Corporate Social Responsibility and Firm Risk: Theory and Empirical Evidence*

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Abstract

This paper presents an industry equilibrium model where firms have a choice to engage in corporate social responsibility (CSR) activities. We model CSR activities as a product differentiation strategy allowing firms to benefit from higher profit margins. The model predicts that CSR decreases systematic risk and increases firm value and that these effects are stronger for firms operating in differentiated goods industries and when consumers' expenditure share on CSR goods is small. We find supporting evidence for our predictions. We address a potential endogeneity problem by instrumenting CSR using data on the political affiliation of the firm's home state.

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1 Introduction

Corporate social responsibility (CSR) has long been a strategic concern for corporations around the world, responding to the interest shown by both consumers and investors. The 2013 UN Global Compact-Accenture CEO Study on Sustainability of over 1000 CEOs listed brand, trust and reputation, together with consumers as their primary motivations to engage in CSR activities. Investors have also recognized the importance of CSR initiatives. Already in 1970 the landmark court decision Medical Committee for Human Rights vs. SEC opened the door for CSR proposals to be included in proxy statements (Glac, 2010). Starting in the 1990's the Global Reporting Initiative, later in partnership with the UN Environment Program and the OECD, has been offering corporations standardized reporting framework for their CSR activities.[1] The pressure from consumers and investors alike to adopt CSR policies has been so significant that the Economist concluded in 2008 that "[t]he CSR industry, as we have seen, is in rude health. Company after company has been shaken into adopting a CSR policy: it is almost unthinkable today for a big global corporation to be without one."

Arguably, CSR's increased popularity inside boardrooms has outpaced the research needed to justify it. Specifically, the mechanisms through which CSR affects firm value, and whether these effects are positive or negative, are not fully understood. In this paper we focus on CSR activities as a product differentiation strategy and how this strategy affects the riskiness of firms' cash flows. In particular, we aim to address the following questions: Does CSR affect systematic risk over and above its effect on firm cash flows (as hypothesized by Bénabou and Tirole, 2010)? How is firm valuation affected by the firm's peers' CSR activities? Is the effect of CSR on firm risk different across industries? Are profits of CSR

[1] Intel Corporation provides a good example of how extensively companies report and publicize their CSR activities. Intel has embedded CSR with tangible metrics into its corporate strategy, management systems, and long-term goals and highlights its achievements in a detailed annual CSR report. The report for 2013 can be found at http://csrreportbuilder.intel.com/PDFFiles/CSR_2013_Full-Report.pdf.

firms relative to non-CSR firms counter-cyclical as would be the case if their systematic risk is lower?

We develop an industry equilibrium model where firms choose to adopt a CSR or a non-CSR production technology. Firms' adoption costs are heterogenous for the CSR technology, so that firms with lower costs are more likely to do it. There are two benefits of choosing a CSR technology. First, since the CSR technology is a product differentiation strategy, this implies that CSR firms face a relatively less price elastic demand and can charge higher prices *ceteris paribus*, consistent with an extensive marketing and economics literature (e.g. Bhattacharya and Sen, 2003, Elfenbein and McManus, 2010, Elfenbein, Fisman, and McManus, 2012, and the review in Kitzmueller and Shimshack, 2012). Second, non-CSR firms may face an idiosyncratic disaster shock that CSR firms do not. The disaster shock could be an oil spill or penalties for breaking the law (for evidence for lighter penalties for CSR firms, see Hong and Liskovich, 2015).

We embed the choice of technology within a standard asset-pricing framework with monopolistic firms. CSR firms face a less price elastic demand, and *ceteris paribus*, enjoy higher profit margins. Higher profit margins reduce the elasticity of profits to aggregate shocks resulting in more stable cash flows for the firm. From the perspective of a risk-averse investor, a firm facing a less price elastic demand exhibits lower systematic risk and has a higher firm value. However, higher profit margins lead more firms to adopt CSR policies and to pay higher adoption costs in order to avoid the idiosyncratic disaster shock. These higher adoption costs increase systematic risk and lower market value for the marginal firm. This industry-equilibrium feedback effect contrasts with the first, partial-equilibrium risk-reduction benefit of CSR.

We show that the relative strength of these two effects, and thus the relative riskiness of CSR firms, depends on consumers' expenditure share on CSR goods. A sufficiently small expenditure share on CSR goods limits the proportion of CSR firms and implies that the marginal CSR firm has lower systematic risk and higher valuation than non-CSR firms. Assuming small enough expenditure share on CSR goods, the two main model predictions are that CSR firms have lower systematic risk and higher firm value. Since lower systematic risk is associated with lower co-movement of profits with aggregate economic conditions, the model also predicts that the ratio of profits of CSR firms relative to those of non-CSR firms is countercyclical.

The industry equilibrium of the model allows us to study the effects of CSR adoption across industries. The model predicts that firms that operate in industries with more product differentiation have a stronger CSR-risk relation. Surprisingly, the model predicts that industries with a larger consumer's expenditure share on CSR goods have a weaker CSR-risk relation. The reason is that greater CSR adoption results in a marginal CSR firm with higher adoption costs, and thus higher sensitivity to aggregate shocks and higher systematic risk.

We test the model predictions using a comprehensive dataset on firm-level CSR from MSCI's ESG STATS database. The sample consists of a panel of U.S. firms from 2003 to 2011 with a total of 23,803 firm-year observations. We construct an overall CSR score that combines information on the firm's performance across community, diversity, employee relations, environment, product, and human rights attributes. We estimate firm systematic risk using a three-factor model of returns and, as in our theory, take firm beta to be the coefficient on the market return. Using the estimated betas as our dependent variable, we run panel regressions with firm and year fixed effects and with control variables that are known to affect systematic risk.

We first document that the level of systematic risk is significantly lower for firms with a higher CSR score, both statistically and economically. One standard deviation increase in firm CSR score is associated with a firm beta that is lower on average by 0.034, which represents 4% lower systematic risk relative to beta's sample mean. This effect does not rely exclusively on any single CSR attribute, but the attributes diversity and environment have the largest economic association. Consistent with the risk mechanism in our model and the product differentiation assumption, we provide evidence that the ratio of CSR firms' profits to non-CSR firms' profits is counter-cyclical.

Next, we find evidence supporting the prediction that the association between CSR and firm beta is stronger in industries with greater product differentiation. We use two measures of product differentiation and we find that the economic magnitude of the CSR-risk association is higher in differentiated goods industries for both measures. We also find evidence supporting the prediction that industries with a larger expenditure share on CSR goods have a weaker CSR-risk relation. In our model, increased consumer spending on CSR translates into a relatively larger number of firms adopting CSR policies and increases the relative valuation of these firms. We use as proxy the stock market capitalization of high CSR rated firms for the popularity of CSR in an industry and test whether the stock market capitalization of these high CSR rated firms is associated with lower betas for CSR firms. We find evidence consistent with this prediction.

There are reasons to suspect that endogeneity may be an issue in our empirical specifications. A firm's financial resources may determine its CSR decisions (Hong, Kubik, and Scheinkman, 2012), or firms that differentiate their products through other means, such as branding, and thus have lower systematic risk, might also invest more in CSR. In order to address these concerns, we use a comprehensive set of control variables that includes cash and advertising expenses, in addition to year and firm fixed effects. In addition, we conduct an IV estimation taking as instrument the political affiliation of the state where the company's headquarters' are located following a literature that suggests that democratic-leaning voters care more about CSR (Gromet, Kunreuther, and Larrick, 2013, Costa and Kahn, 2013, Di Giuli and Kostovetsky, 2014). Since we include firm fixed effects in our first stage estimation, the variation comes from changes in states' political affiliation over time.[2] While we do not expect that changes in the state political affiliation are related to firm risk, we deal with potential indirect violations of the exclusion restriction. One way to do so is to exclude firms that have sales that are geographically focused in their headquarter state. The reason for excluding these firms is to alleviate concerns that other *state-level* variables, such as the headquarter state's wealth inequality or overall demand, may affect both the level of CSR and the level of firm risk. The economic significance for the instrumented CSR is larger than that implied by the OLS estimates, both for all firms and when we exclude geographically focused firms. These results provide support for a causal effect of CSR on systematic risk. We conclude our study by providing evidence that higher CSR score is positively associated with higher Tobin's Q. We again conduct OLS and IV estimations. Consistent with the model, the association between Tobin's Q and CSR is stronger for firms in industries with greater product differentiation and where top CSR firms have lower market capitalization.

Section 2 reviews the existing literature. Section 3 presents the model and Section 4 analyzes the equilibrium properties regarding risk and firm value. Section 5 presents the data and the results are in Section 6. Section 7 concludes. Proofs are in the appendix.

2 Related Literature

One of our main contributions is the development of a theory to study the relation between CSR and firm risk when firms respond to consumers' preferences and to put the analysis into an industry equilibrium framework. This paper belongs to a literature asserting that firms engage in profit-maximizing CSR (e.g. McWilliams and Siegel, 2001).[3] Further, we

[2] Variation could also come form firms changing the state where they are headquartered, but this occurs in less than 1 percent of the firms in our sample.

[3] According to Bénabou and Tirole (2010), the other motivations for CSR policies are delegated philanthropy, where stakeholders delegate social activities they would like to do themselves to corporations, and agency costs, where managers engage in CSR because of private benefits.

draw from the research that argues that CSR is a product differentiation strategy (see e.g. Navarro, 1988, Bagnoli and Watts, 2003, and Siegel and Vitalino, 2007). Consistent with this literature, Luo and Bhattacharya (2006, 2009) have argued that CSR increases customer loyalty, leading to firms having more pricing power. Direct evidence for this is observed in the ability of firms to sell more or at higher prices those products that have CSR features (see e.g. Creyer and Ross, 1997; Auger, Burke, Devinney, and Louviere, 2003; Pelsmacker, Driesen, and Rayp, 2005; Elfenbein and McManus, 2010; Elfenbein et al., 2012; Ailawadi, Luan, Neslin, and Taylor, 2014). Flammer (2015a) provides indirect evidence for CSR as product differentiation strategy by showing that U.S. firms respond to tariff reductions that increase competition by increasing their CSR activities.

Our other main contribution is the empirical evaluation of the CSR-firm risk relation. While there is a recent empirical literature documenting a negative association between CSR and firm risk and cost of equity capital (e.g. El Ghoul, Guedhami, Kwok, and Misra, 2012, and Oikonomou, Brooks, and Pavelin, 2012), these papers do not provide evidence for a causal relation. We contribute to this literature by conducting an instrumental variables estimation and by presenting further evidence on the nature of the relation across industries as predicted by the model.

CSR has received scant attention in the theoretical finance literature. A notable exception is Heinkel, Kraus, and Zechner (2001), who assume that some investors choose not to invest in non-CSR stocks. This market segmentation leads to higher expected returns and risk for non-CSR stocks, which must be held by only a fraction of the investors (as in Errunza and Losq, 1985, and Merton, 1987). Gollier and Pouget (2014) build a model where socially responsible investors can take over non-CSR companies and create value by turning those into CSR companies, but offer no prediction for firm systematic risk. These papers assume that a subset of investors have a preference for CSR stocks. As pointed out by Starks (2009), investors seem to care more about corporate governance than about CSR, and as noted above CEOs seem to care more about consumers when they make their CSR choices. We use the model to make predictions regarding the role of consumers in affecting the CSR-risk relation across industries and we test these predictions empirically. We are therefore able to provide evidence consistent with the main mechanism in the theory.

