Relative Corporate Social Performance and Cost of Equity Capital: International Evidence

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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.

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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[3] (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,[4] 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.

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

[3] 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).
[4] 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).

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 (Gupta, 2018; Malik, 2015). 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).

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 its 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).

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, Ioannou, & Serafeim, 2011; Paul C Godfrey, Merril, & Hansen, 2009; Gregory, Tharyan, & Whittaker, 2014; Koh, Qian, & Wang, 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, Ferreira, & Wongchoti, 2016; Harjoto, Jo, & Kim, 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; 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, Sulaeman, & Varma, 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; Dhaliwal, Heitzman, & Li, 2006; Dhaliwal, Judd, Serfling, & Shaikh, 2016; Hail & Leuz, 2006, 2009; Hou, van Dijk, & Zhang, 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 (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.

Our finding of a non-linear relationship between a firm's recorded 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 is 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. Literature review: CSP and Cost of Capital

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 (Gupta, 2018; Malik, 2015). They argue that these benefits outweigh the cost involved in improving CSP and hence a positive relationship should exist between CSP-CFP. Stakeholder theory (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 (Margolis & Walsh, 2003; Margolis, Elfenbein, & Walsh, 2009; Orlitzky, Schmidt, & Rynes, 2003; Renneboog, Ter Horst, & Zhang, 2008; van Beurden & Gossling, 2008).

This study contributes to and extends this body of literature on the link between CSP and CFP by examining the cost of equity capital acts as a conduit through which industry-relative CSP could affect a firm's financial performance. 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, 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 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 (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 (Dhaliwal, Li, Tsang, & Yang, 2011), coverage by the media and analysts (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:

H1: Corporate social performance is negatively related to a firm’s cost of 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; 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 to not invest in stocks without 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:

H2: The relationship between corporate social performance and cost of equity is stratified and non-linear.

3. Data and Research Methodology

3.1 Measuring CSP

This research utilizes Thomson Reuters Asset4's ESG scores as our measure of CSP following recent studies (Gupta, 2018; La Rosa, Liberatore, Mazzi, & Terzani, 2018; Liang & Renneboog, 2017; Sassen, Hinze, & Hardeck, 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[5] which consists of an equally weighted-average of environmental and social scores. Appendix 1 provides an outline of the ES measurements used.

3.2 Implied Cost of Equity

[5] 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.

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; 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 (Gupta, 2018).

Factor models using realised returns, including the CAPM, are claimed to generate imprecise estimates of the cost of capital as realised returns, affected by cash flow news and shocks (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 (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, Guedhami, Mishra, & Saffar, 2012; 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). 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 (Dhaliwal et al., 2006). Descriptions of these models can be found in Appendix 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 (RI) earnings forecasting model 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 Appendix 3.

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 of 21,338 firm-year observations from 50 countries over the period 2002-2017. Table 1 shows a breakdown of the sample by country over the period.

[Table 1]

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 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 between 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%

[Table 2]

We present Pearson pairwise correlation coefficients between all variables in Table 3. 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 3]

4. 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, Li, & Richardson, 2004; Plumlee, Brown, Hayes, & Marshall, 2015; Richardson & Welker, 2001).

$$COEC_{it} = \beta_1 CSP_{it} + \beta_2 BTM_{it} + \beta_3 ROE_{it} + \beta_4 DLOSS_{it} + \beta_5 ILLIQ_{it} + \beta_6 SIZE_{it} + \beta_7 LEV_{it} + \beta_8 VOL_{it} + \beta_9 LGDPPC_{it} + \beta_{10} inflation_{it} + \varepsilon_{it} \quad (1)$$

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, 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.

5. Empirical Results

5.1 Main Results

Table 4 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 0.10215%.[6] 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.

[Table 4]

In Model 2 of Table 4, 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 0.045362%[7]. In Model 3 of Table 4, 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

[6] Calculated as -0.005, the coefficient for CSP x 20.43, the standard deviation of CSP in Table 3.
[7] Calculated as -0.002, the coefficient for Env x 22.681, the standard deviation of Env in Table 3.

group dummy variables based on 5 quantiles in Model 4 of Table 4. 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 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; 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 40th to 60th 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 60th to 80th 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 environmental performance 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 (Dhaliwal et al., 2006; El Ghoul et al., 2018; Gode & Mohanram, 2003; 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.

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 an slight increase in cost of equity occurs, as illustrated in Figure 1. These findings allow us to accept 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 investors 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.

5.2 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 5. 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 5 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 5 implies that a one standard deviation increase in a firm’s emissions score leads on average to a decrease in cost of equity of 0.057228%. This indicates that firms with lower emissions have a lower cost of capital.

[Table 5]

In Models 4 to 7 in Table 5 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 0.08664%. 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 5. 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.

5.3 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 6. 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 in to 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 it calculation, results in unlagged CSP scores giving a better representation of the relationship between CSP and cost of equity or expected future returns.

[Table 6]

6. 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 not 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 off 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 your 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.

