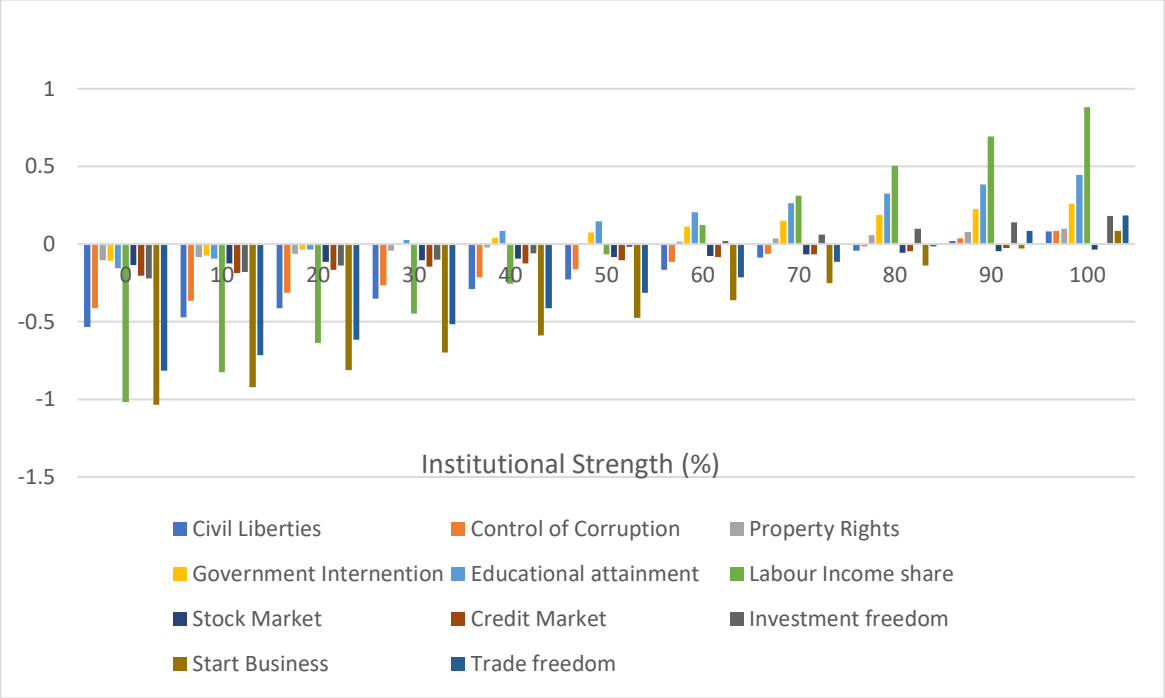
The changing value relevance of CSP is illustrated in Figure 3.1 which demonstrates the value change that would result from a one unit increase in CSP in the presence of differing institutional strengths. Figure 3.2 also demonstrates the value change from a one-point increase in CSP when institutional strengths are set at the first, second and third quartile based on the countries in ours sample as opposed to the firm-year observations. They both demonstrates the negative value implications of higher levels of CSP in the absence of stakeholder supporting institutions and the reversal of value relevance in the presence of stakeholder-supporting institutions.

Table 3. 6 Fixed Effects Regression of Price on CSP_{t-1} and Political & Labour Institutional $Metrics_{t-1}$, with Two-Way Robust Standard Errors

	Price											
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
BVPS	1.046***	1.036***	1.047***	1.040***	1.034***	1.033***	1.049***	1.035***	0.962***	0.959***	1.045***	1.023***
	(0.053)	(0.053)	(0.053)	(0.053)	(0.053)	(0.053)	(0.053)	(0.053)	(0.056)	(0.056)	(0.053)	(0.052)
NIPS	2.410***	2.403***	2.405***	2.404***	2.369***	2.371***	2.412***	2.445***	2.389***	2.377***	2.386***	2.398***
	(0.253)	(0.249)	(0.251)	(0.249)	(0.249)	(0.248)	(0.251)	(0.251)	(0.245)	(0.244)	(0.249)	(0.246)
Leverage	0.190***	0.186***	0.194***	0.194***	0.174***	0.175***	0.196***	0.193***	0.169***	0.165***	0.195***	0.186***
	(0.032)	(0.031)	(0.032)	(0.032)	(0.030)	(0.030)	(0.032)	(0.032)	(0.032)	(0.032)	(0.032)	(0.030)
Size	2.501***	2.610***	2.488***	2.544***	2.631***	2.637***	2.349***	2.600***	4.328***	4.406***	2.570***	2.754***
	(0.668)	(0.664)	(0.664)	(0.658)	(0.653)	(0.651)	(0.673)	(0.695)	(0.804)	(0.802)	(0.655)	(0.651)
Sales Growth	0.017	0.015	0.016	0.015	0.014	0.014	0.016	0.014	0.007	0.007	0.014	0.013
	(0.014)	(0.014)	(0.013)	(0.013)	(0.013)	(0.013)	(0.013)	(0.014)	(0.017)	(0.017)	(0.012)	(0.012)
ROA	0.291***	0.291***	0.288***	0.286***	0.288***	0.287***	0.285***	0.278***	0.304***	0.298***	0.282***	0.276***
	(0.053)	(0.052)	(0.053)	(0.053)	(0.052)	(0.052)	(0.053)	(0.053)	(0.055)	(0.055)	(0.053)	(0.052)
R&D	-0.059	-0.048	-0.067	-0.067	-0.039	-0.039	-0.051	-0.044	-0.046	-0.059	-0.064	-0.064
	(0.175)	(0.174)	(0.175)	(0.175)	(0.177)	(0.177)	(0.178)	(0.177)	(0.198)	(0.201)	(0.178)	(0.173)
LGDPPC	7.066***	8.921***	9.143***	9.691***	5.296**	5.639**	6.506**	9.229***	17.585***	16.687***	7.917***	9.702***
	(2.527)	(2.570)	(2.693)	(2.626)	(2.488)	(2.436)	(2.635)	(3.251)	(3.498)	(3.387)	(2.286)	(2.256)
$Institution_{t-1}$:	civil liberties		control of corruption		property rights		government intervention		educational attainment		labour income share	
CSP_{t-1}	0.034**	-0.535***	0.036**	-0.414***	0.040**	-0.103	0.035**	-0.109**	0.059***	-0.155***	0.039**	-1.017***
	(0.016)	(0.068)	(0.017)	(0.057)	(0.016)	(0.080)	(0.017)	(0.050)	(0.018)	(0.046)	(0.017)	(0.122)
$Institution_{t-1}$	-2.242**	-6.271***	-0.144	-0.371***	-0.454***	-0.505***	-2.708***	-4.031***	-1.496***	-1.804***	-0.835***	-1.470***
	(1.080)	(1.276)	(0.109)	(0.117)	(0.064)	(0.079)	(0.921)	(0.938)	(0.264)	(0.296)	(0.182)	(0.185)
CSP_{t-1}* $Institution_{t-1}$		0.088***		0.005***		0.002*		0.037***		0.006***		0.019***
		(0.010)		(0.001)		(0.001)		(0.012)		(0.001)		
Observations	43,134	43,134	43,171	43,171	43,171	43,171	43,160	43,160	36,490	36,490	43,166	43,166
R^2	0.334	0.340	0.333	0.338	0.349	0.349	0.335	0.338	0.351	0.353	0.337	0.344
Adjusted R^2	0.221	0.228	0.221	0.226	0.239	0.240	0.223	0.227	0.241	0.243	0.225	0.234
F Statistic	1,848.970*** (df = 10; 36914)	1,725.024*** (df = 11; 36913)	1,846.075*** (df = 10; 36951)	1,712.328*** (df = 11; 36950)	1,977.883*** (df = 10; 36951)	1,802.024*** (df = 11; 36950)	1,860.533*** (df = 10; 36940)	1,715.231*** (df = 11; 36939)	1,688.922*** (df = 10; 31191)	1,547.284*** (df = 11; 31190)	1,874.361*** (df = 10; 36946)	1,761.695*** (df = 11; 36945)

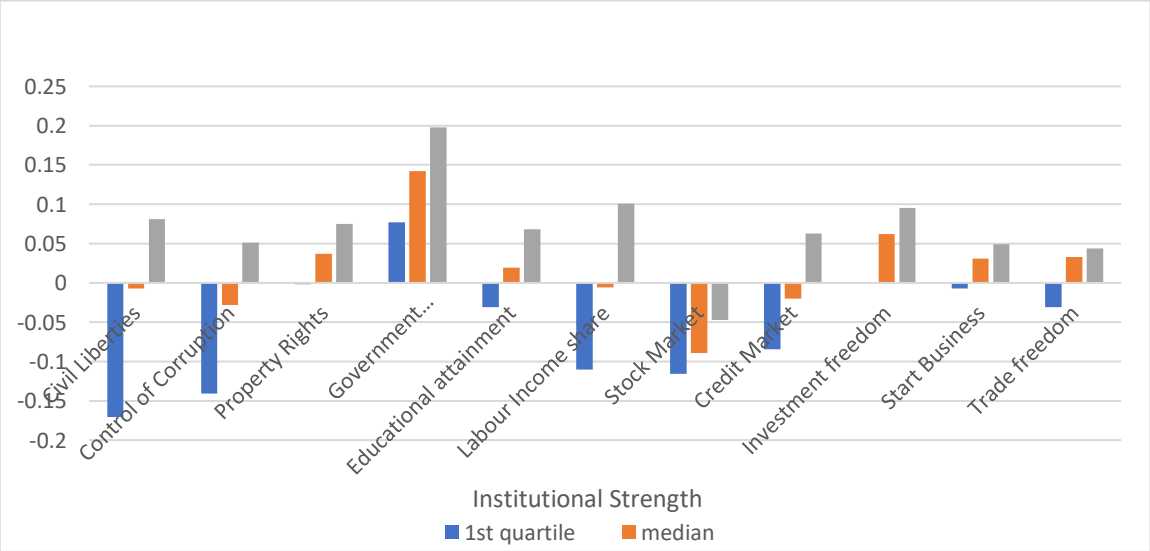
Note: The table shows the results of regressing Price in year *t* on Book value per share (BVPS), Net Income per share (NIPS), the ratio of long term debt to total assets (Leverage), log of total assets (Size), year-on-year sales growth (Sales Growth), return on assets (ROA), the ratio of research and development to total sales (R&D), natural logarithm of GDP per capita (LGDPPC), a measure of CSP in year t-1 (CSP) and six country-level Political and Labour institutional indicators in year t-1; civil liberties, control of corruption , property rights, government intervention , educational attainment , and labour income share . Interaction terms have been included (CSP*Institution) for each institutional indicator and CSP. Clustered robust standard errors from a two-way cluster approach of Petersen (2009) are shown in parentheses. P values are indicated as follows: $^{*}p<0.1$; $^{**}p<0.05$; $^{***}p<0.01$

Figure 3. 1 Institutional Context and the Value Relevance of CSP



Notes: We graph the marginal effect of CSP on CFP by calculating the impact of the main effect and interaction effect with the Institutional Measure for each level of Institutional Strength between its minimum and maximum values. Institutional Strength converts all institutional measures into percentage values.

Figure 3. 2 Institutional Context and the Value Relevance of CSP (Quantiles)



Notes: We graph the marginal effect of a 1% change in CSP on CFP (x-axis) by calculating the impact of the main effect and interaction effect with the Institutional Measure set at the first second and third quartile scores based on the countries in our sample.

In model 2 civil liberties (CL) is included as the moderating variable and the interaction term between CL and CSP is found to be significant at a 1% level[15]. An interpretation of the coefficients on both the CSP and the CSP*CL interaction term indicates that CSP becomes more positively value relevant as the level of civil liberties in a country increases. For a civil liberties score of 7 (highest level), CSP would have a positive relationship with firm value (0.081) while for a score of 6, CSP would have a negative relationship with firm value (-0.007)[16]. The implication of model 2 estimates for a firm's value can be illustrated by examining the effect of a ten percent improvement in a firm's relative CSP in varying institutional contexts. A ten percent increase in a firm's CSP will on average result in an increase of $0.81 in value per share in a country with a civil liberties score of 7 or a reduction of $0.07 in a country with a score of 6, ceteris paribus. This would constitute an economically significant 2.8% increase or 0.24% decrease in value for the average firm in our sample.

In Models 4, Control of corruption is found to positively moderate the relationship between CSP and firm value as the interaction term is positive and significant at a 1% level. For a firm in a country that is ranked in the 50th percentile for control of corruption relative to their peers, a ten percent increase in their CSP score will yield a $1.64 reduction in value while it would result in a $0.36 increase in a country at the 90th percentile. As this would equate to a 5.7% decrease or 1.2% increase in value for the average firm in our sample, a combined 6.9% divergence in value for the same 10% improvement in CSP between the two institutional environments. The subsequent political institutional variable, protection of property rights, displays a similar moderating effect on the relationship between CSP and

[15]An alternate measure of civil liberties was also utilized and found to represent the relationship in the same manner. The alternative measure utilized was the World Bank's Voice and Accountability measure which capture the perception of the extent to which a country's citizens are able to participate in selecting their government, as well as freedom of expression, freedom of association and a free media (World Bank, 2018).

[16]The marginal effect of CSP on value (Price) is represented by everything that is multiplied by CSP in the model B7 + B9*Institution. B7 can now be interpreted as the marginal effect of CSP on value only when Institution = 0.

When CL = 7, the impact of CSP = -0.535 +0.088(7) = 0.081.

firm value at a 10% level of significance. In the case of protection of property rights a 10% increase in CSP when the institutional score is 50, will on average result in a decrease in value of $0.03 as opposed to an increase in value $0.77 in the presence of an institutional score of 90 or a combined 3.48% divergence in value relevance for the average firm. We also find that the final political institution, government intervention, positively moderates the relationship at a 1% level of significance. In the case of government intervention a 10% increase in CSP when the institutional score is 5, will on average result in an increase in value of $0.79 as opposed to an increase in value $1.50 in the presence of an institutional score of 7 which equates to an increase in value of 2.65% and 5.23% for the average firm in our sample, respectively. The results of the political institutional forces taken together lend support to our central hypothesis that stakeholder supporting institutions increase the value relevance of CSP.

Models 10 and 12 report our findings when labour market institutions are included as moderating agents. The coefficients on both interaction terms are significant at a 1% level. These results indicate that an increase in educational attainment and in the power of labour to obtain concessions from capital, as indicated by increased Labour Share of Income, increases the value relevance of CSP to investors. The results from the educational attainment institution indicate that CSP will on averages have a detrimental effect on value in countries if less than 26% of the population have achieved an advanced level of education. Conversely, CSP will be increasing valuable as the level of human capital in the economy increases.

Labour income share or the power of labour relative to capital displays a similar pattern but at higher levels with an increase in CSP being detrimental to firm value in countries with a labour income share of less than 54%. For a firm in a country that has a labour income share at the 25th percentile of our sample and a level of 54.5, a ten percent

increase in their CSP score will yield a $0.19 increase in value while it would result in a $1.19 increase in a country at the 75th percentile with a share of 59.8. This would equate to a 0.65% or 4.16% increase in value for the average firm in our sample, a substantial economically significant difference in the value created from a 10% improvement in CSP between the two institutional environments. The results of the labour institutional forces which empower employee stakeholders' groups lend further support to our central hypothesis that stakeholder supporting institutions increase the value relevance of CSP.

Table 3.6 reports the results of regression model (2) which investigates the possible moderating force of country-level market institutional factors on the relationship between CSP and firm value. The evidence based on these regressions suggests that CSP is more positively related to firm value in the presence of stronger market institutional factors, providing support for our central proposition and Hypothesis 1. The models in table 3.6 without interaction terms display most of the institutional forces to have a negative effect on firm value although they are insignificant except for our measure of the development of the credit market and the ease of starting a new business which may be due to the competitive forces they represent as capital providers and business competition.

Table 3. 7 Fixed Effects Regression of Price on CSP_{t-1} and Market Institutional $Metrics_{t-1}$, with Two-Way Robust Standard Errors

	Price									
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
BVPS	1.012***	0.996***	1.021***	1.014***	1.042***	1.043***	1.038***	1.038***	1.045***	1.045***
	(0.058)	(0.057)	(0.054)	(0.054)	(0.054)	(0.054)	(0.053)	(0.053)	(0.053)	(0.053)
NIPS	2.409***	2.359***	2.394***	2.351***	2.406***	2.409***	2.386***	2.381***	2.406***	2.407***
	(0.261)	(0.257)	(0.254)	(0.250)	(0.251)	(0.250)	(0.251)	(0.250)	(0.250)	(0.250)
Leverage	0.199***	0.181***	0.193***	0.185***	0.190***	0.192***	0.186***	0.187***	0.194***	0.196***
	(0.036)	(0.033)	(0.036)	(0.034)	(0.034)	(0.034)	(0.031)	(0.031)	(0.032)	(0.032)
Size	2.964***	3.218***	3.273***	3.348***	2.596***	2.585***	2.594***	2.601***	2.479***	2.448***
	(0.791)	(0.785)	(0.723)	(0.712)	(0.642)	(0.646)	(0.656)	(0.655)	(0.661)	(0.658)
Sales Growth	0.016	0.014	0.012	0.010	0.014	0.013	0.014	0.014	0.016	0.015
	(0.015)	(0.013)	(0.014)	(0.014)	(0.012)	(0.013)	(0.013)	(0.013)	(0.013)	(0.013)
ROA	0.315***	0.304***	0.313***	0.308***	0.288***	0.288***	0.288***	0.286***	0.286***	0.286***
	(0.056)	(0.055)	(0.056)	(0.055)	(0.053)	(0.053)	(0.052)	(0.052)	(0.053)	(0.053)
R&D	-0.032	-0.046	-0.058	-0.074	-0.073	-0.070	-0.061	-0.056	-0.068	-0.064
	(0.185)	(0.184)	(0.166)	(0.168)	(0.176)	(0.179)	(0.176)	(0.177)	(0.176)	(0.177)
LGDPPC	10.291***	8.013***	8.566***	7.762***	6.458**	7.403**	7.009***	7.390***	7.958***	7.876***
	(3.092)	(2.590)	(2.648)	(2.367)	(3.289)	(3.310)	(2.255)	(2.260)	(2.473)	(2.339)
Institution:	stock market		credit market		investment freedom		new business ease		trade freedom	
CSP_{t-1}	0.050***	-0.135***	0.056***	-0.205***	0.037**	-0.220***	0.036**	-1.035***	0.038**	-0.815***
	(0.018)	(0.028)	(0.018)	(0.056)	(0.017)	(0.078)	(0.017)	(0.189)	(0.017)	(0.184)
$Institution_{t-1}$	-0.023	-0.086***	-0.052**	-0.118***	-0.130	-0.241***	-4.896***	-8.778***	-0.058	-0.387*
	(0.028)	(0.024)	(0.024)	(0.024)	(0.104)	(0.086)	(1.011)	(1.258)	(0.230)	(0.199)
CSP_{t-1}* $Institution_{t-1}$		0.001***		0.002***		0.004***		0.112***		0.010***
		(0.0002)		(0.0004)		(0.001)		(0.020)		(0.002)
Observations	37,154	37,154	39,122	39,122	43,171	43,171	43,160	43,160	43,171	43,171
R^2	0.327	0.337	0.332	0.336	0.334	0.336	0.336	0.339	0.333	0.335
Adjusted R^2	0.214	0.225	0.215	0.220	0.222	0.224	0.225	0.227	0.220	0.223
F Statistic	1,545.811*** (df = 10; 31810)	1,468.807*** (df = 11; 31809)	1,653.633*** (df = 10; 33273)	1,531.984*** (df = 11; 33272)	1,853.887*** (df = 10; 36951)	1,701.553*** (df = 11; 36950)	1,871.829*** (df = 10; 36940)	1,718.910*** (df = 11; 36939)	1,841.982*** (df = 10; 36951)	1,689.115*** (df = 11; 36950)

Note: The table shows the results of regressing Price in year *t* on Book value per share (BVPS), Net Income per share (NIPS), the ratio of long term debt to total assets (Leverage), log of total assets (Size), year-on-year sales growth (Sales Growth), return on assets (ROA), the ratio of research and development to total sales (R&D), natural logarithm of GDP per capita (LGDPPC), a measure of CSP in year t-1 (CSP) and six country-level Market institutional indicators in year t-1; stock market Size and Liquidity (stock market), credit market development (credit market), investment Freedom, the ease of starting a new business (new business ease) and trade freedom . Interaction terms have been included (CSP*Institution) for each institutional indicator and CSP. Clustered robust standard errors from a two-way cluster approach of Petersen (2009) are shown in parentheses. P values are indicated as follows: *p<0.1; **p<0.05; ***p<0.01

In model 2, the size and liquidity of the stock market is found to positively moderate the relationship between CSP and firm value at a 1% level of significance. For a firm in a country that has a stock traded as a percent of GDP at the 25th percentile of our sample and a level of 65.78, a ten percent increase in their CSP score will yield a $0.69 decrease in value while it would result in a $0.76 increase in a country at the 75th percentile with a share of 211. The same relationship is found with regards to credit market institutional forces in model 4 but with an increased level of economic significance. For a firm in a country that has domestic credit as a percent of GDP at the 25th percentile of our sample and a level of 122.63, a ten percent increase in their CSP score will yield a $0.42 increase in value while it would result in a $1.60 increase in a country at the 75th percentile with a share of 182.61. This equates to a 5.59% increase in value for the average firm in the presence of credit market institutions that increase the availability of capital, reducing the power of capital providers relative to other stakeholder groups. Our next institutional measure, investment freedom, also positively moderates the relationship at a 1% level of significance indicating that the absence of constraints on the flow of investment capital into a country increases the value relevance of CSP. The final two institutional metrics which relate to the level of competition in the business environment from domestic start-ups and international competition are both found to positively moderate the relationship between CSP and firm value at a 1% level of significance.

Our findings provide strong support for our hypothesis related to political, labour, and market institutions. This also provides support for the validity of our central proposition: In the presence of institutional forces which increase the salience of a stakeholder group, increased performance in relation to the favoured stakeholder group's interests will be valued more by investors.

A further consideration must be given to the overall effect of Institutional factor and CSP with the recognition that our institutional factors are negatively related to value in many instances. This implies that an increase in the presence of these stakeholder-supporting institutions will reduce the value of a firm. As the value of a firm is often derived as the present value of future cashflows, the presence of institutions which divert resources into other stakeholder issues would have an expected negative effect on shareholder value. For example, in the presence of low levels of business competition, monopolistic or oligopolistic market actors may engage in rent seeking or price gouging to increase their cashflows at the expense of customers. Additionally, an increase in labour income share results by definition in a reduction in the income going to capital. However, our research indicates that the reduction in value due to stakeholder empowering institutional forces can be partially offset by increased CSP which involves a proactive engagement with stakeholder groups and the creation of a multitude of possible benefits (Malik, 2015).

We find that the signs of the control variables are consistent with our expectations across all models in tables 3.5 and 3.6. Book value per share (BVPS), Net Income per share (NIPS), Leverage, Size, return on assets, and GDP per capita are all highly significant and positively related to firm value. R&D and Sales Growth are found to be insignificant across all models. Our models explain between 32.7% and 35.3% of the total variance (R^2).

3.4.2 Sub-Pillars of CSP

We further explore the effect of the institutional context on the relationship between a firm's CSP and CFP with regards to each stakeholder group by disaggregating the CSP score into its component parts. We rerun the regression model used in Tables 3.5 and 3.6, replacing our overall measure of CSP with the firm's environmental and social score, and with each sub-theme of these measures, as listed in the data section. We report the results of

these regressions using the Environmental and social pillars with political and labour market institutions in Table 3.7 and market institutions in Table 3.8.[17]

When we disaggregate the CSP score and examine the relationship between its components pillars and value in various political and labour institutional settings in table 3.7, we find that an improvement in a firm's environmental or social score results in greater losses in the presence of weak institutions and gains in the presence of strong ones, mirroring the findings of the overall CSP score. These finds suggest that increasing a firm's social score will yield greater losses (gains) in value in the presence of weak (strong) political and labour institutions as compared to the same increase in the environmental score. For example, a 10-point increase in a firm's Social score would yield an increase in value of $0.73 when civil liberties score is 7 while the same 10-point increase in the environmental score would result in a $0.51 increase. In table 3.8, the same trend can be found when the moderating effect of market institutions is examined, although the gains or losses are nearly identical when the stock market is the moderating factor.

[17] In order to increase the readability of the tables and to conserve space, we do not report the coefficients on the control variables in tables 6 to 14, which were near identical in terms of sign, size and significance to those in tables 4 and 5.

Table 3. 8 Fixed Effects Regression of Price on Environmental & Social Scores$_{t-1}$ and Political & Labour Institutional Metrics$_{t-1}$, with Two-Way Robust Standard Errors

	Price											
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Institution:	civil liberties		control of corruption		property rights		government intervention		educational attainment		Labour Income share	
ENV_{t-1}	-0.404***		-0.327***		-0.082		-0.073*		-0.079**		-0.824***	
	(0.054)		(0.047)		(0.065)		(0.042)		(0.039)		(0.107)	
$Social_{t-1}$		-0.508***		-0.374***		-0.092		-0.124***		-0.204***		-0.866***
		(0.067)		(0.053)		(0.069)		(0.042)		(0.042)		(0.109)
$Institution_{t-1}$	-5.291***	-6.031***	-0.307***	-0.364***	-0.485***	-0.507***	-3.553***	-4.138***	-1.666***	-1.886***	-1.275***	-1.442***
	(1.209)	(1.324)	(0.116)	(0.116)	(0.075)	(0.077)	(0.902)	(0.926)	(0.290)	(0.286)	(0.181)	(0.183)
ENV_{t-1}* $Institution_{t-1}$	0.065***		0.004***		0.001*		0.024**		0.003***		0.015***	
	(0.008)		(0.001)		(0.001)		(0.010)		(0.001)		(0.002)	
$Social_{t-1}$* $Institution_{t-1}$		0.083***		0.005***		0.002*		0.039***		0.007***		0.016***
		(0.010)		(0.001)		(0.001)		(0.010)		(0.001)		(0.002)
Control variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	43,134	43,134	43,171	43,171	43,171	43,171	43,160	43,160	36,490	36,490	43,166	43,166
R^2	0.338	0.339	0.336	0.337	0.349	0.349	0.337	0.338	0.352	0.354	0.343	0.342
Adjusted R^2	0.227	0.227	0.225	0.225	0.239	0.240	0.225	0.227	0.241	0.244	0.232	0.231
F Statistic	1,713.680*** (df = 11; 36913)	1,719.899*** (df = 11; 36913)	1,702.898*** (df = 11; 36950)	1,707.857*** (df = 11; 36950)	1,798.616*** (df = 11; 36950)	1,801.633*** (df = 11; 36950)	1,703.723*** (df = 11; 36939)	1,718.356*** (df = 11; 36939)	1,537.822*** (df = 11; 31190)	1,551.193*** (df = 11; 31190)	1,752.721*** (df = 11; 36945)	1,747.081*** (df = 11; 36945)

Note: The table shows the results of regressing Price in year *t* on Book value per share (BVPS), Net Income per share (NIPS), the ratio of long term debt to total assets (Leverage), log of total assets (Size), year-on-year sales growth (Sales Growth), return on assets (ROA), the ratio of research and development to total sales (R&D), natural logarithm of GDP per capita (LGDPPC), a measure of Environmental (ENV) and Social (Social) Performance in year t-1 and six country-level Political and Labour institutional indicators in year t-1; civil liberties, control of corruption , property rights, government intervention , educational attainment , and labour income share . Interaction terms have been included (ENV*Institution, Social*Institution) for Environmental and social performance and each institutional indicator. Clustered robust standard errors from a two-way cluster approach of Petersen (2009) are shown in parentheses. P values are indicated as follows: *p<0.1; **p<0.05; ***p<0.01

Table 3. 9 Fixed Effects Regression of Price on Environmental & Social Scores$_{t-1}$ and Market Institutional Metrics$_{t-1}$, with Two-Way Robust Standard Errors

	Price									
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Institution:	stock market		credit market		investment freedom		new business ease		trade freedom	
ENV_{t-1}	-0.115***		-0.169***		-0.149**		-0.736***		-0.507***	
	(0.021)		(0.042)		(0.060)		(0.146)		(0.141)	
$Social_{t-1}$		-0.118***		-0.188***		-0.233***		-1.010***		-0.896***
		(0.029)		(0.055)		(0.077)		(0.194)		(0.188)
$Institution_{t-1}$	-0.068***	-0.083***	-0.097***	-0.116***	-0.193**	-0.263***	-7.269***	-9.195***	-0.223	-0.478**
	(0.024)	(0.024)	(0.023)	(0.024)	(0.093)	(0.081)	(1.092)	(1.367)	(0.215)	(0.189)
ENVt-1 * $Institution_{t-1}$	0.001***		0.001***		0.002***		0.079***		0.006***	
	(0.0002)		(0.0003)		(0.001)		(0.015)		(0.002)	
Socialt-1 * $Institution_{t-1}$		0.001***		0.002***		0.004***		0.109***		0.011***
		(0.0003)		(0.0004)		(0.001)		(0.021)		(0.002)
Control Variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	37,154	37,154	39,122	39,122	43,171	43,171	43,160	43,160	43,171	43,171
R^2	0.335	0.334	0.335	0.335	0.335	0.336	0.338	0.339	0.333	0.335
Adjusted R^2	0.224	0.222	0.218	0.218	0.223	0.225	0.226	0.227	0.221	0.223
F Statistic	1,458.849*** (df = 11; 31809)	1,452.150*** (df = 11; 31809)	1,524.653*** (df = 11; 33272)	1,525.175*** (df = 11; 33272)	1,694.064*** (df = 11; 36950)	1,702.432*** (df = 11; 36950)	1,711.968*** (df = 11; 36939)	1,718.655*** (df = 11; 36939)	1,680.744*** (df = 11; 36950)	1,692.432*** (df = 11; 36950)

Note: The table shows the results of regressing Price in year *t* on Book value per share (BVPS), Net Income per share (NIPS), the ratio of long term debt to total assets (Leverage), log of total assets (Size), year-on-year sales growth (Sales Growth), return on assets (ROA), the ratio of research and development to total sales (R&D), natural logarithm of GDP per capita (LGDPPC), a measure of Environmental (ENV) and Social (Social) Performance in year t-1 and five country-level Market institutional indicators in year t-1 stock market Size and Liquidity (stock market), credit market development (credit market), investment Freedom, the ease of starting a new business (new business ease) and trade freedom . Interaction terms have been included (ENV*Institution, Social*Institution) for Environmental and social performance and each institutional indicator. Clustered robust standard errors from a two-way cluster approach of Petersen (2009) are shown in parentheses. P values are indicated as follows: *p<0.1; **p<0.05; ***p<0.01

A further disaggregation of the environmental score into its sub-themes in table 3.9 shows that the resource use and the emissions score are significant at a 1% level across all models except in the case of the property rights. The interaction term of property rights and resource use is significant at a 10% level and the interaction term with emissions is insignificant. The resource use and emissions score have a similar impact on value in the presence of varying levels of stakeholder supporting political institutions. As these sub-pillars represent the environment or the interests of secondary stakeholders that do not directly control resources that firms are dependent on, the implementation of indirect stakeholder salience strategies would be their primary conduit through which they can influence firm behaviour. The presence of an institutional setting in which these secondary stakeholders can communicate freely (high civil liberties) to convince powerful stakeholders such as the courts (property rights) or government (control of corruption, government intervention) to form coalitions which can impact a firms resources will make attending to their needs both value relevant and in the interest of firms if they are to retain access to valuable resources that have a direct impact on their competitive advantage.