Our paper is also related to the work on brand assets and firm risk. Belo, Lin, and Vitorino (2014) find that firms with higher investments in brand capital, measured by advertising expenditures, exhibit lower stock returns. Gourio and Rudanko (2014) provide a model with search frictions in the product markets where firms spend resources in acquiring customers. The acquired customer base becomes a valuable asset increasing firm value and profit margins. In our empirical tests, we control for advertising expenditures and conclude that CSR appears to have an independent role in affecting firm risk and firm value.

There is a large empirical literature on the association between CSR and firm value. Margolis, Elfenbein, and Walsh (2010) review 35 years of evidence and show that there is on average a small positive effect. Servaes and Tamayo (2013) provide evidence that there is a positive relationship between CSR and firm value when customers have high awareness about firm activities. Krüger (2014) finds a negative effect on stock prices if management is likely to receive private benefits from CSR adoption, but a positive effect if CSR policies are adopted to improve relations with stakeholders. Flammer (2015b) studies shareholder proposals for CSR that pass or fail with a small margin of votes and shows that approved proposals lead to positive abnormal stock returns. Dimson, Karakas, and Li (2015) find that institutional investor activity that leads to changes in firms' CSR policies are followed by positive abnormal stock returns, especially in industries that are likely to be consumer-oriented industries. Deng, Kang, and Low (2013) show that acquirers with high CSR scores experience higher merger announcement returns and better post-merger operating performance.

While the majority of recent studies has demonstrated economic benefits from CSR, Cheng, Hong, and Shue (2013) and Masulis and Reza (2014) provide evidence that an increase in effective managerial ownership leads to a decrease in CSR activities and corporate giving, consistent with the agency cost view of CSR. Both studies measure the marginal effect of changing after-tax ownership on CSR and thus do not show that on average CSR activities destroy value. Interestingly, Ferrell, Liang, and Renneboog (2014) show that well governed firms engage more in CSR activities, and that CSR activities are positively associated with executive pay-performance sensitivity. The evidence in Ferrell et al. (2014) is difficult to reconcile with the view that CSR is largely motivated by managers' personal benefits.

3 The Model

3.1 The model setup

Consider an economy where production, asset allocation, and consumption decisions are made over dates 1 and 2. There is a representative investor and a continuum of firms with unit mass.

Household sector: The representative investor has preferences

$$U\left(C_1, C_2\right) = \frac{C_1^{1-\gamma}}{1-\gamma} + \delta E\left[\frac{C_2^{1-\gamma}}{1-\gamma}\right]. \tag{1}$$

C_1 and C_2 are date 1 and 2 consumption. The relative risk aversion coefficient is $\gamma > 0$ and the parameter $\delta < 1$ is the rate of time preference. The expectations operator is denoted by $E\left[.\right]$. There are two types of goods in the economy. Low elasticity of substitution goods, which we associate with goods produced by socially responsible firms (CSR goods), and high elasticity of substitution goods, which we associate with other firms (non-CSR goods). We label these using the subscripts G and P, respectively, for green and polluting. A convenient analytical way to model differences in the elasticity of substitution across goods is to use the Dixit-Stiglitz aggregator,

$$C_2 = \left(\int_0^{\mu} c_i^{\sigma_G} di \right)^{\frac{\alpha}{\sigma_G}} \left(\int_{\mu}^{1} c_i^{\sigma_P} di \right)^{\frac{1-\alpha}{\sigma_P}} .$$

Accordingly, $0 < \sigma_j < 1$ is the elasticity of substitution within c_j, $j = G, P$ goods. A lower elasticity of substitution implies lower price elasticity of demand and a more differentiated good. We therefore are interested in the case $\sigma_G < \sigma_P$.[4] The parameter α is the share of expenditures allocated to CSR goods and is exogenous. In the context of our representative agent model, α captures the market size for CSR goods.[5] The variable μ measures the fraction of CSR firms and is determined in equilibrium.

Investor optimization is subject to two budget constraints. At date 1, the investor is endowed with stocks and with cash $W_1 > 0$ expressed in units of the aggregate good, which can be used for consumption and investment. The investor decides on the date 1 consumption, C_1, stock holdings, D_i, and the total amount of lending to firms, B, subject to the date 1 budget constraint,

$$\int_0^1 Q_i di + W_1 \geq C_1 + \int_0^1 Q_i D_i di + B, \tag{2}$$

and given the stock prices Q_i and the interest rate r. The presence of $\int_0^1 Q_i di$ on the left hand side of the budget constraint (2) indicates, as is usual in models with a representative investor, that the representative investor is both the seller and the buyer of stocks.

The investor decides on the date 2 consumption, c_i, subject to the budget constraint:

$$W_2 \equiv \int D_i \left(\pi_i - F_i \right) di + wL + B \left(1 + r \right) \geq \int p_i c_i di. \tag{3}$$

In the budget constraint, π_i is the operating profit generated by firm i and F_i is a cash outlay to be specified later so that $\pi_i - F_i$ is the net profit, and in this two-period model it

[4] Gourio and Rudanko (2014) provide microfoundations for our reduced-form way of assuming lower price elasticity of demand for CSR goods. In Gourio and Rudanko search frictions in the goods markets create long-term customer relationships that are slow to adjust, i.e. customer loyalty.

[5] High income consumers may have a higher demand for CSR goods. These consumers have a demand for goods that is less sensitive to the business cycle. We view α as capturing both the fraction of expenditures that comes from these consumers, as well as the fraction from consumers that actively seek out CSR goods independently of their income.

is also the liquidation payoff. W_2 denotes the consumer's wealth at the beginning of date 2, w is the wage rate, L is the amount of labor inelastically supplied and p_i is the price of good i. The investor behaves competitively and takes prices as given.

Production sector: At date 1, firms choose which production technology to adopt, G or P. The decision is based on expected profitability at date 2. Expected profitability depends on two factors: maximizing operating profits and expected costs of idiosyncratic shocks. Operating profits depend on the price elasticity of demand. We interpret choosing the G technology as a product differentiation strategy, because $\sigma_G < \sigma_P$ implies that G firms have more pricing power, *ceteris paribus.* In addition, we assume that if a firm chooses the P technology, it may experience an idiosyncratic shock at date 2 that reduces the firm's profits.

At date 2, firm $i = G, P$ chooses how much to produce of its good, x_i, in order to maximize operating profits. Firms act as monopolistic competitors solving:

$$\pi_i = \max_{x_i} \{p_i (x_i) x_i - wl_i\}, \tag{4}$$

subject to the equilibrium inverse demand function $p_i(x_i)$ as well as the constant returns to scale production technology,

$$l_i = A^{\eta_i} \kappa_i x_i. \tag{5}$$

Production of one unit of output requires $A^{\eta_i} \kappa_i$ units of labor input. η_i measures the sensitivity of firm i's labor to the productivity shock A and κ_i measures the resource intensity of each technology. We make no assumption regarding the relative magnitudes of η_G and η_P and of κ_G and κ_P, though some views of CSR are associated with the assumptions that CSR firms foster employee loyalty[6], i.e., $\eta_G < \eta_P$, or are more resource intensive, i.e., $\kappa_G > \kappa_P$. There is an aggregate productivity shock, A, realized at date 2 before production

[6] Turban and Greening, 1997, argue that CSR activities help to recruit and retain employees.

takes place. The productivity shock changes the number of labor units needed to produce consumption goods and thus high productivity is characterized by low values of A. The shock A is assumed to have bounded support in the positive real numbers.

The other factor that affects expected profits is an idiosyncratic disaster shock at date 2 that reduces $\tau(1+r)$ of the profits of non-CSR firms with probability ω after trading has occurred. With probability $1-\omega$ no disaster occurs. The expected disaster loss is denoted by $\tau_P = \omega\tau$ in units of date 1 consumption. To avoid this uncertainty, a firm can adopt the G technology at a cost τ_{Gi} paid at date 1. The disaster can be viewed as an accident that has happened during the production process (e.g. an oil spill). Alternatively, since Hong and Liskovich (2015) show that CSR firms are fined less than non-CSR firms for violating the Foreign Corrupt Practices Act, the disaster can be viewed as a penalty imposed on CSR firms for behaving unethically or illegally.

Note that without a loss of generality we denote the cost τ_P in date 1 units for comparison with the units of the cost τ_G. We assume that firms differ on the cost with which they can avoid the date 2 disaster. Specifically, we assume that the cost τ_{Gi} is uniformly distributed between 0 and 1 across firms. Note that a higher cost τ_{Gi} does not translate into a higher benefit for CSR firms. Instead, all CSR firms have access to the same elasticity of substitution, σ_G, and the same savings on the cost of the disaster. This assumption captures the idea that CSR adoption is not equally costly to all firms.

Integrating over the disaster shock, net profits for a non-CSR firm are

$$\pi_P - \tau_P(1+r), \tag{6}$$

whereas net profits for a CSR firm are

$$\pi_G - \tau_{Gi}(1+r), \tag{7}$$

assuming that CSR firms finance the adoption cost at date 1 by raising debt B_i and therefore have zero cash flow at date 1.

Market clearing: At date 1, asset markets clear, $D_i = 1$, for all i, and $B = \int_\mu^1 B_i di$. At date 2, goods markets clear, $x_i = c_i$, for all i, and the labor market clears, $\int_0^1 l_i di = L$.

3.2 Equilibrium

We start by solving the equilibrium at date 2.

Date-2 equilibrium: Let $\mu \in (0, 1)$ denote the fraction of CSR firms determined in date 1. The outcome of the date-2 equilibrium is given as a function of μ.

Consider the consumer's problem. Let λ denote the Lagrange multiplier associated with the date-2 budget constraint (3). The first order condition for each CSR good c_l is

$$\alpha C_2^{-\gamma} \left(\int_0^\mu c_i^{\sigma_G} di \right)^{\frac{\alpha}{\sigma_G} - 1} \left(\int_\mu^1 c_i^{\sigma_P} di \right)^{\frac{1-\alpha}{\sigma_P}} c_l^{\sigma_G - 1} = \lambda p_l. \tag{8}$$

There is a similar condition for each non-CSR good. Multiplying both sides of each first order condition by the respective c_j and integrating over the relevant range gives

$$\alpha C_2^{1-\gamma} = \lambda \int_0^\mu p_i c_i di, \tag{9}$$

$$(1 - \alpha)\, C_2^{1-\gamma} = \lambda \int_\mu^1 p_j c_j dj. \tag{10}$$

By taking the ratio of these two conditions, it is straightforward to see that the parameter α gives the expenditure share of CSR goods. The appendix provides the remaining steps that allow us to solve for the demand functions,

$$c_l = \alpha \frac{p_l^{\frac{1}{\sigma_G - 1}}}{\int_0^\mu p_i^{\frac{\sigma_G}{\sigma_G - 1}} di} W_2, \tag{11}$$

$$c_k = (1 - \alpha) \frac{p_k^{\frac{1}{\sigma_P - 1}}}{\int_\mu^1 p_i^{\frac{\sigma_P}{\sigma_P - 1}} di} W_2, \tag{12}$$

for CSR and non-CSR goods, respectively. Firm j's demand elasticity equals $-\frac{1}{1-\sigma_j}$. Thus, a lower elasticity of substitution (lower σ_j) is associated with a demand that is less sensitive to price fluctuations.

It remains to find the value of λ as a function of goods prices and date 2 wealth. Adding up (9) and (10) gives $C_2^{1-\gamma} = \lambda W_2$. Finally, substituting the demand functions into the consumption aggregator gives the value of λ.