7. References

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8. Tables and Figures

Table 1: Sample broken down by country and year

	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	Total
AUSTRALIA	2	2	26	32	42	48	43	70	100	110	135	131	151	161	170	186	1409
AUSTRIA	4	2	4	6	10	13	9	10	10	8	11	10	7	9	7	5	125
BAHRAIN	0	0	0	0	0	0	0	0	0	0	0	0	0	5	5	5	15
BELGIUM	1	2	1	5	8	13	10	9	10	10	11	13	8	14	11	8	134
BRAZIL	1	1	1	1	1	6	10	17	32	35	43	44	44	47	36	45	364
CANADA	3	1	14	28	50	74	76	90	71	81	102	95	91	81	84	91	1032
CHINA	0	0	1	1	1	3	21	40	61	65	59	71	83	86	81	226	799
COLOMBIA	0	0	0	0	0	0	0	3	7	8	10	11	10	8	13	18	88
CZECH REPUBLIC	0	0	0	0	0	1	1	0	0	1	0	0	1	1	1	2	8
DENMARK	3	7	6	6	11	11	13	10	9	9	8	7	7	8	3	2	120
EGYPT	0	0	0	0	0	0	1	2	8	7	7	6	7	7	7	4	56
FINLAND	6	4	4	6	15	14	9	12	6	10	8	12	9	11	11	8	145
FRANCE	6	6	15	14	43	53	51	35	34	42	48	40	41	33	26	26	513
GERMANY	3	7	10	24	36	39	31	28	21	29	36	26	32	27	22	22	393
GREECE	1	1	3	3	6	7	5	6	7	7	6	5	7	5	6	6	81
HONG KONG	5	5	32	39	42	53	56	67	104	118	117	127	132	129	130	153	1309
HUNGARY	0	0	0	0	0	0	1	3	2	3	3	3	2	4	2	1	24
INDIA	0	0	0	0	0	6	17	24	39	54	60	61	70	64	55	59	509
IRELAND	2	1	0	1	4	3	4	3	3	3	7	5	6	7	2	6	57
ISRAEL	0	0	0	0	1	1	1	7	6	8	8	8	8	8	7	7	70
ITALY	10	10	12	18	23	27	29	25	28	22	21	23	29	32	24	30	363
JAPAN	7	9	104	225	273	305	291	197	257	286	284	286	303	301	261	234	3623
JORDAN	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	10
KUWAIT	0	0	0	0	0	0	3	3	3	3	3	3	3	9	9	9	48
LUXEMBOURG	0	0	1	1	2	2	2	1	1	1	1	3	3	1	1	1	21
MALAYSIA	0	0	0	0	0	0	10	15	34	36	38	40	40	40	36	39	328
MEXICO	1	1	1	1	1	5	10	12	12	15	17	22	24	24	29	27	202
MOROCCO	0	0	0	0	0	1	1	0	1	1	2	2	1	2	1	1	13
NETHERLANDS	1	3	5	3	12	12	7	10	9	6	7	10	11	10	11	5	122
NEW ZEALAND	0	0	5	6	7	9	9	5	7	8	9	11	13	36	41	44	210
NORWAY	6	5	5	11	14	13	7	10	5	11	10	12	8	7	10	11	145
OMAN	0	0	0	0	0	0	0	1	1	1	1	1	1	8	9	8	31
PERU	0	0	0	0	0	0	1	0	0	1	1	1	1	0	18	20	43
PHILIPPINES	0	0	0	0	0	0	0	4	13	17	18	21	21	21	21	22	158
POLAND	0	0	0	0	0	0	3	5	11	14	15	17	16	18	14	12	125
PORTUGAL	0	0	1	5	7	7	4	5	5	4	5	4	3	6	5	8	69
QATAR	0	0	0	0	0	0	0	0	0	0	0	0	4	3	5	4	16
RUSSIA	1	1	1	1	1	5	11	14	13	13	14	13	12	4	14	11	129
SAUDI ARABIA	0	0	0	0	0	0	3	3	1	2	3	2	2	9	7	7	39
SINGAPORE	0	0	15	24	25	28	30	36	32	34	36	35	34	33	34	31	427
SOUTH KOREA	1	1	1	2	3	6	12	12	25	38	60	55	50	52	42	36	396
SPAIN	4	6	9	11	21	19	17	16	14	18	22	25	24	27	22	19	274
SRI LANKA	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	8
SWEDEN	12	14	18	23	29	30	21	26	19	23	29	27	26	37	27	26	387
SWITZERLAND	3	7	7	6	20	24	14	16	13	18	29	26	22	16	16	15	252
THAILAND	0	0	0	0	0	2	5	8	12	13	21	20	26	24	26	26	183
TURKEY	0	0	0	0	0	0	12	14	17	18	20	18	22	21	17	24	183
UAE	0	0	0	0	0	0	0	1	1	1	1	1	8	10	9	11	43
UNITED KINGDOM	26	26	76	105	140	145	120	137	123	141	164	147	128	168	164	174	1984
UNITED STATES	34	16	55	110	290	326	282	302	217	284	342	309	248	405	545	490	4255
Total	143	138	433	718	1138	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.