Table 3. 10 Fixed Effects Regression of Price on Environmental sub-pillars$_{t-1}$ and Political Institutional Metrics$_{t-1}$, with Two-Way Robust Standard Errors

	Price											
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Institution:	civil liberties			control of corruption			property rights			government intervention		
Resource $_{t-1}$	-0.321***			-0.256***			-0.062			-0.053*		
	(0.042)			(0.040)			(0.051)			(0.029)		
Emissions $_{t-1}$		-0.292***			-0.257***			-0.054			-0.081**	
		(0.043)			(0.040)			(0.050)			(0.032)	
Environmental Innovation $_{t-1}$			-0.236***			-0.170***			-0.054			-0.024
			(0.038)			(0.027)			(0.042)			(0.026)
Institution $_{t-1}$	-4.934***	-4.740***	-3.559***	-0.288**	-0.289**	-0.195*	-0.481***	-0.477***	-0.463***	-3.543***	-3.702***	-2.831***
	(1.203)	(1.196)	(1.170)	(0.115)	(0.116)	(0.113)	(0.071)	(0.072)	(0.070)	(0.884)	(0.898)	(0.897)
Resource Use $_{t-1}$ * Institution $_{t-1}$	0.054***			0.003***			0.001*			0.022***		
	(0.007)			(0.0005)			(0.001)			(0.008)		
Emissions $_{t-1}$ * Institution $_{t-1}$		0.046***			0.003***			0.001			0.024***	
		(0.007)			(0.0005)			(0.001)			(0.008)	
Environmental Innovation $_{t-1}$ * Institution $_{t-1}$			0.035***			0.002***			0.001			0.004
			(0.006)			(0.0003)			(0.001)			(0.006)
Control Variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	43,134	43,134	43,134	43,171	43,171	43,171	43,171	43,171	43,171	43,160	43,160	43,160
R^2	0.339	0.337	0.335	0.337	0.336	0.334	0.349	0.348	0.348	0.338	0.337	0.335
Adjusted R^2	0.227	0.225	0.223	0.226	0.224	0.222	0.240	0.239	0.238	0.226	0.225	0.223
F Statistic	1,718.357*** (df = 11; 36913)	1,702.882*** (df = 11; 36913)	1,691.298*** (df = 11; 36913)	1,708.407*** (df = 11; 36950)	1,697.720*** (df = 11; 36950)	1,683.064*** (df = 11; 36950)	1,803.337*** (df = 11; 36950)	1,796.297*** (df = 11; 36950)	1,794.527*** (df = 11; 36950)	1,712.862*** (df = 11; 36939)	1,707.746*** (df = 11; 36939)	1,688.900*** (df = 11; 36939)

Note: The table shows the results of regressing Price in year *t* on Book value per share (BVPS), Net Income per share (NIPS), the ratio of long term debt to total assets (Leverage), log of total assets (Size), year-on-year sales growth (Sales Growth), return on assets (ROA), the ratio of research and development to total sales (R&D), natural logarithm of GDP per capita (LGDPPC), a measure of performance on the Environmental sub pillars (Resource Use, Emissions, Environmental innovation) in year t-1 and four country-level Political institutional indicators in year t-1; civil liberties, control of corruption , property rights, and government intervention . Interaction terms have been included (e.g. Resource Use*Institution) for each Environmental sub-pillar and each institutional indicator. Clustered robust standard errors from a two-way cluster approach of Petersen (2009) are shown in parentheses. P values are indicated as follows: *p<0.1; **p<0.05; ***p<0.01

The environmental innovation score which represents a company's capacity to reduce the environmental costs and burden for its customers is found to show the most divergence across the various models. The value relevance of a company's environmental innovation score is found to be positively moderated by a country's civil liberties and control of corruption score while the protection of property rights and government intervention were found to be insignificant as moderating factors. The environmental innovation score represents the interests of a primary stakeholder group, the customer, but also secondary stakeholders who are interested in a clean environment. As environmental innovation involves creating new processes and technologies, the ability of stakeholders to form coalitions with the government or use the courts system is somewhat irrelevant as you cannot be brought to court or fined for not being creative. Additionally, the ability of a firm to differentiate itself from its competitors in the eyes of its customer and gain the benefits of its environmental innovations may also be contingent on the institutional environment. If consumers are unable to differentiate between firms because they lack information from independent third party (civil liberties) or government sources (control of corruption), they will be unable to change their purchasing patterns to reward high performing firms with increased resources.

Table 3. 11 Fixed Effects Regression of Price on Social sub-pillars$_{t-1}$ and Political Institutional Metrics$_{t-1}$, with Two-Way Robust Standard Errors

	Price															
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
Institution $_{t-1}$	civil liberties				control of corruption				property rights				government intervention			
Workforce $_{t-1}$	-0.274***				-0.223***				-0.063				-0.102***			
	(0.048)				(0.036)				(0.044)				(0.026)			
Human Rights $_{t-1}$		-0.308***				-0.218***				-0.090*				-0.054**		
		(0.046)				(0.037)				(0.048)				(0.027)		
Community $_{t-1}$			-0.224***				-0.194***				0.070*				-0.100***	
			(0.046)				(0.037)				(0.037)				(0.023)	
Product Responsibility $_{t-1}$				-0.260***				-0.166***				-0.073**				-0.043*
				(0.039)				(0.029)				(0.035)				(0.022)
Institution $_{t-1}$	-4.769***	-3.655***	-3.932***	-4.419***	-0.283**	-0.244**	-0.262**	-0.243**	-0.490***	-0.469***	-0.426***	-0.485***	-4.019***	-3.017***	-3.894***	-3.171***
	(1.348)	(1.117)	(1.245)	(1.235)	(0.116)	(0.112)	(0.106)	(0.117)	(0.071)	(0.068)	(0.066)	(0.071)	(0.879)	(0.882)	(0.876)	(0.889)
Workforce $_{t-1}$ * Institution $_{t-1}$	0.042***				0.003***				0.001				0.026***			
	(0.008)				(0.0004)				(0.001)				(0.007)			
Human Rights $_{t-1}$ * Institution $_{t-1}$		0.051***				0.003***				0.001**				0.019***		
		(0.007)				(0.0004)				(0.001)				(0.006)		
Community$_{t-1}$ * Institution $_{t-1}$			0.036***				0.002***				-0.001				0.027***	
			(0.007)				(0.0005)				(0.0004)				(0.006)	
Product Responsibility $_{t-1}$ * Institution $_{t-1}$				0.041*** (0.006)				0.002*** (0.0003)				0.001** (0.0004)				0.012** (0.005)
Control Variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	43,134	43,134	43,134	43,134	43,171	43,171	43,171	43,171	43,171	43,171	43,171	43,171	43,160	43,160	43,160	43,160
R^2	0.336	0.338	0.335	0.337	0.334	0.337	0.334	0.334	0.348	0.350	0.348	0.349	0.337	0.337	0.337	0.335
Adjusted R^2	0.224	0.226	0.223	0.225	0.222	0.225	0.222	0.222	0.239	0.240	0.239	0.239	0.225	0.226	0.226	0.223
F Statistic	1,695.633*** (df = 11; 36913)	1,712.290*** (df = 11; 36913)	1,688.344*** (df = 11; 36913)	1,702.611*** (df = 11; 36913)	1,688.044*** (df = 11; 36950)	1,706.024*** (df = 11; 36950)	1,686.470*** (df = 11; 36950)	1,687.048*** (df = 11; 36950)	1,794.969*** (df = 11; 36950)	1,806.128*** (df = 11; 36950)	1,795.610*** (df = 11; 36950)	1,797.526*** (df = 11; 36950)	1,703.869*** (df = 11; 36939)	1,709.828*** (df = 11; 36939)	1,708.752*** (df = 11; 36939)	1,694.496*** (df = 11; 36939)

Note: The table shows the results of regressing Price in year *t* on Book value per share (BVPS), Net Income per share (NIPS), the ratio of long term debt to total assets (Leverage), log of total assets (Size), year-on-year sales growth (Sales Growth), return on assets (ROA), the ratio of research and development to total sales (R&D), natural logarithm of GDP per capita (LGDPPC), a measure of performance on the Social sub pillars (Workforce, Human Rights, Community, Product Responsibility) in year t-1 and four country-level Political institutional indicators in year t-1; civil liberties, control of corruption , property rights, and government intervention . Interaction terms have been included (e.g. Workforce*Institution) for each Social sub-pillar and each institutional indicator. Clustered robust standard errors from a two-way cluster approach of Petersen (2009) are shown in parentheses. P values are indicated as follows: *p<0.1; **p<0.05; ***p<0.01

When we disaggregate the social score into its sub pillars and investigate the moderating effect of political institutions in table 3.10, we find that most sub-pillars are positively moderated by the political institutional forces under investigation at a 1% level of significance with the exception of the property rights score. The interests of primary stakeholder are represented by the workforce (employees) and product responsibility (customers) scores while secondary stakeholders are represented by the community score. The human rights score represents the interests of the most powerless worker and is also of interest to other secondary stakeholder groups in society due to general ethical considerations. The human right score shows the largest divergence in value relevance in the presence of varying levels of civil liberties and turns positive at lower levels of stakeholder supporting political institutions than the other sub-pillars. The second social sub-pillar that represents the issues of secondary stakeholders, the community score, is found to have the greatest marginal effect in the presence of varying levels of control of corruption while it's unaffected by the level of property rights. The Property rights score was found to significantly moderate the relationship with the product responsibility and human rights score, but the workforce and community score were found to be statistically insignificant. This indicates that while stronger property rights may lead to the empowerment of specific stakeholders through regulations affecting human rights and customers, it has no impact on the value relevance of non-legally binding commitments towards being a good citizen (community score). This further displays the importance of the political institutional environment to both primary and secondary stakeholder group's ability to impact firm's behaviour.

Table 3. 12 Fixed Effects Regression of Price on Environmental sub-pillars$_{t-1}$ and Labour Institutional Metrics$_{t-1}$, with Two-Way Robust Standard Errors

	Price					
	(1)	(2)	(3)	(4)	(5)	(6)
Institution $_{t-1:}$	educational attainment			labour income share		
Resource Use $_{t-1}$	-0.106***			-0.628***		
	(0.028)			(0.082)		
Emissions $_{t-1}$		-0.060*			-0.662***	
		(0.032)			(0.078)	
Environmental Innovation $_{t-1}$			-0.010			-0.446***
			(0.028)			(0.087)
Institution $_{t-1}$	-1.696***	-1.649***	-1.546***	-1.214***	-1.252***	-0.960***
	(0.282)	(0.285)	(0.272)	(0.174)	(0.180)	(0.182)
Resource Use $_{t-1}$ * Institution $_{t-1}$	0.004***			0.012***		
	(0.001)			(0.002)		
Emissions $_{t-1}$ * Institution $_{t-1}$		0.002***			0.012***	
		(0.001)			(0.001)	
Environmental Innovation $_{t-1}$ * Institution $_{t-1}$			0.0002			0.008***
			(0.001)			(0.002)
Control Variables	Yes	Yes	Yes	Yes	Yes	Yes
Observations	36,490	36,490	36,490	43,166	43,166	43,166
R^2	0.354	0.351	0.350	0.343	0.342	0.339
Adjusted R^2	0.244	0.241	0.240	0.232	0.231	0.227
F Statistic	1,550.918*** (df = 11; 31190)	1,534.924*** (df = 11; 31190)	1,528.327*** (df = 11; 31190)	1,754.060*** (df = 11; 36945)	1,745.755*** (df = 11; 36945)	1,719.242*** (df = 11; 36945)

Note: The table shows the results of regressing Price in year *t* on Book value per share (BVPS), Net Income per share (NIPS), the ratio of long term debt to total assets (Leverage), log of total assets (Size), year-on-year sales growth (Sales Growth), return on assets (ROA), the ratio of research and development to total sales (R&D), natural logarithm of GDP per capita (LGDPPC), a measure of performance on the Environmental sub pillars (Resource Use, Emissions, Environmental innovation) in year t-1 and two country-level Labour institutional indicators in year t-1; educational attainment and labour income share . Interaction terms have been included (e.g. Resource Use*Institution) for each Environmental sub-pillar and each institutional indicator. Clustered robust standard errors from a two-way cluster approach of Petersen (2009) are shown in parentheses. P values are indicated as follows: *p<0.1; **p<0.05; ***p<0.01

The next set of institutional variables to be investigated in tables 3.11 and 3.12 are those related to the labour market, educational attainment, and labour income share, which are expected to be the most important for employees. We find that the relationship between the performance of a company with regards to the environment (resource use and emissions score), its employees (as reflected in the Workforce and Human Rights Score), society (Community Score), consumers (Product Responsibility Score) and its financial performance, is positive moderated in the context of a more educated workforce and increased labour power. With the exception of the statistically insignificant educational attainment and environmental innovation interaction term, all other pillars and sub-pillars were positively moderated by the educational attainment and labour income share at a 1% level. The positive impact of a highly skilled and empowered workforce on the value relevance of multiple elements of CSP may stem from the ability of other stakeholders to form coalitions with this empowered group in addition to the fact that employees can often have multiple stakeholder roles as consumers and members of the community that allows for a spill over effect into other stakeholder interest areas.

Table 3. 13 Fixed Effects Regression of Price on Social sub-pillars$_{t-1}$ and Labour Institutional Metrics$_{t-1}$, with Two-Way Robust Standard Errors

	Price							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Institution $_{t-1}$:	educational attainment				labour income share			
Workforce $_{t-1}$	-0.141***				-0.510***			
	(0.035)				(0.091)			
Human Rights $_{t-1}$		-0.102***				-0.553***		
		(0.022)				(0.071)		
Community $_{t-1}$			-0.117***				-0.320***	
			(0.033)				(0.081)	
Product Responsibility $_{t-1}$				-0.070**				-0.411***
				(0.029)				(0.064)
Institution $_{t-1}$	-1.812***	-1.668***	-1.709***	-1.655***	-1.304***	-1.018***	-1.097***	-1.079***
	(0.274)	(0.274)	(0.265)	(0.273)	(0.187)	(0.181)	(0.178)	(0.177)
Workforce $_{t-1}$ * Institution $_{t-1}$	0.004***				0.009***			
	(0.001)				(0.002)			
Human Rights $_{t-1}$ * Institution $_{t-1}$		0.003***				0.010***		
		(0.001)				(0.001)		
Community $_{t-1}$ * Institution $_{t-1}$			0.003***				0.006***	
			(0.001)				(0.002)	
Product Responsibility $_{t-1}$ * Institution $_{t-1}$				0.002***				0.007***
				(0.001)				(0.001)
Control Variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	36,490	36,490	36,490	36,490	43,166	43,166	43,166	43,166
R^2	0.352	0.353	0.351	0.351	0.339	0.342	0.337	0.339
Adjusted R^2	0.241	0.243	0.241	0.241	0.227	0.231	0.226	0.228
F Statistic	1,537.765*** (df = 11; 31190)	1,546.764*** (df = 11; 31190)	1,536.702*** (df = 11; 31190)	1,534.690*** (df = 11; 31190)	1,720.185*** (df = 11; 36945)	1,745.500*** (df = 11; 36945)	1,710.098*** (df = 11; 36945)	1,723.396*** (df = 11; 36945)

Note: The table shows the results of regressing Price in year *t* on Book value per share (BVPS), Net Income per share (NIPS), the ratio of long term debt to total assets (Leverage), log of total assets (Size), year-on-year sales growth (Sales Growth), return on assets (ROA), the ratio of research and development to total sales (R&D), natural logarithm of GDP per capita (LGDPPC), a measure of performance on the Social sub pillars (Workforce, Human Rights, Community, Product Responsibility) in year t-1 and two country-level Political institutional indicators in year t-1; educational attainment and labour income share . Interaction terms have been included (e.g. Workforce*Institution) for each Social sub-pillar and each institutional indicator. Clustered robust standard errors from a two-way cluster approach of Petersen (2009) are shown in parentheses. P values are indicated as follows: *p<0.1; **p<0.05; ***p<0.01

In tables 3.13 and 3.14, the market institutional variables were found to positively moderate the relationship between most of the environmental and social sub-themes and value at a 1% level of significance. As an increase in the availability of capital via the stock or credit markets would reduce its uniqueness or scarcity, the power of shareholders relative to other stakeholder groups such as workers and the environment may be reduced. Additionally, a larger and more liquid stock market and more developed credit markets may improve informational efficiency which may increase the valuation of the performance of the company with regards to climate related risk factors as evidenced by how the sub pillars are moderated by the size and liquidity of a country's stock market and development of stock markets.

Investment Freedom is significant in all cases implying that the presence of foreign investors and fewer restrictions to the movement of capital, increases the valuation of higher levels of CSP, affecting employees, consumers, and the environment. In the presence of increased capital from international sources, the relative power of shareholders may be reduced making attending to the issues on non-shareholding stakeholders more relevant to valuation. This would also align with the predictions of legitimacy theory which suggests that greater CSP would increase the firm's legitimacy and valuation in the presence of more SRI investors (Lourenço et al., 2012). The business competitions based institutional factors, new business ease and trade freedom, were found to be significant in all cases. Employees and consumers would be expected to be the stakeholders most directly affected by greater start-up competition and trade freedom, given the increased scope for competition in product and labour markets but the spill over effect of their empowerment can be seen by the effect on other sub-pillars.

Table 3. 14 Fixed Effects Regression of Price on Environmental sub-pillars$_{t-1}$ and Market Institutional Metrics$_{t-1}$, with Two-Way Robust Standard Errors

	Price														
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
Institution t-1:	stock market			credit market			investment freedom			new business ease			trade freedom		
Resource Use $_{t-1}$	-0.072***			-0.127***			-0.108**			-0.645***			-0.474***		
	(0.016)			(0.032)			(0.052)			(0.133)			(0.109)		
Emissions $_{t-1}$		-0.082***			-0.136***			-0.105**			-0.505***			-0.312***	
		(0.017)			(0.033)			(0.041)			(0.124)			(0.109)	
Environmental Innovation $_{t-1}$			-0.089***			-0.081***			-0.117***			-0.366***			-0.287**
			(0.017)			(0.029)			(0.041)			(0.088)			(0.117)
Institution $_{t-1}$	-0.061**	-0.057**	-0.042	-0.099***	-0.092***	-0.059**	-0.189**	-0.180*	-0.154	-7.325***	-6.801***	-5.499***	-0.244	-0.174	-0.095
	(0.024)	(0.025)	(0.027)	(0.023)	(0.023)	(0.023)	(0.091)	(0.096)	(0.098)	(1.095)	(1.092)	(0.981)	(0.217)	(0.222)	(0.220)
Resource Use* Institution $_{t-1}$	0.001***			0.001***			0.002***			0.071***			0.006***		
	(0.0001)			(0.0002)			(0.001)			(0.014)			(0.001)		
Emissions* Institution $_{t-1}$		0.001***			0.001***			0.002***			0.054***			0.004***	
		(0.0001)			(0.0002)			(0.001)			(0.013)			(0.001)	
Environmental Innovation* Institution $_{t-1}$			0.001***			0.001***			0.002***			0.038***			0.003**
			(0.0001)			(0.0002)			(0.001)			(0.009)			(0.001)
Control Variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	37,154	37,154	37,154	39,122	39,122	39,122	43,171	43,171	43,171	43,160	43,160	43,160	43,171	43,171	43,171
R^2	0.336	0.332	0.330	0.337	0.334	0.332	0.336	0.335	0.334	0.339	0.337	0.336	0.335	0.333	0.333
Adjusted R^2	0.224	0.220	0.217	0.220	0.217	0.214	0.224	0.223	0.222	0.227	0.225	0.225	0.223	0.221	0.220
F Statistic	1,460.201*** (df = 11; 31809)	1,440.105*** (df = 11; 31809)	1,424.529*** (df = 11; 31809)	1,534.346*** (df = 11; 33272)	1,518.884*** (df = 11; 33272)	1,500.902*** (df = 11; 33272)	1,700.280*** (df = 11; 36950)	1,689.384*** (df = 11; 36950)	1,687.633*** (df = 11; 36950)	1,720.218*** (df = 11; 36939)	1,706.604*** (df = 11; 36939)	1,702.003*** (df = 11; 36939)	1,690.091*** (df = 11; 36950)	1,675.905*** (df = 11; 36950)	1,673.766*** (df = 11; 36950)

Note: The table shows the results of regressing Price in year *t* on Book value per share (BVPS), Net Income per share (NIPS), the ratio of long term debt to total assets (Leverage), log of total assets (Size), year-on-year sales growth (Sales Growth), return on assets (ROA), the ratio of research and development to total sales (R&D), natural logarithm of GDP per capita (LGDPPC), a measure of performance on the Environmental sub pillars (Resource Use, Emissions, Environmental innovation) in year t-1 and five country-level Labour institutional indicators in year t-1; stock market Size and Liquidity (stock market), credit market development (credit market), investment Freedom, the ease of starting a new business (new business ease) and trade freedom . Interaction terms have been included (e.g. Resource Use*Institution) for each Environmental sub-pillar and each institutional indicator. Clustered robust standard errors from a two-way cluster approach of Petersen (2009) are shown in parentheses. P values are indicated as follows: *p<0.1; **p<0.05; ***p<0.01

Table 3. 15 Fixed Effects Regression of Price on Social sub-pillars$_{t-1}$ and Market Institutional Metrics$_{t-1}$, with Two-Way Robust Standard Errors

	Price																			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)
Institution$_{t-1}$:	stock market				credit market				investment freedom				new business ease				trade freedom			
Workforce $_{t-1}$	-0.094***				-0.159***				-0.121**				-0.556***				-0.430***			
	(0.021)				(0.041)				(0.048)				(0.149)				(0.122)			
Human Rights $_{t-1}$		-0.072***				-0.117***				-0.129***				-0.671***				-0.564***		
		(0.017)				(0.030)				(0.041)				(0.115)				(0.121)		
Community $_{t-1}$			-0.032				-0.071**				-0.106*				-0.460***				-0.640***	
			(0.023)				(0.033)				(0.059)				(0.155)				(0.183)	
Product Responsibility $_{t-1}$				-0.069***				-0.085***				-0.137***				-0.481***				-0.311***
				(0.015)				(0.030)				(0.034)				(0.131)				(0.102)
Institution $_{t-1}$	-0.067***	-0.041*	-0.042*	-0.054**	-0.113***	-0.070***	-0.078***	-0.071***	-0.210**	-0.156	-0.211***	-0.191**	-8.085***	-6.386***	-7.192***	-6.613***	-0.311	-0.168	-0.411**	-0.184
	(0.026)	(0.025)	(0.024)	(0.025)	(0.027)	(0.022)	(0.023)	(0.023)	(0.089)	(0.098)	(0.078)	(0.093)	(1.438)	(1.041)	(1.211)	(1.044)	(0.208)	(0.219)	(0.175)	(0.218)
Workforce $_{t-1}$ * Institution $_{t-1}$	0.001***				0.001***				0.002***				0.058***				0.005***			
	(0.0002)				(0.0003)				(0.001)				(0.016)				(0.002)			
Human Rights$_{t-1}$*Institution $_{t-1}$		0.001***				0.001***				0.002***				0.073***				0.007***		
		(0.0001)				(0.0002)				(0.001)				(0.012)				(0.001)		
Community $_{t-1}$ * Institution $_{t-1}$			0.0003				0.001***				0.002*				0.049***				0.008***	
			(0.0002)				(0.0002)				(0.001)				(0.016)				(0.002)	
Product Responsibility$_{t-1}$* Institution $_{t-1}$				0.001*** (0.0001)				0.001*** (0.0002)				0.002*** (0.0005)				0.051*** (0.014)				0.004*** (0.001)
Control Variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	37,154	37,154	37,154	37,154	39,122	39,122	39,122	39,122	43,171	43,171	43,171	43,171	43,160	43,160	43,160	43,160	43,171	43,171	43,171	43,171
R^2	0.330	0.334	0.327	0.330	0.333	0.335	0.332	0.332	0.334	0.336	0.334	0.335	0.337	0.339	0.337	0.337	0.333	0.335	0.334	0.333
Adjusted R^2	0.218	0.223	0.214	0.218	0.216	0.219	0.214	0.215	0.222	0.224	0.222	0.223	0.225	0.228	0.225	0.225	0.221	0.223	0.222	0.221
F Statistic	1,426.162** * (df = 11; 31809)	1,452.602** * (df = 11; 31809)	1,405.546** * (df = 11; 31809)	1,426.972** * (df = 11; 31809)	1,510.168** * (df = 11; 33272)	1,526.423** * (df = 11; 33272)	1,502.599** * (df = 11; 33272)	1,505.519** * (df = 11; 33272)	1,687.303** * (df = 11; 36950)	1,700.051** * (df = 11; 36950)	1,687.837** * (df = 11; 36950)	1,694.523** * (df = 11; 36950)	1,705.595** * (df = 11; 36939)	1,721.311** * (df = 11; 36939)	1,704.147** * (df = 11; 36939)	1,706.306** * (df = 11; 36939)	1,677.038** * (df = 11; 36950)	1,693.874** * (df = 11; 36950)	1,685.826** * (df = 11; 36950)	1,675.655** * (df = 11; 36950)

Note: The table shows the results of regressing Price in year *t* on Book value per share (BVPS), Net Income per share (NIPS), the ratio of long term debt to total assets (Leverage), log of total assets (Size), year-on-year sales growth (Sales Growth), return on assets (ROA), the ratio of research and development to total sales (R&D), natural logarithm of GDP per capita (LGDPPC), a measure of performance on the Social sub pillars (Workforce, Human Rights, Community, Product Responsibility) in year t-1 and five country-level Market institutional indicators in year t-1; stock market Size and Liquidity (stock market), credit market development (credit market), investment Freedom, the ease of starting a new business (new business ease) and trade freedom . Interaction terms have been included (e.g. Workforce*Institution) for each Social sub-pillar and each institutional indicator. Clustered robust standard errors from a two-way cluster approach of Petersen (2009) are shown in parentheses. P values are indicated as follows: *p<0.1; **p<0.05; ***p<0.01

These results, while adding another level of scrutiny to the data, provide further support for our central proposition that performance in relation to a stakeholders interests are more highly valued by investors in the presence of institutions which increase the salience of that stakeholder group. The disaggregation of CSP into its component parts may also indicate the interconnected nature of many stakeholder issues. The value of performance on metrics not directly related to a stakeholder group that is empowered by the presence of certain institutional factors or a spill-over effect is clearly present in our results.

3.4.3 Peer Group CSP Variables

In order to increase the robustness of our findings and to account for a possible divergence of treatment along the CSP-CFP continuum, we substitute our CSP variable with peer group dummy variables and report the results in Table 3.15. These peer group dummy variables are implemented as heterogeneous information constraints and utility functions could lead investors to value CSP differently, inducing groupings along the CSP-CFP continuum similar to a clientele effect (Ding et al., 2016). A CSP clientele effect would entail each grouping of firms being assumed to have a body of shareholders who find their strategic CSP positioning optimal and that a change from one grouping to another results in a change in clientele which could be beneficial or costly. Organisations have a number of strategic options available to them to address the economic, legal or ethical claims that a stakeholder group may assert which have been categorised as proaction, accommodation, defence and reaction (A. Carroll, 1979; Clarkson, 1995; Gatewood & Carroll, 1981; Jawahar & McLaughlin, 2001). Proaction involves an attempt to enhance the interests of a particular stakeholder group by anticipating and actively addressing specific concerns or leading an industry effort to do so (Jawahar & McLaughlin, 2001). Accommodation involves accepting responsibility but at the same time, bargaining to obtain concessions (Jawahar &

McLaughlin, 2001). A defensive strategy results in the firm doing only what is the minimum legal requirement to address a stakeholder's issue and actively defending against demands to do more. Finally, a reactionary strategic stance entails either fighting against addressing a stakeholder's issues or completely withdrawing and ignoring the stakeholder (Jawahar & McLaughlin, 2001). These strategies exist on a continuum with the first two strategies being more satisfactory to stakeholders and resource intensive for organisations than the remaining two, and a defence strategy being legally defensible but more costly than a reactionary stance. Hence the choice of strategy with regards to each stakeholder group may be a function of the extent to which the firm is dependent on the stakeholder for critical resources. Our peer group variables are used as a proxy for these strategic approaches, and we test whether their value relevance is contingent on the institutional context.

Table 3. 16 Fixed Effects Regression of Price on CSP_{t-1} Peer groupings and Institutional $Metrics_{t-1}$ with Two-Way Robust Standard Errors

	Price											
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
$Institution_{t-1}$:	none	civil liberties	control of corruption	property rights	government intervention	educational attainment	labour income share	stock market	credit market	investment freedom	new business ease	trade freedom
CSP Group 2 (25-50%)	-0.073	-9.918***	-6.994***	-0.263	-3.919***	-3.973***	-18.376***	-3.621***	-6.377***	-2.951**	-21.424***	-8.940*
	(0.417)	(1.490)	(1.300)	(1.935)	(1.240)	(1.442)	(3.504)	(0.712)	(1.459)	(1.486)	(6.941)	(5.023)
CSP Group 3 (50-75%)	1.034	-22.151***	-16.563***	-3.540	-4.224**	-7.347***	-41.027***	-7.107***	-11.621***	-8.346***	-42.842***	-31.163***
	(0.677)	(2.956)	(2.397)	(3.605)	(2.146)	(2.041)	(5.173)	(1.102)	(2.244)	(3.179)	(8.627)	(8.287)
CSP Group 4 (75-100%)	3.458***	-32.751***	-27.209***	-10.893**	-6.589**	-8.415***	-67.147***	-7.829***	-10.486***	-14.088**	-67.299***	-56.992***
	(1.102)	(4.940)	(3.964)	(5.314)	(3.285)	(3.261)	(8.976)	(2.039)	(3.584)	(5.571)	(13.182)	(13.692)
$Institution_{t-1}$		-4.638***	-0.275**	-0.472***	-3.488***	-1.701***	-1.167***	-0.060**	-0.092***	-0.173*	-7.056***	-0.196
		(1.155)	(0.114)	(0.071)	(0.900)	(0.279)	(0.174)	(0.024)	(0.023)	(0.093)	(1.073)	(0.207)
CSP Group 2 * $Institution_{t-1}$		1.543***	0.082***	0.002	1.081***	0.116***	0.323***	0.029***	0.045***	0.042**	2.229***	0.108*
		(0.243)	(0.016)	(0.023)	(0.331)	(0.038)	(0.062)	(0.006)	(0.010)	(0.021)	(0.729)	(0.061)
CSP Group 3 * $Institution_{t-1}$		3.581***	0.208***	0.058	1.408***	0.237***	0.743***	0.068***	0.090***	0.131***	4.577***	0.385***
		(0.470)	(0.028)	(0.044)	(0.538)	(0.051)	(0.096)	(0.010)	(0.016)	(0.043)	(0.915)	(0.102)
CSP Group 4 * $Institution_{t-1}$		5.500***	0.362***	0.180***	2.402***	0.322***	1.239***	0.094***	0.102***	0.238***	7.371***	0.716***
		(0.758)	(0.047)	(0.065)	(0.809)	(0.078)	(0.167)	(0.018)	(0.025)	(0.074)	(1.409)	(0.164)
Control Variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	43,171	43,134	43,171	43,171	43,160	36,490	43,166	37,154	39,122	43,171	43,160	43,171
R^2	0.333	0.339	0.338	0.350	0.338	0.353	0.344	0.336	0.336	0.336	0.339	0.335
Adjusted R^2	0.221	0.227	0.226	0.241	0.227	0.243	0.233	0.225	0.220	0.225	0.228	0.223
F Statistic	1,680.275*** (df = 11; 36950)	1,261.311*** (df = 15; 36909)	1,256.620*** (df = 15; 36946)	1,327.453*** (df = 15; 36946)	1,258.605*** (df = 15; 36935)	1,134.598*** (df = 15; 31186)	1,289.297*** (df = 15; 36941)	1,074.284*** (df = 15; 31805)	1,124.735*** (df = 15; 33268)	1,248.935*** (df = 15; 36946)	1,262.923*** (df = 15; 36935)	1,241.413*** (df = 15; 36946)

Note: The table shows the results of regressing the average price in year *t* on net book value (BVPS) and net income (NIPS) for financial year *t* together with leverage – ratio of long term debt to total assets (LEV), log of total assets (SIZE), return on assets (ROA), dummy variables constructed by grouping firms into quartiles based on their CSP scores (CSP Group 2, 3 ,4) and eleven country-level institutional indicators; civil liberties, control of corruption , property rights, government intervention , educational attainment , labour income share , stock market size and liquidity (stock market), credit market development (credit market), investment freedom , the ease of starting a new business (new business ease) and trade freedom . Interaction terms have been included (CSP*Institution) for each institutional indicator and CSP. Clustered robust standard errors from a two-way cluster approach of Petersen (2009) are shown in parentheses. P values are indicated as follows: *p<0.1; **p<0.05; ***p<0.01

The first model in table 3.15 examines the value relevance of the various groupings without the inclusion of an institutional variable, having used Group 1 (CSP score of 0-25) which represents a reactionary strategy as the reference group against which all other groups are compared. Our findings from model one suggests that there is no significant difference in the value of firms in groups 1 to 3 representing the reactionary (CSP of 0-25), defence (CSP of 25-50) and accommodation (CSP of 50-75) strategies. However, group 4 (CSP of 75-100) which represents a proactive strategic stance is found to be significant at a 1% level. On average, a firm that improves its CSP score relative to its industry peers enough to become a member of the top grouping would benefit from a $3.49 increase in value which equates to a 12% increase in value for the average firm in our sample. This increase is roughly double of what would be expected from a 50-point change in CSP score estimated using model 2 (a) of table 3.5[18]. This provides some evidence for Barnett & Salomon's (2006) theory that firms must reach a level of credibility in their CSP before they are rewarded with increases in value. While this indicates the importance of considering the treatment of different groupings or strategic approaches, the value of these approaches may be altered in different institutional setting, so we include our institutional interaction terms in the remaining models.