We now turn to the firms' problem. Each firm acts as a monopolistic competitor and chooses x_i according to equation (4). The first order conditions are:

$$\begin{aligned}\sigma_G p_l &= w A^{\eta_l} \kappa_l, \\ \sigma_P p_k &= w A^{\eta_k} \kappa_k.\end{aligned}$$

The second order condition for each firm is met because $0 < \sigma_j < 1$. Using these first order conditions, we get the optimal value of operating profits,

$$\pi_j = (1 - \sigma_j)\, p_j x_j. \tag{13}$$

Goods with lower elasticity of substitution σ_j, i.e. more differentiated goods, allow producers to extract higher profits per unit of revenue, all else equal.

To solve for the equilibrium, Walras' law requires that a price normalization be imposed. We impose that the price of the aggregate consumption good is time invariant, so its price at date 2 equals the price at date 1, which is 1. This normalization imposes an implicit constraint on prices p_l, $1 = \min_{c_i \in \{c_i : C_2 = 1\}} \int_0^1 p_i c_i di$. The price normalization implies that $W_2 = \int p_l c_l dl = C_2$, from which we obtain the usual condition for the marginal utility of date-2 wealth with constant relative risk aversion preferences, $\lambda = C_2^{-\gamma}$. The next proposition describes the date-2 equilibrium as a function of μ. The proof is in the Appendix.

Proposition 1 *For any interior value of μ and any aggregate shock A, a symmetric date-2 equilibrium exists and is unique with goods prices,*

$$\begin{aligned}p_G &= \bar{p} A^{(1-\alpha)(\eta_G - \eta_P)} \frac{\sigma_P}{\sigma_G} \frac{\kappa_G}{\kappa_P}, \\ p_P &= \bar{p} A^{-\alpha(\eta_G - \eta_P)},\end{aligned}$$

consumption,

$$
\begin{aligned}
c_G &= \frac{\kappa_P}{\sigma_P}\frac{\sigma_G}{\kappa_G}\bar{x}\frac{\alpha}{\mu}A^{-\eta_G}, \\
c_P &= \bar{x}\frac{1-\alpha}{1-\mu}A^{-\eta_P},
\end{aligned}
$$

wage rate, $w = \bar{p}A^{-\bar{\eta}}\sigma_P/\kappa_P$*, operating profits,*

$$
\begin{aligned}
\pi_G &= \bar{p}\bar{x}\left(1-\sigma_G\right)\frac{\alpha}{\mu}A^{-\bar{\eta}}, \\
\pi_P &= \bar{p}\bar{x}\left(1-\sigma_P\right)\frac{1-\alpha}{1-\mu}A^{-\bar{\eta}},
\end{aligned}
$$

and marginal utility of wealth, $\lambda = \left[\bar{p}\bar{x}\right]^{-\gamma}A^{\gamma\bar{\eta}}$*, where* $\bar{p}, \bar{x} > 0$ *are functions of exogenous parameters given in the Appendix, and* $\bar{\eta} = (1-\alpha)\,\eta_P + \alpha\eta_G$*.*

In equilibrium, a higher productivity shock (lower A) increases the demand for labor and thus also increases the wage rate. The sensitivity of the wage rate to the productivity shock is given by the weighted average of the sensitivities, $\bar{\eta}$, where the weights are the expenditure shares. Prices of goods increase or decrease in response to a productivity shock depending on which types of goods are more sensitive to the productivity shock, as given by $\eta_G - \eta_P$. When $\eta_G - \eta_P < 0$, the production of non-CSR goods increases in expansions as unit labor costs decrease more for those firms, leading to an increase in the relative price of CSR goods. The opposite occurs if $\eta_G - \eta_P > 0$. While the relative price of CSR goods depends on the sign of $\eta_G - \eta_P$, operating profits for both firm types, π_i, and the marginal utility of date-2 wealth, λ, depend only upon the weighted average of sensitivities, $\bar{\eta}$.

Date-1 equilibrium: To solve for the date-1 equilibrium, we need to determine the rate used by the representative investor to discount future profits. Imposing the equilibrium conditions, the date-1 budget constraint gives $C_1 = W_1 - B$, so that the intertemporal marginal rate of substitution, or stochastic discount factor, becomes:

$$
m \equiv \delta\left(\frac{C_2}{C_1}\right)^{-\gamma} = \bar{m}\left[\bar{p}\bar{x}\right]^{-\gamma}A^{\gamma\bar{\eta}}, \tag{14}
$$

where $\bar{m} = \delta (W_1 - B)^{\gamma}$, and the amount borrowed equals $B = \int_0^{\mu} i di$ since only the G firms borrow at date 1. States of the world with low productivity (high A), and therefore low consumption, have higher marginal utility of consumption and higher discount factor.

The date-1 equilibrium has the familiar pricing conditions for bonds,

$$1 = E\left[m\left(1+r\right)\right], \tag{15}$$

and for stocks,

$$Q_i = E\left[m\pi_i\right] - \tau_i. \tag{16}$$

Firms choice problem is to solve

$$\max\left\{Q_G, Q_P\right\}.$$

In equilibrium, if there is an interior solution for μ, then $Q_j \geq 0$ and the price of the marginal CSR firm, Q_G^*, has to equal the price of the non-CSR firm,

$$Q_P = Q_G^*.$$

This equality determines the cut-off cost τ_G^* at which the marginal firm is indifferent between investing or not investing in CSR:

$$E\left[m\pi_G\right] - \tau_G^* = E\left[m\pi_P\right] - \tau_P. \tag{17}$$

This expression makes clear the trade-off between the adoption cost τ_{Gi} and the expected disaster cost τ_P. At an interior solution for μ, infra-marginal CSR firms, with $\tau_{Gi} < \tau_G^*$, have stock prices higher than Q_G^*, because π_G is equal for all CSR firms. At a corner solution with $\mu = 1$, $Q_P \leq Q_G$, for all τ_G. At a corner solution with $\mu = 0$, $Q_P \geq Q_G$, for all τ_G. Given an equilibrium threshold level τ_G^*, the equilibrium mass of CSR firms is $\mu = \int_0^{\tau_G^*} di = \tau_G^*$.

We are unable to show analytically existence of date-1 equilibrium for μ.[7] The next proposition offers a characterization of the solution when an equilibrium exists and states that the proportion of CSR firms is related to the expenditure share on CSR goods.

Proposition 2 *At an interior equilibrium for μ, the proportion of CSR firms in the industry is $\mu < \tau_P$ iff $\alpha < \bar{\alpha}$, where*

$$\bar{\alpha} = \frac{(1-\sigma_P)\,\tau_P}{1-\sigma_G-\tau_P\,(\sigma_P-\sigma_G)}.$$

Moreover, the constant $\bar{\alpha}$ is increasing in σ_G and $\bar{\alpha} < \tau_P$ iff $\sigma_P > \sigma_G$.

The constant $\bar{\alpha}$ is the expenditure share at which $\mu = \tau_P$. Any expenditure share $\alpha < \bar{\alpha}$ leads to a proportion $\mu < \tau_P$. Lower marginal rate of substitution for CSR firms, $\sigma_P > \sigma_G$, implies that the threshold expenditure share $\bar{\alpha} < \tau_P$. Intuitively, if $\sigma_P > \sigma_G$, then CSR firms are able to extract higher rents for the same expenditure share α and the proportion of CSR firms grows. To place an upper bound on μ, a sufficiently smaller expenditure share α is required.

4 CSR and Risk in Equilibrium

In this section, we analyze the properties of CSR firms' risk and the proportion of CSR firms in the industry. For simplicity, in what follows, we use the notation $\alpha_j = \alpha$ if $j = G$, and $\alpha_j = 1-\alpha$ if $j = P$. Likewise, $\mu_j = \mu$ if $j = G$, and $\mu_j = 1-\mu$ if $j = P$.

4.1 Profitability and aggregate shocks

We start by describing the properties of date 2 net profits in response to aggregate shocks. Consider the elasticity of net profits (equations 6 and 7) to the aggregate shock for a generic firm j,

$$\frac{d\ln\left(\pi_j-\tau_j\,(1+r)\right)}{d\ln A^{-1}} = \frac{\bar{\eta}\bar{p}\bar{x}\,(1-\sigma_j)\,\frac{\alpha_j}{\mu_j}A^{-\bar{\eta}}}{\bar{p}\bar{x}\,(1-\sigma_j)\,\frac{\alpha_j}{\mu_j}A^{-\bar{\eta}}-\tau_j\,(1+r)}.$$

[7] We have verified numerical existence of an interior solution for μ.

We compute the elasticity with respect to A^{-1} so that the elasticity is positive (recall that a high value of A^{-1} corresponds to an economic upturn.) The sensitivity of firms' profits to aggregate shocks depends on the price elasticity of demand. To see this, consider the partial equilibrium effect that lower σ_j has on the sensitivity of profits to aggregate shocks holding μ constant. The partial derivative with respect to σ_j is positive, implying that a firm facing a lower price elasticity of demand has profits that are less sensitive to aggregate shocks. This result is supported by the evidence in Lins, Servaes, and Tamayo (2015) showing that CSR firms experienced higher profitability than non-CSR firms during the financial crisis. The intuition for the result is that more product differentiation generates greater profit margins for the firm, which dilute the effect of the technology adoption costs. This partial equilibrium result captures the widely held view that a less price elastic demand gives the firm the ability to smooth out aggregate fluctuations better. Similarly, profits are more sensitive to aggregate shocks when the costs τ_j are high.

The next proposition extends this partial equilibrium result by considering the industry equilibrium implications of productivity shocks on the net profits of CSR and non-CSR firms.

Proposition 3 *Define the ratio of net profits evaluated at the marginal CSR firm:*

$$R_\pi \equiv \frac{\pi_G - \tau_G^* (1+r)}{\pi_P - \tau_P (1+r)}.$$

R_π is increasing with A iff $\alpha < \bar{\alpha}$.

For a sufficiently small expenditure share in CSR, $\alpha < \bar{\alpha}$, i.e., for $\mu < \tau_P$, firms that choose the CSR technology have profits that are less sensitive to productivity shocks than those of non-CSR firms. That is, net profits of CSR firms relative to the profits of non-CSR firms are countercyclical.

4.2 CSR and systematic risk

To see how the results on profits translate to systematic risk, define the gross return to firm j as the ratio of its net profits to its stock price, $1 + r_j \equiv (\pi_j - \tau_j (1 + r)) / Q_j$. Using equations (15) and (16), we obtain the usual pricing condition in a consumption-CAPM model:

$$\begin{aligned} E(r_j - r) &= -E(m)^{-1} Cov(m, r_j) \\ &= -E(m)^{-1} Q_j^{-1} Cov(m, \pi_j). \end{aligned}$$

The expected excess return is determined by the covariance of the stock return with the intertemporal marginal rate of substitution, $Cov(m, r_j)$. This covariance depends on how aggregate productivity affects both variables. In the Appendix, we prove that:

Proposition 4 *Firm j's equilibrium expected excess stock return is:*

$$E(r_j - r) = \frac{\bar{p}\bar{x}(1 - \sigma_j)\frac{\alpha_j}{\mu_j}}{\bar{m}[\bar{p}\bar{x}]^{1-\gamma}(1 - \sigma_j)\frac{\alpha_j}{\mu_j}E\left[A^{(\gamma-1)\bar{\eta}}\right] - \tau_j} \frac{-Cov(A^{-\bar{\eta}}, A^{\gamma\bar{\eta}})}{E(A^{\gamma\bar{\eta}})}. \tag{18}$$

The expected excess return is increasing in σ_j. Furthermore, at an interior solution for μ, the marginal CSR firm has

$$E(r_P - r) > E(r_G^* - r) \text{ iff } \bar{\alpha} > \alpha.$$

The proposition gives an expression for firm j's expected excess return. The first term in the expression gives the profit sensitivity to the aggregate shock. It amplifies the term $Cov(A^{-\bar{\eta}}, A^{\gamma\bar{\eta}})$ that captures how profits co-vary with the stochastic discount factor. This covariance is negative for any risk aversion parameter $\gamma > 0$ and thus $E(r_j - r) > 0$.[8]

Holding μ constant, $E(r_j - r)$ increases with σ_j. Intuitively, lower σ_j reduces the sensitivity of the firm's net profits to aggregate shocks. Such a firm has relatively higher payoffs

[8] If investors are risk neutral, i.e., $\gamma = 0$, then $Cov\left(A^{-\bar{\eta}}, A^{\gamma\bar{\eta}}\right) = 0$ and $E(r_j - r) = 0$.

in states of lower consumption and high marginal utility, and is thus less risky to a risk averse investor and worth more.