Table 2: 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 3: Pearson Correlation Matrix

		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***

Table 4: 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

Table 5: 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)

Grouped by	(8) Resource Use	(9) Emissions	(10) Environmental Innovation	(11) Workforce	(12) Human Rights	(13) Community Score	(14) 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)
BTM	3.671***	3.672***	3.671***	3.667***	3.667***	3.670***	3.668***
	(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***	0.310***	0.301***	0.310***	0.309***	0.311***
	(0.063)	(0.063)	(0.063)	(0.063)	(0.063)	(0.063)	(0.063)
ILLIQ	23.493***	23.502***	23.485***	23.505***	23.486***	23.486***	23.486***
	(0.493)	(0.493)	(0.493)	(0.493)	(0.493)	(0.493)	(0.493)
SIZE	-1.421***	-1.417***	-1.424***	-1.418***	-1.427***	-1.424***	-1.424***
	(0.054)	(0.054)	(0.053)	(0.053)	(0.053)	(0.053)	(0.053)
LEV	2.542***	2.541***	2.541***	2.539***	2.549***	2.550***	2.539***
	(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	-0.410***	-0.403***	-0.418***	-0.402***	-0.421***	-0.416***	-0.402***
	(0.146)	(0.146)	(0.146)	(0.146)	(0.146)	(0.146)	(0.146)
Inflation	0.035**	0.035**	0.035**	0.035**	0.033**	0.034**	0.035**
	(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	0.417	0.416	0.417	0.417	0.416	0.417	0.416
Adjusted R2	0.275	0.275	0.276	0.275	0.275	0.276	0.275
F Statistic	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)

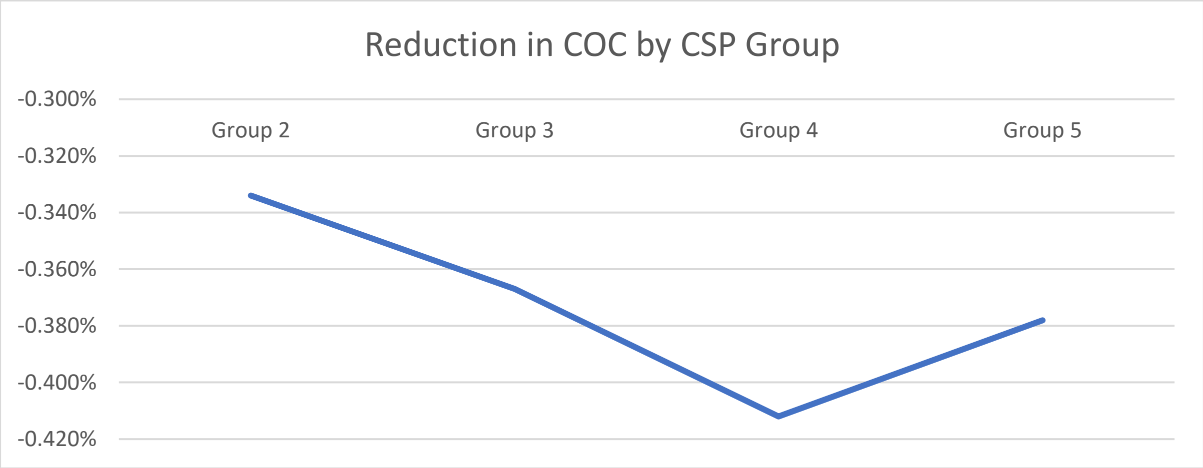
Notes: The dependent variable, implied cost of capital for firm i in year t (calculated using forecasts of earnings per share generated by the residual income model) is regressed on our main dependent variables, the sub pillars of CSP, as well as firm-level and country-level control variables; book to 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

Table 6: 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

Figure 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.

9. Appendices

Appendix 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.

Appendix 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.

<u>Common notation</u>
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

<table>
<tr><td>1. Claus & Thomas (2001)</td><td>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:

$$ae_{t+\tau} = FEPS_{t+t} - R_{CT}B_{t+\tau-1}$$
$$B_{t+\tau} = B_{t+\tau-1} + FEPS_{t+\tau}(1-DPR_{t+\tau})$$
$$B_{t+1} = B_t + FEPS_{t+1} - DIV_{t+1}$$</td></tr>
<tr><td>2. Gebhardt, Lee, & Swaminathan (2001)</td><td>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 4^{th} to 12^{th} year, EPS will grow linearly to the industry-specific median ROE. The terminal value beyond the 12^{th} year assumes 0 incremental profits, Residual income does not change.</td></tr>
<tr><td>3. Ohlson & Juettner-Nauroth (2005)</td><td>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: $A = \frac{1}{2}(g + \frac{DPR*FEPS_{t+1}}{P_t})$

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.</td></tr>
<tr><td>4. Easton (2004)</td><td>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</td></tr>
</table>

Appendix 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.