A clear pattern emerges across the institutional variables in our models with the interaction term on most groups becoming significant at a 1% level, indicating that the value of varying strategic approaches to CSP is impacted by the contextual setting. The only exceptions is the interaction terms on the property rights variable which only becomes significant at a 1% level for groups 4. These findings confirm the same relationship that was found in tables 3.5 and 3.6 with higher levels of CSP being valued more (less) in the presence of stronger (weaker) stakeholder supporting institutions but with higher quartiles displaying

[18] CSP coefficient from model 2(a) is 0.034 so a 50 point increase in CSP from 25 to 75 would equate to a $1.80 increase in value.

increasingly steep slopes. Across the institutional models, the higher the grouping the greater the loss in value in the presence of weak institutional forces and the greater the gains in the presence of strong institutions. For example, if a firm was to move from group 1 to group 2, group 3, or group 4 in a country with a control of corruption score of 60, they would suffer a reduction in value of $2.07, $4.08 and $5.49 respectively. However, the same moves in a country with a control of corruption score of 90 would increase the value of the firm by $0.38, $2.16, and $5.37 respectively. Using the model estimates from table 3.4, a change of this magnitude or a 25-, 50-, or 75-point increase in CSP would equate to $2.85, $5.70 and $8.55 reduction in value in a country with a control of corruption score of 60 or an increase of $0.90, $1.8 and $2.70 in countries with a control of corruption score of 90. These findings confirm that in the presence of weak stakeholder supporting institutions, CSP strategies that attend to stakeholders' issues have a negative effect on firm value with the more active strategies resulting in the greatest losses. However, in the presence of strong institutions which empower stakeholders a proactive or accommodative strategic stance will result in outsized gains as compared to estimates using our non-grouped model.

These findings provide support for our first hypothesis that investors value CSP more in countries with stronger stakeholder supporting institutions in addition to demonstrating the presence of groupings along the CSP-CFP continuum similar to a clientele effect (Ding et al., 2016). The implementation of industry- relative peer groupings, representing the various types of stakeholder management strategies, contribute evidence of a more nuanced relationship with CSP becoming value relevant to investors only after a firm's strategic approach is perceived to have changed. Additionally, the higher quartiles display increasingly steep slopes, further displaying the importance of context in the value relevance of CSP. These findings that more proactive stakeholder management strategies are more valuable in the presence of institutions that empower stakeholder groups with the ability to impact the resources of firms lends further evidence to substantiate the claim that investors

take an instrumental view of CSP with context dictating whether CSP positively or negatively relates to value. Additionally, it may also indicate that the presence of heterogeneous information constraints forces investors to group firms based on their overall strategic stance towards stakeholder issues, rewarding a change in overall stance or a change in grouping as opposed to individual point changes in CSP score.

3.4.4 Domestic and Multinational Firms

The reliance of a firm on domestic stakeholder groups for access to resources and its resulting exposure to stakeholder pressure may differ based on the level of embeddedness of the firm in its home country. An ability to access resources in other jurisdictions or even the threat of doing so may increase the power of a firm relative to its stakeholders and hence make attending to their claims via increased CSP less valuable. Hence, a difference in the value relevance of a firm's level of CSP to investors may be affected by a firm's level of multinationality. To address these issues and to increase the robustness of our study, we divide the sample into domestic and multinational firms to examine whether there is a divergence in the value relevance of CSP between these groups. Following Cai et al. (2016), firms are classified into each group based on their amount of foreign assets with firms that have at least 10% of their assets in host countries categorised as multinational firms and the remaining firms as domestic. We rerun the panel regression including the institutional moderators separately for domestic and multinational firms and report the results in tables 3.16 and 3.17.

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Table 3. 17 Multinational and Domestic Firms with Political & Labour Institutional Metrics$_{t-1}$ with Two-Way Robust Standard Errors

	Price													
	Domestic							Multinational						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
BVPS	1.131***	1.116***	1.117***	1.108***	1.111***	1.038***	1.109***	1.024***	1.014***	1.027***	1.016***	1.012***	0.929***	0.996***
	(0.086)	(0.086)	(0.086)	(0.087)	(0.087)	(0.096)	(0.087)	(0.088)	(0.087)	(0.087)	(0.087)	(0.086)	(0.088)	(0.086)
NIPS	2.566***	2.543***	2.549***	2.493***	2.578***	2.471***	2.549***	2.055***	2.096***	2.064***	2.056***	2.104***	2.119***	2.085***
	(0.323)	(0.322)	(0.320)	(0.321)	(0.318)	(0.319)	(0.317)	(0.269)	(0.266)	(0.267)	(0.263)	(0.271)	(0.269)	(0.265)
Leverage	0.264***	0.257***	0.263***	0.243***	0.257***	0.245***	0.257***	0.120***	0.110**	0.122***	0.103**	0.121***	0.075	0.115***
	(0.038)	(0.037)	(0.037)	(0.036)	(0.038)	(0.038)	(0.037)	(0.044)	(0.043)	(0.043)	(0.042)	(0.043)	(0.046)	(0.043)
Size	1.229	1.357	1.374	1.562	1.417	2.487*	1.459	3.103***	3.312***	3.041***	3.196***	3.314***	5.435***	3.350***
	(1.251)	(1.256)	(1.256)	(1.217)	(1.260)	(1.419)	(1.228)	(1.127)	(1.113)	(1.117)	(1.101)	(1.121)	(1.314)	(1.136)
Sales Growth	0.014	0.012	0.012	0.011	0.011	0.006	0.013	0.020	0.019	0.020*	0.021*	0.019	0.018	0.017
	(0.016)	(0.016)	(0.016)	(0.015)	(0.016)	(0.019)	(0.015)	(0.012)	(0.013)	(0.012)	(0.012)	(0.013)	(0.017)	(0.012)
ROA	0.247***	0.246***	0.246***	0.248***	0.240***	0.261***	0.233***	0.285***	0.289***	0.285***	0.284***	0.280***	0.282***	0.277***
	(0.067)	(0.066)	(0.067)	(0.066)	(0.066)	(0.071)	(0.066)	(0.060)	(0.060)	(0.060)	(0.059)	(0.061)	(0.065)	(0.058)
R&D	-0.284	-0.265	-0.288	-0.252	-0.249	-0.236	-0.273	-0.001	0.022	0.003	0.012	0.006	0.019	-0.021
	(0.222)	(0.220)	(0.221)	(0.217)	(0.219)	(0.238)	(0.218)	(0.236)	(0.223)	(0.236)	(0.236)	(0.229)	(0.280)	(0.228)
LGDPPC	12.069***	13.712***	14.155***	9.849***	14.293***	18.470***	13.109***	8.218***	9.233***	10.008***	5.638**	8.451**	18.629***	10.282***
	(2.799)	(2.856)	(3.519)	(2.963)	(3.518)	(3.594)	(2.755)	(3.067)	(3.304)	(3.263)	(2.813)	(3.643)	(4.687)	(3.151)
Institution	none	civil liberties	control of corruption	property rights	government intervention	educational attainment	labour income share	None	civil liberties	control of corruption	property rights	government intervention	educational attainment	labour income share
CSP_{t-1}	0.056**	-0.461***	-0.413***	-0.043	-0.161***	-0.194***	-0.964***	0.009	-0.654***	-0.438***	-0.140	-0.100**	0.024	-1.028***
	(0.024)	(0.080)	(0.072)	(0.074)	(0.051)	(0.071)	(0.151)	(0.024)	(0.109)	(0.089)	(0.106)	(0.051)	(0.085)	(0.229)
$Institution_{t-1}$		-3.107***	-0.355***	-0.469***	-4.386***	-1.875***	-1.558***		-10.615***	-0.557***	-0.503***	-3.618***	-1.139***	-1.124***
		(1.175)	(0.114)	(0.082)	(1.296)	(0.347)	(0.253)		(1.826)	(0.153)	(0.102)	(0.977)	(0.346)	(0.209)
CSP_{t-1} * $Institution_{t-1}$		0.081***	0.006***	0.001	0.060***	0.007***	0.018***		0.100***	0.005***	0.002	0.026**	-0.0002	0.018***
		(0.013)	(0.001)	(0.001)	(0.015)	(0.002)	(0.003)		(0.017)	(0.001)	(0.001)	(0.012)	(0.002)	(0.004)
Observations	19,852	19,846	19,852	19,852	19,846	16,865	19,851	14,149	14,133	14,149	14,149	14,149	12,106	14,148
R^2	0.321	0.326	0.326	0.336	0.326	0.335	0.330	0.322	0.333	0.326	0.335	0.327	0.336	0.331
Adjusted R^2	0.150	0.156	0.156	0.168	0.157	0.167	0.161	0.188	0.201	0.193	0.204	0.194	0.205	0.199
F Statistic	831.753*** (df = 9; 15861)	696.632*** (df = 11; 15854)	697.377*** (df = 11; 15859)	728.234*** (df = 11; 15859)	698.538*** (df = 11; 15853)	616.802*** (df = 11; 13450)	709.687*** (df = 11; 15858)	623.151*** (df = 9; 11817)	535.575*** (df = 11; 11799)	520.026*** (df = 11; 11815)	540.991*** (df = 11; 11815)	521.007*** (df = 11; 11815)	464.897*** (df = 11; 10106)	531.519*** (df = 11; 11814)

Note: The table shows the results of two sets of regressions having split the sample into domestic and multinational firms based on their percentage of foreign assets with firms with firms with over 10% of foreign assets being categorised as multinationals. Each table shows the results of regressing the average price in year *t* on net book value (BVPS) and net income (NIPS) for financial year *t* together with leverage – ratio of long term debt to total assets (LEV), log of total assets (SIZE), institutional concentration of ownership (INSCON), return on assets (ROA), a measure of CSP (CSP) and six country-level Political and Labour institutional indicators; civil liberties, control of corruption , property rights, educational attainment , and labour income share . Interaction terms have been included (CSP*Institution) for each institutional indicator and CSP. Clustered robust standard errors from a two-way cluster approach of Petersen (2009) are shown in parentheses. P values are indicated as follows: *p<0.1; **p<0.05; ***p<0.01

We find that the effect of three of the four political institutional moderators, civil liberties, control of corruption and government intervention remain positive and significant for both groups of firms. In the case of civil liberties and control of corruption we find that the strength of these home country Institutions has a larger effect for multinational firms in the presence of weak institutions and domestic firms in the presence of strong institutions. For example, a ten percent increase in a multinational firms CSP will on average result in a decrease of $1.38 in a country with a control of corruption score of 50 while this would result in a smaller decrease of $1.13 for a domestic firm in the same institutional environment. In a country with a control of corruption score of 90, the same increase in CSP would result in a $0.12 and $1.27 increase in value for a multinational and domestic firm respectively. The increased importance of these institutions to the value of multinationals may stem from their ability to impact the perceived reputation of a firm. These results may also add some supportive empirical evidence to the idea of "liabilities of origins" (Edman, 2016; Pant & Ramachandran, 2017) as it demonstrates that multinationals from countries with weak institutions reap less benefits from CSP due to a possible lack of credibility as investors may believe that they are constrained in their capacity to act legitimately when they expand abroad. For domestic firms, their relatively greater reliance on domestic stakeholders for access to resources can explain why attending to their issues via increased CSP adds to value in weaker institutional settings and has a greater positive impact the stronger the stakeholder supporting institutions.

Government intervention shows a slightly different trend from the other two political institution variables with domestic firms having a greater downside in the presence of weak institutions in addition to upside in the presence of strong institutions. The impact of a 10-point increase in CSP in the presence of the mean government intervention score in our sample (6.116) would result in a 2.06% or 7.18% increase in value for the average multinational and domestic firm in our sample respectively. A similar pattern is found in

relation to the Labour income share, Investment freedom and trade freedom Institutional measures with the interaction terms found to be significant at a 1% level and an amplification of the importance of CSP to value for domestic firms. This indicates that while these Institutions of a firm's home country are important for investors in both types of firms, domestic firms are more embedded in their home countries and hence more exposed to stakeholder pressure in the presence of strong institutions, so it would be rational that investors would value CSP to a greater degree for these firms due to their greater degree of resource dependence from reduced substitutability.

Educational attainment, stock market, credit market and start-up competition institutional metrics the most divergence of any groups with all four measures positively moderating the relationship at a 1% level of significance for domestic firms while they are found to be insignificant for multinational firms. This could be due to a multinational's ability to access multiple labour, capital and product markets decreasing their dependence on their home country and hence reliance on home-country stakeholder groups for human capital, capital, and sales.

Table 3. 18 Multinational and Domestic Firms with Market Institutional Metrics$_{t-1}$ with Two-Way Robust Standard Errors

	Price									
	Domestic					Multinational				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Institution$_{t-1}$:	stock market	credit market	investment freedom	new business ease	trade freedom	stock market	credit market	investment freedom	new business ease	trade freedom
CSPt-1	-0.047	-0.372***	-0.234**	-1.172***	-0.832***	0.019	-0.004	-0.226**	-0.508	-0.594**
	(0.030)	(0.064)	(0.101)	(0.257)	(0.165)	(0.031)	(0.066)	(0.088)	(0.354)	(0.281)
Institution$_{t-1}$	-0.037**	-0.147***	-0.206*	-8.819***	-0.668***	0.006	-0.040*	-0.225***	-6.279***	0.036
	(0.019)	(0.033)	(0.106)	(1.675)	(0.182)	(0.008)	(0.022)	(0.066)	(2.196)	(0.233)
CSP$_{t-1}$ * Institution$_{t-1}$	0.001***	0.003***	0.004***	0.128***	0.011***	-0.0001	0.0002	0.003***	0.054	0.007**
	(0.0002)	(0.0004)	(0.001)	(0.027)	(0.002)	(0.0001)	(0.0004)	(0.001)	(0.036)	(0.003)
Control Variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	18,400	18,366	19,852	19,846	19,852	12,599	12,750	14,149	14,149	14,149
R^2	0.323	0.323	0.324	0.326	0.324	0.314	0.318	0.325	0.324	0.324
Adjusted R^2	0.153	0.148	0.153	0.157	0.153	0.175	0.180	0.192	0.191	0.190
F Statistic	637.835*** (df = 11; 14701)	633.492*** (df = 11; 14585)	689.749*** (df = 11; 15859)	697.790*** (df = 11; 15853)	689.767*** (df = 11; 15859)	435.486*** (df = 11; 10484)	450.000*** (df = 11; 10601)	517.453*** (df = 11; 11815)	514.979*** (df = 11; 11815)	513.911*** (df = 11; 11815)

Note: The table shows the results of two sets of regressions having split the sample into domestic and multinational firms based on their percentage of foreign assets with firms with firms with over 10% of foreign assets being categorised as multinationals. Each table shows the results of regressing the average price in year *t* on net book value (BVPS) and net income (NIPS) for financial year *t* together with leverage – ratio of long term debt to total assets (LEV), log of total assets (SIZE), institutional concentration of ownership (INSCON), return on assets (ROA), a measure of CSP (CSP) and five country-level Market institutional indicators; stock market size and liquidity (stock market), Business freedom and investment freedom . Interaction terms have been included (CSP*Institution) for each institutional indicator and CSP. Clustered robust standard errors from a two-way cluster approach of Petersen (2009) are shown in parentheses. P values are indicated as follows: *p<0.1; **p<0.05; ***p<0.01

These results highlight the divergent importance of home-country institutions on the value relevance of CSP for firms with different levels of multinationalism. Investors are found to value CSP more in domestic firms, possibly due to their recognition that their high level of embeddedness in their home country exposes them to a higher degree of stakeholder influence on financial outcomes, making attending to their claims more valuable. These results support our central proposition that CSP is more valued in institutional settings that increase stakeholder salience by demonstrating that a firm's level of reliance on domestic stakeholders' groups for access to resources due to their level of multinationality has an impact on CSP's value to investors.

3.4.5 Robustness Checks

3.4.5.1 Tobin's Q

In order to increase the robustness of our study and comparability to other studies (El Ghoul et al., 2017; Servaes & Tamayo, 2013; Waddock & Graves, 1997) we implement Tobin's Q as a measure of firm value and regress it our set of independent variables with CSP and institutional variables lagged by one year in Table 3.18.[19] We compute Tobin's Q as the market value of equity plus book value of assets minus book value of equity, all divided by book value of assets with an average value 1.24 in our sample. The results for these sets of regressions are somewhat equivalent to those found using our other measure of value with most institutional measures demonstrating positive moderating properties although at an altered level of economic significance[20]. The economic importance of civil

[19] Results for regressions without interaction terms are available on request. The results of these regressions find the relationship between Tobin's Q and Civil liberties, control of corruption, Educational attainment, stock market size, Investment freedom and trade freedom were found to be statistically insignificant. Labour income share and New Business were found to be negative and significant at a 5% level of significance. Domestic credit was found to be negative and significant at a 1% level of significance. These results are similar to those found using our alternative measure of value with the exception the civil liberties and control of corruption score which become insignificant when using Tobin's Q as our measure of value.

20 The regressions are run having dropped net income per share and book value as an independent variable as they are part of the Olson model.Additionally, book value plays an important role in the construction of Tobin's Q.

liberties as a moderator is amplified when Tobin's Q is used with an increase in a firms CSP resulting in positive value creation in the presence of lower levels of the institution and leading to greater increases in value when stronger institutional forces are present, compared to the models in Table 3.5 and Table 3.6. For example, a ten percent increase in a firms CSP will on average result in an increase of 0.04 in Tobin's Q in a country with a civil liberties score of 7 or an increase of 0.02 in a country with a score of 6, ceteris paribus. This would constitute an economically significant 3.22% (Olson model 2.8%) increase or 1.61% increase (Olson model -0.24%) in value for the average firm in our sample.

This amplification of economic importance is also found when our institutional variable related to competitive forces are included, new business ease and trade freedom. The reverse of this is found when comparing moderating role of the remaining political and labour market institutional variables with a decrease in the gains or losses from changes in CSP across institutional settings. For example, in the case of government intervention a 10% increase in CSP when the institutional score is 5, will on average result in an increase in value of 0.01 as opposed to an increase in value 0.03 in the presence of an institutional score of 7 which equates to an increase in value of 0.81% and 2.42% (Olson model equivalent: 2.65% and 5.23%) for the average firm in our sample, respectively. A similar reduction in the economic value of increased CSP in the context of increasing Investment freedom is also observed.

Table 3. 19 Fixed Effects Regression of Tobin's Q on CSP, with Two-Way Robust Standard Errors

	Tobin's Q											
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Leverage	0.003***	0.003***	0.003***	0.003***	0.003***	0.003***	0.003***	0.003***	0.003***	0.003***	0.003***	0.003***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Size	-0.116***	-0.118***	-0.116***	-0.116***	-0.113***	-0.121***	-0.115***	-0.133***	-0.113***	-0.116***	-0.115***	-0.117***
	(0.024)	(0.024)	(0.024)	(0.024)	(0.025)	(0.027)	(0.024)	(0.027)	(0.025)	(0.024)	(0.024)	(0.024)
Sales Growth	0.002***	0.002***	0.002***	0.002***	0.002***	0.002***	0.002***	0.002***	0.002***	0.002***	0.002***	0.002***
	(0.0003)	(0.0003)	(0.0003)	(0.0003)	(0.0003)	(0.0003)	(0.0003)	(0.0003)	(0.0003)	(0.0003)	(0.0003)	(0.0003)
ROA	0.044***	0.044***	0.044***	0.044***	0.044***	0.042***	0.044***	0.044***	0.045***	0.044***	0.044***	0.044***
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
R&D	-0.004	-0.004	-0.004	-0.004	-0.004	-0.003	-0.004	-0.004	-0.006	-0.004	-0.004	-0.004
	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.004)	(0.005)	(0.005)	(0.005)
LGDPPC	0.097	0.141*	0.089	0.079	0.151*	0.408***	0.116	0.212**	0.112	0.117	0.092	0.099
	(0.078)	(0.075)	(0.082)	(0.077)	(0.083)	(0.086)	(0.074)	(0.100)	(0.081)	(0.081)	(0.080)	(0.079)
Institution	none	civil liberties	control of corruption	property rights	government intervention	educational attainment	labour income share	stock market	credit market	investment freedom	new business ease	trade freedom
CSP_{t-1}	0.001	-0.010***	-0.010***	-0.004***	-0.004***	-0.003*	-0.010***	0.0002	-0.001	-0.006***	-0.014**	-0.021***
	(0.0004)	(0.002)	(0.001)	(0.001)	(0.001)	(0.002)	(0.004)	(0.001)	(0.002)	(0.002)	(0.007)	(0.005)
$Institution_{t-1}$		-0.058	-0.003	-0.007***	-0.084***	-0.001	-0.020***	-0.001	-0.002***	-0.003*	-0.110**	-0.011**
		(0.039)	(0.003)	(0.002)	(0.024)	(0.008)	(0.007)	(0.001)	(0.001)	(0.002)	(0.046)	(0.005)
CSP_{t-1} * $Institution_{t-1}$		0.002***	0.0001***	0.0001***	0.001***	0.0001***	0.0002***	0.00001	0.00001	0.0001***	0.002**	0.0003***
		(0.0003)	(0.00002)	(0.00002)	(0.0002)	(0.00004)	(0.0001)	(0.00001)	(0.00001)	(0.00003)	(0.001)	(0.0001)
Observations	42,803	42,765	42,803	42,803	42,792	36,070	42,798	36,775	38,887	42,803	42,792	42,803
R^2	0.151	0.153	0.154	0.154	0.155	0.156	0.153	0.156	0.155	0.152	0.152	0.152
Adjusted R^2	0.008	0.010	0.011	0.011	0.012	0.012	0.010	0.013	0.007	0.010	0.009	0.009
F Statistic	929.640*** (df = 7; 36626)	733.447*** (df = 9; 36586)	738.984*** (df = 9; 36624)	740.986*** (df = 9; 36624)	744.060*** (df = 9; 36613)	634.919*** (df = 9; 30806)	732.582*** (df = 9; 36619)	644.433*** (df = 9; 31458)	675.713*** (df = 9; 33072)	732.171*** (df = 9; 36624)	728.978*** (df = 9; 36613)	731.246*** (df = 9; 36624)

Notes: The table shows the results of regressing the Tobin's Q in year *t* on the ratio of long term debt to total assets (Leverage), log of total assets (Size), year-on-year sales growth (Sales Growth), return on assets (ROA), the ratio of research and development to total sales (R&D), natural logarithm of GDP per capita (LGDPPC), a measure of CSP (CSP) and eleven country-level institutional indicators in year t-1; civil liberties, control of corruption , property rights, government intervention , educational attainment , labour income share , stock market size and liquidity (stock market), Business freedom and investment freedom . Interaction terms have been included (CSP*Institution) for each institutional indicator and CSP. Clustered robust standard errors from a two-way cluster approach of Petersen (2009) are shown in parentheses. P values are indicated as follows: *p<0.1; **p<0.05; ***p<0.01

However, the main divergence in the findings between the regressions that use the Olson model and Tobin's Q relate to the moderating effect of the institutions that relate to credit and equity markets. In regression using Tobin's Q as our measure of value, the moderating effect of the stock market becomes insignificant. This finding, while not directly comparable due to the sample and CSP construction, fails to confirm the negative relationship found by EL Ghoul et al (2017) who attribute the increased value of CSP in the presence of weak market supporting institutions to its ability to reduce transaction costs and subsequently improve access to valuable resources that provide competitive advantage. The size of credit markets was also found to be statistically insignificant as opposed to positively moderating the relationship

The results of the political, labour market and market institutional forces using Tobin's Q as our measure of value corroborate our previous findings and lend support to our central hypothesis that stakeholder supporting institutions increase the value relevance of CSP. However, the divergence in findings between the models relating to the stock and credit market institutional metrics complicates the analysis of the stakeholder power implications of their increased presence. As we highlight in the methods section, Tobin's Q suffers from a number of drawbacks as a measure of value, so the results of the Ohlson model are deemed to be the most representative of the relationship.

3.4.5.2 Two-Stage Least Squared Analysis

While the implementation of industry-year-relative CSP scores lagged by one period, peer group dummies and regression method in our study may mitigate endogeneity concerns, we undertake further endogeneity checks in order to evaluate whether our results suffer from reverse causality or unobservable firm specific variables as highlighted by Garcia-Castro, Ariño, & Canela (2010). We implement a two-stage least squared regression with an

instrumental variable to achieve this aim. This approach centres on finding an exogeneous proxy for the independent variable of interest, called an instrument, which influences the independent variable but appears unlikely to affect the dependent variable except through its effect on the independent variable of interest (Larcker & Rusticus, 2010; Reeb, Mariko, & Mahmood, 2012; Wintoki, Linck, & Netter, 2012). We use the country-average CSP score from the previous year (t-2) as an instrumental variable for our firm-level CSP_{t-1} variable (for both CSP_{t-1} and CSP_{t-1}*$Institution_{t-1}$). The country-average CSP score is suitable as an instrumental variable as it is highly correlated with firm-level CSP, due to the fact that it is exposed to the same country-level factors that affect firm-level CSP and could only be associated with firm value through its impact on firm-level CSP. The correlation between country-average CSP and firm-level CSP is 0.4145 while the correlation with price is 0.0756. A similar approach is used by El Ghoul et al. (2017, 2011) and Kim, Li, & Li (2014), but we use a country-average measure of CSP rather than an industry-average measure as our CSP measure is already an industry-relative measure. To ensure that the country average is representative, we omit countries with less than ten firm level observations in a given year.

Table 3. 20 Two stage least squared regression analyses of Price on CSP_{t-1} and Institutional $Metrics_{t-1}$ with Two-Way Robust Standard Errors

	Price										
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
BVPS	1.000***	1.005***	1.004***	0.998***	0.941***	0.980***	1.001***	0.989***	1.007***	1.007***	1.009***
	(0.056)	(0.057)	(0.055)	(0.058)	(0.059)	(0.055)	(0.063)	(0.057)	(0.057)	(0.057)	(0.057)
NIPS	2.446***	2.441***	2.438***	2.465***	2.448***	2.464***	2.457***	2.415***	2.434***	2.397***	2.437***
	(0.231)	(0.232)	(0.230)	(0.239)	(0.243)	(0.231)	(0.256)	(0.243)	(0.239)	(0.234)	(0.236)
Leverage	0.176***	0.189***	0.171***	0.189***	0.179***	0.176***	0.212***	0.188***	0.192***	0.184***	0.191***
	(0.032)	(0.033)	(0.031)	(0.034)	(0.042)	(0.031)	(0.041)	(0.040)	(0.036)	(0.033)	(0.035)
Size	4.031***	4.215***	3.482***	4.679***	6.307***	4.167***	4.933***	5.075***	4.944***	4.322***	4.535***
	(1.161)	(1.245)	(1.056)	(1.293)	(1.777)	(1.035)	(1.627)	(1.474)	(1.149)	(1.223)	(1.271)
Sales Growth	0.002	-0.001	0.007	-0.006	-0.014	0.002	-0.010	-0.003	-0.011	-0.003	-0.002
	(0.020)	(0.021)	(0.018)	(0.022)	(0.033)	(0.018)	(0.026)	(0.022)	(0.020)	(0.019)	(0.022)
ROA	0.275***	0.272***	0.267***	0.264***	0.292***	0.249***	0.281***	0.286***	0.279***	0.270***	0.271***
	(0.055)	(0.056)	(0.053)	(0.059)	(0.064)	(0.054)	(0.060)	(0.060)	(0.059)	(0.055)	(0.058)
R&D	0.012	-0.013	-0.008	0.025	0.034	-0.021	0.028	-0.036	0.008	0.020	-0.012
	(0.179)	(0.184)	(0.182)	(0.186)	(0.209)	(0.175)	(0.196)	(0.173)	(0.192)	(0.189)	(0.186)
LGDPPC	13.606***	16.106***	8.844**	14.334**	19.731***	14.575***	14.593***	11.680**	15.393***	13.388***	13.227***
	(4.093)	(4.928)	(3.750)	(5.721)	(5.095)	(3.714)	(5.082)	(4.883)	(5.134)	(4.304)	(4.705)
Institution	civil liberties	control of corruption	property rights	government intervention	educational attainment	labour income share	stock market	credit market	investment freedom	new business ease	trade freedom
CSP_{t-1}	-1.311***	-1.090***	-0.529***	-0.697***	-0.247	-2.237***	-0.776**	-0.626**	-1.329***	-4.432***	0.191
	(0.198)	(0.184)	(0.197)	(0.252)	(0.227)	(0.282)	(0.374)	(0.287)	(0.281)	(0.835)	(0.937)
$Institution_{t-1}$	-10.450***	-0.609***	-0.596***	-4.945***	-1.501***	-2.153***	-0.002	-0.058	-0.435***	-19.786***	0.423
	(2.083)	(0.171)	(0.148)	(1.005)	(0.428)	(0.334)	(0.014)	(0.052)	(0.108)	(3.955)	(0.416)
CSP_{t-1} * $Institution_{t-1}$	0.150***	0.008***	0.005	0.030	-0.009	0.034***	-0.0001	0.001	0.009***	0.413***	-0.009
	(0.037)	(0.002)	(0.003)	(0.023)	(0.011)	(0.006)	(0.0003)	(0.001)	(0.002)	(0.087)	(0.009)
Observations	41,538	41,538	41,538	41,538	35,465	41,538	37,779	38,309	41,538	41,538	41,538
R^2	0.287	0.265	0.327	0.233	0.241	0.295	0.177	0.240	0.209	0.248	0.232
Adjusted R^2	0.162	0.136	0.209	0.099	0.109	0.172	0.033	0.103	0.070	0.117	0.098
F Statistic	16,331.740***	15,571.710***	17,933.340***	14,623.740***	13,123.330***	16,785.440***	11,244.830***	13,429.690***	13,741.060***	15,133.270***	14,495.240***

Notes: The table shows the results of a two stage least square regression of price on net book value (BVPS) and net income (NIPS) for financial year *t* together with leverage – ratio of long term debt to total assets (LEV), log of total assets (SIZE), return on assets (ROA), a measure of CSP (CSP) and eleven country-level institutional indicators; civil liberties, control of corruption , property rights, government intervention , educational attainment , labour income share , stock market size and liquidity (stock market), Business freedom and investment freedom . Interaction terms have been included (CSP*Institution) for each institutional indicator and CSP. This research uses country year average CSP scores lagged by one year as our instrument for CSP (in both CSP and CSP*Institution). Clustered robust standard errors from a two-way cluster approach of Petersen (2009) are shown in parentheses. P values are indicated as follows: *p<0.1; **p<0.05; ***p<0.01

A test of instrument relevance was undertaken using a F-test to analyse whether the instrument is sufficiently strongly correlated with the endogenous variable yielding a value of between 324 and 1004 with an extremely low p-value allowing us to clearly reject the null hypothesis that the instrument is irrelevant. Furthermore, a Hausman-Wu test was implemented to test for endogeneity in our CSP variable with a resulting p-value significant at a 1% level. Although an endogeneity issue may be present, the results presented in Models 1 - 11 of Table 3.19 indicate that the positive moderating effect of country level institutional forces on the relationship between CSP and value remain statistically significant for civil liberties, control of corruption, labour income share, investment freedom and new business. However, the remaining institutional interaction terms become insignificant. These results indicate that if endogeneity is present and not mitigated by the lagged design of our main models and method, our results using a two stage least squares approach demonstrate that it's not the primary driver of the relationship across many of the institutional metrics. This reinforces the importance of considering the role of the institutional context in moderating the value relevance of CSP.