The lower price elasticity of demand, by increasing firm profits and stock prices, produces a feedback equilibrium effect via an increase in the proportion of CSR firms, μ. The proposition gives a stark result regarding the equilibrium riskiness of CSR versus non-CSR firms. We show that the proportion of CSR firms determines the relative riskiness of CSR versus non-CSR firms: if $\mu \leq \tau_P$ (or $\alpha \leq \bar{\alpha}$) then the marginal CSR firm has $E(r_G^* - r) \leq E(r_P - r)$. In this case, infra-marginal CSR firms also have higher prices and lower expected returns than non-CSR firms. Therefore, if $\mu \leq \tau_P$, then on average CSR firms have lower expected excess returns. When $\mu > \tau_P$ (or $\alpha > \bar{\alpha}$), then $E(r_P - r) < E(r_G^* - r)$ and the marginal CSR firm has higher adoption costs, profit sensitivity and systematic risk than non-CSR firms. By continuity, infra-marginal firms with costs close to $\tau_G^* = \mu$ also have higher expected returns, but there may be firms with low enough τ_{Gi} such that $E(r_P - r) > E(r_{Gi} - r)$.

Systematic risk can also be measured with respect to the market return. Define the value-weighted market return as $1 + r_M \equiv \int (\pi_i - \tau_i (1 + r))\, di / \int Q_i di$.

Proposition 5 *Consider firm j's market $\beta_j = Cov(r_j, r_M)/Var(r_M)$. We have,*

$$\beta_j = \frac{(1 - \sigma_j)\alpha_j}{(1 - \sigma_G)\alpha + (1 - \sigma_P)(1 - \alpha)} \frac{\int Q_i di}{\mu_j Q_j}.$$

At an interior solution for μ, $\beta_P > \beta_G^*$ iff $\bar{\alpha} > \alpha$.

This proposition compares the *level* of systematic risk between CSR and non-CSR firms. Consider an equilibrium where the fraction of CSR firms is not too large, i.e., $\mu \leq \tau_P$ (or $\alpha \leq \bar{\alpha}$). In such an equilibrium, the marginal CSR firm has lower β than a non-CSR firm. In addition, because $Q_j \geq Q_G^*$ for any infra-marginal CSR firm j, then $\beta_j \leq \beta_G^*$. Therefore, if $\mu \leq \tau_P$, then the average CSR firm has lower market β than the average non-CSR firm. Now consider an equilibrium where the fraction of CSR firms is sufficiently large, i.e., $\mu > \tau_P$. When $\mu > \tau_P$ (or $\alpha > \bar{\alpha}$), the marginal CSR firm has higher market β than non-CSR firms. The reason is that when the proportion of CSR firms is larger, the marginal CSR firm has high technology adoption costs and high profit sensitivity to aggregate shocks. Hence, high systematic risk.[9]

The next proposition indicates the determinants of systematic risk for CSR and non-CSR firms. We are able to derive general analytical results for average betas, $\bar{\beta}_G \equiv \int_0^{\mu} \beta_j \frac{Q_j}{\int Q_i di} dj$,

$$\bar{\beta}_G = \frac{(1-\sigma_G)\,\alpha}{(1-\sigma_G)\,\alpha + (1-\sigma_P)\,(1-\alpha)}. \tag{19}$$

The weighted average market β of non-CSR firms is $\bar{\beta}_P = 1 - \bar{\beta}_G$. If a determinant leads to lower betas for CSR firms, it must lead to higher betas for non-CSR firms and a wider gap between $\bar{\beta}_G$ and $\bar{\beta}_P$. Straightforward differentiation of expression (19) yields:

Proposition 6 *The weighted average market β of CSR firms decreases with:*

1. *lower elasticity of substitution in the industry (decrease in σ_G and σ_P, keeping $\sigma_P - \sigma_G$ constant); and,*

2. *lower expenditure share for CSR goods (decrease in α).*

Together, Propositions 5 and 6 imply that if the firm-level beta for CSR firms is lower than for non-CSR firms in two industries, then that difference is larger in the industry with lower elasticity of substitution and with lower expenditure share for CSR goods.

4.3 Testable Predictions

In this subsection, we collect the model predictions discussed above. In stating the predictions we assume that the expenditure share for CSR products is not too large, i.e., $\alpha \leq \bar{\alpha}$. Therefore, we are implicitly stating joint predictions. From Proposition 5:

[9] Idiosyncratic volatility is higher for non-CSR firms because they are the only ones facing the idiosyncratic disaster shock.

Prediction 1 Firm-level CSR is associated with lower firm-level systematic risk.

We test this prediction by regressing firm-level systematic risk on the firm's CSR attributes, controlling for known determinants of systematic risk. In addition, we control for determinants of product differentiation associated with other product characteristics such as R&D and advertising to emphasize the independent effect of CSR. We estimate the impact of CSR on beta using both OLS and IV regressions. Furthermore, since in our theory the choice of CSR technology is discrete, we test this prediction by forming a dummy variable that equals 1 if the firm's CSR score belongs to the top tercile, and then regressing firm-level systematic risk on the CSR dummy variable, using the same control variables as in the regressions where CSR is a continuos variable.

In the next prediction, we emphasize the aspect of the model that relates to the degree of substitutability across goods (Proposition 6). We use measures of product and industry differentiation and assume that greater differentiation is a proxy for lower elasticity of substitution. This prediction is complementary to the hypothesis studied in Servaes and Tamayo (2013) stating that CSR has a positive impact on firm value when customer awareness is high.

Prediction 2 Firm-level CSR is associated with lower firm-level systematic risk, particularly in industries with greater product differentiation.

While our model predictions build on lower price elasticity of demand, we do not differentiate between consumer industries and business-to-business industries in testing our model because consumers are aware of firms' supply chains, which creates an incentive for firms in other industries to also engage in CSR. That is, consumers demand better CSR policies from the firms they buy from and from the firms that supply to these firms. For example, according to Fortune magazine ("Apple does a 180 with suppliers in China", June 7, 2013), Apple has become one of the most environmentally friendly IT-companies in China and demanding similar policies from its key suppliers. This distinguishing feature of CSR is likely to be critical to identify its effects vis-à-vis other ways that firms use to differentiate their products, such as advertising.

The third main model prediction is also obtained from Proposition 6. Strictly speaking, the proposition says that the CSR-risk relation is weaker in industries where the expenditure share of CSR goods is higher. Intuitively, if consumers spend more on CSR goods, then CSR firms capture a greater market share and have initially higher profit margins. This in turn leads more firms to adopt CSR policies, attracting firms that are willing to pay a higher adoption cost to avoid the idiosyncratic disaster shock. These higher adoption costs increase the sensitivity of firm profits to aggregate shocks and the firm's systematic risk. This prediction captures the idea of decreasing returns to CSR in an industry. In the absence of data on CSR expenditure shares, we restate the result in Proposition 6 in terms of the stock market capitalization of the high rated CSR firms. In the model, industries with higher CSR expenditure shares have higher relative market capitalization for CSR firms. Thus,

Prediction 3 Firm-level CSR is associated with lower firm-level systematic risk, but the effect is weaker in industries with higher relative market capitalization of CSR firms.

The next prediction is obtained from Proposition 3. Formally:

Prediction 4 The ratio of CSR firm profits to non-CSR firm profits is counter-cyclical.

It is interesting to contrast this prediction with the prediction from an alternative view that CSR goods are superior goods. Under this alternative view, CSR firms would be riskier because their profits co-move more with the business cycle than non-CSR firms' profits.

The last prediction is about the valuations of CSR versus non-CSR firms. In equilibrium $Q_P = Q_G^*$, so that firm values are equal for the marginal CSR firm and all non-CSR firms.

Recall that the value of the marginal CSR firm is $Q_G^* = E(m\pi_G) - \tau_G^*$. Because infra-marginal CSR firms have lower costs of adopting the CSR technology, the net benefits of CSR adoption are higher for those firms. Thus firm values have to be higher for the infra-marginal firms, i.e. $Q_{Gi} = E(m\pi_G) - \tau_{Gi} \geq Q_G^* = Q_P$. Therefore,

Prediction 5 Firm-level CSR is associated with higher firm value.

The model also predicts that operating profits of CSR firms are lower than operating profits of non-CSR firms, i.e. $\pi_G < \pi_P$ if and only if $\alpha < \bar{\alpha}$, consistent with the evidence in Di Giuli and Kostovetsky (2014). It is important to note that while operating profits are lower for CSR firms, net profits are larger, i.e. $\pi_G - \tau_G(1+r) > \pi_P - \tau_P(1+r)$, when $\alpha < \bar{\alpha}$. The model generates also other predictions, but current data limits our ability to test them. For example, when $\eta_G < \eta_P$, which can be interpreted as CSR firms having more loyal employees, the relative price of CSR goods to non-CSR goods increases in expansions (Proposition 1).

5 Data Description

We obtain firm-level CSR data from 2003 to 2011 from the MSCI's ESG (Environmental, Social and Governance) database, formerly known as KLD Research & Analytics.[10] ESG ratings aim to identify social and environmental risk factors that may affect a firm's financial performance and its risk management. Importantly, as in the model, ESG ratings do not measure dollars spent but rather corporate policy choices. A detailed description of the data is provided in Table A.I in the Appendix. Firms are rated on a variety of strengths and concerns on seven attributes: community, diversity, employee relations, environment, product, human rights, and governance.

[10] MSCI ESG coverage for years prior to 2003 is reduced to about 1,100 firms in 2001 and 2002, and to 650 firms from 1991 to 2001.

We compute a firm-level score as the difference between the strengths and concerns on each attribute and define seven corresponding variables. Following Hillman and Keim (2001), we construct a CSR score by adding the scores of the individual attributes. We exclude governance from the aggregate CSR score to focus on non-governance aspects of CSR. Our results remain robust if governance is included in the CSR score. In addition to rating firms on the various CSR attributes, MSCI identifies six "sin" controversial business issues: firearms, gambling, military, nuclear, tobacco, and alcohol. We use a sin dummy to account for the potential effect of "sin" stocks on firm risk (Hong and Kacperczyk, 2009).