3.4.5.3 Factor Analysis

An exploratory factor analysis (EFA) was undertaken on our institutional factors to examine whether the chosen institutional factors with their high correlation represented some underlying factors. Bartlett's test indicated correlation adequacy with a test statistic of 2676 and p value of less than 0.001 and the KMO test indicated sampling adequacy with a score of 0.8. A parallel analysis suggested three factors while the Kaiser criterion suggested two factors. A two and three factor model were tested using maximum likelihood estimation with direct oblimin rotation because of expected factor correlation. Only the 2-factor model achieved simple structure with each factor loading on one factor using the criterion that loadings must be greater than 0.3 and explained 52 percent of the variance for the entire set

of variables. This model had poor fit: RMSEA indicated poor fit at 0.185 while the CFI (0.82) and TLI (0.72) indicated a poor goodness of fit. Factor 1 included control of corruption, property rights, government intervention, educational attainment, labour income share, investment freedom, new business ease and trade freedom while factor 2 contained the stock markets and credit markets variables. These factors could be classed as stakeholder supporting institutions (factor 1) and capital market institutions (factor 2). The uniqueness of the political institutional variables level of uniqueness was low at 32.5% for civil liberties, 8.1% for control of corruption, 10% for property rights except for government intervention's uniqueness was 71%. The Labour market institutional measures also displayed a high level of uniqueness at 77% (educational attainment) and 61% (labour income share). Of the market institutional forces, the stock market, credit market and investment freedom variables showed the lowest level of uniqueness at 41%, 36% and 43% respectively while start-up competition (88%) and Trade freedom (59%) showed higher levels.

Due to the high levels of uniqueness in the variables and the poor fit measures, the research uses the institutional factor individually as the main results of our research. However, to increase the robustness of our study we ran regressions using the factors from the 2 factor models. The results indicate that both factors positively moderate the relationship between CSP and firm value at a 1% level of significance but that the variance of stakeholder supporting institutions (factor 1) has a greater economic impact on the CSP- CFP relationship.

3.5 Discussion and Conclusion

In this paper we empirically examine the moderating role of country-level institutional forces on the relationship between CSP and firm value through the utilization of an extensive international dataset consisting of 43,171 firm-year observations in 49 countries over a seventeen-year period. This answers the call of previous researcher for a cross country comparison of the relationship (Nollet et al., 2016) and an expanded set of moderators (El Ghoul et al., 2017). The use of Reuter's Asset4 ESG data allows this research to examine the relationship using industry-year relative CSP score but also to construct peer group dummy variables to examine whether heterogeneous information constraints and utility functions could lead investors to value CSP differently, inducing groupings along the CSP-CFP continuum similar to a clientele effect (Ding et al., 2016).

Our findings indicate the presence of a level of contingency to the relationship between CSP and firm value with stakeholder-supporting institutions positively moderating the relationship. Through our examination of the valuation of corporate behaviour by markets across different institutional environment, this research highlights the contextual conditions under which firms are encouraged to act in a socially responsible manner by financial markets. This contributes a conditional perspective to a highly contested area of research on the role of capital markets in encouraging or discouraging business towards a more sustainable path.

The institutional contextual indicators examined in this research are the result of the interaction of both formal and informal political, labour market, financial market and business-related institutional forces which represent or are proposed to alter the relative salience of stakeholder groups (Aguilera & Jackson, 2003; J. L. Campbell, 2007) through its influence on stakeholder groups' ability to directly and indirectly gain control or power over resources needed by the firm for its survival or success (Frooman, 1999; Pfeffer & Salancik,

1978). In addition, our measures of institutional forces represent the dynamic nature of societal forces with institutional forces theorised to be the result of ongoing disagreements and contests between societal stakeholders and hence political in nature (Singer & Ron, 2020). Our findings support Jackson & Deeg (2008) suggestion that CSR may also emerge as a complement to strong regulatory institutions, since such institutional arrangements empower stakeholders to demand socially responsible behaviour from the firm (J. L. Campbell, 2007; Gjølberg, 2010). Kourula, Moon, Salles-Djelic, & Wickert (2019) call for a reconsideration of the assumption that governmental mechanisms will be less effective than private sector mechanisms in achieving societal and environmental outcomes. We substantiate this by finding a positive moderating effect of government institutions on the relationship between CSP and CFP which indicates the impact of political actions on private or market outcomes.

Our research allows us to directly contribute empirical evidence to the debate between Friedman's (1970) view of CSP as a constraint to creating value and the alternative view held by Freeman (1984) and others that integrating CSP into firm strategy can create value. Our findings corroborate both the theoretical stance taken by stakeholder proponents that CSP is value enhancing, and the stance taken by Friedman (1970) that CSP is value destroying. Our research reconciles these two theories, oft presented as conflicting, through the introduction of a contingency approach with context or the power dynamics between stakeholder groups in the firm's immediate environment defining the relationship between CSP and value. By way of a theoretical explanation for this occurrence, we integrate institutional, stakeholder salience (Mitchell et al., 1997) and resource dependency (Pfeffer & Salancik, 1978) theory, proposing that investors value CSP more in the presence of institutions which increase the salience of stakeholder groups whose interests CSP represents. This is akin to stating that investors take an instrumental view of CSP, valuing it in relation to its implications on firm performance (Garriga & Melé, 2004). This highlights

the fact that the instrumental logic of the marketplace with its consequential orientation is intertwined and shaped by the institutional setting in which it operates.

Our findings highlight the need to integrate internal and external approaches to business ethics, recognising the political genesis of the values reflected in market systems, and to examine the constellation of interests, distribution of resources, and interactions that produce a given outcome (Singer & Ron, 2020). This would suggest a pragmatic approach that recognises that the perceived ethical responsibilities of managers are socially constructed and historically contingent and are the result of an ongoing dynamic political process which businesses themselves can play a role in shaping.

The practical implications of our findings that CSP and its constituent elements are value-relevant to investors lends support to the idea that market forces can play a positive supporting role in moving business towards a more sustainable future. However, a major caveat to this implication exists as our research finds that the institutional forces in a firms' environment have a major effect on the value relevance of CSP. As the salience of stakeholder groups is an important factor in whether addressing their claims is value relevant, the creation and maintenance of institutions which empower societal and environmental stakeholders is of utmost importance if market forces are to play a part in our transition to a sustainable future.

While our research offers supporting evidence for our central proposition, a multitude of additional moderating institutional forces are yet to be examined in the literature which offer possible venues for future research. Furthermore, future research could investigate the contribution of investors to the CSP-CFP relationship through an investigation of possible mediating agents such as cost of capital and whether they are moderated by institutional factors.

Ethical ideas or frameworks embedded in formal and informal institutions can shape market behaviours. An area for future research would be to investigate the impact of the institutions context on ethical decision making by managers at a micro level, creating an understanding of the ethical values implied in their observed decision-making outcomes and how these vary amongst diverse institutional contexts. This practical approach would shed light on the ethical frameworks guiding business actions in a variety of contexts as opposed to a focus on universal ethical values, adding greater depth and breadth to our understanding in this field. Furthermore, an investigation of how these frameworks are embedded could shed further light on the evolving system of the governance of business conduct and its ethical underpinnings.

Although our sample contains a large number of publicly traded firms from multiple countries, firms are unevenly spread across countries with the majority located in more prosperous developed countries. This prosperous country bias is also compounded by a large cap bias with large firms more likely to be present in the sample. While this is currently the best available data, future research could apply the current methodology to an expanded and more representative global sample to increase the generalizability of its findings. Finally, the construct validity of our CSP measure may be questioned. However, the focus on the investor in this research mitigates this concern as we are interested in the value relevance of CSP to investors and whether or not it is an incomplete measure of the social impact of a firm, it is perceived by investors to be the CSP of the firm.

Chapter 4 - The Evolving Impact of the European Union Emissions Trading System on the Value of Environmental News

Abstract

This research examines the market reaction to the publication of firm-specific and system wide environmental news for participating firms in the European Union's Emission trading system (EU ETS) during its third phase. Using an event study methodology on a sample of 123 participating firms during the period from 2014 to 2021, we find that positive news is rewarded with increased returns in the latter years of the phase (2018-2021) while it had an insignificant impact in earlier years (2014-2017). We also find evidence of a significant market reaction to a number of political events relating to the revisions of the system which we identify as a possible inflection point between the two periods. Our examination of the evolution of the value relevance of Emissions related environmental performance over time in the presence of the changing market dynamics in the politically constructed EU ETS provides evidence that increased external pressure alters the value of environmental performance to market actors. This highlights the contextually contingent nature of the relationship between environmental and financial performance.

Keywords:

Environmental performance, Emissions Trading, Cap and trade system, EU ETS, financial performance

4.1 Introduction

Over recent decades, external pressure from stakeholders such as government, the media and consumers for businesses to behave more responsibly towards the environment has intensified (Barkemeyer et al., 2017; Flammer, 2013; Hase, Mahl, Schäfer, & Keller, 2021). Many governments have implemented policies aimed to help their economies decarbonise while at the same time the investment community has recognised environmental performance as a key metric to consider as part of the growing field of ESG investing (Global Sustainable Investment Alliance, 2018). Increased levels of both public and private investment are required if the goals of the Paris agreement are to be reached and a climate catastrophe averted (United Nations, 2021). An understanding of the impact of policies introduced by government on the allocation of capital to sustainable economic activities is crucial if the required reduction in environmental degradation is to be achieved.

The European Union (EU) has implemented a carbon emissions trading system as one of its key policies to achieve its decarbonisation ambitions (European Commission, 2015b). It is based on the Polluter-Pays-Principles enshrined in EU treaties and aims to incentivise companies to reduce their carbon emissions. However, the performance of the system and the incentives it creates have been repeatedly brought into question since its inception (Bruninx et al., 2019). The system has evolved with politically agreed revisions implemented to address its failings and increase its stringency. The aim of this study is to explore the impact of the EU's Emission Trading System (ETS) on the valuation of participating firms during its third phase (2013-2020). We conduct an in-depth analysis of the market reaction to news relating to the carbon emissions related environmental performance of participating firms and the future stringency of the system itself.[21]

[21] The EU ETS has developed through a number of consecutive with each phase being governed by an evolving set of rules and regulations. Phase 3 (2013-2020) introduced major structural changes to the system as compared to Phases 1 (2005-2007) and Phase 2 (2008-2012) while the current Phase 4 (2021-2030) involves a further tightening of the system.

Specifically, we use an event study methodology to analyse the market reaction to two distinct categories of events, emissions verification events and political events, during the third phase of the EU ETS over the period 2014-2021 on a sample of 123 participating listed firms. Emission verification events reveal participating firms' carbon emissions and resultant EU ETS allowance (EUA) demand for the previous year, which are used to investigate the market reaction to news about the environmental performance of firms. On the other hand, the chosen political events reveal news related to the future supply of EUAs or stringency of the ETS which may impact participating firms' market valuation by altering the markets perception of the cost of their future carbon liabilities.

We identify two distinct periods during the third phase of the emissions trading system between 2013 and 2020 with regards to the price of traded allowances. An inflection point occurs around the time of the announcement of the revisions to the system for Phase 4 in late 2017. Hence, we examine the market reaction to the series of political events relating to these revisions while also splitting Phase 3 into the period before (Phase 3a: 2013-2017) and after (Phase 3b: 2018-2020) the announcements of these revisions to investigate whether the market reaction to verified emissions data changed. Changes in the expectation of future allowance supply and consequently the expected price per tonne of carbon emissions, would be expected to have an immediate impact on the valuation of participating firms in efficient markets with these additional costs embedded in current market prices. Concurrently, the valuation of participating firms carbon-related environmental performance revealed during subsequent emission verification events (Phase 3b) may also be altered in the presence of a more stringent regulatory environment (Clarkson et al., 2015).

Our focus on the firms that participate in the EU ETS and its impact on their financial performance is warranted as they are the entities that the ETS is designed to incentivise to reduce their carbon emissions by monetizing their carbon liability. By examining the response of market actors to the announcement of EUA supply and demand information, this

allows us to observe the market's assessment of the expected financial impact on participating firms, and to assess whether news of positive (negative) environmental performance is rewarded (punished) with increases (decreases) in firm value.

Firstly, we examine the market reaction to the verification events in each year and find evidence of a change in the impact of the announcement of the verified emissions between the early and later stages of Phase 3. While the earlier verification announcements (2014-2018) were found to have an insignificant effect on firm value, similar to the findings of research on previous phases of the ETS (Brouwers et al., 2016), later verification announcements (2019, 2020) resulted in significant market reactions.

We also examine whether the market reaction is impacted by the type of firm specific emissions news that is released during the verification events by categorising each firm's reported emissions as positive or negative news using three distinct measures. Firstly, we measure the change in a firm's allowance surplus since the previous year as the absolute change in a firm's EUA or carbon liability (Clarkson et al., 2015). This change in carbon liability would result in a direct financial impact on the firm by altering the number of additional EUA that a firm would have to buy or could sell. Secondly, Brouwers et al. (2016) highlight the importance of industry factors on a firm's ability to reduce its carbon emissions so we measure a firm's change in industry relative allowance surplus/deficit. As industry peers are subject to the same operational, technological, and regulatory constraints, positive (negative) news of a reduction (increase) in the relative size of a firm's EUA or carbon liability represents an increase (reduction) in its relative carbon efficiency and competitiveness. Thirdly, we create measures of environmental performance expectations based on the past emission reductions of the firm. The provision of new information about the carbon emissions of a firms may cause abnormal changes in its stock price when the information deviates from investor's expectations and is perceived to impact profitability (S. Gupta & Goldar, 2005).

We find that positive news of a reduction in both absolute and industry-relative carbon liability are rewarded with increased returns in Phase 3b while it has an insignificant impact in Phase 3a. These findings are consistent with previous finding that the EU ETS was not adequately compensating proactive firms or penalizing those that pollute in the earlier periods (Andreou & Kellard, 2021). The increased value relevance of carbon liability reductions in the latter period may be attributed to a number of changes in contextual factors internal to the EU ETS including the increased stringency of the system and the puncturing of the waterbed attributed to the introduction of the market stability reserve cancellation policy (Verde, Galdi, Alloisio, & Borghesi, 2021). Additionally, a number of external contextual factors such as the intensified political focus on combating climate change and the increased flow of funds into socially responsible investment funds may have also altered the perception of the value relevance of emission reductions. However, a lack of symmetry exists with the valuation of an increase in a firm's absolute and relative carbon liability found to have an insignificant effect across all periods.

When we measure the emissions reduction performance of firms relative to expectations, the same asymmetric relationship is also found during Phase 3b while verification events in Phase 3a remains insignificant. However, we find that substantial deviations from expectations result in market reactions with very positive (negative) news being rewarded with increased (reduced) returns during Phase 3b. These findings indicate that emissions reductions were not valued by investors until Phase 3b and from that point on that major emissions related surprises do provoke a significant market reaction.

We also find evidence of a significant market reaction to a number of political events relating to the revisions of the system that occurred over a period of time which we identify as a possible inflection point between the two periods, the conclusion of the trilogue negotiations (09.11.2017), the agreement of the European parliament's position (06.02.2018) and formal approval of the deal by the council of ministers (27.02.2018). These

events triggered a negative market response for participating firms lending empirical evidence to the proposition that the stringency and intensity of the regulatory environment impacts investors' expectations of the valuation of carbon liabilities (Clarkson et al., 2015). The market reaction to the announcements of future changes to the system, indicates the forward-looking nature of the carbon market and the impact of market expectations about the future stringency of the system and political commitment on current firm level outcomes.

Our research contributes to the body of research which examines the stock market reaction to environmental news (Capelle-Blancard & Laguna, 2010; Capelle-Blancard & Petit, 2019; Fisher-Vanden & Thorburn, 2011; Flammer, 2013; Gilley et al., 2000; Klassen & McLaughlin, 1996; Lioui & Sharma, 2012; Oberndorfer et al., 2013; Shane & Spicer, 1983) by examining the publication of verified emissions data in a specific evolving institutional setting. Hence, our research also extends the line of investigation into the link between environmental performance and financial performance with a consideration of the impact of time-variant external pressures. Higher external pressure may amplify shareholders reaction to positive or negative news related to a firm's environmental performance. Additionally, holding a firms environmental performance constant, a change in the external pressures may change investors' perspectives on the impact of the firm's environmental liabilities and resultant future financial performance. We examine the evolution of the value relevance of emissions related environmental performance over time in the presence of the changing market dynamics in the politically constructed EU ETS and find that increased external pressure alters the value of environmental performance. This makes a major contribution to the literature by highlighting the contextually contingent nature of the relationship between environmental and financial performance.

Our research extends previous research on the EU ETS which evaluated its impact on the financial performance of publicly traded participating firms in Phase 1, Phase 2 and the first half of Phase 3 of the ETS (Andreou & Kellard, 2021; Brouwers et al., 2016; Jong

et al., 2014). The operation of Phase 3 of the ETS differs considerably from previous phases and this study is the first to examine how these changes impact the market reaction to the publication of verified emissions data of participating firms, as well as the first to examine the divergent market reaction to news about the change in a firms' carbon liability and emissions with previous research focusing on differences based on carbon surplus position (Brouwers et al., 2016; Jong et al., 2014). This paper makes a major policy related contribution by highlighting the increased effectiveness of the EU ETS in shaping the market treatment of emissions related environmental performance brought about by an increased perception of the future stringency of the system and political commitment to it.

Our paper is structured as follows. In Section 2 we describe the evolution of the EU ETS and review the prior literature on the factors driving the price of EUAs and the relationship between environmental performance and financial performance to develop our hypothesis to be tested. Section 3 describes our dataset and provides details of the methodological approach used to test our hypothesis. We then present our results in Section 4, followed by a discussion of the findings, limitations, and implications of our study in Section 5.

4.2 Literature Review

4.2.1 European Union Emissions Trading Scheme

The European Union's Emissions Trading Scheme is intended to be the corner stone of EU strategy to tackle climate change by creating financial incentives for European companies with the largest emissions of carbon dioxide to reduce their emissions (European Commission, 2015b). It is the first and largest cap-and trade system for reducing greenhouse gas (GHG) emissions and accounts for the majority of international carbon trading (De Clara

& Mayr, 2018). The EU ETS limits emissions from around 10,000 installations in the power sector and manufacturing industries in EU and EEA-EFT countries. These installations produce approximately 40% of the EU's greenhouse gas emissions (European Commission, 2021). The policy instrument is designed to directly limit GHG emissions by setting a system cap and then harnesses the power of market forces by allowing participating companies the flexibility to trade emission allowances. The quantity of allowances that will result in the overall level of emissions equalling the cap is distributed via free allocations and a primary EUA market based on auctioning. Participating firms must surrender one EUA for every tonne of GHGs emitted in a given year or pay a fine. Firms with a deficit (surplus) of EUA to cover their emissions can also buy (sell) them in the secondary EUA market. The trading of allowances allows companies in the system to determine the least cost option for them to meet the fixed cap in a cost effective and efficient manner (European Commission, 2015b). This system design sidesteps the difficulty of determining the "right price" of carbon to obtain a given amount of emission reduction by setting the overall reduction goal and allowing the market to decide the price. Carbon pricing is claimed to be the most efficient way to reduce GHG emissions at a minimum cost as it claims to equalise marginal abatement costs across subject polluters which thus minimizes the cost of achieving a given abatement level (European Commission, 2015b).

The EU ETS was established in 2005 and has developed through an iterative process with successive phases involving constant updates, changes and improvements. The first implementation phase, the pilot phase or Phase 1, ran from 2005 to 2007 and was described as a period of learning by doing. The second phase ran from 2008 to 2012 and coincided with the first commitment period of the Kyoto protocol and its binding emissions reduction targets (De Clara & Mayr, 2018). The third phase of the system started in 2013 and ran until 2020. It was substantially different from the previous two phases with a number of central policy changes introduced to improve the resilience and effectiveness of the system. The

fourth phase of the system which runs from 2021 to 2030 represents a further tightening of the system as more ambitious emissions reduction targets have been chosen.

In the first phase of the system, only $C0_2$ emissions from power generators and energy-intensive industries were included and member states were the driving force in setting the emissions cap. The EU-wide cap was determined from the aggregated total quantity of allowances provided by member states in their national allocation plan. The vast majority of allowances were given to emitters at no cost and the volume of EUAs freely allocated to installations was the responsibility of member states who developed a national allocation plan (NAP) for approval by the European commission (De Clara & Mayr, 2018). A lack of data resulted in an over-allocation of allowances in this period with a resultant collapse in the price of EUAs when the first publication of verified emissions data highlighted the misallocation (De Clara & Mayr, 2018). This grandfathering approach of allowance allocation which based the free allocation of allowances on a firms past emissions was also criticized as rewarding higher emitters and punishing early movers (European Commission, 2015b).

As a transfer of allowances from Phase 1 to Phase 2 was not allowed, the second phase of the system did not being with an oversupply of banked allowances (De Clara & Mayr, 2018). For the second phase, the cap was lowered by 6.5 per cent compared to 2005 while more GHGs such as nitrous oxide and perfluorocarbons were included. The allocation of EUAs proceeded through a more simplified and transparent NAP process and the proportion of free allocation was reduced to 90% with the remaining the remaining 10% auctioned (European Commission, 2015b). It was hoped that the functioning of the system would be improved by the adjustments and availability of verified data for the allocation process. However, a slowdown in economic activity due to the 2008 financial crisis, the abundant usage of international credits generated through the Kyoto Protocol (Clean Development Mechanism, Joint Implementation) and the impact of overlapping policies

contributed to the creation of a substantial surplus of allowances in the system (De Clara & Mayr, 2018; European Commission, 2015b; Verde et al., 2021).

In 2013, the EU ETS's entry into its third phase was marked by a number of major revisions designed to improve the functioning of the system. The nationally determined cap was replaced by a centrally determined EU-wide cap on allowances which decreased by a linear reduction factor (LRF) of 1.74% annually (European Commission, 2015a). The linear reduction was chosen as it results in a 21% reduction in emissions compared to the EU ETS emissions in 2005, lower than the overall reduction target of 20% (European Commission, 2015a). The second major change related to the method for allocating allowances with a single EU wide set of rules governing free allowance allocation. Additionally, the quantity of free allowances given was substantially reduced with auctioning becoming the default method of allocation. In 2013, around 50% of total allowances were auctioned with the percentage increasing over the phase (European Commission, 2015b). The power sector faced full auctioning of allowances with the only exception being free allocations granted for the modernisation of power plants. The industrial and heating sectors were allocated free allowances based on EU-wide performance benchmarks as set out in the newly introduced harmonised allocation rules. This benchmarking approach was introduced to create incentives for inefficient installations to take action to reduce their emissions. The benchmarks are set at the at the average level of emissions for the most efficient 10% of installations in each sector, therefore highly efficient installations should receive all or most of the allowance they require to comply with EU ETS obligations while laggard installations will be forced to improve their performance or buy additional allowances. The proportion of free allowances given to the industrial sector diminished throughout the phase reducing from 80% of the quantity determined by the free allocation rule in 2013 to 30% in 2020.

In order to ensure the competitiveness of firms that operated in industries that are exposed to carbon leakage, a carbon leakage list (Carbon List) of such industries was also

created with exposed installations receiving a higher share of up to 100% of the quantity determined by the free allocation rule (De Clara & Mayr, 2018). Carbon leakage is the risk that the additional costs placed on companies in jurisdictions with proactive climate policy impacts their competitiveness against foreign companies from laxer regulatory environments or incentivise companies to transfer their production to such areas in order to eliminate the additional cost (European Commission, 2015b).[22] Additionally, member states were given the option to grant transitional free allocation for the modernization of electricity generation. To spur innovation, the NER 300[23] fund was created to encourage the development of low carbon technologies with funding from the sale of EU ETS allowances.

While the system was revised to improve its functioning during the third phase, it was hindered by a legacy issue. Banking of allowances from phase 2 to phase 3 was allowed and resulted in an oversupply of banked allowances weighing on the EUA price in the third phase. This subdued price was deemed detrimental to the flow of funds into investments in low-carbon technology to a sufficient degree to illicit concern (European Commission, 2015a). At the start of Phase 3, a surplus of around 2 billion allowances including 1.8 million allowanced banked from phase 2 existed. The revisions of the system did little to reduce the surplus which stood at 2.1 billion allowances in 2013 before falling slightly to 2.07 billion allowances in 2014 (European Commission, 2015a). The lack of market balance and the overabundance of allowances (Hintermann et al., 2016) in the market have been pointed to as a possible cause of a depression of the EUA price, which followed a downward trend from the start of the third phase until towards the end of 2017 when the trend began to reverse.

Even with the substantial changes made to the system for the third phase, the system still lacked an adjustment mechanism to reduce the oversupply of allowances that it faced.

[22] The number of free allowances allocated to an installation over phase three was calculated at the beginning using the following formula (European Commission, 2015b): Free allocation = Benchmark x Historical activity level x carbon leakage exposure factor x cross-sectoral correction factor OR linear reduction factor.

[23] NER 300 is a funding programme for innovative low-carbon technology.

A short-term measure to reduce the supply of allowances in the system by 900 million until 2019 and 2020 started in March 2014. However, the large imbalance of allowances in the system remained and prompted the adoption of a structural change to the system called the market stability reserve (MSR). It addressed both the existing imbalance and made the system more resilient to large demand or supply shocks in the future (Gerlagh, Heijmans, & Rosendahl, 2020). In January 2014, the European Commission proposed legislation to establish a MSR which was then agreed upon and established by the European Parliament and the Council in October 2015. The MSR is a rules-based mechanism that is intended to address the imbalances between supply and demand in the market by adjusting auction volumes in response to allowance surplus thresholds (Vivid Economics, 2020). The MSR absorbs (releases) allowances by reducing (increasing) the number of allowances auctioned in the period if the total number of allowances in circulation (TNAC) is above (below) the predefined upper (lower) threshold of 833 million (400 million) allowances (European Commission, 2015a). The TNAC is calculated as the supply minus demand plus allowances held in the MSR. The reserve started operating in 2019.

The reforms for Phase 4 of the EU ETS were another leap forward in its evolution. The history of emissions trading demonstrates the importance of learning from experience (Schmalensee & Stavins, 2017), and the three main objectives of the reforms were aimed at doing just that by strengthening the system where it was deemed to be weakest. The aims of the reforms were to strengthen the price signal by tightening the cap and enhancing the MSR, improve the targeting of free allowances, and the establishment of funding channels for low carbon innovation and energy modernisation in lower-income member states (Verde et al., 2021). On 15 July 2015, the European Commission began the legislative process for the fourth phase of the system by releasing its legislative proposal for the rules that would guide the system during the period from 2021 to 2030. The proposal was released to the backdrop of a malfunctioning EU ETS market and the EU's 2030 Climate and Energy Policy

Framework. The framework, adopted in 2014, extended the EU's decarbonation goals beyond 2020 with the key goals of reducing GHG emissions by at least 40% compared to 1990 levels, increasing the share of renewable energy to a minimum of 27% and improving energy efficiency by at least 27% (European Commission, 2020). The tripartite nature of the European legislative process places the responsibility for proposing amendments to the proposal on the co-legislators, the Council of the European Union and the European parliament, before a final identical text is agreed and approved by the three bodies. The European parliament and Council adopted their position on the reform of the system on 15 and 28 of February 2017 respectively (De Clara & Mayr, 2018).

After all three bodies had adopted their position, they entered into a negotiation process called a trilogue, to resolve the difference in their proposals. A grand compromise on the EU ETS reforms for Phase 4 was agreed between negotiators from the European Parliament, European Council and European Commission in the early hours of the 9th of November 2017 after an intense trilogue which finished after 3:00 a.m. (Georgio, 2017). The provisional deal, needing formal approval from the European Council and European Parliament, was the result of two and a half years of negotiating between the bodies and established the rules that guide the EU ETS in its fourth trading period from 2021 until 2030. The outcome of these negotiations resulted in a deal that contained several elements designed to reduce the supply of allowances and rebalance the market. The revised EU ETS Directive was published on the 14th of March 2018 and included reforms to the system that aim to facilitate a 43% GHG emissions reduction from participants by 2030 (relative to 2005 levels), to safeguard industrial competitiveness, and foster low carbon modernisation and innovation (European Commission, 2018).

The final agreement contained a linear reduction factor (LFR) of 2.2% with the opportunity to review it. The impact of the increase in the LRF equates to an emission reduction of 556 million tonnes of carbon over the fourth phase (De Clara & Mayr, 2018).

It also contained a 24% MSR intake rate for the first 5 years, double what had been proposed by the European Commission. Importantly, the MSR was equipped with a rules-based cancellation mechanism. All allowances in the MSR above the total number of allowances auctioned during the previous year becoming invalid from 2023 onwards. The doubling of the MSR rate should lead to a quicker reduction of the existing surplus of allowances in the system while the cancellation mechanism will make the reduction permanent. Carp (2018) contends that new clauses in the phase 4 revisions will partially address the EUA surplus but that it lacks the level of ambition needed under the Paris Agreement in 2015 and lacks a provision that ensures progressive tightening of the emissions allowance cap from phase 4 onwards. The targets of the EU ETS for phase 3 with a linear reduction factor of 1.74% are inconsistent with the EU's politically stated 90% reduction in emissions from the EU ETS firms by 2050 (European Commission, 2011), equating to a 73% reduction by 2050. Additionally, the 2.2% LRF from 2021 onwards in phase 4, still falls short of this target and would result in only a 84% reduction by 2050 (Grosjean, Fuss, Edenhofer, & Koch, 2016). Carp (2018) foresees further adjustments being made in terms of the level of ambition and the introduction of an automatic ratchet mechanism that aligns the ETS with the timeline of the 2015 Paris Agreement.

European institutions intervened in the market to address the oversupply of EUA on three separate occasions during phase 3, but it was only the third intervention which involved a permanent adjustment to supply via a tightened cap and the enhanced MSR that coincided with a change in the direction of EUA prices. The introduction of the cancellation policy has been pointed to as the primary reason for the change in price trend for EUAs due to its tightening of the cumulative emissions cap while others worry about the unintended consequences of the policy (Bruninx et al., 2019). It is important to note that the EU ETS does not exist in a vacuum with the emissions reduction of participating firms impacted by other policy instruments and measures such as emission efficiency standards, subsidies to

innovation and adoption of renewable energy technologies, energy and carbon taxes, as well as mandated shutdowns of polluting plants. Verde et al. (2021) highlight that the calibration of the entire policy mix and interaction between policies can either enhance or diminish the performance of individual policies.

An ETS with a fixed supply of allowances can suffer from a waterbed effect in which abatement of regulated emissions by companion policies is offset by increased emissions within the system (Verde et al., 2021). Put simply, the reduction in emissions of ETS participating firms undertaken to comply with companion policies increases the excess supply of allowances and reduces the price of emissions. The lower price will encourage increased demand for allowances for firms whom emitting more and buying allowances to cover the emissions becomes economical (Böhringer, Koschel, & Moslener, 2008; Eichner & Pethig, 2019; Goulder & Stavins, 2011). The lack of an automatic adjustment mechanism in the ETS which reduces the overall cap or punctures the waterbed to account for the presence of companion policies makes them environmentally ineffective or vice versa (Verde et al., 2021). The market stability reserve without a cancellation policy alters the timing and price of emissions but has no impact on how much is emitted in total under a fixed cap. However, the introduction of the cancellation policy may have punctured the waterbed, altered the total emissions cap, and created uncertainty (Bruninx et al., 2019).

The classic Hotelling-type work on the dynamics of emissions trading (Hasegawa & Salant, 2015; Rubin, 1996; Schennach, 2000) predicts that optimizing market participants with perfect foresight act in anticipation of any new information about future demand and supply paths of the ETS. Hence, announcements regarding the supply or demand for allowances that contains new information should translate to a revision of market expectations that are reflected in event-induced market reactions. According to economic theory, price formation in the EU ETS should be driven by supply and demand derived market fundamentals such as coal and gas prices as well as economic activity that impact the

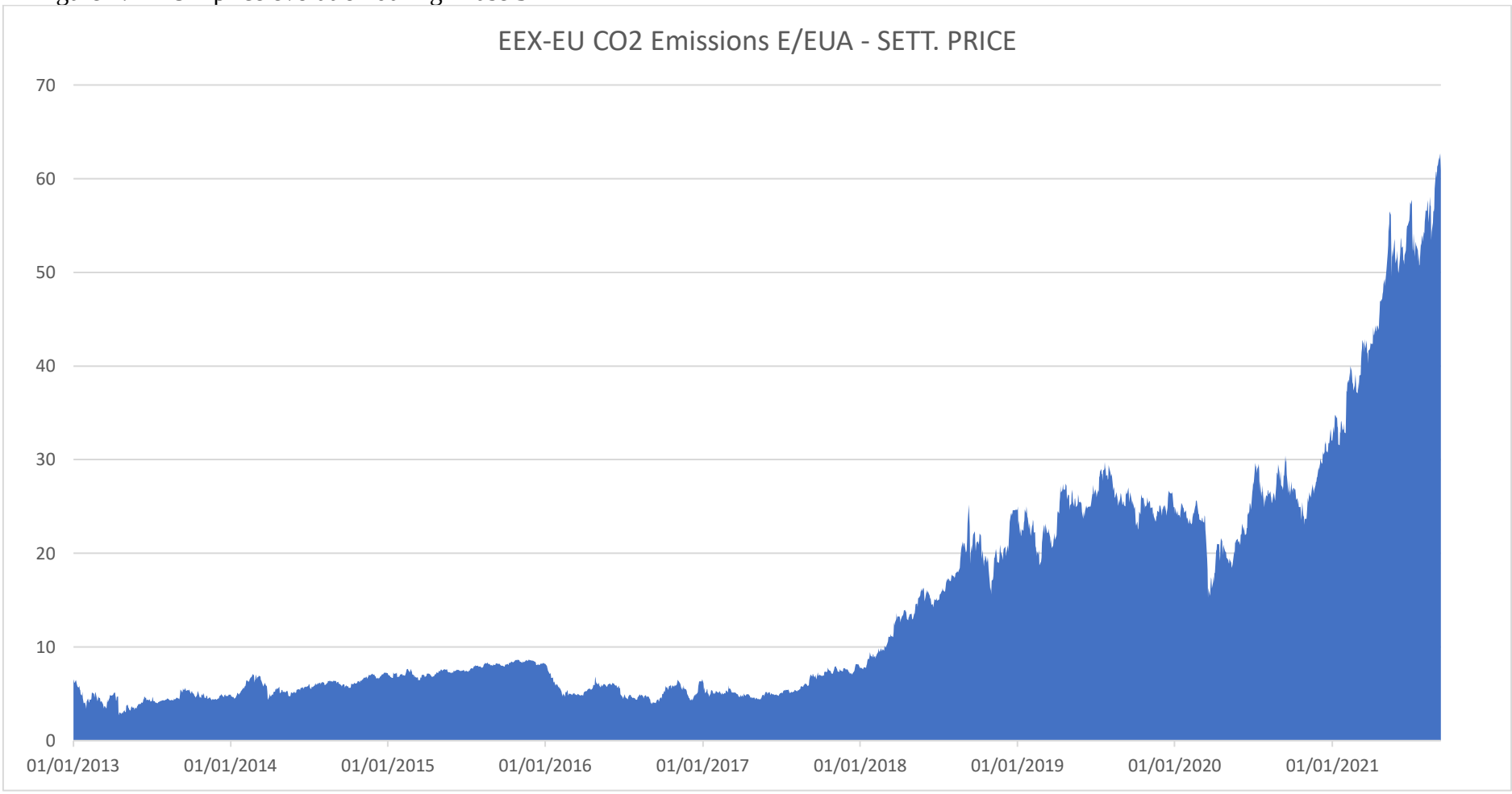
marginal abatement cost and stringency of the cap (Friedrich, Mauer, Pahle, & Tietjen, 2020). However, a review of the empirical literature by Friedrich et al. (2020) concludes that fundamental price drivers such as these have relatively little explanatory power and that the price is driven by other factors.

Since political actions can impact both the supply of EUA by altering the stringency of the cap and the implementation of companion environmental policies can have an impact on the demand for allowances, they have garnered increased attention as possible drivers of the EUA price (Grosjean et al., 2016; Salant, 2016). Regulatory risk in the EUA market stem primarily from the features of the cap setting process in the real-world political environment (Grosjean et al., 2016) with allocation made over time and politically agreed adjustments being continually made to the system. Salant (2016) and Grosjean et al. (2016) empirically investigate the impact of supply related political events on EUA price and find a high level of market responsiveness indicating the presence of regulatory risk. Salant (2016) proposes that the EUA price is a function of the probability of a price altering regulatory intervention and points to the dominant perception of a lack of political will to undertake price increasing regulatory intervention as one of the reasons for the depressed EUA's spot price during the early years of Phase 3. This implies that the market expectations with regards to the uncertain future strictness of the EU ETS weighs on the current price with announcements about its future containing information about the future supply conditions but also about the probability and shape of future political interventions.

As can be seen in figure 1, the EUA price during phase 3 (2013 – 2020) was characterised by two different trends with the prevalence of a subdued horizontal trend until towards the end of 2017 being replaced by an increasing trend after this. We will call the first period of low prices, Phase 3a (2013-2017) and the subsequent period of increasing prices Phase 3b (2018-2020) for the remainder of our analysis. Multiple explanations for the subdued price during the Phase 3a period have been proposed with some considering the

depressed price as an indicator of market inefficiencies (Fuss et al., 2018), allowance oversupply and/or low allowance demand (Hintermann et al., 2016), or political risk (Salant, 2016). The persistently low EUA price created the impression that the EU ETS did not work as intended and was in need of reform (Edenhofer, 2014).

Figure 4. 1 EUA price evolution during Phase 3



Note: This figure shows the evolution of the price of a EUA in Euros during Phase 3 of the EU ETS. Each EUA allows the holder to Emit 1 tonne of Greenhouse Gasses.

Political interventions in the market (backloading and the creation of the MSR) failed to reverse the trend until the announcement of the reforms of the EU ETS for Phase 4 in early 2018. This event coincided with a change in trend and the beginning of EUA price increases. The precise reason for this change in the EUA market dynamic is contested with some pointing to the announcement of the revisions for Phase 4 as the catalyst for the change due to its impact on market participants' perception of the future scarcity of allowances as the introduction of the MSR increasing the robustness of the system to future economic shocks and its cancellation policy increased the stringency of the system by reducing the overall cap or puncturing the waterbed (Gerlagh et al., 2020). Another possible reason for the change could be attributed to a change in the perception of the political will. The dominating perception of a lack of political will to tighten the system which weighed on the EUA price in the earlier period (Grosjean et al., 2016; Salant, 2016) was dispelled with the passing of the revisions. The increased probability of further scarcity increasing political interventions in the market during the Phase 3b period due to the increasing political focus on carbon emission reduction as evidenced in proposals such as the European Green Deal (European Commission, 2019) may also be a key driver of the price.[24] Friedrich, Fries, Pahle, & Edenhofer (2019) also point to the announcement of the revisions as a turning point for

[24] A cursory examination of the EU overall climate policy over the period may display the general political direction which would inform investor beliefs. For most of the life of the EU ETS, the EU's climate related policies were contained in the 2020 Climate and Energy package which set out three main targets to be achieved by 2020: 20% reduction in GHG emissions relative to 1990 levels; 20% share of EU energy from renewables; and 20% improvement in energy efficiency (European Commission, 2020). The EU's climate and energy objectives were updated with the introduction of the 2030 Climate and Energy Framework with a 40% reduction in emissions target, 32% share for renewable energy and at least 32.5% improvement in energy efficiency. However, a level of increased urgency and ambition was introduced into the EU's climate policy in 2019 with the introduction of the European Green Deal that included the achievement of climate neutrality by 2050 as a top priority (European Commission, 2020). This implies a further tightening of the EU ETS and other climate policies are the most likely scenario going forward or the presence of increase risk of regulatory intervention that would increase the EUA price in the later Bull market period of Phase 3.

the market but contend that the reform triggered market speculation and that the new price level may not reflect an anticipated tighter supply of allowances.

Previous sections have described how the EU ETS has evolved since its inception and the resultant pricing dynamics. We have clearly identified the presence of two distinct periods within the third phase and have discusses how the announcements of revisions in Phase 4 may have created an inflection point between the periods that we term Phase 3a and 3b for structural reasons related to the puncturing of the waterbed (Bruninx et al., 2019) and the market sentiment regarding political commitment (Salant, 2016). A common thread throughout was the importance of considering the importance of the context within which the system operated, both political and technological, on market outcomes. Our focus now shifts to the firms that participate in the EU ETS and its impact on their financial performance. This focus on the firm as opposed to the EUA price is warranted as they are the ultimate players that the Carbon Market was designed to influence. An examination of the response of market actors to the announcement of supply and demand information, allows us to observe the market's judgement on the valuation implications of both system wide and firm specific environmental news.

4.2.2 Stock Market Reactions to ETS Demand-side Announcements

We examine the impact of demand-related events in the form of emissions verification events which provide information on the carbon emissions of participating firms over the previous year. According to the efficient market hypothesis (Fama, 1991), information about the carbon emissions of firms will be incorporated into their stock price depending on how it is interpreted by the majority of investors guided by their beliefs about the relationship between carbon emissions and financial performance. Our research extends the line of investigation into the link between environmental performance and financial performance with a consideration of the impact of time-variant external pressures which may

alter the interpretation of emissions information. We examine the evolution of the value relevance of emissions- related environmental performance over time in the presence of the changing market dynamics in the politically constructed EU ETS.

The relationship between a firm's environmental and financial performance has attracted an increasing amount of attention over the years as the climate emergency focuses the minds of academics and policymakers (Hase et al., 2021). However, there are still divergent views on the nature of the relationship, its shape or even the need for policy intervention to encourage companies to transition to more environmentally friendly business activities (Hang et al., 2019). Disagreement still exists regarding the sign of the relation, moderating and mediating factors, and the causality of the effect (Feng et al., 2018; Hang et al., 2019; Hartmann & Vachon, 2018).

Some propose that a trade-off exists between a firm's environmental performance and financial performance (Walley & Whitehead, 1994) resulting in a compliance or cost minimization focus with regards to environmental management. This zero-sum perspective views the internalisation by the firm of an externality such as the cost of air pollution as an additional operating cost that reduces profitability (Bragdon & Marlin, 1972). It is argued that wealth maximizing firms would have already undertaken any projects that create value via efficiency gain or cost reduction so any funds invested in other projects to satisfy environmental regulations or managerial taste must have negative value implications. The negative costs related to these investments would be particularly prevalent in the short term when the costs are realised (Hang et al., 2019). Additionally, environmental regulations that force firms to bear these costs may place them at a competitive disadvantage relative to firms that are not subject to similar requirements.

The counter-argument that environmental performance generates new and competitive resources for a firm has been made from numerous theoretical perspectives such as stakeholder theory (Freeman, 1984), instrumental stakeholder theory (Jones, 1995), the

natural resource based view of the firm (Hart, 1995; Russo & Fouts, 1997) and using the Porter hypothesis (Porter & Linde, 1995). One theoretical pathway that has been proposed to link environmental performance and financial performance relates to operational strategy and the impact that environmental management can have on both the structural (plant and equipment) and infrastructural (production planning, performance measurement, and product design) choices of a firm (Klassen & McLaughlin, 1996). These choice of product and process technology and underlying management systems can positively impact the financial performance of a firm through both market (revenue increases) and cost reduction pathways (Klassen & McLaughlin, 1996).

The Porter hypothesis presents the relationship as a win-win scenario in which increased environmental performance has a positive impact on both environment and financial performance. It proposes that firms will be spurred on by appropriately designed environmental regulation to innovate with resultant efficiency and competitiveness gains (Esty & Porter, 1998; M. E. Porter & Linde, 1995) that would not have been realised without the additional incentive of stricter regulatory requirements. Importantly, firms that move ahead of regulation and their industry peers in terms of environmental performance are better positioned to meet tighter standards in the future and could gain a competitive advantage by establishing the industry standards and creating barriers to entry (Barrett, 1992; Chynoweth & Kirshner, 1993). This would imply that firms which are the most environmentally efficient in their industry will benefit competitively when environmental regulations become stricter regardless of the costs involved as their less efficient competitors' cost base will expand to a greater extent. This is contingent on all firms in the industry being subject to the same regulations and may not hold if competitors are located in other jurisdictions with less strict regulations.

Empirical investigations into the environmental performance – financial performance relationship fall into two major categories: one involving long term accounting

and market measures, and another one applying event study methodology to identify short term financial impacts caused by environmental performance related announcements. In the context of the EU ETS, Andreou & Kellard (2021) use accounting and market measures to investigate the relationship between environmental proactivity and financial performance and find that there is an economic cost to good environmental behaviour in the period from 2005 to 2016. They also highlight the importance of firm type and institutional context on the propensity for firms to be environmentally proactive, finding that public firms are less likely to be proactive than private firms while firms from common law jurisdictions are on average more environmentally proactive than their civil law peers.

Due to the incremental nature of many environmental improvements and the opacity surrounding them, numerous studies have used an event study methodology to examine the stock market reaction to environmental news about a firm (Adamska & Dąbrowski, 2021; Capelle-Blancard & Laguna, 2010; Capelle-Blancard & Petit, 2019; Fisher-Vanden & Thorburn, 2011; Flammer, 2013; Gilley et al., 2000; Klassen & McLaughlin, 1996; Lioui & Sharma, 2012; Oberndorfer et al., 2013; Shane & Spicer, 1983). As small incremental managerial decisions and actions are not easy to observe and evaluate objectively (Klassen & McLaughlin, 1996), a single discrete event, such as the publication of verified emissions data, can signal changes in a firms environmental performance and alter market participants perception of the firm. Stock splits are an oft-used example of the signalling effect of events as they should be irrelevant to valuation but have been found to result in a positive stock market response due to the signal of higher future earnings that markets perceive them to convey (Klein & Peterson, 1989; McNichols & Dravid, 1990). An event study approach has also been widely used to investigate the broader Corporate Social responsibility – financial performance relationship (Adamska & Dąbrowski, 2021) as analysis of event related abnormal returns can be used to reveal whether the market treats the information as relevant (having a positive or negative effect) or irrelevant to company value.

Empirical investigation of the link between environmental performance and financial performance using an event study methodology has resulted in contradictory findings and the need for further investigation. Fisher-Vanden & Thorburn (2011) and Oberndorfer, Schmidt, Wagner, & Ziegler (2013) both find a significantly negative stock market reaction for firms that commit to reducing greenhouse gas emissions or are recognised for their sustainability by inclusion in an index. In the Chinese context, Lyon, Lu, Shi, & Yin (2013) also find a negative stock market reaction to the receivers of environmental awards. Hassel, Nilsson, & Nyquist (2005) find a negative relationship between environmental performance and the market value of equity. Gilley, Worrell, Davidson III, & El–Jelly (2000) disaggregate environmental actions into product and process driven actions, finding that process driven activities generate significantly negative abnormal returns. They contend that these process driven actions which are aimed at reducing costs are associated with a direct cost which drives the market reaction. Lioui & Sharma (2012) find that although environmental initiatives have a direct negative impact on financial performance, they also result in positive indirect effects through efficiency gains from the research and development spending involved.

Conversely, Klassen & McLaughlin (1996) empirically test the stock market reaction to new information about a firm's environmental performance and find a positive relationship between environmental performance and stock returns. Hamilton (1995) and Shane & Spicer's (1983) findings corroborate the presence of a positive relationship between environmental performance and stock prices. Capelle-Blancard & Laguna (2010) also find that news of a chemical disaster results in a significant negative stock market reaction for the firm involved. Flammer (2013) confirms the previous findings of a significant stock price increase for news about positive performance and decrease for negative performance. However, Flammer (2013) adds an element of conditionality to the relationship, finding that

the value of environmental performance depends on time-variant external pressures and internal factors such as the firm's historical environmental performance.

More recently, researchers have focused on the impact of news related to a firms sustainability, inclusive of environmental performance, on stock returns by examining the market reaction to inclusion and exclusion in sustainability indexes (Adamska & Dąbrowski, 2021). This line of investigation has also resulted in substantial heterogeneity of results with findings of significant positive investor reaction to index inclusions and negative to exclusions (Adamska & Dabrowski, 2016; Cheung, 2011; Consolandi, Jaiswal-Dale, Poggiani, & Vercelli, 2009; Curran & Moran, 2007; Hawn, Chatterji, & Mitchell, 2014; Ramchander, Schwebach, & Staking, 2012), only negative reactions to exclusion (Becchetti, Ciciretti, Hasan, & Kobeissi, 2012; Doh, Howton, Howton, & Siegel, 2010; Kappou & Oikonomou, 2016), only negative reaction to inclusion (Lackmann, Ernstberger, & Stich, 2012), no significant reaction (R. Durand, Paugam, & Stolowy, 2019; Hawn, Chatterji, & Mitchell, 2018; Robinson, Kleffner, & Bertels, 2011; Yilmaz, Aksoy, & Tatoglu, 2020), and negative investor reaction to both inclusion and exclusion (Joshi, Pandey, & Ros, 2017; Oberndorfer et al., 2013). Adamska & Dąbrowski (2021) propose that one reason for the divergence in the finding is related to the institutional environment.

Hamilton (1995) opines that investors in publicly traded firms may be concerned about pollution levels because of the cost of future liabilities arising from the pollution, regulatory compliance costs associated with emission reduction, and the loss of good will connected with high pollution figures. The EU ETS legalises and prices carbon emission liabilities for firms operating in the EU and directly impacts both the cost of future liabilities through the carbon allowance price mechanism and the regulatory compliance costs via the stringency of the carbon cap which drives the speed at which firms will have to reduce emissions.

The theoretical relationship between the EU ETS and stock returns could be based on its impact on real cash flows or by changing the expected returns taking that asset values are determined by expected discounted cashflows (Fisher, 1930; Williams, 1938). First, because EUA are a required input for participating firms, higher EUA prices increase the cost of current and future production, reducing future cash flows, earnings, and dividends. This cost effect would imply a negative relationship between EUA prices and stock returns which gains in importance the more carbon intensive the firm. Secondly, the EU ETS could impact the risk premium component of a firm's discount rate incorporating a level of regulatory risk (Grosjean et al., 2016) that would not have been present otherwise. Another possible reason for an association between ETS and stock returns may be a policy signalling affect with investors associating increasing ETS stringency and resultant EUA scarcity with future environmental regulatory stringency. In anticipation of a more stringent emissions system, we should expect a negative market reaction for participating firms as this implies an increase in future costs and the prospect of more stringent regulations in the future. However, the reaction may not be uniform across all participating firms as more carbon efficient firms may have a greater capacity to shoulder the burden than their less efficient peers.

Brouwers, Schoubben, Van Hulle, & Van Uytbergen (2016) implement an event study methodology to investigate the value relevance of emissions verification announcements on participating firms in the first two phases of the EU ETS and find that the first publication of compliance data for each phase resulted in a statistically significant abnormal market reaction while the remaining years had no impact. They attribute these findings to the markets perception that there would be a scarcity of allowances during each of these phases which failed to materialise. The first announcement contained new information on the performance of participating firms that was perceived to be value relevant due to the anticipation of allocation scarcity and resulting high prices. Hence, the perception

of future scarcity and the increased price of carbon liabilities was a key driver of the market reaction during these first announcement. Our research extends Brouwers et al.'s (2016) study by examining the value relevance of emissions verification announcements in the 3rd phase of the EU ETS and also examines the effects of changes in the perception of future scarcity brought about by structural changes to the system through sub period analysis. In order to examine the relevance of announcements which impact demand for emissions allowances during the third phase of the EU ETS, we test the following hypotheses:

H_1: The verification events during the third phase of the EU ETS triggered significant market reactions.

The impact of verification events on EU ETS participating firms may not be homogeneous as the reported emissions of firms will differ and the importance placed on it by market actor may be shaped by firm level characteristics. Firstly, our research also extends the body of research into the impact of environmentally related news on the returns of publicly traded firms (Capelle-Blancard & Laguna, 2010; Capelle-Blancard & Petit, 2019; Fisher-Vanden & Thorburn, 2011; Flammer, 2013; Gilley et al., 2000; Klassen & McLaughlin, 1996; Lioui & Sharma, 2012; Oberndorfer et al., 2013; Shane & Spicer, 1983) through an examination of the market reaction to positive and negative news related to the carbon emissions of firms in an evolving institutional setting.

Secondly, previous research on the EU ETS has highlighted the importance of considering industry characteristics of participating firms when examining the market reaction to supply and demand information related to participating firms (Abrell, Ndoye Faye, & Zachmann, 2011; Bushnell, Chong, & Mansur, 2013; Jong et al., 2014; Koch & Bassen, 2013; Oestreich & Tsiakas, 2012). Industry specific characteristics such as the availability of carbon mitigation measures, carbon intensity, regulatory constraints, asset composition and the composition of cashflows for investments could weigh heavily on the

ability of firms to reduce their carbon emissions. Our research incorporates the impact of industry characteristics on the relevance of carbon reduction performance through two strategies. We measure the emissions reduction performance of firms relative to their peers and also examine the impact of two relevant characteristic that have been identified as possible moderating factors: EU ETS derogations for specifics sectors on the Carbon List and the carbon intensity of firms. Membership of the Carbon List may reduce the stringency of the system and reduce the importance of carbon emissions reduction while increased direct spending on carbon allowances, increased regulatory intervention, abatement expenses and reputational impact are all more likely to accrue to firms in carbon intensive industries (Brouwers et al., 2016). These costs which represent a relative larger proportion of carbon intensive industry's cost base may increase the attention of investors to the publication of verified emissions data as compared to less carbon intensive industries for whom these costs are less consequential. To test the impact of carbon reduction performance and other characteristics on the market reaction to verification events, we test the following hypothesis:

H_2: A positive relationship exists between the firm-specific environmental performance news published during Phase 3 verification event and stock returns for EU ETS participating firms.

H_3: The verification events during Phase 3a and Phase 3b of the EU ETS triggered different market reactions to firm specific environmental performance news.

H_4: The verification events during Phase 3 triggered a significant market reaction which was heterogeneous across firms depending on membership of the Carbon List or level and carbon intensity.

4.2.3 Stock Market Reactions to ETS Supply-side Announcements

We supplement our examination of the impact of verification events which contain information about the system-wide and firm-specific demand for EUA's with an examination of supply-related events which have been identified in previous sections as instrumental in the transition from Phase 3a to Phase 3b, namely the Phase 4 revisions. Clarkson et al. (2013) find evidence indicating that the valuation impact of a firm's EU carbon emissions is significantly greater than that of its non-EU carbon emissions which are not subject to a cap-and-trade system. They present this as supporting evidence for their proposition that the stringency and intensity of regulatory and judicial setting with regards to effective carbon emissions monitoring and enforcement impacts investors' expectations of carbon liabilities. We extend the investigation of the institutional forces driving the relationship between emissions and valuation by examining the market reaction to a change in the structure of the cap-and-trade system which impacted its stringency and intensity. We propose that an increase in the perception of the future stringency of the cap-and-trade system will impact the valuation of participating firms by altering investors' expectations of current and future carbon liabilities. To test this proposition, we choose a number of key events related to revisions of the EU ETS for Phase 4 and test the following hypothesis:

H_5: The political events related to the revisions of the EU ETS for Phase 4 triggered significant market reactions.

H_6: The political events related to the revisions of the EU ETS for Phase 4 triggered a significant market reaction which was heterogeneous across firms depending on carbon efficiency, carbon list membership and carbon intensity.

4.3 Data and Methodology

4.3.1 Data

In order to investigate how the publication of verified emissions in the EU ETS affected stock prices of participating firms during Phase 3, we analyse the market reactions on 8 event dates. From the beginning of the third trading period, the monitoring and reporting of greenhouse gas emissions was required to be in line with the EU Monitoring and Reporting regulations to ensure that the monitoring, reporting and verification of emissions is complete, consistent, accurate and transparent (European Commission, 2015b). Participating installations are required to submit an annual emissions report which is then verified by an independent accredited verifier and published in the following year on a central European registry maintained by the European Commission (European Commission, 2015b). The preceding year's verified emissions data for all firms are simultaneously published on the Commissions website. The publication of Phase 3 emissions data took place on the 1st (2014, 2015, 2016, 2019, 2020, 2021) or 3rd (2017, 2018) of April each year, corresponding to 8 event dates. Two types of data are available for each installation; the number of free allowances allocated to it and its verified emissions for a given year.

In order to investigate how the politically agreed changes to the EU ETS affected the stock prices of participating firms during Phase 3, we analyse the market reaction on 6 event dates. As the choice of event date is of utmost importance in event studies because estimates will become biased if key dates in the regulatory process are ambiguous (Jong et al., 2014), we examine the impact of a number of events in the regulatory process relating to the Phase 4 revisions which occurred during the period from 28.02.2017 to the 27.02.2018. This includes 6 event dates during the process which begins with the European council agreeing its negotiating position for the review of the EU ETS (28.02.2017), a deal being reached in the trilogue process (09.11.2017), endorsement of the deal by the council (22.11.2017),

European parliament agreement on their position (06.02.2018), the parliament voting in favour (15.02.2018) and its formal approval (27.02.2018).

In this research we also categorise firms as being on the carbon list or not. We categorise firms as being on the carbon list if their primary or secondary NACE industry code is on the official list of sectors and sub-sectors considered to be at significant risk of carbon leakage drawn up by the European Commission with the agreement of the member states and the European Parliament, following an impact assessment and extensive consultation with stakeholders (European Commission, 2015b).

4.3.1.1 Sample selection

As our study seeks to explore the stock market reaction to EU ETS verification and political events during the third phase of the system, our study contains European listed firms with installations covered by the EU ETS during the period. We matched the emissions data from the Union registry, provided by the Carbon Market Data database[25], to financial data from Refinitiv DataStream. The installation level emissions and allowance allocation data provided on the Community Independent Transaction Log by the European Commission was matched to firms which resulted in a sample of 123 publicly traded firms covering 4,139 installation in our sample. As 16,061 installations have been covered by the EU ETS since its inception, this represents 25.8% of the total number of installations. However, these 25.8% of installations accounted for 45.43% of the total verified emissions in the entire EU ETS for 2020. Table 4.1 compares the regional breakdown of firms and installations in our dataset to the distribution of installations covered by the EU ETS. It can be noted that our sample is heavily weighted towards five countries (Germany, France, Italy, Spain and United Kingdom) which contain 57% of firms and 64% of installations. However, these countries

[25] Carbon Market Data is a carbon market research company and data vendor

account for 54% of installations covered by the EU ETS which shows that our sample is similarly structured to the overall sample.

Table 4. 1 Regional Breakdown

Country	Listed firms	%	Installation sample	%	Installation EU ETS	%
Austria	6	4.88%	81	1.96%	264	1.64%
Belgium	7	5.69%	163	3.94%	467	2.91%
Bulgaria	0	0.00%	10	0.24%	170	1.06%
Croatia	0	0.00%	3	0.07%	62	0.39%
Cyprus	0	0.00%	0	0.00%	15	0.09%
Czech Republic	1	0.81%	159	3.84%	455	2.83%
Denmark	2	1.63%	34	0.82%	441	2.75%
Estonia	0	0.00%	19	0.46%	63	0.39%
Finland	7	5.69%	127	3.07%	733	4.56%
France	16	13.01%	692	16.72%	1528	9.51%
Germany	18	14.63%	695	16.79%	2613	16.27%
Greece	0	0.00%	11	0.27%	196	1.22%
Hungary	2	1.63%	82	1.98%	301	1.87%
Iceland	0	0.00%	1	0.02%	9	0.06%
Ireland	2	1.63%	18	0.43%	154	0.96%
Italy	12	9.76%	487	11.77%	1557	9.69%
Latvia	0	0.00%	9	0.22%	116	0.72%
Liechtenstein	0	0.00%	0	0.00%	2	0.01%
Lithuania	1	0.81%	26	0.63%	124	0.77%
Luxembourg	0	0.00%	13	0.31%	27	0.17%
Malta	0	0.00%	0	0.00%	7	0.04%
Netherlands	4	3.25%	146	3.53%	644	4.01%
Norway	4	3.25%	64	1.55%	183	1.14%
Poland	3	2.44%	179	4.32%	1070	6.66%
Portugal	3	2.44%	45	1.09%	341	2.12%
Romania	2	1.63%	50	1.21%	301	1.87%
Slovak Republic	1	0.81%	51	1.23%	223	1.39%
Slovenia	0	0.00%	2	0.05%	103	0.64%
Spain	11	8.94%	361	8.72%	1443	8.98%
Sweden	6	4.88%	204	4.93%	960	5.98%
Switzerland	2	1.63%	0	0.00%	0	0.00%
United Kingdom	13	10.57%	407	9.83%	1489	9.27%
Total	123		4139		16061	

Note: This tables shows the regional distribution of firms, sample installations and EU ETS installations

Table 4.2 presents the industry composition in our sample and the two sub-sample periods. Firms operating in the sectors Utilities, Basic materials and Energy constitute the majority of our sample as is to be expected as these are the sectors covered by the EU ETS. Utilities dominate in the amount of carbon emissions created by the sector at 52% of the sample but also of note is the allowance deficit in the sector at -92.95%. This represents a clear break with the previous two phases of the EU ETS in which 56.24% (Phase 1) and 47.90% (Phase 2) of free allowances were allocated to the Utility sector which was responsible for 60% of verified carbon emissions (Brouwers et al., 2016). In aggregate, all sectors except Industrials and Basic Materials have a deficit in allowances during Phase 3 which is contrary to the finding of research on the previous phases in which only Utilities firms were found to be in deficit (Brouwers et al., 2016). Figure 2 clearly demonstrates the change from the earlier phases for our sample.