Panel A of Table I reports summary statistics for each of the CSR attributes and also for the aggregate CSR score. The CSR score displays greater variance than the sum of the variances of the individual attributes, because the individual attributes are positively correlated. Panel B of Table I reports the distribution of companies covered by the CSR score over time and a breakdown by year of the mean value of the scores in each attribute. For every year, the data contain about 2,600 publicly listed U.S. companies. In total, the sample has 23,803 firm-year observations from 4,462 distinct companies.[11]

[Insert Table I here]

We match social responsibility data with Compustat using CUSIPs as firm identifiers. We manually check stock ticker and company name for accuracy. Panel C of Table I reports the number of firms and average CSR score per industry. We report in the table the statistics by one-digit SIC code and report here the top and bottom CSR industries by two-digit SIC code. The industries with highest CSR are Hotels (SIC = 70) with a score of 0.981 and Credit Institutions (SIC = 61) with a score of 0.804. The industries with lowest CSR are Coal Mining (SIC = 12) with a score of -3.309 and Petroleum Refining (SIC = 29) with a score of -2.413.

[11] The sample we obtain from MSCI has 26,559 firm-year observations from 4,577 distinct companies from 2003 to 2011. We lose observations after matching with Compustat and CRSP.

Table II reports pairwise correlation coefficients between the aggregate CSR score, its various categories, and the sin dummy variable. Most CSR categories are positively correlated with other categories except for the product and human categories that are negatively correlated with the categories community and diversity, reflecting the many facets of CSR. The product category covers such things as antitrust and access to capital and the human category covers concerns about business dealings in countries with poor human rights records. The sin dummy is negatively correlated with the CSR score and with each of the CSR categories, except for diversity. This is somewhat surprising as we expect these firms to compensate for their controversial business issues by building up other aspects of CSR. At the same time it highlights the importance of controlling for the sin dummy.

[**Insert Table II and Figure 1 here**]

To illustrate the time series variation of the CSR score by firm, Figure 1 plots the histogram of the standard deviation of the time series of firm-level CSR. For the purpose of this figure only, we exclude the firms with fewer than three years of CSR data, resulting in a sample of 3,264 unique firms. In this subsample, there are 430 firms (about 13%) that have a zero standard deviation. Of these, only 30 firms are in our data for the entire sample period.[12] So while there are firms that see no change in CSR during the sample, the histogram shows that a significant fraction of firms experience changes in CSR that are several standard deviations larger than the regular change (average standard deviation is 0.95).

We match these data with stock return data from CRSP in order to obtain an estimate of systematic risk. To construct an estimate of systematic risk that proxies our model's main

[12] For example, NIC, Inc., is a fairly large company that processes federal and state government payments. It is present in our sample for all nine years of data and always displays a CSR score of "-1". This score comes from one concern on the diversity category regarding the lack of women representation in senior management.

variable, we run a market model regression that accounts for the Fama-French factors. To deal with infrequent trading, we follow Scholes and Williams (1977) and Schwert (1977) and construct beta as the sum of the slope coefficients on contemporaneous and lagged market returns. We run the following time-series regression for every stock i in year t using weekly data:

$$r_{i,s} - r_s = h_i + \beta_i^1 \left(r_{M,s} - r_s\right) + \beta_i^2 \left(r_{M,s-1} - r_{s-1}\right) + h_i^1 SMB_s + h_i^2 HML_s + \varepsilon_{i,s}, \quad (20)$$

where $r_{i,s}$ is the weekly return for stock i at week s, r_s is the one-month T-Bill rate at time s transformed into a weekly rate, $r_{M,s}$ is the return on the CRSP value-weighted index at time s, and SMB_s and HML_s are the Fama-French factors at time s. The value of systematic risk for stock i at year t is, $\hat{\beta}_{it} = \frac{1}{2}\left(\hat{\beta}_i^1 + \hat{\beta}_i^2\right)$.[13]

Table A.I in the Appendix provides a detailed description of the variables used in the analysis including all accounting variables and two variables used to describe the degree of product differentiation in an industry: *Differentiated goods industries* dummy (24% of the sample) from Giannetti, Burkart, and Ellingsen (2011) and *Hoberg and Phillips product similarity*, a firm-level variable that is inversely related to product differentiation, from Hoberg and Phillips (2015). Table III provides summary statistics. All of the variables (except for the CSR score) are winsorized at the 1% and 99% levels. The results are robust if an alternative outlier detection methods is used, such as Cook's D statistic.

[Insert Table III here]

[13] We have also run regressions where β is just the coefficient on the contemporaneous market excess return, β_i^1, and also where β is estimated using Equation (20) without the FF factors. Our results remain qualitatively the same in either case.

6 Empirical Results

6.1 Empirical Strategy

To explain variation in firm β due to CSR, we control for firm and year fixed effects as well as other variables known to be associated with firm systematic risk. Leverage (long term debt to assets), sales growth, size (log of assets), market equity (market equity divided by total assets, abbreviated as ME henceforth), earnings variability, and the dividend yield have been shown to affect systematic risk (e.g., Beaver, Kettler, and Scholes, 1970). McAlister, Srinivasan, and Kim (2007) show that R&D expenditures and firm age have an impact on systematic risk. Melicher and Rush (1973) show that conglomerate firms have higher βs than stand-alone firms. Palazzo (2012) shows that firms with higher levels of cash holdings display higher systematic risk. Novy-Marx (2011) shows that operating leverage predicts cross-sectional returns. In addition, we control for profitability, advertising expenses, CAPEX and state corporate tax rate. We report two-dimensional clustered standard errors (see Petersen, 2009) in all cross-sectional tests, clustered by firm and year to adjust for arbitrary heteroskedasticity, cross-sectional and time-series correlation.

6.2 Results

To test Prediction 1, we examine how CSR and its attributes are related to firm systematic risk. Table IV reports panel regressions where we control for firm-level variables as well as firm and year fixed effects. Of the various controls, we highlight the inclusion of *Advertising* expenditures that also may be a part of product differentiation strategy. If product differentiation originated only through advertising, then we would not expect CSR to be related to risk. Likewise, if product differentiation arose because of the firm's technology (e.g., Apple or Microsoft), then controlling for *R&D*, *CAPEX* and *Sales growth* should help capture this additional channel. Specification 1 shows the results with control variables only. The control variables mostly display the expected signs: *Profitability*, *Leverage*, *Cash*, *ME*, *Dividend yield*, and *Diversification* are positively related to systematic risk, whereas *R&D* is associated with lower systematic risk. The other controls, including *Advertising* expenditures, *Operating leverage*, and *State tax* are not significant across specifications.

In the remaining specifications of Table IV, we include CSR together with the controls. Specification 2 shows that the level of systematic risk is statistically significantly lower for firms with higher CSR scores (coefficient of -0.0159 with t-statistic of -6.59). Economically, this association is significant as well: an increase in CSR of one standard deviation of the sample CSR (equal to 2.162 from Table III) reduces β by $0.0159 \times 2.162 = 0.034$, which is close to a 4% decrease relative to the sample mean of systematic risk of 0.914 (from Table III). We have also formed a dummy variable where the variable equals one if the overall CSR score for the firm belongs to the top tercile of CSR scores and zero otherwise. The reason for this specification is that in our theory the CSR technology choice is discrete, i.e. either the firm adopts a CSR technology or a non-CSR technology. Empirically, we interpret a firm having a CSR score in top tercile as being a CSR firm. In our untabulated regression including all the control variables the CSR dummy variable has a coefficient of -0.0318 (with t-statistic of -4.42). Thus the results with continuos and discrete CSR scores are very similar.[14]

Community, diversity, employee, environment and human categories of CSR, when entered separately, also are negatively and statistically significantly linked to firm β. While the effect of CSR is not driven by any single category, diversity and environment have the strongest association with systematic risk. A one standard deviation increase in each of these categories decreases β by $0.0192 \times 1.377 = 0.026$ and $0.034 \times 0.715 = 0.024$, respectively. The product and governance categories of CSR are not related to β (specification 7 and 9), and the significance of CSR is preserved if the CSR score incorporates the gover-

[14]We have also performed a placebo test where we regress 10-year lagged beta on CSR score and all the control variables. The CSR coefficient is statistically insignificant (0.005, t-statistics 0.44).

nance component (specification 10). The reason why the product category is not significant may be the way it is defined: it is a mixture of attributes that are directly related to products (safety, quality and innovation), but also attributes that are only tangentially relevant (marketing concerns, antitrust, benefits to economically disadvantaged, and access to capital). Also ESG's governance category differs from traditional governance metrics. For example, it does not contain information on the firm's anti-takeover provisions. Instead, it contains information on activities that are not typically included in governance metrics, such as equity stakes in other firms having social concerns, or information about the firm's transparency record concerning its political involvement.[15] Finally, firm CSR remains significant if the sin dummy is controlled for (specification 11).[16] Note that the R^2 of the regressions does not change noticeably from one specification to another because firm fixed effects absorb most of variation in β.

[Insert Table IV here]

One potential alternative explanation for our finding is that firms spend more on CSR in economic expansions (as in the agency view of CSR that we return to below) when risk tends to be lower. While we note that the effect of economic expansions on β should be captured by the year fixed effects, we further examine how the relation between firm systematic risk and CSR changes through time. In untabulated regressions repeating our analysis year by year, we find that firms with higher CSR have significantly lower βs in most years in the sample, with uniformly high t-statistics, implying that our results are not unique to economic expansions. In fact, the years 2003 and 2009, when there is no association between CSR and β, coincide with strong stock market recoveries.

[15] Parigi, Pelizzon, and von Thadden (2013) show that for traditional corporate governance metrics there is a positive relation between the level of corporate governance and systematic risk.

[16] We have also conducted the regressions in Table IV with CSR strengths and CSR concerns entering separately as independent variables. We find that the coefficient on CSR strengths is estimated to be negative and significant, as expected. The coefficient on CSR concerns is positive, as expected, but marginally significant.

To test Prediction 2 of whether firm-level CSR is more negatively related with firm systematic risk in industries with greater product differentiation, we interact firm CSR with the *Differentiated goods industry* dummy and the *Hoberg-Phillips product similarity* variable (specifications 1 and 2 of Table V, respectively). In both specifications, the coefficients on the interaction terms have the predicted signs and are statistically significant. The coefficient (in absolute value) of CSR on firm risk goes up from 0.0170 when the *Differentiated goods industry* dummy is zero to 0.0236 when the firm belongs to a differentiated goods industry, an increase in economic significance of 38%. Likewise, the coefficient (in absolute value) of CSR on firm risk goes up from 0.0152 (equal to $0.022 - 0.0882 \times 0.0773$) for a firm with mean product similarity of 0.0773 (see Table III) to 0.022 for a firm with zero product similarity, an increase in economic significance of 44%. The untabulated results when we use the CSR dummy as an explanatory are again qualitatively very comparable to our results when the CSR is a continuos variable. The coefficient (in absolute value) of CSR dummy on firm risk goes from 0.0332 when the firm doesn't belong to a differentiated goods industry to 0.0424 when the firm does, an increase of economic significance of 28%. The coefficient (in absolute value) of CSR dummy on firm risk increases from 0.0317 for a firm with mean product similarity to 0.0380, an increase in economic significance of 20%.

Prediction 3 states that firm-level CSR is associated with lower firm-level systematic risk, but the effect is weaker in industries with higher *Industry top-CSR market cap* (defined at the two-digit SIC industry as the market capitalization of the top-third CSR firms relative to the industry's market capitalization). We find that firm CSR remains negative and significant with the coefficient of -0.0192 and t-statistic of -4.53 and that the coefficient of the interaction between *Industry top-CSR market cap* and firm CSR score is positive and significant, as excepted. The untabulated results with the CSR dummy are once more comparable: CSR dummy coefficient is -0.0290 with t-statistics of -2.99 and the interaction between *Industry top-CSR market cap* and the CSR dummy is positive and significant.