Table 4. 2 Industry Breakdown

Panel A: Full Sample

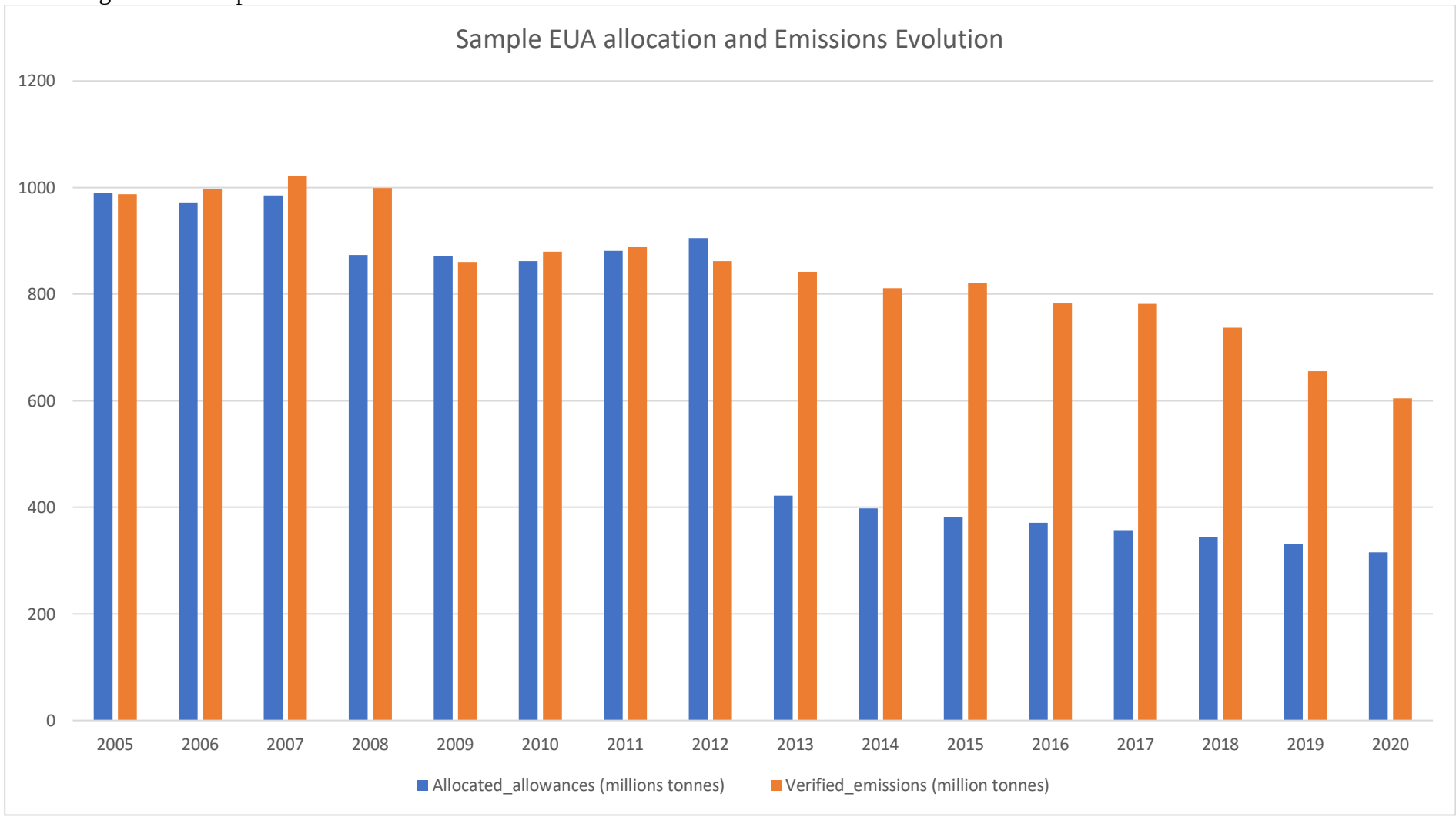
Industry	Number of Firms	% of Firms	% of Sample Free Allocation	% of Sample Emissions	% on Carbon list	% Intense	Allocated EUA	Verified emissions	Allowance Surplus/ Deficit
Industrials	26	21.14%	30.95%	13.97%	26.92%	59.13%	926,281,103	904,586,267	2.40%
Utilities	20	16.26%	9.26%	51.95%	23.75%	81.88%	208,793,305	2,962,407,991	-92.95%
Energy	19	15.45%	22.38%	16.28%	36.84%	71.71%	668,186,625	1,040,960,169	-35.81%
Basic Materials	35	28.46%	35.99%	16.69%	27.14%	40.36%	1,076,284,962	1,058,636,991	1.67%
Consumer goods	17	13.82%	0.95%	0.85%	13.24%	5.88%	27,263,099	53,472,233	-49.01%
Health Care	5	4.07%	0.47%	0.25%	30.00%	20.00%	13,959,076	15,679,828	-10.97%
Telecommunications	1	0.81%	0.00%	0.00%	0.00%	0.00%	5,272	7,008	-24.77%
Total	123						2,920,773,442	6,035,750,487	-51.61%

Panel B: Sub Sample Periods

	Phase 3a (2013- 2016)			Phase 3b (2017-2020)		
Industry	Allocated Allowances	Verified emissions	Allowance Surplus/ Deficit	Allocated Allowances	Verified emissions	Allowance Surplus/ Deficit
Industrials	486601247	454955940	6.96%	439679856	449630327	-2.21%
Utilities	145648905	1692099702	-91.39%	63144400	1270308289	-95.03%
Energy	351923878	530247191	-33.63%	316262747	510712978	-38.07%
Basic Materials	565858936	543652555	4.08%	510426026	514984436	-0.89%
Consumer goods	14947104	27799870	-46.23%	12315995	25672363	-52.03%
Health Care	7358235	8108864	-9.26%	6600841	7570964	-12.81%
Telecommunications	3985	4180	-4.67%	1287	2828	-54.49%
Total	1572342290	3256868302	-51.72%	1348431152	2778882185	-51.48%

Note: This tables illustrates the industry composition of the sample of participating firms used in the study. It also presents information about their cumulative allocated EUAs, verified emissions and allowance position for the entire sample in Panel A and for the two sub samples in Panel B. Each EUA is equivalent to permission to emit 1 tonne of GHGs and emissions are measures in tonnes of GHGs.

Figure 4. 2 Sample Emissions and allocated allowances evolution



4.3.2 Methodology

4.3.2.1 Event Study methodology

Stock market event studies are based on the Efficient Market Hypothesis and the premise that stock markets operate efficiently by reflecting current information and expectations (Hamilton, 1995). Hence, events that impact a firm's market price convey information that is new, unexpected and perceived to be relevant to the valuation of the firm. The event triggers the incorporation of this new information into the current stock price with the magnitude and direction of the reaction indicating the evaluation of its impact on the firm's future financial performance by market actors. Event studies have been widely applied in studies of stock market responses to negative and positive information with market-wide and company-specific relevance such as stock splits (Fama, Fisher, Jensen, & Roll, 1969), dividend payments (Asquith & Mullins Jr, 1983), financial results (Deshpande & Svetina, 2011), Corporate social responsibility and irresponsibility (Groening & Kanuri, 2018), Corporate crime (Song & Han, 2017), firm reputation (Abraham, Friedman, Khan, & Skolnik, 2008) and inclusion and deletions form indices (Adamska & Dąbrowski, 2021; Geppert, Ivanov, & Karels, 2011).

We use an event study methodology to analyse the impact of the 8 EU ETS emissions verification announcements and the 6 selected political events during the third phase of the system. An event study methodology assumes efficient capital markets in which stock prices fully reflect any changes in the information set for investors on any day (Fama, 1991). This implies that all available information which impacts a firm's future cash flows and profitability is incorporated into the stock price and event-induced changes in stock prices allow for the possible extraction of the returns related to that event. The basic notion of an event study is to disentangle the effect of two types of information: firm specific and market wide information. In order to disentangle these two types of information, a market model is implemented to create a business-as-usual estimate of returns which is used to adjust the

event date returns to remove the influence of the overall market (Corrado, 2011). We derive the expected returns for the event period using a single factor market model (MacKinlay, 1997) estimated over 200 trading days ending 20 days prior to the event date for the 8 emissions verification events. In the case of the 6 political events, many events are clustered around the same period, so we reduce the estimation period to 150 trading days ending 20 days prior to the first event date where the events are within 170 days of each other. This results in one estimation period for the first political event on the 28.02.2017 and a common estimation period for the remaining five political events ending 20 days prior to 09.11.2017. This eliminates the bias in estimating the expected returns that would be present if an event was present in the estimation period.

We then calculate the abnormal returns over the event window to examine whether the event had a significant impact on stock prices. To estimate the expected stock returns, the daily stock returns of firm i are regressed on the market returns over the estimation window (day -220 to day -21):

$$R_{it} = \alpha_i + \beta_i R_{mt} + \varepsilon_{it}, \quad t \in [-220, -21], \ i = 1,2, \dots, N \tag{4.1}$$

Where R_{it} is the return on stock i on day t and R_{mt} is the market returns on day t. α_i, a constant term for firm i, and β_i, the slope of the characteristic return of firm i, are ordinary least squares (OLS) estimates, and ε_{it} is the error term. We use standard country indices as our market proxies to estimate the relationship between individual stock returns and the market within the estimation period. The abnormal returns (AR) for stock i on day t is given by

$$AR_{it} = R_{it} - \alpha_i + \beta_i R_{mt} \tag{4.2}$$

The stock prices used to calculate the abnormal returns are the daily closing prices as these should reflect the impact of the event on day zero. To estimate the total impact of

the event over the entire event window, the daily abnormal returns are aggregated into the cumulative abnormal return (CAR) for stock i.

$$CAR_i(\tau_1, \tau_2) = \sum_{t=\tau_2}^{\tau_2} AR_{it} \tag{4.3}$$

Where τ_1 and τ_2 denote the beginning and end of the event window. As the focus of our research is on the aggregate effect of the event on participating firms as opposed to a single firm, we estimate the average abnormal return (AAR) across all firms:

$$AAR = \frac{1}{N}\sum_{t=t}^{N} AR_{it} \tag{4.4}$$

The average abnormal return is then aggregated into the cumulative average abnormal returns (CAARs) to capture the total impact of the multiple observations across the entire event window:

$$CAAR = \sum_{t=t}^{N} AAR_t \tag{4.5}$$

We use the following event windows to capture possible leaks in information and to reflect possible delays in the incorporation of the information into the stock price: (-1, +1), (0, +1), (0, +2), (0, +3) and (0,+4). We implement a short event window to minimize confounding effects (McWilliams & Siegel, 1997) but allow some time for the information to influence investors decisions and trigger a market reaction due to the complex and difficult to interpret nature of the information. A relatively short event window also essentially eliminates the effect of company characteristics such as size, profitability or leverage, which were already known and were unlikely to change substantially over a very short period (Adamska & Dąbrowski, 2021).

We assess the event date abnormal returns for statistical significance relative to the distribution of abnormal returns in the estimation period. One common method is to test for statistical significance using parametric tests that assume abnormal returns are normally distributed (Corrado, 2011). The Patell T-test is a popular test that can be used when it is desirable to aggregate results into a single hypothesis (Corrado, 2011; Patell, 1976).

However, the fact that the validity of the test depends critically on the assumption that stock returns are normally distributed has spurred the development of non-parametric tests which rely on no such assumption and avoid imprecise inference in the presence of non-normally distributed security returns. A number of studies have concluded that non-parametric sign and rank tests provide an improvement in test power compared to standard parametric tests (Bartholdy, Olson, & Peare, 2007; Chandra, Rohrbach, & Willinger, 1992, 1995; Corrado & Truong, 2008; Cowan, 1992, 1993; Seiler, 2000). Campbell & Wesley (1993) find that the non-parametric rank test by Corrado (1989) was well specified with Nasdaq data while parametric event study tests were poorly specified. The finding that non-parametric rank and sign tests were well specified while standard parametric tests were not was supported when data from the Toronto stock exchange (Maynes & Rumsey, 1993), the Copenhagen stock exchange (Bartholdy et al., 2007) and the Asia-Pacific stock exchanges (Corrado & Truong, 2008) were used. Corrado & Truong (2008) find that the rank test introduced in Corrado (1989) and further adjusted for cross-sectional variance in Corrado & Zivney (1992) has the best specification overall with United States and Asia Pacific market returns data.

Additionally, cross sectional correlation may lead to downward-biased estimates in the standard errors of regression coefficients and consequently overstated t-statistics when the event takes place at the same time for all firms (Brouwers et al., 2016; Ingram & Ingram, 1993). As verified emissions and political dates are simultaneous across all firms, we

mitigate the impact of cross-sectional correlation and event induced volatility (Corrado & Zivney, 1992) in addition to reducing the possibility of misspecification from the presence of non-normally distributed data by using the non-parametric rank test adjusted for cross-sectional variance in Corrado & Zivney (1992) to test the significance of the event in this study.

For our first and fourth hypothesis, we examine whether a market reaction is triggered in the stocks of publicly traded EU ETS participating firm when new information about the supply and demand of EUAs is published. As the sign of the reaction is irrelevant to both hypotheses, we test whether cumulative average abnormal returns are significantly different from zero. Once our research has examined the relevance of these event, we analyse the effect of environmental news (Positive and Negative) and test the null hypothesis of no price reaction against a signed alternative in the remaining models related to the verification events.

New information about a reduction in a firm's carbon liability or emissions may signal a firm's strong current environmental performance in addition to altering expectations of continued strong performance with a possible impact on financial performance. Conversely, new information about carbon liabilities increases may signal a firm's poor current and future environmental performance and the financial repercussions that would entail.

4.3.2.2 Categorisation of Firms by Environmental Performance News

We categorise the firm specific information released on the verification event date as positive or negative news using four methods; the change in a firm's allowance surplus/deficit or the increase or reduction in their uncovered carbon liability (Absolute performance (1)), the change in a firm's industry relative allowance surplus/deficit (2), the

change in a firm's verified emissions compared to the previous year's change in emissions (3) and the change in a firm's verified emissions relative to expectations (Expectations (4)).

As Clarkson et al. (2015) find that market participants pay attention to a firm's uncovered carbon liability, the amount of emissions that exceed free allowances, as oppose to its absolute level of emissions within the EU ETS, we measure absolute performance as the change in a firm's allowance surplus since the previous year with firms categorised as positive or negative based on the sign of the change (1).[26] The news from the absolute measure entails both an immediate direct financial cost for the firms as a firm with negative performance would have to increase their purchase of EUA's to cover the increased carbon liability (or have fewer EUAs to sell) and also signalling an increase in future carbon liabilities.

Firms' internal and industry characteristics may also impact the perspectives taken by investors on the relevance of our EU ETS events. A firm's emissions reduction performance should be judged against the performance of others in the same industry as the availability of carbon mitigation measures, carbon intensity, regulatory constraints, asset composition, the composition of cashflows for investments etc. are industry specific. Additionally, the ability of a firm to pass on the carbon compliance costs may also rely on its industry relative carbon performance with the most carbon efficient firms being able to pass on a larger proportion of the cost while their less efficient peers would not as this would cause their pricing to become un-competitive. Hence, positive (negative) news of a reduction (increase) in the relative size of a firm's EUA or carbon liability represents an increase in its relative carbon efficiency and competitiveness. Industry relative performance is measured

[26] We calculate a firm absolute surplus or deficit of allowances as a percentage of its total emissions covered by its free allowances. Absolute Surplus = (Free Allowances- Verified Emissions)/ Verified Emissions.

as the change in a firm's industry relative allowance surplus/deficit since the previous year with firms categorised as positive or negative based on the sign of the change (2).[27]

Gupta & Goldar (2005) note that the provision of new information about the carbon performance of a firm may cause abnormal changes in its stock price when the information deviates from investor's expectations and is perceived to impact profitability. Hence, absolute changes in emissions may matter less if these changes were expected and hence already included in the stock price previous to the event. This is in line with the Efficient Market Hypothesis which postulates that the expected changes will be already priced in and only deviations from expectations will result in market reactions. Hence, we compare a firm's change in emissions in a given year to the change in emissions that may be expected based on the historical verified emission changes of the firm. Firstly, we compare the current year's percentage verified emission change with the previous year, with positive (negative) performance attributed to firm that reduce (increase) their emissions by a greater percentage than the previous year or increase (reduce) their emission by a lesser extent (3). Secondly, we create a measure of expectations which is the average percentage verified emissions reduction over the previous five years (4). The standard deviation of the percentage emissions reduction is also calculated over the same five-year period and firms are classified into one of four groups based on their observed performance relative to our measure of expectations in a given year. Firms which perform worse than their average performance over the previous five years (expectations) are categorised into two groups, firm with negative performance within one standard deviation of expectations are classified as negative while firms with a negative performance greater than this are classified as very

[27] A firm's industry relative allowance surplus is calculated by subtracting the average industry surplus from the firm's allowance surplus/deficit in a given year. The average industry surplus/deficit is created by combining average activity-level emissions and allocated allowance data in proportion to the number and type of installations for each firm.

negative. The same method of classification is applied to positive firms. The use of these groupings allows us to examine whether more extreme deviations from expectations elicit more pronounced market responses. Table 4.3 shows the performance of different industries over Phase 3 across our four measures in Panel A and a further breakdown into the two market periods can be found in Panel B.

Table 4. 3 Change in performance measures Industry Breakdown

Panel A: Full Sample

Industry	Obs.	(1) Positive Absolute Performance	(2) Positive Industry Relative Performance	(3) Better Performance than Previous Year	(4) Emission reduction relative to expectations			
					Very Negative	Negative	Positive	Very Positive
Industrials	208	75	113	108	36	61	76	35
Utilities	160	41	100	86	40	45	38	37
Energy	152	66	83	82	17	53	44	38
Basic Materials	280	119	148	145	33	91	109	47
Consumer goods	136	37	61	73	19	39	40	38
Health Care	40	14	24	24	5	10	14	11
Telecommunications	8	2	3	3	1	2	1	4
Total	984	354	532	521	151	301	322	210
%		36%	54%	53%	15%	31%	33%	21%

Panel B: Sub Sample Periods

Industry	Phase 3a (2013- 2016)					Phase 3b (2017-2020)				
	Positive Absolute Performance	Positive Industry Relative Performance	Better Performance than Previous year	Very Positive	Very Negative	Positive Absolute Performance	Positive Industry Relative Performance	Better Performance than Previous year	Very Positive	Very Negative
Industrials	31	60	49	11	23	44	53	59	29	12
Utilities	18	49	40	25	15	23	51	46	22	9
Energy	27	44	40	10	17	39	39	42	15	9
Basic Materials	49	76	63	11	28	70	72	82	37	11
Consumer goods	17	36	35	11	15	20	25	38	15	10
Health Care	5	12	11	4	2	9	12	13	5	2
Telecommunications	1	2	2	1	1	1	1	1	1	3
Total	148	279	240	73	101	206	253	281	124	56
%	30%	57%	49%	15%	21%	42%	51%	57%	25%	11%

Note: Panel A of this tables illustrates the number of firms in each industry that had positive performance on three of our performance measures and the four groupings for emissions reduction performance relative to expectations during Phase 3 of the EU ETS. Panel B shows the number of firms in each industry that had positive performance on three of our performance measures and very positive and very negative emissions reduction performance relative to expectations during the two sub periods of the EU ETS's Phase 3.

4.3.2.3 Categorising firms by Environmental Efficiency

When we examine the market reaction to political events it is not possible to use the same measure of the change in a firm's carbon liability or emissions as no new firm level information is revealed during the event. As the information revealed on the event date is common across the entire sample of firms, we instead investigate whether the importance and impact of this information is perceived to impact firms differently depending on their level of carbon efficiency. During Phase 3 of the EU ETS, firms' level of free allowances are based on a benchmark method with the most carbon efficient firms receiving enough free allowances to cover their carbon emissions and the less carbon efficient the firm the larger their allowance deficit (European Commission, 2015b). Hence, the size of a firms allowance surplus/deficit can be used as a proxy measure of their carbon efficiency (Andreou & Kellard, 2020).

We categorise firms based on their absolute and relative allowance surplus to examine whether the carbon efficiency of firms impacts the market reaction to political events (5). In absolute terms, we calculate a firm surplus or deficit of allowances as a percentage of its total emissions and then categorise firms into four groups based on the size of the surplus. Firms that have a surplus greater than 20% of their emissions are classified as proactive, firms that have a surplus that is less than 20% are classified as surplus, firms with a deficit greater than 20% are classified as reactive and firms with a deficit less than 20% are classified as deficit firms.

To measure the industry relative carbon efficiency of firms, we categorise firms based on their industry relative surplus (6). Firms that have a relative surplus greater than 20% are classified as top performers, firms that have a relative surplus that is less than 20% are classified as Above, firms with a relative deficit greater than 20% are classified as bottom performers and firms with a deficit less than 20% are classified as below firms. Table 4.4 illustrates the number of firms in each category of absolute and industry relative carbon

efficiency during the political events under examination. Table 4.5 outlines the breakdown of our measures.

For both types of events, we also investigate whether two other factors impact the market reaction, Carbon list membership and Carbon intensity. We classify firms into two groups based on whether their activities are covered by the carbon list and rerun the analysis of the market reaction to verification events with our measures of performance. In order to ensure the competitiveness of firms that operated in industries that are exposed to carbon leakage, a carbon leakage list (Carbon List) of such industries was created with exposed installations receiving a higher share of up to 100% of the quantity determined by the free allocation rule (De Clara & Mayr, 2018). To investigate the impact of carbon intensity, we classify firms into two groups based their level of emissions with firms that are above the median emission level in our sample classified as carbon intense and those below classified as less carbon intense

Finally, in order to test our third hypothesis which relates the impact of the changing dynamics of the market between Phase 3a and Phase 3b, we also examine the impact of our measures of performance having split our sample into two periods as changes in the structure of the EU ETS system may alter investors perception of the future cost of emissions and benefits (drawbacks) of good (poor) environmental performance. The first sub period is classified as the Phase 3a and include the publication of data for the years 2013 to 2016 which were release in the years from 2014 to 2017. The second subperiod is classified as Phase 3b and include the publication of data for the years 2017 to 2020 which were release in the years from 2018 to 2021.

Table 4. 4 Carbon efficiency measures during political events

Political Event Date	Absolute				Industry Relative			
	Reactive	Deficit	Surplus	Proactive	Bottom	Below	Above	Top
28.02.2017	56	27	26	14	17	18	25	63
09.11.2017	57	28	16	22	15	22	21	65
22.11.2017	57	28	16	22	15	22	21	65
06.02.2018	57	28	16	22	15	22	21	65
15.02.2018	57	28	16	22	15	22	21	65
27.02.2018	57	28	16	22	15	22	21	65

Note: This tables illustrates the number of firms in each category of absolute and industry relative carbon efficiency during the political events related to the revisions of the EU ETS for phase 4.

Table 4. 5 Performance measures

Measure	Calculation	Categorisation
Allowance surplus (Carbon Liability)	$Allowance\ Surplus\ (AS)_{it} = \frac{Allocated\ Allowances(AA)_{it} - Verified\ Emissions(VE)_{it}}{Verified\ Emissions(VE)_{it}}$	Reactive: $AS_{it} <$ -20% Deficit: $0 > AS_{it} \geq$ -20% Surplus: $0 < AS_{it} \leq$20% Proactive: $AS_{it} >$ 20%
(1) Change in allowance surplus (Absolute Performance)	$\Delta AS_{it} = AS_{it} - AS_{it-1}$	Negative change: $\Delta AS_{it} < 0$ Positive change: $\Delta AS_{it} > 0$
Industry Relative Surplus	$Industry\ Relative\ Surplus\ (RS)_{it} = AS_{it} - Average\ Industry\ surplus_{it}$ Where: $Average\ Industry\ surplus_{it} = \frac{Allocated\ Allowances\ to\ Activity_t - Verified\ Emissions\ of\ Activity_t}{Verified\ Emissions\ of\ Activity_t}$	Bottom: $RS_{it} <$ -20% Below: $0 > RS_{it} \geq$ -20% Above: $0 < RS_{it} \leq$ 20% Top: $RS_{it} >$ 20%
(2) Change in Industry relative surplus (Relative Performance)	$\Delta RS_{it} = RS_{it} - RS_{it-1}$	Negative change: $\Delta RS_{it} < 0$ Positive change: $\Delta RS_{it} > 0$
(3) Emissions reduction relative to previous year	$\Delta\ Verified\ Emissions\ (VE)_{it} = \frac{VE_{it} - VE_{it-1}}{VE_{t-1}}$	Negative change: $\Delta VE_{it} < \Delta VE_{it-1}$ Positive change: $\Delta VE_{it} > \Delta VE_{it-1}$
(4) Change in Emissions relative to previous 5 years' changes (Emissions reduction Relative to Expectations)	$E(\Delta VE)_{it} = \frac{1}{5}(\Delta VE_{it-1} + \Delta VE_{it-2} + \Delta VE_{it-3} + \Delta VE_{it-4} + \Delta VE_{it-5})$ $\sigma_{it} = \sqrt{\sum_{i=-5}^{-1} \frac{(VE_{it} - \overline{VE_i})^2}{5}}$ $SD1P_{it} = E(\Delta VE)_{it} - \sigma_{it}$ $SD1N_{it} = E(\Delta VE)_{it} + \sigma_{it}$	Very Negative: $\Delta VE_{it} > SD1N_{it}$ Negative: $E(\Delta VE)_{it} < \Delta VE_{it} \leq SD1N_{it}$ Positive: $E(\Delta VE)_{it} > \Delta VE_{it} \geq SD1P_{it}$ Very Positive: $\Delta VE_{it} < SD1P_{it}$

Note: This tables shows the calculation of our performance measures and how they are used to categorise firms.

4.4 Findings

4.4.1 Market Reactions to the EU ETS Verification Events

In this section we examine the market reaction to EU ETS emission verification events for publicly traded participating firms. We start by examining the overall market reaction by year over four event windows ranging from (-1, +1) to (0, +4) for each publication of Phase 3 data. We then examine whether a firm's published performance impacts the market reaction across the entire period and in our two sub periods, Finally, we also examine the possible moderating impact of membership of the Carbon List and the carbon intensity of the firm.

Table 4.6 lists the cumulative average abnormal returns (CAARs) for the 8 different verification event dates of the EU ETS for Phase 3 (2013-2020). The results indicate that stock prices only react significantly for the publication of 2018 emission data in 2019 and 2019 emission data in 2020. The publication of the 2018 emissions data in 2019 resulted in a positive and significant market reaction for participating firms across four of the five event windows with CAARs ranging from 0.8% to 1.3%. The positive market reaction may be attributed to the overall positive performance of the participating firms who reduced their emissions by 5.7% compared to the previous year's publication and represented the largest drop in emissions up to that point in phase 3. In 2020, the market reaction to the publication was positive and significant across all event windows with CAARs ranging from 1.4% to 2.6%. The overall reduction in emissions from the previous year reported in this period was substantial at 11.1% with the reduction in activity due to the COVID crisis a probable cause for the outsized reduction. However, as this reduction coincides with a reduction in the required expenditure on EUAs for the firms involved, markets reacted positively to the reduction in this liability. In 2021, no significant market reaction is registered across all event windows even though the overall decrease in emissions reported was -7.8%.

Table 4. 6 EU ETS Emissions verification events

Event:	CAAR[-1, +1]	CAAR[0,+1]	CAAR[0,+2]	CAAR[0,+3]	CAAR[0,+4]
2014 (2013 Emissions)	-0.0007	-0.0021	-0.0034	-0.0027	-0.0021
	-0.7932	-1.2768	-1.4867	-1.1969	-0.7464
2015 (2014 Emissions)	-0.0012	0.0000	0.0003	0.0009	0.0041
	-0.5033	0.2705	0.3885	0.4431	1.1089
2016 (2015 Emissions)	0.0071	0.0055	0.0051	0.0026	0.0035
	0.9091	1.0363	0.7533	0.3402	0.6923
2017 (2016 Emissions)	-0.019	-0.0024	-0.0017	-0.0075	-0.0052
	-0.3506	0.2672	0.8808	-0.0841	0.3368
2018 (2017 Emissions)	-0.0028	-0.0027	-0.0003	0.0027	0.0003
	-0.3768	-0.4585	0.2237	1.0631	0.8283
2019 (2018 Emissions)	0.0111	0.0081	0.0091	0.0099	0.0128
	1.921*	2.0917**	1.9496*	1.304	1.8367*
2020 (2019 Emissions)	0.0258	0.0141	0.0156	0.0184	0.0195
	2.9219***	2.3973**	2.4922**	2.0751**	1.6784*
2021 (2020 Emissions)	-0.0071	-0.003	-0.0034	-0.0022	-0.0015
	-0.8312	-0.2405	-0.0116	0.3979	0.6757

Note: This table shows the Cumulative average abnormal returns for the different windows surrounding verification events for data from the Phase 3 of the EU ETS. The second line reports a Corrado Rank test statistic (Corrado, 1989). Significance measures are two-tailed and P values are indicated as follows: $^{*}p<0.1$; $^{**}p<0.05$; $^{***}p<0.01$

However, the average reduction in firm level emissions reported in 2021 was a less substantial -2.6% which may account for the insignificant market reaction and highlights the importance of considering firm level emissions measures when analysing the market reaction to these events. These findings are partially support our first hypothesis as some of the verification events during the third phase of the EU ETS triggered significant market reactions.

Overall, the increase in significance for events later in Phase 3 and the lack of a significant impact of earlier verification events, indicates a possible change in the importance of the emissions verification data in the latter half of the phase and informs our choice to examine the two periods of the phase separately. Our results also highlight the need for a more granular investigation of the market reaction to these events.

The above analysis examines the entire sample of firms without considering the nature of the firm level information that the event was revealing. Hence, the overall CAARs reported above may be subdued as they represent the average market reaction to both positive and negative firm level news. To gain further insight into the market reaction to these events, we segregate the sample based on whether the published verified emissions data represented positive or negative news about the firms' carbon liability and carbon emissions reduction performance.

This will allow us to investigate whether firms are rewarded with higher returns for a reduction in their carbon liabilities and/or carbon emissions and vice versa. We categorise the news as positive or negative using three separate methods. These are the change in a firm's absolute carbon liability (Absolute Performance), industry relative carbon liability (Relative Performance) and emissions relative to expectations (Emissions reduction Relative to Expectations).

Table 4. 7 Absolute and Industry Relative Performance

Absolute Performance	CAAR[0, 1]	CAAR[0, 2]	CAAR[0, 3]	Relative Performance	CAAR[0, 1]	CAAR[0, 2]	CAAR[0, 3]
Panel A: Full sample							
Negative	0.0021	0.0022	0.0014	Negative	0.0029	0.0025	0.003
	0.9616	1.297	0.8752		1.3607	1.0179	1.3011
Positive	0.0023	0.0034	0.0052	Positive	0.0025	0.003	0.0015
	1.4654	1.8205*	1.8081*		1.6965*	1.5338	1.1325
Panel B: 3a							
Negative	0.0011	0.0006	-0.0007	Negative	0.0017	0.0009	0.0002
	0.0002	0.012	-0.5193		0.4657	0.2409	-0.2051
Positive	-0.0016	-0.0011	-0.0038	Positive	-0.0008	-0.0006	-0.0031
	0.4082	0.6873	0.3695		-0.0629	0.2853	-0.1806
Panel C: 3b							
Negative	0.0034	0.0042	0.0039	Negative	0.0041	0.0045	0.0045
	1.406	1.879*	1.8897*		1.2857	1.56	1.5079
Positive	0.0052	0.0068	0.0119	Positive	0.0042	0.006	0.0098
	1.6133	1.868*	2.0923**		1.7541*	2.2172**	2.4723**

Note: This tables shows the Cumulative average abnormal returns for the different windows surrounding verification events for Phase 3 with firms grouped by their absolute and industry relative carbon liability reduction performance. Panel A reports the findings for the entire sample of verification events from 2014 to 2021. Panel B reports the results for the Phase 3a period which includes the events from 2014 to 2017. Panel C reports the findings for the Phase 3b period which included the events from 2018 to 2021. The second line reports a Corrado Rank test statistic (Corrado, 1989). Significance measures are two-tailed and P values are indicated as follows: $^{*}p<0.1$; $^{**}p<0.05$; $^{***}p<0.01$

Table 4.7 presents the cumulative average abnormal returns for firms in our sample categorised by their absolute and industry relative performance revealed by each verification events over phase three and for the two sub periods. Panel A presents our findings for the entire sample over three event windows (0,1), (0,2) and (0,3).[28] They show that positive absolute performance is on average rewarded by a 0.3% increase in returns over a three-day window at a 10% level of significance which then increases to 0.5% over a four-day event window at a 10% level of significance. This indicates that a reduction in the absolute emission liability of a firm has a positive impact on its returns while an increase in a firm's absolute emissions liability doesn't have a corresponding negative effect. The impact of positive industry relative performance on returns is also present over a two-day window at a 10% level of significance but insignificant over other windows. The lack of symmetry in the reaction to the emissions performance may indicate that markets are not just reacting to the increased/reduced current carbon liability but also to the signalling effect that positive performance may entail.

In Panel's B and C of Table 4.7, we test the market reaction to absolute and relative performance in the two subsamples and find clear divergence in our results. In Panel B which tests the importance of performance on the market reaction during the Phase 3a period of phase 3 from 2013 to 2017, we find a lack of significance across all measures and event windows. This may indicate that a firm's level of absolute and relative performance as revealed by the verification events during this period were not considered relevant information to firm valuation. This non-significance is contrasted by the results from Phase 3b. In the case of absolute performance, markets were found to significantly react to both positive and negative performance over both the three- and four-day event windows. For

[28] We also tested the relationship over (-1,1) and (-1, 0) which were found to be insignificant and may indicate a lack of information leakage prior to the event and a delayed response in its incorporation into the market price. Additionally, a (0,4) window was also implemented with insignificant reactions across most models. Results are available on request.

both positive and negative absolute performance, we find positive CAARs that range from 0.39% to 0.42% for negative performers and from 0.68% to 1.2% for positive performance. The larger increase of firms with positive performance could be attributed to their reduction in carbon liabilities in addition to the signalling effect of increased future performance. However, the positive impact of negative absolute performance defies this interpretation and may point to the importance of judging performance on a relative basis due to the continually reducing nature of the EUA free allocations over the period. The relative performance measure indicates a clearer picture with positive performance resulting in positive returns across all event windows with CAARs ranging from 0.42% to 0.98% at various levels of significance while negative performance results in non-significant returns. The lack of symmetry in the reaction to the emissions performance mirrors the findings of the full sample and lends further support to the conjecture that the relationship is driven by more than just the implied current carbon liabilities. These finding also reinforce the difference between the two period of Phase 3 and point to its increased relevance in Phase 3b. This supports our third hypothesis that the verification events during Phase 3a and Phase 3b of the EU ETS triggered different market reactions to firm specific environmental performance news.

Table 4. 8 Emissions Reduction Performance Relative to Expectations

Emissions change relative to previous year	CAAR[0, 1]	CAAR[0, 2]	CAAR[0, 3]	Emissions change relative to expectations	CAAR[0, 1]	CAAR[0, 2]	CAAR[0, 3]
Panel A: Full sample							
				Very Negative	-0.0032	-0.0045	-0.005
Negative	0.0007	0.0011	-0.0001		-1.6155	-1.6509*	-1.7861*
	0.4028	0.7356	0.325	Negative	0.0025	0.0041	0.0032
Positive	0.0035	0.0041	0.0053		1.5314	2.2492**	1.9671**
	1.8753*	2.2354**	2.1375**	Positive	0.004	0.0043	0.0032
					1.5459	1.7282*	1.0952
				Very Positive	0.0023	0.0033	0.0073
					1.5778	1.8031*	2.3093**
Panel B: 3a							
				Very Negative	-0.0002	-0.0029	-0.0035
Negative	0.001	0.0003	-0.0008		-0.189	-0.8452	-1.0989
	0.3851	0.3079	0.0938	Negative	0.0005	0.0016	0.0007
Positive	-0.0005	-0.0002	-0.0027		0.7197	1.501	1.3077
	-0.1043	0.2197	-0.5033	Positive	0.0014	0.0013	-0.0027
					0.2965	0.2576	-0.6164
				Very Positive	-0.0026	-0.0021	-0.0009
					-0.7518	-0.4827	-0.1355
Panel C: 3b							
				Very Negative	-0.0082	-0.0073	-0.0076
Negative	0.0004	0.0019	0.0008		-2.5511**	-1.6631*	-1.5352
	0.1308	0.7269	0.3734	Negative	0.0048	0.0069	0.0061
Positive	0.0069	0.0078	0.012		1.4593	1.6468*	1.4459
	2.6337***	2.8523***	3.3038***	Positive	0.0067	0.0072	0.0092
					1.8983*	2.1977**	2.2213**
				Very Positive	0.0052	0.0064	0.012
					2.188**	2.2835**	2.6515***

Note: This tables shows the Cumulative average abnormal returns for the different windows surrounding verification events for Phase 3 with firms grouped by their emissions reduction performance relative to the previous year's reduction performance and relative to expectations. Expectations are calculated as the average emissions reduction over the previous five years and firms are grouped based on the whether their observed performance is within one standard deviation of expectations (positive or negative) or greater than one standard deviation away from expectations (very positive or very negative). Panel A reports the findings for the entire sample of verification events from 2014 to 2021. Panel B reports the results for the Phase 3a period which includes the events from 2014 to 2017. Panel C reports the findings for the Phase 3b period which included the events from 2018 to 2021. The second line reports a Corrado Rank test statistic (Corrado, 1989). Significance measures are two-tailed and P values are indicated as follows: $^{*}p<0.1$; $^{**}p<0.05$; $^{***}p<0.01$

In Table 8, we extend our analysis with the use of an additional measure to categorise the information released on the event dates, the change in emissions compared to the previous year and change in emissions relative to expectations with firms grouped by distance from expected change. Panel A of Table 4.8 displays the results of our analysis of the impact of deviations from expected performance for the entire sample of verification events publishing Phase 3 data.

When we measure emissions reduction performance relative to the previous year, we find the presence of a positive relationship between positive news and returns over all three event windows with CAARs ranging from 0.35 to 0.53% at various levels of significance. These increased returns for positive news are not matched with negative returns for negative news of worse emissions reduction performance than the previous year. This points to further asymmetry in the market reaction to the verification event as noted with our other measures. When we turn to our second measure, we find a significant negative market reaction occurring for firms with very negative news about their change in emissions relative to expectations, across a three- and four-day window at a 10% level of significance and CAARs ranging from -0.45% to -0.5%. The group with very positive news displays the opposite relationship with positive CAARs ranging from 0.33% to 0.73% registered across a three- and four-day event window at a 10% and 5% level of significance respectively. The other two groups, representing 66.8% of the sample, display a near identical relationship with positive CAARs of similar magnitudes but with greater level of significance for the Negative group. While it might be expected that negative performance would elicit a negative market response, the fact that the performance is within one standard deviation of expectations may temper it somewhat.

In Panels B and C of Table 4.8, we split the sample into two periods and investigate whether the market reaction differs when we implement the above measures. As with our previous analysis, a clear difference between the two periods can be observed with the level

of performance in the Phase 3a being inconsequential across all groups and event windows. This contrasts with an increased impact in terms of strength and significance across many of the groups in Phase 3b. When we measure emissions reduction performance relative to the previous year, we find that positive news of better performance results in CAARs ranging from 0.69% to 1.2% at a 1% level of significance across our three event windows. This represents close to twice the impact when compared to the entire sample of events.

When we turn to our second measure, performance relative to expectations, we find a similarly enhanced market reaction for firms at the two ends of the spectrum. Very negative news of worse than expected changes in emissions on average results in a -0.82% CAAR across a two-day event window at a 5% level of significance and a -0.73 CAAR across a three-day window at a 10% level of significance. Very positive news of better than expected changes in emissions also resulted in more pronounced gains with CAARS increasing from 0.5% at a 5% level of significance for a two-day event window increasing to 1.2% at a 1% level of significance across a 4-day event window. As with the full sample, the two middle groups display positive CAARs, although of slightly greater size and significance in Phase 3b. [29]

These results compound the observation resulting from our previous analysis of the importance of considering the two periods separately due to a change in the EUA market dynamics which have altered the market perception of the value of participating firms' carbon emissions. This lends further support to our third hypothesis. They also highlight that major deviations from expectations during the latter period resulted in positive and negative

[29] The similarity of the two middle groups which are within one standard deviation of expectations may be impacted due to the variance within this group and those firms that are close to expectations on both sides expected performance. In order to increase the robustness of our study, we further disaggregate our sample and rerun the analysis. We create an additional group which we categorise as "Expected" and includes the firms that were close to expected performance (-1/2 standard deviation: +1/2 standard deviation) and reduce our Negative and Positive groups to those firms that had negative/positive performance greater than ½ standard deviations and less than or equal to 1 standard deviation below/ above expectations. The changes result in the altered Negative 2 group's CAARs becoming insignificant in the Bull market period. The altered Positive results in a negative CAAR of 1.8% at a 10% level of significance across a four-day window and positive CAARs of 0.88% and 0.97% at a 5% level of significance across a two- and four-day event window respectively. Surprisingly, the firms in the expected group also registered positive CAARs of 0.8% in the bull market period across a three- and four-day event window at a 5% level of significance. Results available on request.

market reactions which indicates that firms are rewarded when they make major improvements to their carbon efficiency and suffer losses when they undershoot expectations by a substantial amount. This confirms the finding of previous studies related to the positive relationship between environmental news and stock returns (Capelle-Blancard & Laguna, 2010; Capelle-Blancard & Petit, 2019; Flammer, 2013; Hamilton, 1995; Klassen & McLaughlin, 1996; Shane & Spicer, 1983) and may be the most comparable measure of performance to these studies as they examine the effect of substantial news such as environmental awards or disasters which would be akin to very positive or negative news. However, the inconsistency between the two sub periods in our sample may point to one possible reason for the inconsistences in previous research investigating the impact of environmental news on stock returns (Y. Wang, Delgado, Khanna, & Bogan, 2019) by highlighting the importance of institutional context and external pressures on the relationship.

In order to increase the robustness our study we investigate whether the market reaction to news about the change in a firms' carbon liability or emissions differs if they that benefit from EU ETS derogations due to operating in sectors covered by the carbon list or due to their level of carbon intensity.

In Table 4.9, we find similar results for both Carbon list and non-carbon list groups in Phase 3a, with insignificant market reaction across our measure of performance. Table 4.10 show our results for Phase 3b. In the case of absolute performance during the Phase 3b period, the carbon list group have positive market reactions to negative performance across the three event windows with CAARs ranging from 0.81% to 1.13% at various levels of significance while positive performance elicits a non-significant response. Conversely, firms that do not benefit from the protection of the carbon list and increase their absolute allowance surplus are on average rewarded with abnormal returns of 0.79% over a three-day event window which extends to 1.59% over the four-day window at a 1% level of significance.

The results of the industry relative measure are close to commensurate as industry characteristics such as membership of the carbon list are already embedded.

Table 4. 9 Emissions Performance and the carbon list during Phase 3a

Phase 3a	CAAR[0,1]	CAAR[0,2]	CAAR[0,3]		CAAR[0,1]	CAAR[0,2]	CAAR[0,3]
Panel A: Carbon List firms							
Negative (Absolute)	-0.0001	-0.0009	-0.0059	Negative (Relative)	0.0014	-0.0003	-0.0032
	-0.0677	0.056	-0.9527		0.0284	0.0478	-0.6319
Positive (Absolute)	-0.0018	0.0004	-0.0053	Positive (Relative)	-0.0023	-0.0005	-0.0077
	0.3068	0.5488	-0.1964		0.132	0.4672	-0.7337
Panel B: Non-Carbon List Firms							
Negative (Absolute)	0.0014	0.0011	0.0009	Negative (Relative)	0.0018	0.0014	0.0014
	0.0369	-0.0153	-0.1257		0.5639	0.2691	0.1715
Positive (Absolute)	-0.0016	-0.0018	-0.0032	Positive (Relative)	-0.0003	-0.0006	-0.0016
	0.3517	0.5727	0.6081		-0.1343	0.1387	0.1095
Emissions reduction relative to previous year	CAAR[0,1]	CAAR[0,2]	CAAR[0,3]	Emissions reduction relative to expectations	CAAR[0,1]	CAAR[0,2]	CAAR[0,3]
Panel C: Carbon List firms							
Negative	0.0009	-0.0007	-0.006	Very Negative	-0.0035	-0.004	-0.0065
	0.1026	0.1364	-0.49		-0.6097	0.0213	-0.2218
Positive	-0.0022	-0.0002	-0.0053	Negative	0.0018	0.0027	-0.0011
	0.0413	0.3749	-0.847		0.6625	1.0759	0.2204
				Positive	0.0013	0.0023	-0.0067
					0.6512	0.6129	-0.5556
				Very Positive	-0.0081	-0.0105	-0.0116
					-1.3289	-1.8755*	-2.01**
Panel D: Non-Carbon List firms							
Negative	0.001	0.0007	0.001	Very Negative	0.0007	-0.0026	-0.0027
	0.4162	0.2998	0.4125		0.0878	-0.9512	-1.1155
Positive	0.0001	-0.0002	-0.0017	Negative	-0.0001	0.0012	0.0014
	-0.1485	0.0724	-0.1688		0.4907	1.2097	1.4759
				Positive	0.0014	0.001	-0.0014
					0.0088	-0.0195	-0.4811
				Very Positive	-0.0008	0.0008	0.0027
					-0.1706	0.4355	0.909

Note: This tables shows the cumulative average abnormal returns for the different windows surrounding verification events in the Phase 3 a period with firms grouped by whether their activities are covered by the carbon list and their absolute performance, industry relative performance or performance relative to expectations. Panel A reports the findings when firm on the carbon are grouped by their absolute and industry relative carbon liability reduction performance. Panel B reports the findings when firm not on the carbon are grouped by their absolute and industry relative carbon liability reduction performance. Panel C reports the findings when firm on the carbon are grouped by their carbon emissions reduction performance relative to the previous year's performance and relative to expectations. Expectations are calculated as the average emissions reduction over the previous five years and firms are grouped based on the whether their observed performance is within one standard deviation of expectations (positive or negative) or greater than one standard deviation away from expectations (very positive or very negative). Panel D reports the findings when firm not on the carbon are grouped by their carbon reduction performance relative to the previous year's performance and relative to expectations. The second line reports a Corrado Rank test statistic (Corrado, 1989). Significance measures are two-tailed, and P values are indicated as follows: $^{*}p<0.1$; $^{**}p<0.05$; $^{***}p<0.01$.

Table 4. 10 Emissions Performance and the carbon list during Phase 3b

Phase 3b	CAAR[0,1]	CAAR[0,2]	CAAR[0,3]		CAAR[0,1]	CAAR[0,2]	CAAR[0,3]
Panel A: Carbon List Firms							
Negative (Absolute)	0.0113	0.0096	0.0081	Negative (Relative)	0.0117	0.0091	0.0063
	2.0548**	2.0064**	1.7719*		1.5875	1.4271	0.9174
Positive (Absolute)	0.0052	0.0053	0.0045	Positive (Relative)	0.0056	0.0062	0.0064
	1.0706	1.2818	0.6935		1.5955	1.9033*	1.585
Panel B: Non-Carbon List Firms							
Negative (Absolute)	0.0006	0.0022	0.0025	Negative (Relative)	0.0012	0.0028	0.0039
	0.426	1.0057	1.1552		0.5076	0.966	1.2531
Positive (Absolute)	0.0051	0.0076	0.0159	Positive (Relative)	0.0035	0.0058	0.0114
	1.5948	1.8145*	2.6048***		1.3528	1.7922*	2.3617**
Emissions reduction relative to previous year	CAAR[0,1]	CAAR[0,2]	CAAR[0,3]	Emissions reduction relative to expectations	CAAR[0,1]	CAAR[0,2]	CAAR[0,3]
Panel C: Carbon List firms							
				Very Negative	-0.002	-0.0043	-0.0075
Negative	0.0048	0.0036	0.0003		-1.2441	-1.0995	-1.5073
	0.5301	0.2781	-0.1861	Negative	0.0147	0.0167	0.0155
Positive	0.0107	0.0101	0.0104		3.0024***	3.0946***	2.7818***
	2.2211**	2.5209**	2.1787**	Positive	0.0089	0.0053	0.0037
					1.6815*	1.3692	1.0822
				Very Positive	0.0061	0.0075	0.0076
					0.8163	1.168	0.8377
Panel D: Non-Carbon List firms							
				Very Negative	-0.01	-0.0082	-0.0076
Negative	-0.0013	0.0013	0.001		-2.076**	-1.1952	-0.8294
	-0.1865	0.7079	0.5782	Negative	0.0012	0.0034	0.0027
Positive	0.0052	0.0067	0.0128		-0.0839	0.0776	0.0293
	1.9763**	2.0513**	2.9709***	Positive	0.0057	0.0081	0.0116
					1.4866	2.0983**	2.315**
				Very Positive	0.0048	0.0059	0.0144
					2.5606**	2.383**	3.219***

Note: This tables shows the Cumulative average abnormal returns for the different windows surrounding verification events in the Phase 3 b period with firms grouped by whether their activities are covered by the carbon list and their absolute performance, industry relative performance or performance relative to expectations. Panel A reports the findings when firm on the carbon are grouped by their absolute and industry relative carbon liability reduction performance. Panel B reports the findings when firm not on the carbon are grouped by their absolute and industry relative carbon liability reduction performance. Panel C reports the findings when firm on the carbon are grouped by their carbon emissions reduction performance relative to the previous year's performance and relative to expectations. Expectations are calculated as the average emissions reduction over the previous five years and firms are grouped based on the whether their observed performance is within one standard deviation of expectations (positive or negative) or greater than one standard deviation away from expectations (very positive or very negative). Panel D reports the findings when firm not on the carbon are grouped by their carbon reduction performance relative to the previous year's performance and relative to expectations. The second line reports a Corrado Rank test statistic (Corrado, 1989). Significance measures are two-tailed, and P values are indicated as follows: $^{*}p<0.1$; $^{**}p<0.05$; $^{***}p<0.01$.

We find the most divergence when we use our measure of change in carbon emissions relative to expectations and group the firms into four levels. In the Phase 3a period, Carbon list firms which demonstrated a very positive performance registered have a CAAR of -1.05% over a three-day window at a 10% level of significance and -1.16% across a four-day event window at a 5% level of significance while all other groups were insignificant. This may indicate that markets interpret increased performance for this group as an additional cost without benefit during period 3a. During the Phase 3b period, carbon list firms were rewarded with positive CAARs for both slightly positive and negative while other levels of performance resulted in insignificant market reactions. Conversely, non-carbon list firms experienced a positive market reaction to positive and very positive performance in addition to a negative reaction to very negative performance. Overall, these finding indicate that the presence of the carbon list is distorting the markets treatment of firms within the EU ETS and lessening the markets perception of the value of emissions reduction.

As firms that are more carbon intense will have a greater carbon liability, a greater market reaction may be expected for these firms. However, when we separate our sample into two groups based on their carbon intensity, a similar market reaction to both absolute and relative carbon reduction performance is observed in our sub sample periods in tables 4.11 and 4.12. We find the most divergence when we use our measure of the change in carbon emissions relative to expectations and group our firms into four levels. During the Phase 3a period, carbon intense firms with very negative performance were the only group to experience a significant market reaction with negative abnormal returns of -0.75% over a four-day window at a 10% level of significance. During the Phase 3b period, a positive market reaction was registered for carbon intense firms with positive performance while all other level of performance elicited insignificant responses. Less carbon intense firms registered significant responses at both ends of the performance spectrum with highly negative and positive performance resulting in a significant market response. These findings

indicate the publication of emissions verification data for less carbon intense firms only garner the attention of investors and elicit a market response when they contain a large positive or negative surprise. However, markets react positively to smaller positive incremental changes for intense firms. These findings lend some support to our fourth hypothesis.

Table 4. 11 Emissions Performance and the carbon intensity during Phase 3a

Phase 3a	CAAR[0, 1]	CAAR[0, 2]	CAAR[0, 3]		CAAR[0, 1]	CAAR[0, 2]	CAAR[0, 3]
Panel A: Intense							
Negative (Absolute)	0.0003	-0.0008	-0.0028	Negative (Relative)	0.0014	0.0006	0
	-0.703	-0.7737	-1.099		-0.3253	-0.3456	-0.5528
Positive (Absolute)	0.0037	0.0049	0.0051	Positive (Relative)	0.0011	0.001	-0.0009
	1.2826	1.2916	1.1907		0.2456	0.1885	-0.0815
Panel B: Less Intense							
Negative (Absolute)	0.002	0.0021	0.0015	Negative (Relative)	0.0019	0.0013	0.0003
	0.9206	1.0347	0.4828		1.135	0.7963	0.3212
Positive (Absolute)	-0.0063	-0.0064	-0.0116	Positive (Relative)	-0.0029	-0.0023	-0.0054
	-0.6978	-0.2656	-0.6607		-0.4454	0.2934	-0.2355
Emissions reduction relative to previous year	CAAR[0,1]	CAAR[0,2]	CAAR[0,3]	Emissions reduction relative to expectations	CAAR[0,1]	CAAR[0,2]	CAAR[0,3]
Panel C: Intense							
				Very Negative	-0.0038	-0.0061	-0.0075
Negative	0.0012	-0.001	-0.0033		-1.5227	-1.5675	-1.6776*
	-0.1059	-0.3673	-0.5236	Negative	0.002	0.0015	0.0003
Positive	0.0013	0.0028	0.0025		0.5839	0.6834	0.6695
	0.1134	0.2914	-0.033	Positive	0.0053	0.0058	0.0034
					0.9691	0.9169	0.3474
				Very Positive	-0.0053	-0.0053	-0.004
					-1.0906	-1.3031	-1.1423
Panel D: Less Intense							
				Very Negative	0.0037	0.0006	0.0009
Negative	-0.0023	-0.0032	-0.0077		1.4001	0.3619	0.0671
	-0.303	-0.0019	-0.7605	Negative	-0.0014	0.0018	0.0011
Positive	0.0007	0.0018	0.002		0.4646	1.5967	1.3035
	0.8337	1.0151	0.8188	Positive	-0.0026	-0.0034	-0.009
					-0.6071	-0.6149	-1.4949
				Very Positive	-0.0008	0.0002	0.0012
					-0.069	0.4575	0.7723

Note: This tables shows the Cumulative average abnormal returns for the different windows surrounding verification events in Phase 3a with firms grouped by their carbon intensity and their absolute performance, industry relative performance or performance relative to expectations. Panel A reports the findings when carbon intense firm are grouped by their absolute and industry relative carbon liability reduction performance. Panel B reports the findings when less intense firm are grouped by their absolute and industry relative carbon liability reduction performance. Panel C reports the findings when carbon intense firm are grouped by their carbon emissions reduction performance relative to the previous year's performance and relative to expectations. Expectations are calculated as the average emissions reduction over the previous five years and firms are grouped based on the whether their observed performance is within one standard deviation of expectations (positive or negative) or greater than one standard deviation away from expectations (very positive or very negative). Panel D reports the findings when less intense firms are grouped by their carbon reduction performance relative to the previous year's performance and relative to expectations. The second line reports a Corrado Rank test statistic (Corrado, 1989). Significance measures are two-tailed, and P values are indicated as follows: $^{*}p<0.1$; $^{**}p<0.05$; $^{***}p<0.01$.

Table 4. 12 Emissions Performance and the carbon intensity during Phase 3b

Phase 3b	CAAR[0, 1]	CAAR[0, 2]	CAAR[0, 3]		CAAR[0, 1]	CAAR[0, 2]	CAAR[0, 3]
Panel A: Intense Firms							
Negative (Absolute)	0.005	0.0057	0.0044	Negative (Relative)	0.0059	0.0058	0.0044
	1.8931*	2.1668**	1.4689		1.6184	1.5938	0.9404
Positive (Absolute)	0.007	0.0062	0.0119	Positive (Relative)	0.0057	0.006	0.0098
	1.2965	1.0192	1.7385*		1.6259	1.672*	2.1497**
Panel B: Less Intense Firms							
Negative (Absolute)	0.002	0.0028	0.0035	Negative (Relative)	0.0027	0.0036	0.0046
	0.3724	0.8708	1.5854		0.4606	0.8992	1.4109
Positive (Absolute)	0.0035	0.0074	0.0119	Positive (Relative)	0.0024	0.006	0.0098
	1.3912	2.1058**	1.7344*		1.2903	2.0836**	1.9909**
Emissions reduction relative to previous year	CAAR[0,1]	CAAR[0,2]	CAAR[0,3]	Emissions reduction relative to expectations	CAAR[0,1]	CAAR[0,2]	CAAR[0,3]
Panel C: Intense Firms							
Positive	0.0049	0.006	0.0041	Very Negative	0.002	0.0023	-0.0054
	1.3104	1.4361	0.7461		-0.7107	-0.3965	-1.5016
Negative	0.0065	0.0058	0.0101	Negative	0.0048	0.0065	0.0068
	1.8479*	1.7748*	2.2677**		1.1512	1.511	1.0484
				Positive	0.0098	0.0106	0.0117
					2.7301***	2.6147***	2.6645***
				Very Positive	0.002	-0.0005	0.0061
					0.5733	0.3245	1.0585
Panel D: Less Intense Firms							
Negative	-0.004	-0.0021	-0.0024	Very Negative	-0.0143	-0.0131	-0.0089
	-1.2034	-0.3498	-0.1898		-2.741***	-1.8318*	-0.9073
Positive	0.0073	0.0095	0.0137	Negative	0.0048	0.0073	0.0054
	2.5842***	3.0453***	3.3091***		1.0184	0.9372	1.0999
				Positive	0.0037	0.0039	0.0067
					0.2464	0.8416	0.8284
				Very Positive	0.0084	0.0134	0.018
					3.1073***	3.5145***	3.3741***

Note: This tables shows the Cumulative average abnormal returns for the different windows surrounding verification events in Phase 3b with firms grouped by their carbon intensity and their absolute performance, industry relative performance or performance relative to expectations. Panel A reports the findings when carbon intense firm are grouped by their absolute and industry relative carbon liability reduction performance. Panel B reports the findings when less intense firm are grouped by their absolute and industry relative carbon liability reduction performance. Panel C reports the findings when carbon intense firm are grouped by their carbon emissions reduction performance relative to the previous year's performance and relative to expectations. Expectations are calculated as the average emissions reduction over the previous five years and firms are grouped based on the whether their observed performance is within one standard deviation of expectations (positive or negative) or greater than one standard deviation away from expectations (very positive or very negative). Panel D reports the findings when less intense firms are grouped by their carbon reduction performance relative to the previous year's performance and relative to expectations. The second line reports a Corrado Rank test statistic (Corrado, 1989). Significance measures are two-tailed, and P values are indicated as follows: $^{*}p<0.1$; $^{**}p<0.05$; $^{***}p<0.01$.

Our findings suggest that the emissions verification event only became relevant to the equity investors of participating firms in Phase 3b. Two possible inter-related explanations could possibly account for this change in significance, the increased direct carbon liability due the higher EUA price and an increase in the market expectations of future environmental regulatory stringency. As the EUA price was found to be driven by political considerations with the expectation of weaker regulations depressing the price in the Phase 3a period, the reverse market sentiment may be present in the Phase 3b period. Hence, improved current emissions reduction performance would signal a positive trajectory for the firm into a future of stricter environmental regulations. The asymmetric nature of our findings related to the treatment of performance may point to the greater importance of the second factor as an increased direct current carbon cost should weigh equally for positive and negative performance.

4.4.2 Market Reactions to Political Events

In the previous section, we established a shift in the treatment of emission reduction performance between the two periods of phase 3. We extend this investigation of the changing dynamics of the market by examining the political events that may have led to a change in perception for market participant. We focus our attention on the political events surrounding the structural changes to the EU ETS for phase 4 which have been noted by many observers as the EUA market inflection point (Friedrich et al., 2019, 2020). Specifically, we investigate whether political events relating to the future structure of the EU ETS have a significant effect on the returns of participating firms.

Table 4.13 presents our finding for the six political events over the six event windows ranging from (-1, 0) to (0,4). A lack of significance is present across the (-1, 0), (-1,1) and (0,1) event windows for all events. This may be attributed to a lack of leakage of information prior to the event due to their political and uncertain nature of the outcomes. Additionally,

the events themselves or the conclusion of the events and production of new tradable information often happens later in the day and contains complex information which may have delayed the market response. Three of the six events engender significant market responses over a three- and four-day event window. This supports our fifth hypothesis. The first significant event was the conclusion of the trilogue on the 09.11.2017 which resulted in a CAAR of -0.4% over a three-day window that decreased to -1.25% over a four-day event window at a 1% level of significance. The event represented the end of a long negotiation process between the three legislative bodies involved in which their conflicting position on the future shape of the EU ETS were reconciled and the final shape of the reform became clear. The importance of this event, which represents a combined political commitment to the changes, lends weight to Grosjean et al.'s (2016) finding that the market is reluctant to update their expectations prior to policy passing through the legislative process and that perceptions about the degree of political commitment play an important role in shaping market outcomes.

Table 4.13: Political Events

Date:	CAAR[-1, 0]	CAAR[-1, 1]	CAAR[0, 1]	CAAR[0, 2]	CAAR[0, 3]	CAAR[0, 4]
28.02.2017	0.004	0.0048	-0.0002	0.0022	0.0011	-0.0001
	1.4035	1.3444	-0.1066	0.3811	0.1652	-0.1555
09.11.2017	0.0037	0.0028	-0.0003	-0.004	-0.0082	-0.0125
	0.3516	-0.394	-1.5856	-1.9282*	-2.3661**	-3.1401***
22.11.2017	0.001	0.0042	0.0037	0.0022	-0.0006	-0.0054
	-0.2457	0.4329	0.6421	-0.494	-1.1621	-0.7659
06.02.2018	-0.0051	-0.0031	0.0006	-0.0041	-0.007	-0.002
	-1.6433	-1.3545	-0.3858	-1.671*	-2.3466**	-1.1666
15.02.2018	0.0022	0.0048	0.0028	0.0033	0.0041	0.0021
	-0.0518	0.5186	0.4196	0.5494	0.6017	0.2901
27.02.2018	0.0012	-0.0002	-0.0014	-0.0058	-0.008	-0.0053
	0.0491	-0.3974	-1.335	-1.8711*	-2.1665**	-1.39

Note: This tables shows the Cumulative average abnormal returns for the different windows surrounding various political events relating to the revision of the EU ETS for Phase 4 for the entire sample. The second line reports a Corrado Rank test statistic (Corrado, 1989). Significance measures are two-tailed and P values are indicated as follows: *p<0.1; **p<0.05; ***p<0.01

The second event which caused a significant market reaction was when the European parliament reached an agreement on the future of the system on the 06.02.2018. This event also had an on average negative impact on the returns of participating publicly traded firms of between -0.41% and -0.7%. The final event that caused a significant market reaction was the formal approval of the deal by the council of ministers on the 27.02.2018 and the final step in the process. This event also had a negative effect on the publicly traded participating firms with CAARs ranging from -0.58% to -0.8%. The negative impact of this event on participating firms could be attributed to the increased stringency of the system that the reforms cemented. Additionally, the reaching of a consensus between the bodies indicated the presence of a political will that had hither to been questioned. These findings confirm that the regulatory risk that was found to be embedded in the EUA price (Salant, 2016), extends to participating firms. Our finding of a negative market response for participating firms also lend empirical evidence to the proposition that the stringency and intensity of regulatory environment impacts investors' expectations of carbon liabilities (Clarkson et al., 2015).

Finally, we examine whether certain firm characteristics impact the sign and strength of the market reaction to the three significant political events identified above. We categorise firms based on their absolute and relative allowance surplus to examine whether the carbon efficiency of firms moderates the perceived impact of EU ETS political events on their future financial performance.