Prediction 4 states that the ratio of CSR firm profits relative to non-CSR firm profits is counter-cyclical. To test this prediction, we construct, for each industry and for each year, the mean net income of the firms in the top-third CSR score divided by the mean net income of the firms in the bottom-third CSR score, called *Profit ratio*. Specification 4 in Table V shows that the relation between *Profit ratio* and GDP growth expressed in 2003 dollars (as a proxy for economic cycles) is negative (coefficient of -0.122) and statistically significant, as predicted.[17]

[Insert Table V here]

6.3 Endogeneity in the CSR-Risk Relation

One concern with our analysis, and in fact with most other studies of CSR, is that of endogeneity. Consider the following mechanism for reverse causality in the CSR-risk relation. Hong et al. (2012) present evidence showing that financially constrained firms are less likely to spend resources on CSR and that when these firms' financial constraints are relaxed spending on CSR increases consistent with the slack hypothesis of Waddock and Graves (1997).[18] Extending the slack hypothesis, it may be that firms with low levels of systematic risk have higher valuations and more resources to spend in CSR, or have fewer growth options and again more resources to dedicate to CSR. Another mechanism for reverse causality occurs if firms that traditionally build customer loyalty through advertising, and thus have lower systematic risk, also invest more in CSR. Finally, firms with low level of systematic risk or higher valuation may even have certain management styles, cater to certain groups of investors, or be in industries that are more prone to developing more intensive CSR policies.

[17] The regressions include industry fixed effects. Using median net income produces similar result. Further, the results are not changed if we detrend growth in GDP.

[18] Note, however, that causation may go the other way around: Cheng, Ioannou, and Serafeim (2014) provide evidence that CSR activities improve access to finance and thus relax financing constraints.

To alleviate these concerns, we proceed in two ways. First, we control for a long list of lagged variables that capture some of the above mentioned effects. For example, when we control for *Cash*, *CAPEX* and *R&D* we partially control for the slack hypothesis. When we control for *Advertising* and *R&D*, we control for the other types of investment in customer loyalty. Finally, firm fixed effects capture a great deal of unobserved firm characteristics that can be correlated with the error term and result in endogeneity.

Second, we deal with endogeneity by instrumenting for CSR. The instrument we use builds on a literature that argues that democratic-leaning voters tend to care more about CSR issues. The instrument we use is the political affiliation of the state where the company is headquartered. Di Giuli and Kostovetsky (2014) find that firms headquartered in Democratic party-leaning states are more likely to spend resources on CSR. Gromet et al. (2013) demonstrate that more politically conservative individuals are less in favor of investment in energy efficient technology than are those who are more politically liberal (see also Costa and Kahn, 2013). When the electorate is more Democratic companies may be more susceptible to pressure from activists to adopt CSR policies (for activist pressure and CSR, see Baron, 2001).[19] Specifically, we use the following variables to instrument for CSR: *President vote, democrats* is the proportion of votes in each state received by the Democratic candidate for president; *Congress, democrat* captures House and Senate Democratic representation from each state; and *State government, democrats* captures state chambers' representation by Democrats (see Appendix A.I for details). We include firm fixed-effects in our first stage regression, so that the explanatory variation for our regressions comes from states becoming more or less Democratic over time.[20]

[19] Cornett, Erhemjamts, and Tehranian (2015) provide evidence that firms respond to activist and political pressure. Cornett et al. show that commercial banks adopted CSR policies in the aftermath of the financial crisis as a response to the criticism of being socially irresponsible prior to the crisis.

[20] We use Compustat data for the location of firms' headquarters (or actual firm 10K reports when information is missing). It can be argued that firms may change their headquarter location in response to changes in a state's political attitude. In our sample, less than 1 percent of companies changed the location of their heasdquarters. Our results are also robust if we keep only companies headquartered in the state for more than 20 years.

We expect the exclusion restrictions to apply to political inclination of a state and systematic risk. This is confirmed in the unconditional correlations between *President vote, democrats* and beta of -0.11 with a p-value of 0.22, between *Congress, democrat* and beta of -0.07 with a p-value of 0.25 and between *State government, democrats* and beta of -0.16 with a p-value of 0.17. However, political inclination of a state could be related to the geographic clustering of industries (see Almazan, De Motta, Titman, and Uysal, 2010), and thus indirectly to firm systematic risk. Because industry effects are captured by the firm fixed-effects, geographic clustering of industries should not be a concern. More generally, the state of headquarters could be related with state wealth inequality or other state-level variables that drive consumer behavior and in turn these variables could be related with firm systematic risk. To address this broad concern we run our tests for the full sample and for a sample that excludes geographically focused firms, so that the firms in the restricted sample are not overexposed to the demand conditions of the state where they are headquartered. To identify geographically focused firms, we follow Garcia and Norli (2012) and Colak, Durnev, and Qian (2014) and count the number of times a firm mentions the state where it is its headquartered and other states in four sections of its first electronically available 10-K annual report: "Item 1, Business," "Item 2: Properties," "Item 6: Consolidated Financial Data," and "Item 7: Management's Discussion and Analysis." A firm is defined as geographically focused, if it mentions the state where it is headquartered more than 50% of times relative to other states. In our sample 44% of firms are geographically focused.

Table VI reports the results of the IV estimation. We discuss first the results in columns 1 and 2 for the full sample. Column 1 displays the first stage, and column 2 displays the second stage for the β regressions. In the first stage, we regress firm CSR on the instruments and all the control variables, including firm fixed-effects. As expected, firms headquartered in more Democratic-leaning states have higher CSR scores (the first and the third instruments are positive and significant). In the second stage, we use the fitted values of CSR as an independent regressor to explain firm systematic risk. In column 2, the magnitude of the coefficient associated with CSR (-0.1302) implies a reduction of 0.083 in β for one standard deviation increase in instrumented CSR (0.640, untabulated), which is double the effect in the OLS regression in Table IV. In columns 3 and 4 we exclude the geographically focused firms. The coefficient for the instrumented CSR is -0.1551, implying a reduction of 0.100 in β for one standard deviation increase in instrumented CSR (0.647, untabulated). If higher average incomes or more generous social welfare programs in Democratic-leaning states lead to lower βs, then we wouldn't observe stronger effects for firms that have more geographically dispersed businesses. On the contrary, we would observe significantly weaker results for the restricted sample.

[Insert Table VI here]

We run two specification tests reported in the last rows of Table VI. First, we run a test on the joint significance of the excluded instruments. The first-stage regression of CSR on the political instruments and other exogenous variables produces an F-statistic of joint significance of the excluded instruments of 23.488 with a p-value of 0.00, indicating that the excluded, political instruments are relevant (and similarly for the restricted sample). Second, we run Hansen's (1982) test of overidentifying restrictions that tests for the exogeneity of the instruments. To perform the test, we first collect IV regression residuals and then use them as dependent variables in regressions with the instruments and control variables. The test results reveal that the independent variables are jointly insignificant with p-values greater than 0.10 in all cases. While a definite test of exogeneity does not exist (e.g. Roberts and Whited, 2012), these results together with our attempts at dealing with the above mentioned potential violations of the exclusion restriction suggest that our results survive the endogeneity concerns.

6.4 Firm Value and CSR

Table VII presents the results of the tests of Prediction 5 using OLS that firm-level CSR is associated with higher firm valuation as measured by *Tobin's Q*. We find that the association between CSR score and *Tobin's Q* is positive and significant (coefficient of 0.0599 and t-statistic of 8.22), consistent with Prediction 5 (specification 1).[21] We also find in specifications 2 and 3 that CSR is more strongly related to *Tobin's Q* in industries with greater product differentiation, consistent with the model (coefficient of CSR interacted with *Differentiated goods industry* dummy is 0.0249 with t-statistic of 3.17 and coefficient of CSR interacted with *Hoberg-Phillips product similarity* variable is -0.0817 with t-statistic of -2.30).[22] Specification 4 shows that association with CSR and *Tobin's Q* is weaker if a firm belongs to an industry where top-CSR firms have relatively larger market capitalization, also consistent with the model (coefficient on the interaction term is -0.0086 with t-statistic of -1.92).[23]

[Insert Tables VII and VIII here]

Table VIII presents the IV estimation of firm value on CSR. To conduct this test we again use the political affiliation of the state where the firm is headquartered. We believe that our political instruments are exogenous especially when considered in the restricted sample of geographically focused firms. Note also that if Democratic states have higher taxes as shown by Heider and Ljungqvist (2014), our political instruments may be correlated with

[21] In our placebo tests, where *Tobin's Q* is lagged by 10 years and then regressed on CSR score and all control variables, the coefficient on CSR is insignificant (0.002, t-statistics 0.313).

[22] We find that the coefficient on the *Differentiated goods industries* dummy is negative. Differentiated goods industries spend more money on advertising and R&D and those have a positive effect on valuation, so while the marginal effect of differentiation might be negative, the total effect of differentiation may still be positive.

[23] When we use the CSR dummy as an explanatory variable for *Tobin's Q*, the results are comparable to our main specifications: the coefficient of the CSR dummy is 0.1017 with t-statistics of 6.18, and results are stronger for firms in industries with greater product differentiation and weaker where top-CSR firms have larger market capitalizations.

firm value. However, according to Di Giuli and Kostovetsky (2014), firms do more CSR in Democratic states, which then should lead to *higher* firm value, not *lower* firm value as should be the case according to the tax story. Nonetheless, our regressions include state taxes to account for any omitted correlation. Continuing our discussion of exclusion restrictions, it may be argued that technology firms with high growth options have low firm risk and are also more likely to both invest in CSR and to locate in Silicon Valley or in Boston, which are located in traditionally Democratic states. However, since we use firm fixed-effects in the first stage of our IV estimation, geographic clustering of industries should not be a concern. Moreover, the argument above goes against the evidence in Campbell and Vuolteenaho (2004) that suggests that high growth options firms have high betas. Nonetheless, in untabulated regressions we document the robustness of our results in a sample without firms headquartered in Massachusetts and California. The results in Table VIII show that instrumented CSR has a positive and significant effect over firm value as predicted by the theory (the Table repeats the first stage regressions from Table VI).

7 Conclusion

This paper studies a mechanism through which CSR policies affect firms' systematic risk based on the premise that CSR is a product differentiation strategy. Our theory and evidence point to consumers being important agents in influencing firm policies and their risk profiles, in line with recent CEO survey evidence showing that consumers are more important than investors in determining firms' CSR policies. This paper thus fills a gap in the literature by formalizing a channel through which CSR policies affect firm systematic risk and value. The paper also contributes to the literature by offering an instrumental variables estimation that tries to deal with potential endogeneity of CSR.

Modeling consumers that are heterogenous in wealth and where CSR goods are superior goods is a potential avenue for extending our CSR model. We believe that such a model would offer similar predictions to our current model, if wealthy consumers, who buy the superior CSR goods, have also more stable demands across the business cycle. Moreover, we recognize that not all CSR activities are geared towards customer loyalty. In a richer model, it would be interesting to study the relationship between CSR and employee loyalty and the implications of that relationship.