Table 4. 14 Political Events and absolute/relative position

Event Date	Absolute Surplus	CAAR[0, 1]	CAAR[0, 2]	CAAR[0, 3]	Relative Surplus	CAAR[0, 1]	CAAR[0, 2]	CAAR[0, 3]
09.11.2017	Reactive	0.0048	0.0004	-0.0025	Bottom	-0.0108	-0.016	-0.0167
		-0.9197	-1.0526	-1.5965		-1.1519	-1.6151	-1.0208
	Deficit	-0.0055	-0.006	-0.0077	Below	0.0244	0.0104	0.0109
		-1.8142*	-1.8612*	-1.501		-0.5976	-1.5193	-1.6003
	Surplus	-0.0007	-0.0064	-0.019	Above	-0.0051	-0.0086	-0.0114
		-0.165	-0.7795	-1.609		-0.633	-1.0763	-1.3559
	Proactive	-0.0062	-0.0111	-0.0164	Top	-0.0042	-0.0045	-0.0113
		-1.1937	-1.4084	-1.3021		-1.5162	-1.3182	-2.0816**
06.02.2018	Reactive	-0.0015	-0.0067	-0.0118	Bottom	0.0008	-0.0048	0.0032
		-1.4529	-2.1187**	-2.787***		0.1203	-0.5432	0.0373
	Deficit	0.0086	0.0044	0.0061	Below	-0.0035	-0.0131	-0.0207
		1.8094*	0.0832	0.0071		-0.8167	-2.0116**	-2.7182***
	Surplus	-0.008	-0.0085	-0.0063	Above	-0.0029	-0.0057	-0.0052
		-0.724	-0.7724	-0.5312		-0.4357	-0.8972	-0.5284
	Proactive	0.0007	-0.0059	-0.013	Top	0.0028	-0.0007	-0.0054
		0.5593	-0.4146	-1.4439		-0.1314	-1.2167	-2.3622**
27.02.2018	Reactive	-0.0004	-0.0061	-0.007	Bottom	0.0012	-0.0065	-0.0056
		-1.6757*	-2.0819**	-2.191**		-0.1583	-0.9874	-1.0601
	Deficit	-0.0006	-0.0076	-0.0094	Below	-0.0012	-0.0075	-0.0067
		-0.38	-1.3083	-1.5946		-0.9176	-0.8581	-0.419
	Surplus	0.0126	0.013	0.0094	Above	-0.003	-0.0052	-0.0138
		1.047	1.087	0.8608		-1.0742	-1.0802	-1.6058
	Proactive	-0.0147	-0.0157	-0.0208	Top	-0.0015	-0.0053	-0.0072
		-1.5785	-1.5213	-1.7516*		-1.1921	-1.7333*	-2.1024**

Note: This tables shows the Cumulative average abnormal returns for the different windows surrounding three political events relating to the revision of the EU ETS for Phase 4 with firms grouped by their absolute and relative EUA surplus. The second line reports a Corrado Rank test statistic (Corrado, 1989). Significance measures are two-tailed and P values are indicated as follows: *p<0.1; **p<0.05; ***p<0.01

Table 4.14 presents the results of our analysis of the impact of the three political events when firms are categorised based on their absolute and relative allowance surplus. A reduction in the supply of allowance and increase in price would be expected to impact the worst performing firms the most due to their larger carbon liability. This is somewhat the case when we use the absolute surplus level to categorise the firms. For the first event, firms with a surplus deficit had CAARs ranging from -0.55% to -0.6% at a 10% level of significance across a two and three-day event window while all other groupings register insignificant responses. However, deficit firms experienced a positive market reaction with a CAAR of 0.86% at a 10% level of significance across a two-day window for the second event. This may indicate a variance in the interpretation of these events by market actors. For both the second and third event, the reactive firms with the biggest deficit experienced negative market reaction at various levels of significance. Firms that were classified as Surplus and Proactive displayed insignificant market reactions to the events except for the proactive group of firms who had on average abnormal returns of -2.08% at a 10% level of significance over a four-day event window after the 27.02.2018. The negative performance of these firms that had the largest absolute surplus may be the result of changes to the system that would have a large impact on their free allocation. Something akin to the idea that these firms had the most to lose as they were recipients of a large amount of free allowance under the current system.

When we use our relative measure of allowance surplus, the impact of the events also seems to fall most consistently on the top performing firms with the largest relative surplus with significant negative CAARs registered over a four-day event window for all events. The only other significant reaction is for the Below group who experience CAARs of between -1.31% and -2.07% at various levels of significance over a three- and four-day event window following the 06.02.2018. These finding present a complex picture of the market

reaction to the political events that may have been impacted by other firm level characteristics.

We consider two such factors, Carbon list membership and Carbon Intensity, and report our findings in Table 4.15. When the sample is split by whether a firm's activities are covered by the carbon list, we find some divergence in the market treatment of firms following two of the three political events. For the first event, 09.11.2017, the non-carbon list group register significance CAARs ranging from -0.28 to -0.64 across three- and four-day event window at 10% and 5% levels of significance respectively. The Carbon list group register a CAAR of -1.27% at 10% level of significance over a four-day event window. This indicated that the market reaction for the Carbon list group was delayed but then more pronounced. An extension of the event window to five days further displays this trend with the CAAR of the Non-carbon list group increasing to -0.89 at a 5% level of significance while the CAAR of the Carbon list group increased to -2.09% at a 1% level of significance.[30] This may indicate that the markets interpretation of the impact of the reforms with regards to firm covered by the carbon list and the agreed revision of the carbon list in 2019, took some time. For the second event, only non-carbon list firms experienced a negative market reaction after the event with CAARs ranging from -0.73 to -0.83 at a 5% level of significance over a three- and four-days window. The final event shows an insignificant response across all groups and event windows. These results present some evidence that the carbon list alters the Markets treatment of firms as it alters the stringency of the system for certain firms.

[30] Results are available on request

Table 4. 15 Political events and moderators

Panel A: Carbon List		CAAR[0, 1]	CAAR[0, 2]	CAAR[0, 3]
09.11.2017	Non-Carbon List	0.002	-0.0028	-0.0064
		-1.2221	-1.7786*	-2.0027**
	Carbon List	-0.0057	-0.0068	-0.0127
		-1.3836	-1.2084	-1.7877*
06.02.2018	Non-Carbon List	3.75E-06	-0.0073	-0.0083
		-0.4332	-2.1361**	-2.443**
	Carbon List	0.002	0.0036	-0.0038
		-0.111	-0.0119	-0.9746
27.02.2018	Non-Carbon List	-0.002	-0.0067	-0.0087
		-1.3709	-1.6471	-1.8989
	Carbon List	0.0001	-0.0036	-0.0063
		-0.611	-1.3094	-1.5351
Panel B: Intensity				
09.11.2017	Intense	0.0052	-0.0016	-0.0054
		-1.0182	-1.736*	-2.347**
	Less Intense	-0.0058	-0.0064	-0.0111
		-1.6373	-1.463	-1.5646
06.02.2018	Intense	-0.0007	-0.0055	-0.0078
		-0.6753	-1.6336	-1.9893**
	Less Intense	0.0019	-0.0026	-0.0062
		0.057	-1.1436	-1.9426*
27.02.2018	Intense	0.003	-0.001	-0.0028
		-0.8462	-1.2524	-1.4825
	Less Intense	-0.0057	-0.0105	-0.0132
		-1.3904	-1.8837*	-2.15**

Note: This tables shows the Cumulative average abnormal returns for the different windows surrounding three political events relating to the revision of the EU ETS for Phase 4 with firms grouped by whether they are members of the carbon list in Panel A and their carbon intensity in Panel B. The second line reports a Corrado Rank test statistic (Corrado, 1989). Significance measures are two-tailed, and P values are indicated as follows: *p<0.1; **p<0.05; ***p<0.01

Panel B of table 4.15 presents our findings when we categories our sample based on the carbon intensity of firms with firms above the median emissions level of our sample being classified as intense while those below classified as less intense. Intense firms with greater carbon liabilities would be expected to be more impacted by an increase in the stringency of the ETS and this is observed with the first event as Intense firms have a negative significant reaction while less intense firms have none. However, the second event results in a similar response between the two groups while the third event elicits a significant negative response for the less intense firms while the intense group of firm's response is non-significant.

In this section, we have examined the relevance of a number of political events surrounding the revisions of the EU ETS for the fourth Phase. These revisions represented a tightening of the system, and a negative market response was observed in the returns of participating firms. These findings display the political risk (Salant, 2016) that participating firms are exposed to but also the divergence in treatment of the regulatory news depending on the emissions characteristics of the firm. This implies that the institutional setting has a major impact on the evaluation of a firm environmental performance by investors.

4.5 Conclusion

This research examines the impact of the EU ETS on the valuation of participating firms by examining whether events that contain supply and demand information about the market and its participants provoke a market reaction in the days following the announcements. As incremental managerial decisions and actions related to a firm's environmental performance are not easy to observe and evaluate (Klassen & McLaughlin, 1996), a single discrete event can signal these changes and alter the market's perception of performance. Hence, we use an event study methodology to gauge the markets interpretation of both firm specific and system wide emissions related environmental news during Phase 3

of the system. The publication of verified emissions for participating firms represents news which can be both positive or negative depending on their performance so our research contributes to the body of research which examines the stock market reaction to environmental news (Capelle-Blancard & Laguna, 2010; Capelle-Blancard & Petit, 2019; Fisher-Vanden & Thorburn, 2011; Flammer, 2013; Gilley et al., 2000; Klassen & McLaughlin, 1996; Lioui & Sharma, 2012; Oberndorfer et al., 2013; Shane & Spicer, 1983).We also examine the market reaction to politically derived changes in the EU ETS and whether they altered the market reaction to firm specific environmental performance new in subsequent verification events by splitting our sample into two period during the third phase.

Our findings suggest that the emissions verification event only became relevant to the equity investors of participating firms in the latter Phase 3b period beginning in 2018. The turning point has been linked to the announcements of the revision to the system for Phase 4 of the system which may have altered the actual and perceived future EUA scarcity (Bruninx et al., 2019) and probability of future price increasing regulatory intervention (Salant, 2016). Two possible inter-related explanations could possibly account for this change in significance, the increased direct cash flow effect of their carbon liability due the higher EUA price and an increase in the market expectations of future environmental regulatory stringency which embedded political risk in participating firms discount rate. The asymmetric nature of our findings related to the treatment of performance may point to the greater importance of the second factor as an increased direct current carbon cost should weigh equally for positive and negative performance. A symmetric relationship between emissions reduction news and returns was only found when large positive and negative changes relative to expectations were revealed by the verification events in the later period confirming previous findings in the area (Capelle-Blancard & Laguna, 2010; Capelle-Blancard & Petit, 2019; Flammer, 2013; Hamilton, 1995; Klassen & McLaughlin, 1996;

Shane & Spicer, 1983). However, the inconsistency between the two sub periods in our sample points to one possible reason for the inconsistences in previous research investigating the impact of environmental news on stock returns (Y. Wang et al., 2019) by highlighting the importance of institutional context and external pressures on the relationship. Relatedly, by examining the market reaction to the publication of news related to the future structure of the EU ETS for Phase 4, we find empirical evidence that the stringency and intensity of regulatory environment impacts investors' expectations of carbon liabilities (Clarkson et al., 2015).

Our research provides policy makers with an evaluation of the incentives created by the EU ETS over the third period of its existence which can inform the revisions and design of other Cap-and Trade system. The lack of significance of events in the earlier period of subdued EUA prices provide evidence that a lack of market created incentives for increased carbon reduction performance by participating firms was present and that the announcement rather than enactment of reforms changed this dynamic. This highlights that the announcement of reforms have an immediate impact on markets before they come into force, bringing forward the impact of future policy updates. Our research also provides some insight into the carbon trading market for participating firms by highlighting the increasing market attention to emissions data with news of positive environmental performance increasing returns in more recent years. It also highlights their increased exposure to political risk stemming from their participation in the EU ETS which should be considered in their strategic planning.

Our sample is limited to publicly traded firms that emit close to half of the emissions covered by the scheme, this means that the impact of the system on smaller privately held or governmental firms is absent from our analysis. Future research could investigate whether the financial incentives created by the system are the same for non-listed participating firms.

Chapter 4: The Evolving Impact of the EU ETS on the Value of Environmental News

While our study examines the impact of firm emissions reduction performance on market reactions, other firm and industry characteristics could moderate the reaction to news related to environmental performance which presents fertile ground for future research in the area. Additionally, a key finding of this study is the context specific nature of the incentives created by the system which belies that fact that the nature of the incentives will change as the EU ETS and the environmental policy environment continues to evolve further. Further research will be required to examine the incentives created by the EU ETS in later stages of its development.

Chapter 5 - Conclusion

5.1 Introduction

In this three-paper thesis, I have investigated the relationship between environmental and social performance, and financial performance having contextualised the relationship to move beyond the question of whether the constructs are related, to under which circumstances. Investor holdings with respect to environmental and social performance are likely to reflect the interplay of two potential drivers of investment decisions: social norms and economic incentives. This research examines whether the alignment or mutually exclusivity of these drivers is contingent on context. This approach to the relationship stems from the recognition that market-based financial performance outcomes are shaped by the perception of financial markets on the context specific merits of an action.

The business case for improved environmental and social performance has been the focus of much academic discourse with conflicting theoretical stances and empirical evidence (Margolis & Walsh, 2003; Margolis, Elfenbein, & Walsh, 2009; Orlitzky, Schmidt, & Rynes, 2003; Renneboog, Ter Horst, & Zhang, 2008; van Beurden & Gossling, 2008, Eccles et al., 2014). While these studies adopt different approaches to measuring the cost and benefits of increased environmental and social performance, they often frame the conversation in relation to their impact on financial performance. Proponents of shareholder theory (e.g. Aupperle, Carroll, & Hatfield, 1985; Friedman, 1962; Jiao, 2010) propose a trade-off between environmental or social performance, and financial performance, while proponents of stakeholder theory (e.g. Freeman, 1984; Frooman, 1999; Gupta, 2018; Jeffrey & Freeman, 1999; Malik, 2015) propose a win-win scenario where the two are mutually beneficial. This research recognises that measures of market-based financial performance, such as firm value, are shaped by contextual factors and seeks to gain a greater understanding of the impact of these factors. The motivation for this approach is not only to provide greater insights into the

incentives created by financial markets for publicly traded firms to have a positive impact on the environment and society but also to understand how the financial market's perception of the value relevance of these positive impacts and the resultant incentives it creates are shaped by contextual factors. Hence, this research pivots away from the search for an absolute truth about the relationship between environmental and/or social performance, and financial performance to examining this relationship from a contingent perspective.

In the first paper, I empirically examine the relationship between CSP and CFP through an examination of the relationship between a firm's CSP and its implied cost of equity capital with the utilization of an extensive international dataset consisting of 21,338 firm-year observation from 50 countries during the period from 2002 to 2017. In the second paper, I empirically examine the moderating role of country-level institutional forces on the relationship between CSP and firm value through the utilization of an extensive international dataset consisting of 43,171 firm-year observations in 49 countries over a seventeen-year period. In the third paper, I empirically examine how market outcomes are shaped by changes in institutional setting through an examination of the evolving impact of environmental news on the valuation of 123 EU ETS participating firms during the period from 2014 to 2021 using an event study methodology.

The use of Refinitiv (formerly Reuter)'s Asset4 ESG data in the first two papers and my measure of a firm's industry-relative carbon liability reduction in the third paper allows this research to examine the CSP-CFP relationship using industry-relative measures of performance. This approach to measuring performance against an industry benchmark, common across other areas of finance, places the firm's performance in the context of its industry to examine the extent to which the most environmentally or socially efficient (inefficient) firms in a given industry, facing similar asset composition, cashflows, regulatory constraints and carbon intensity, are treated by financial markets. The importance of using industry context is highlighted by Flammer (2015) and Ding, Ferreira, & Wongchoti

(2016) who show that impact of CSR activities on firm valuation relies heavily on a firm's industry-specific relative position. Furthermore, in recognition of the fact that different levels of environmental and social performance involve varying costs and benefits that may alter the financial markets' perception of its implication for financial performance, I construct peer group dummy variables to examine whether heterogeneous information constraints and utility functions could lead investors to value environmental and social performance differently at different levels, inducing groupings along the CSP-CFP continuum similar to a clientele effect (Ding et al., 2016), in my first two papers.

I also extend my contextualised analysis to consider how institutional forces in the firm's external environment impact the market valuation of its environmental and social activities, in the second and third papers. How corporations treat their stakeholders depends on the institutions within which they operate (Aguilera & Jackson, 2003; J. L. Campbell, 2007; Fligstein & Freeland, 1995) due to their impact on the salience of stakeholder group (Agle et al., 1999; Frooman, 1999; Pfeffer & Salancik, 1978), therefore the value placed on different approaches to stakeholder management by financial markets may also be contingent on institutional context. This involves an examination of the impact of both country level factors and supranational institutional factors on the valuation of environmental and social performance. I examine how cross-country institutional differences, which shape the relative salience of a firm's stakeholder groups, can alter the financial market perspective of the value relevance of attending to stakeholders' requests through increased environmental and social performance. Further, I examine whether changes to a particular politically created supranational institution, the EU ETS, impacts the valuation of the environmental performance of affected firms.

5.2 Findings

In Chapter 2, I find that increased industry-relative CSP reduces a firm's cost of equity capital up until a point, beyond which the marginal benefits of further CSP investment decreases. The significance of the industry-relative firm groups provide evidence of a stratified and non-linear relationship with groupings along the CSP-CFP continuum similar to a clientele effect (Ding et al., 2016). These finding highlight the importance of considering industry context and the relative CSP performance position of firms as the cost of equity-related costs and benefits of a change to a firm's level of CSP are contingent on its initial position. This may be due to the possibility that financial markets perceive the presence of a dynamic trade-off between the costs and benefits of increased CSP at different levels of performance. The results of this type of dynamic trade-off at different levels of performance can be observed in my findings which support the proposition that the neglected stock hypothesis (Hong & Kacperczyk, 2009) applies to low CSP firms but also to high CSP firms as their cost of equity was found to be marginally higher than those with average levels of CSP.

In Chapter 3, I find that industry-relative CSP has a stronger positive relationship with firm value in countries with strong political, labour and market institutions. The significance of country-level institutional factors as moderators of the relationship between CSP and financial performance further substantiates the importance of considering the relationship using a contextualised lens. The institutional measures in this chapter are chosen to represent forces that would empower non-shareholding stakeholder groups through altering their relative resource dependency relationship with the firm and access to stakeholder salience strategies (Frooman, 1999; Pfeffer & Salancik, 1978). Hence, the finding that these institutions alter the value placed on CSP by financial markets provides evidence that in aggregate investors take an instrumental view of CSP, valuing CSP only in a contextual setting where it is in the financial interest of the firm and shareholders to address

the concerns of stakeholder groups. This is because failure to do so would produce suboptimal financial consequences from disgruntled salient stakeholders adopting strategies which withhold or limit the flow of resources to the firm (Frooman, 1999). This paper also examines the impact of a firm's relative CSP performance position on the valuation of CSP in varying institutional settings by using industry-relative peer groupings to represent the various types of stakeholder management strategies and finds an amplification of the positive relationship with the highest performing groups displaying increasingly steep slopes. Finally, I also examine whether the impact of home country institutional forces on the CSP-firm value relationship is itself contingent on the firm's level of multinationalism and find it to be the case with CSP being more highly valued for domestic firms due to the higher levels of embeddedness in their home country.

In the third paper, I find that positive firm-specific environmental news is associated with higher returns in the latter years of the EU ETS's third phase (2018-2021) while it had an insignificant impact in earlier years (2014-2017). These findings lend further weight to the argument for considering the relationship between environmental and market-based financial performance through a contextual lens, given the time-variant nature of financial market perceptions of the value relevance of corporate actions by demonstrating the ability of institutions to mould financial market outcomes. Furthermore, the impact of institutions on market outcomes is further substantiated by my finding of a significant market reaction to a number of political events relating to the revisions of the system which I identify as a possible inflection point between the two periods. These findings further highlight the importance of context as a determining factor in shaping the financial market perception of the value of environmental performance but also the fluid nature of politically derived institutional settings and extension of political risk into the valuation of participating firms.

My findings across the three papers support my supposition that our understanding of the relationship between environmental and social performance, and financial performance can be greatly enhanced through the implementation of a contextualised lens. Firstly, by highlighting the importance of considering industry context through the use of industry-relative measures of environmental and social performance. Secondly, by finding supportive evidence that any increase in CSP should be considered in the context of the firm's existing level of CSP. Thirdly, by showing that the relationship between CSP and firm value is moderated by the country level institutional context with the presence of stakeholder-supporting institutional forces increasing its value due to instrumental considerations. Finally, by highlighting how changes in a specific institutional setting altered the value placed by markets on firm-specific environmental news.

5.3 Contribution

My research allows me to directly contribute to the debate between Friedman's (1970) view of environmental and social performance as a constraint to creating value and the alternative view held by Freeman (1984) and others that integrating environmental and social performance into firm strategy can create value. My findings corroborate both the theoretical stance taken by stakeholder proponents that environmental and social performance can be value enhancing, and the stance taken by Freeman (1984) that it can be value destroying. My research reconciles these two theories, oft presented as conflicting, through the introduction of a contingency approach with context as the decisive factor in defining the relationship between environmental and social performance, and market-based measures of financial performance.

Firstly, this research contributes a contextualised understanding of the relationship between industry-relative CSP and a firm's cost of equity capital by discovering the presence

of a stratified and non-linear relationship. It contributes empirical evidence that the cost of equity- related benefits of increased CSP are contingent on a firm's existing level of industry-relative CSP. It finds a large reduction in a firm's cost of equity from moving out of the worst performing group but once the initial reduction has occurred, the marginal reductions from increasing levels CSP are far more modest, eventually increasing beyond a certain level of CSP. This finding provides evidence for the existence of a CSP clientele effect (Ding et al., 2016) and that the neglected stock hypothesis extends to low CSP firms (El Ghoul et al., 2011; Heinkel et al., 2001) but also partially to top performers. The substantial reduction in cost of equity capital reduction attributable to firms who move out of the bottom performing group also contributes empirical evidence for the proposition that CSP-related idiosyncratic risks are priced due to the reduced relative size and breath of their shareholder base (Chichernea et al., 2015). The presence of an increase in cost of capital for firms with top CSP performance negates the possibility of an absolute truth about the relationship and highlights that the nature of the alignment between social and economic investment incentives is an important determinant of financial market outcomes.

Secondly, this research extends its contribution to a contextualised understanding of the relationship by directly examining how the alignment of social and economic incentives impact the ultimate measure of financial performance, firm value. This research contributes a theoretical explanation for cross country differences in the market valuation of CSP by integrating institutional, stakeholder salience theory (Mitchell et al., 1997) and resource dependency theory (Pfeffer & Salancik, 1978). I contribute empirical evidence that the institutional setting, with its ability to align or misalign the social and economic incentives for investors, by altering the power dynamics between stakeholder groups, moderates the relationship between CSP and firm value. This highlights the fact that the instrumental logic of the marketplace with its consequential orientation is intertwined and shaped by the institutional setting in which it operates. Additionally, I provide empirical evidence that

supports Jackson & Deeg (2008) suggestion that CSR emerges as a complement to strong regulatory institutions, since such institutional arrangements empower stakeholders to demand socially responsible behaviour from the firm (J. L. Campbell, 2007; Gjølberg, 2010).

Finally, this research contributes further empirical evidence to the moderating role of institutional context on financial market outcomes related to environmental performance. By examining the market reaction to changes in the institutional setting and how these changes impact the market's interpretation of the value relevance of subsequent firm-specific environmental information, this research contributes a time-variant contextualised understanding to the body of research which examines the stock market reaction to environmental news (Capelle-Blancard & Laguna, 2010; Capelle-Blancard & Petit, 2019; Fisher-Vanden & Thorburn, 2011; Flammer, 2013; Gilley et al., 2000; Klassen & McLaughlin, 1996; Lioui & Sharma, 2012; Oberndorfer et al., 2013; Shane & Spicer, 1983). The inconsistency between the two sub periods in my sample points to one possible reason for the inconsistences in previous research investigating the impact of environmental news on stock returns (Y. Wang et al., 2019) by highlighting the importance of institutional context and external pressures on the relationship. When examining the market reaction to the publication of news related to the future structure of the EU ETS for Phase 4, I repeatedly find empirical evidence that the stringency and intensity of regulatory environment impacts investors' expectations of the financial impact of carbon liabilities (Clarkson et al., 2015).

5.4 Implications

The more nuanced contextualised understanding of the role played by financial markets in incentivising firms to improve their environmental and social performance offered by this research has a number of implications for policy and practice. The overriding implication of my research is that environmental and social performance is value-relevant to

investors which lends support to the idea that market forces can play a positive role in moving business towards a more sustainable future. However, a major caveat to this implication exists as my research finds that contextual factors have a major effect on financial markets' valuation of environmental and social performance, so that the nature of the role that financial markets play is contingent on external factors.

A major implication of this research relates to the importance of viewing the environmental and social performance of firms relative to their industry peers that face similar asset composition, cashflows, regulatory constraints, carbon intensity etc. As investors were found to perceive the relationship between industry-relative CSP and financial performance as stratified and non-linear, managers should be cognisant that minor changes to performance, which leave the general market perception of their category of performance unchanged will result in little market reaction. This implies that only major changes of environmental and social performance that will result in market reactions. Policy maker may take note of the findings of a stratified and non-linear relationship between industry-relative CSP and cost of equity capital in which the market offers decreasing incentives via cost of equity capital reduction to firms that increase their CSP until an optimal level is reached, beyond which further investment increases a firm's cost of equity capital. If markets primarily encourage firms to increase their CSP from low to mid-range industry-relative performance, regulation or technological change may be required to incentivise further CSP investment beyond this point. Hence, if the goal is to move business to a more sustainable footing, stricter regulations, and incentives for investment in innovation may help to raise the general level of industry environmental and social performance. Under these circumstances, financial markets would support the progression to higher levels of absolute performance by incentivising laggards to keep up with the general improvement in industry performance as failing to do so would result in a decrease in their industry-relative performance and a resultant increase in their cost of equity and fall in firm value.

Additionally, there are practical and policy implications related to the findings of this research that financial market outcomes and the incentives created by financial markets for firms to improve their environmental and social performance are themselves shaped by the institutional context in which the firm operates. For managers, the knowledge of the contextually contingent nature of financial market outcomes related to environmental and social performance can assist in their investment decision making process. Fuelled with the knowledge that markets positively value increased environmental and social performance in the presence of stakeholder supporting institutions, managers in these contextual settings can invest in improving their performance in the knowledge that financial markets will judge the investments as value enhancing. However, the contrary is also true for managers in a contextual setting without stakeholder supporting institutions which highlights an important implication for policy makers. As the salience of stakeholder groups is an important factor in whether addressing their claims are value relevant, the creation and maintenance of institutions which empower societal and environmental stakeholders is of utmost importance if market forces are to play a part in our transition to a sustainable future. The realisation that markets take their cues from the institutional setting in which they operate, due to their ability to shape the costs and benefits of certain actions, should encourage policy makers aiming to improve the impact of business on society to act, as markets require guidance on what is a valuable activity from society itself. This guidance can be institutionalised in laws and regulations, as in the case of the EU ETS, that change the perceptions of the value relevance of corporate actions.

5.5 Limitations and Future Research

Although the sample for my first two papers both contain a large number of publicly traded firms from multiple countries, the spread of firms is uneven and concentrated in

higher income countries and hence suffers from a prosperous country bias. This prosperous country bias is also compounded by a large cap bias with large firms more likely to be present in the sample. Additionally, the number of firm-year observations are also skewed towards more recent years. This data constraint was the result of and is evidence of the increasing importance of ESG data to investors over the years. ESG data was first published by and about the larger corporations in larger developed countries before expanding to smaller companies and developing countries in more recent years. While this is currently the best available data, future research could apply the current methodology to an expanded and more representative global sample to increase the generalizability of its findings.

In my third paper, I also face similar data constraints, and prosperous country and large company bias, however the impact on the generalizability of the findings of this paper is reduced because these constraints relate to the construction of the EU ETS which cover large emitters in the European Union. The three papers in this research share a common lack of generalizability to firms that are not publicly traded and which constitute a large part of the business community. However, the central focus of this research is the role that financial markets play in incentivising publically listed firms to improve their impact on society. The value of environmental and social performance to privately held firms is outside its scope but this could be a fruitful area for future research.

A more central question of this research is the construct reliability and validity of the measures of environmental and social performance. While my third paper's measure of environmental performance does not suffer from these issues due to its objective and verified nature, the use of Asset4's ESG data to measure a firm's industry-relative environmental and social performance may. The use of ESG data has become prevalent in the academic research yet its reliability has been questioned due to a lack of standardisation and the resulting lack of consistency in the scores provided by different rating agencies (Berg, Koelbel, & Rigobon, 2019; Billio, Costola, Hristova, Latino, & Pelizzon, 2021). There are

approximately 125 organisations providing ESG ratings and research, although many are niche players (M. Porter, Serafeim, & Kramer, 2019). The most commonly used ESG ratings are provided by: Morgan Stanley Capital International (MSCI); Institutional Shareholder Services Inc. (ISS); RobecoSAM; Sustainalytics; RepRisk AG; and Refinitiv (formerly Asset4) (Bergman, Curran, Deckelbaum, Karp, & Martos, 2021). Berg et al. (2019) find that the correlation between the ratings provided by six of the major ESG rating agencies was on average 0.54 with the divergence between ratings categorised as emanating from three sources with 53% of the variation attributed to measurement disagreement, 44% related to scope and the remaining 3% to the weighting of different elements.

Many investors reportedly circumnavigate the issue of divergent ratings by using raw ESG data from the rating bodies as an input to their propriety models, disregarding the aggregate company ratings (Bergman et al., 2021). SustainAbility (2020) survey research on the use of ESG data by investors finds that raw ESG data is often used to benchmark companies against comparators using internal scoring and analysis mechanisms. This informs my choice of Asset4 as my data source as their scores are benchmarked against industry peers which would best represent the approach of investors, who even if not using the Asset4 data, are using raw ESG data to benchmark the performance of firms relative to their peers. Additionally, materiality is also another benefit of using Asset4 data as comparing firms within the same industry allows for a more insightful interpretation of their environmental or social efficiency given industry-specific operational requirements. Secondly, my use of industry-relative groupings in this research is informed by the presence of heterogeneous information constraints and utility functions (Ding et al., 2016) and hence is designed to negate some of the noise caused by divergent ratings. Additionally, critics suggest that combining E, S and G scores may create aggregate confusion due to the broad nature of each of the individual headings and the propensity for positive performance in one area to negate poor performance in another (Berg et al., 2019). In my study, I reduce the

impact of this aggregate confusion by using a combination of only the environmental and social score in addition to examining its constituent parts individually.

A further question regarding the construct validity of my measures may stem from the possibility that the scores which I obtained from Asset4, although accurately reflecting all of the available information about a firm's environmental and social performance, may not accurately reflect the actual environmental and social impact of the firm. The incidence of 'greenwashing' or gaming of the system to create the perception that a firm is more socially responsible than they are in reality so as to generate favourable outcomes may be an issue in research regarding environmental and social performance. The focus on the investor in this research mitigates some of these concerns as we are interested in the value relevance of the available measures of CSP to investors. Whether or not this is an incomplete or misleading measure of the environmental and social impact of a firm, it is a measure used by financial markets and investors to proxy the environmental and social performance of the firm. Ensuring the accuracy of these measures by institutionalizing their measurement and reporting in law may empower stakeholders and increase the value of environmental and social performance to market actors.

My research demonstrates the importance of measuring environmental and social performance on an industry-relative basis. However, it is of course the case that reducing the negative impact of human activity on the natural environment can not only be done on an industry-relative basis. Reducing the overall impact of all economic activity is crucial if we are to keep our planet habitable for future generations. While the ultimate goal is reduce absolute emissions to net zero, a crucial lever to reach this goal is the financial incentives for firms in every industry to be as environmentally efficient as possible in the transition period.

A further limitation of this research and its generalizability may also stem from its contextualised lens which indicates that the market outcomes observed in this research are contingent on the specific context in which the study was undertaken. While my research offers supporting evidence for viewing the relationship through a contextualised lens, the setting in which businesses are operating is in constant flux with multiple other possible moderating factors in a firm's external environment. Future research could examine other additional moderating institutional forces yet to be examined in the literature. Finally, an area for future research would be to investigate the impact of the institutional context on ethical decision making by managers at a micro level, creating an understanding of the ethical values implied in their observed decision-making outcomes and how these vary between diverse institutional contexts. This practical approach would shed light on the ethical frameworks guiding business actions in a variety of contexts as opposed to a focus on universal ethical values, adding greater depth and breadth to our understanding in this field. Furthermore, an investigation of how these frameworks are embedded could shed further light on the evolving system of the governance of business conduct and its ethical underpinnings.

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