Our results have practical capital budgeting, portfolio selection and policy implications. Beta is the major parameter used in estimating the cost of equity. Given our results on beta, CSR companies have lower cost of equity than non-CSR firms. Also, the choice of securities to include in a portfolio relies partly on the degree to which the securities co-move with the market. Including CSR stocks would have the effect of lowering the overall riskiness of the portfolio. In addition, projects that increase firms' reputation for CSR should be discounted with lower cost of equity, compared to otherwise similar projects. However, our theory cautions that the benefits from investing in CSR are tied to the proportion of firms already doing CSR relative to the total demand for CSR. Thus we do not wish to claim that investing in CSR is in the best interest of all firms or at all times.

Appendix

The Appendix contains proofs of the propositions in the paper.

A Proofs

Proof of Proposition 1. Consider the date-2 investor optimization problem:

$$\max_{c_l} \frac{C_2^{1-\gamma}}{1-\gamma},$$

subject to the budget constraint,

$$W_2 = \int_0^1 p_i c_i di. \tag{A.1}$$

Letting λ_2 be the Lagrange multiplier associated with equation (A.1). The first order sufficient and necessary conditions for an interior solution are equations (A.1) and

$$\begin{aligned}
\alpha C_2^{-\gamma} \left(\int_0^\mu c_i^{\sigma_G} di \right)^{\frac{\alpha}{\sigma_G}-1} \left(\int_\mu^1 c_i^{\sigma_P} di \right)^{\frac{1-\alpha}{\sigma_P}} c_l^{\sigma_G - 1} &= \lambda_2 p_l, \qquad \text{all } 0 \le l \le \mu, \\
(1-\alpha) C_2^{-\gamma} \left(\int_0^\mu c_i^{\sigma_G} di \right)^{\frac{\alpha}{\sigma_G}} \left(\int_\mu^1 c_j^{\sigma_P} dj \right)^{\frac{1-\alpha}{\sigma_P}-1} c_k^{\sigma_P - 1} &= \lambda_2 p_k, \qquad \text{all } \mu \le k \le 1.
\end{aligned}$$

Multiplying both sides of the equations above by the respective consumption level and integrating over the relevant range gives

$$\alpha C_2^{1-\gamma} = \lambda_2 \int_0^\mu p_i c_i di,$$

$$(1-\alpha) C_2^{1-\gamma} = \lambda_2 \int_\mu^1 p_j c_j dj.$$

Eliminating λ_2 we see that α is the expenditure share of CSR goods:

$$\int_0^\mu p_i c_i di = \frac{\alpha}{1-\alpha} \int_\mu^1 p_j c_j dj.$$

Also, $C_2^{1-\gamma} = \lambda_2 W_2$. Take the ratio of two conditions for $0 \le i, l \le \mu$ to get

$$c_i = \left(\frac{p_i}{p_l} \right)^{\frac{1}{\sigma_G - 1}} c_l, \tag{A.2}$$

and the ratio of two conditions for $\mu \le j, k \le 1$ to get

$$c_j = \left(\frac{p_j}{p_k} \right)^{\frac{1}{\sigma_P - 1}} c_k. \tag{A.3}$$

Replacing (A.2) and (A.3) back in the first order conditions

$$\begin{aligned}
\alpha C_2^{-\gamma}\left(\int_0^{\mu} p_i^{\frac{\sigma_G}{\sigma_G-1}}di\right)^{\frac{\alpha}{\sigma_G}-1}\left(\int_{\mu}^{1} p_i^{\frac{\sigma_P}{\sigma_P-1}}\right)^{\frac{1-\alpha}{\sigma_P}} p_l^{\frac{1-\alpha}{\sigma_G-1}}c_l^{\alpha-1}p_k^{-\frac{1-\alpha}{\sigma_P-1}}c_k^{1-\alpha} &= \lambda_2,\\
(1-\alpha)\,C_2^{-\gamma}\left(\int_0^{\mu} p_i^{\frac{\sigma_G}{\sigma_G-1}}\right)^{\frac{\alpha}{\sigma_G}}\left(\int_{\mu}^{1} p_j^{\frac{\sigma_P}{\sigma_P-1}}dj\right)^{\frac{1-\alpha-\sigma_P}{\sigma_P}} p_l^{-\frac{\alpha}{\sigma_G-1}}c_l^{\alpha}p_k^{\frac{\alpha}{\sigma_P-1}}c_k^{-\alpha} &= \lambda_2.
\end{aligned}$$

The ratio of these two equations yields:

$$\frac{\alpha\left(\int_{\mu}^{1} p_i^{\frac{\sigma_P}{\sigma_P-1}}\right)}{(1-\alpha)\left(\int_0^{\mu} p_i^{\frac{\sigma_G}{\sigma_G-1}}\right)}\frac{p_l^{\frac{1}{\sigma_G-1}}}{p_k^{\frac{1}{\sigma_P-1}}}c_k = c_l.$$

Replacing all in the budget constraint:

$$\begin{aligned}
W_2 &= \int p_i c_i\\
&= \int_0^{\mu} p_i\left(\frac{p_i}{p_l}\right)^{\frac{1}{\sigma_G-1}}c_l di + \int_{\mu}^{1} p_j\left(\frac{p_j}{p_k}\right)^{\frac{1}{\sigma_P-1}}c_k dj\\
&= \frac{1}{1-\alpha}\left(\int_{\mu}^{1} p_i^{\frac{\sigma_P}{\sigma_P-1}}\right)\frac{c_k}{p_k^{\frac{1}{\sigma_P-1}}},
\end{aligned}$$

from which we get the demand functions:

$$c_k = (1-\alpha)\,\frac{p_k^{\frac{1}{\sigma_P-1}}}{\int_{\mu}^{1} p_i^{\frac{\sigma_P}{\sigma_P-1}}di}W_2,$$

and

$$c_l = \alpha\frac{p_l^{\frac{1}{\sigma_G-1}}}{\int_0^{\mu} p_i^{\frac{\sigma_G}{\sigma_G-1}}di}W_2.$$

Turn now to the firms' problems. Using the demand functions from the investor's problem, the first order necessary and sufficient conditions for firms are:

$$\begin{aligned}
\sigma_G p_j x_j &= wA^{\eta_G}\kappa_G x_j\\
\sigma_P p_k x_k &= wA^{\eta_P}\kappa_P x_k,
\end{aligned}$$

so that profits are

$$\pi_j = (1-\sigma_j)\,p_j x_j.$$

By Walras' law, the equilibrium requires a price normalization. We normalize prices such that the price level of the aggregate consumption good equals 1. Define

$$P = \min_{c_l\in\{c_l:C_2=1\}}\int_0^1 p_l c_l dl.$$

It can be shown that the solution yields

$$P=\alpha^{-\alpha}\left(1-\alpha\right)^{-(1-\alpha)}\left(\int_0^{\mu}p_i^{\frac{\sigma_G}{\sigma_G-1}}di\right)^{-\alpha\frac{1-\sigma_G}{\sigma_G}}\left(\int_{\mu}^{1}p_k^{\frac{\sigma_P}{\sigma_P-1}}dk\right)^{-(1-\alpha)\frac{1-\sigma_P}{\sigma_P}}.$$

If $P=1$, and setting $p_k=p_P$ for all $k\in[\mu,1]$ and $p_l=p_G$ for all $l\in[0,\mu]$, then

$$p_P=\left(\alpha\mu^{\frac{1-\sigma_G}{\sigma_G}}\right)^{\alpha}\left(\left(1-\alpha\right)\left(1-\mu\right)^{\frac{1-\sigma_P}{\sigma_P}}\right)^{(1-\alpha)}\left(\frac{p_G}{p_P}\right)^{-\alpha}.$$

From the firms' problem

$$\frac{p_P}{p_G}=\frac{\sigma_G}{\sigma_P}\frac{A^{\eta_P}\kappa_P}{A^{\eta_G}\kappa_G},$$

and we arrive at

$$\begin{aligned}p_P &= \bar{p}A^{-\alpha(\eta_G-\eta_P)},\\ p_G &= \frac{\sigma_P}{\sigma_G}\frac{\kappa_G}{\kappa_P}\bar{p}A^{(1-\alpha)(\eta_G-\eta_P)},\end{aligned}$$

where

$$\bar{p}=\left(\alpha\mu^{\frac{1-\sigma_G}{\sigma_G}}\right)^{\alpha}\left(\left(1-\alpha\right)\left(1-\mu\right)^{\frac{1-\sigma_P}{\sigma_P}}\right)^{(1-\alpha)}\left(\frac{\sigma_P}{\sigma_G}\frac{\kappa_G}{\kappa_P}\right)^{-\alpha}.$$

By construction this solution obeys $P=1$.

Now we solve the labor market clearing condition. From the investor's problem:

$$\begin{aligned}c_G &= \frac{\alpha\left(1-\mu\right)}{\left(1-\alpha\right)\mu}\frac{p_P}{p_G}c_P\\ &= \frac{\alpha\left(1-\mu\right)}{\left(1-\alpha\right)\mu}\frac{\sigma_G}{\sigma_P}\frac{A^{\eta_P}\kappa_P}{A^{\eta_G}\kappa_G}c_P. \qquad (A.4)\end{aligned}$$

Replacing these expressions in the labor market clearing condition, $\int_0^1 l_i di=L$, gives

$$\mu A^{\eta_G}\kappa_G c_G+\left(1-\mu\right)A^{\eta_P}\kappa_P c_P=L.$$

Using equation (A.4) again:

$$\begin{aligned}c_P &= \bar{x}\frac{1-\alpha}{1-\mu}A^{-\eta_P} \qquad (A.5)\\ c_G &= \bar{x}\frac{\sigma_G}{\sigma_P}\frac{\alpha\kappa_P}{\mu\kappa_G}A^{-\eta_G}, \qquad (A.6)\end{aligned}$$

where

$$\bar{x}=\frac{L\sigma_P/\kappa_P}{\alpha\sigma_G+\left(1-\alpha\right)\sigma_P}.$$

We then use one of the first order conditions from the firms' problem to get the wage rate,

$$w=\bar{p}\frac{\sigma_P}{\kappa_P}A^{-\bar{\eta}},$$

where $\bar{\eta} = (1-\alpha)\,\eta_P + \alpha\eta_G$. Profits are

$$\pi_G = \bar{p}\bar{x}\,(1-\sigma_G)\,\frac{\alpha}{\mu}A^{-\bar{\eta}},$$

for CSR firms and

$$\pi_P = \bar{p}\bar{x}\,(1-\sigma_P)\,\frac{1-\alpha}{1-\mu}A^{-\bar{\eta}},$$

for non-CSR firms. Finally, under our price normalization, $C_2 = W_2$, and

$$\lambda_2 = C_2^{-\gamma} = [\bar{p}\bar{x}]^{-\gamma}\,A^{\gamma\bar{\eta}}.$$

■

Proof of Proposition 2. This proposition discusses conditions under which $\mu < \tau_P$, in terms of exogenous model parameters. Before we show the main result in the proposition, we show that the sign, but not the magnitude of $\mu - \tau_P$ is independent of any heterogeneity in κ_j and η_j. To show this, note that the expenditure shares of CSR and non-CSR goods are α and $1-\alpha$, respectively, so that

$$\mu p_G c_G = \frac{\alpha}{1-\alpha}\,(1-\mu)\,p_P c_P.$$

Because operating profits are $\pi_j = (1-\sigma_j)\,p_j c_j$, the difference in profits $\pi_G - \pi_P$ is proportional to

$$\Delta \equiv (1-\sigma_G)\,\frac{\alpha}{\mu} - (1-\sigma_P)\,\frac{1-\alpha}{1-\mu}. \tag{A.7}$$

Inserting this result into the equilibrium condition (17) proves that the sign of $\mu - \tau_P$ (or $\tau_G - \tau_P$) is given only by the sign of Δ, which is independent of any heterogeneity in κ_j and η_j. This is surprising because η_j describes the sensitivity of firm j's labor demand to the aggregate shock (i.e., employee loyalty) and yet heterogeneity in η_j does not affect the relative proportion of CSR firms in the industry or their relative riskiness. The main reason is that with fixed expenditure shares and homogeneity of operating profits to sales revenue, the sensitivity of revenues to the productivity shock must in equilibrium be equal across types of consumption goods, i.e., it responds to $\bar{\eta}$. This result is helpful in isolating the effect of product differentiation on systematic risk studied in this paper.

To show the main result in the proposition note that $\Delta > 0$ if, and only if,

$$\frac{(1-\sigma_G)\,\alpha}{1-\sigma_P + (\sigma_P - \sigma_G)\,\alpha} > \mu.$$

The left hand side of the inequality is strictly increasing in α varying between 0 and 1. Define $\bar{\alpha}$ implicitly as

$$\frac{(1-\sigma_G)\,\bar{\alpha}}{1-\sigma_P + (\sigma_P - \sigma_G)\,\bar{\alpha}} = \tau_P.$$

We can solve for $\bar{\alpha}$ to get the expression in the proposition. Let $\alpha < \bar{\alpha}$ and assume by way of contradiction that $\mu > \tau_P$. Then, by definition of $\bar{\alpha}$,

$$\tau_P > \frac{(1-\sigma_G)\,\alpha}{1-\sigma_P + (\sigma_P - \sigma_G)\,\alpha}.$$

But, $\mu > \tau_P$, or equivalently, $\Delta > 0$, implies that the right hand side of this inequality is larger than μ, which is a contradiction. Now, let $\mu < \tau_P$. Then,

$$\frac{(1-\sigma_G)\,\alpha}{1-\sigma_P+(\sigma_P-\sigma_G)\,\alpha} < \mu < \tau_P = \frac{(1-\sigma_G)\,\bar{\alpha}}{1-\sigma_P+(\sigma_P-\sigma_G)\,\bar{\alpha}}.$$

The inequalities imply $\alpha < \bar{\alpha}$. ■

Proof of Proposition 3. Write R_π using the equilibrium values of π_j and noting that $\mu = \tau_G^*$:

$$R_\pi = \frac{(1-\sigma_G)\,\frac{\alpha}{\mu}\bar{p}\bar{x}A^{-\bar{\eta}} - \mu\,(1+r)}{(1-\sigma_P)\,\frac{1-\alpha}{1-\mu}\bar{p}\bar{x}A^{-\bar{\eta}} - \tau_P\,(1+r)}.$$

Before continuing, note that stock prices are

$$\begin{aligned} Q_j &= E\left[m\pi_j\right] - \tau_j \\ &= \bar{m}\left[\bar{p}\bar{x}\right]^{1-\gamma}(1-\sigma_j)\,\frac{\alpha_j}{\mu_j}E\left[A^{-(1-\gamma)\bar{\eta}}\right] - \tau_j. \end{aligned} \tag{A.8}$$

At an interior solution the price of the marginal CSR firm obeys $Q_G^* = Q_P$, which can be written as

$$\bar{m}\left[\bar{p}\bar{x}\right]^{1-\gamma}E\left[A^{-(1-\gamma)\bar{\eta}}\right]\Delta = \tau_G^* - \tau_P, \tag{A.9}$$

where we have used the definition of Δ in equation (A.7). Now take the derivative of R_π with respect to $A^{-\bar{\eta}}$:

$$\begin{aligned} \frac{dR_\pi}{dA^{-\bar{\eta}}} &= (1+r)\,\bar{p}\bar{x}\frac{-(1-\sigma_G)\,\frac{\alpha}{\mu}\tau_P + \mu\,(1-\sigma_P)\,\frac{1-\alpha}{1-\mu}}{\left[(1-\sigma_P)\,\frac{1-\alpha}{1-\mu}\bar{p}\bar{x}A^{-\bar{\eta}} - \tau_P\,(1+r)\right]^2} \\ &\propto -(1-\sigma_G)\,\frac{\alpha}{\mu}\tau_P + \mu\,(1-\sigma_P)\,\frac{1-\alpha}{1-\mu} \\ &= (1-\sigma_G)\,\frac{\alpha}{\mu}\,(\mu-\tau_P) - \mu\Delta \\ &= \left\{(1-\sigma_G)\,\frac{\alpha}{\mu}\bar{m}\left[\bar{p}\bar{x}\right]^{1-\gamma}E\left[A^{-(1-\gamma)\bar{\eta}}\right] - \mu\right\}\Delta \\ &= Q_G^*\Delta. \end{aligned}$$

The third line uses the definition of Δ and combines the terms with $(1-\sigma_G)\,\frac{\alpha}{\mu}$. The fourth line uses equation (A.9) to eliminate $\mu - \tau_P$ and the last line uses the equilibrium value of Q_G^* in equation (A.8). It follows that $\frac{dR_\pi}{dA^{-\bar{\eta}}} \gtrless 0$ if, and only if, $\Delta \gtreqless 0$. From (A.9), and noting that $\mu = \tau_G^*$ in equilibrium, then $\Delta \gtrless 0$ if and only if $\tau_P - \mu \lesseqgtr 0$. From Proposition 2, $\tau_P - \mu \lesseqgtr 0$ if and only if $\bar{\alpha} \lesseqgtr \alpha$. ■

Proof of Proposition 4. The investor's stochastic discount factor is,

$$m = \bar{m}\left[\bar{p}\bar{x}\right]^{-\gamma}A^{\gamma\bar{\eta}}.$$

Then, we have

$$
\begin{aligned}
Cov\left(m,\pi_j\right) &= Cov\left(\bar{m}\left[\bar{p}\bar{x}\right]^{-\gamma}A^{\gamma\bar{\eta}}, \bar{p}\bar{x}\left(1-\sigma_j\right)\frac{\alpha_j}{\mu_j}A^{-\bar{\eta}}\right) \\
&= \bar{m}\left[\bar{p}\bar{x}\right]^{1-\gamma}\left(1-\sigma_j\right)\frac{\alpha_j}{\mu_j}Cov\left(A^{\gamma\bar{\eta}}, A^{-\bar{\eta}}\right).
\end{aligned}
$$

Using equation (A.9), and substituting in the various terms, expected stock excess returns for firm j are

$$
E\left(r_j-r\right)=\frac{\bar{p}\bar{x}\left(1-\sigma_j\right)\frac{\alpha_j}{\mu_j}}{\bar{m}\left[\bar{p}\bar{x}\right]^{1-\gamma}\left(1-\sigma_j\right)\frac{\alpha_j}{\mu_j}E\left[A^{-(1-\gamma)\bar{\eta}}\right]-\tau_j}\frac{-Cov\left(A^{\gamma\bar{\eta}},A^{-\bar{\eta}}\right)}{E\left(A^{\gamma\bar{\eta}}\right)}.
$$

For any CSR firm, the ratio of expected excess returns to that of a non-CSR firm is:

$$
\frac{E\left(r_G-r\right)}{E\left(r_P-r\right)}=\frac{\left(1-\sigma_G\right)\frac{\alpha}{\mu}}{\left(1-\sigma_P\right)\frac{1-\alpha}{1-\mu}}\frac{Q_P}{Q_G}.
$$

The the marginal CSR firm:

$$
\frac{E\left(r_G^*-r\right)}{E\left(r_P-r\right)}=1+\frac{\Delta}{\left(1-\sigma_P\right)\frac{1-\alpha}{1-\mu}}.
$$

Therefore,

$$
E\left(r_P-r\right)\gtreqless E\left(r_G^*-r\right)\text{ if, and only if, }\tau_P-\mu\gtreqless 0.
$$

From Proposition 2, $\tau_P-\mu\lesseqgtr 0$ if and only if $\bar{\alpha}\lesseqgtr\alpha$. ■

Proof of Proposition 5. Recall that the gross return on firm i is defined as $1+r_i\equiv\left(\pi_i-\tau_i\left(1+r\right)\right)/Q_i$ and that the value-weighted market return is $1+r_M\equiv\int\left(\pi_i-\tau_i\left(1+r\right)\right)di/\int Q_jdj$. We wish to solve for $\beta_j=Cov\left(r_j,r_M\right)/Var\left(r_M\right)$. Consider first solving for $Cov\left(r_j,r_M\right)$. Because τ_i and r are constants

$$
Cov\left(r_j,r_M\right)=Cov\left(\frac{\pi_j}{Q_j},\int\frac{\pi_i}{Q_i}\frac{Q_i}{\int Q_ldl}di\right).
$$

Taking $Q_j\int Q_ldl$ out of the covariance operator and substituting in for the value of π_i gives:

$$
Cov\left(r_j,r_M\right)=\frac{\left(\bar{p}\bar{x}\left(1-\sigma_j\right)\frac{\alpha_j}{\mu_j}\right)\left(\int\bar{p}\bar{x}\left(1-\sigma_i\right)\frac{\alpha_i}{\mu_i}di\right)}{Q_j\int Q_jdj}Var\left(A^{-\bar{\eta}}\right).
$$

Consider now solving for $Var\left(r_M\right)$. Following similar steps as above

$$
Var\left(r_M\right)=\frac{\left(\int\bar{p}\bar{x}\left(1-\sigma_i\right)\frac{\alpha_i}{\mu_i}di\right)^2}{\left(\int Q_jdj\right)^2}Var\left(A^{-\bar{\eta}}\right).
$$

Thus,

$$
\beta_j=\frac{\bar{p}\bar{x}\left(1-\sigma_j\right)\frac{\alpha_j}{\mu_j}}{Q_j}\left[\frac{\int\bar{p}\bar{x}\left(1-\sigma_i\right)\frac{\alpha_i}{\mu_i}di}{\int Q_idi}\right]^{-1}
$$

or solving the integral,

$$\beta_j = \frac{(1-\sigma_j)\,\alpha_j}{(1-\sigma_G)\,\alpha_G + (1-\sigma_P)\,\alpha_P}\frac{\int Q_i di}{\mu_j Q_j}.$$

For completeness, calculate total stock market value:

$$\begin{aligned}\int Q_i di &= \int_0^\mu Q_i di + (1-\mu)\,Q_P \\ &= \int_0^\mu \left(E\left(m\pi_G\right) - \tau_{Gi}\right) di + (1-\mu)\,Q_P.\end{aligned}$$

Note that $\int_0^\mu \tau_{Gi} di = \frac{1}{2}\mu^2$ and $E\left(m\pi_G\right) = Q_G^* + \tau_G^* = Q_G^* + \mu$. Therefore,

$$\int Q_i di = Q_G^* + \frac{1}{2}\mu^2.$$

■

B Variable Definitions

[Insert Table A.I here]

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Figure 1. Distribution of Standard Deviation of Firm CSR

This figure is the histogram of standard deviation of firm time-series of aggregate social responsibility (CSR). The unit of observation is one firm. The sample years are from 2003 through 2011. The aggregate corporate social responsibility (CSR) score is the sum of six attributes: community, diversity, employee relations, environment, product, and human rights. We exclude governance from the aggregate score calculation. For this graph, we drop 1,198 firms with fewer than three years of data. The remaining number of firms is 3,264. The Appendix provides details on the categories and aggregate CSR score.

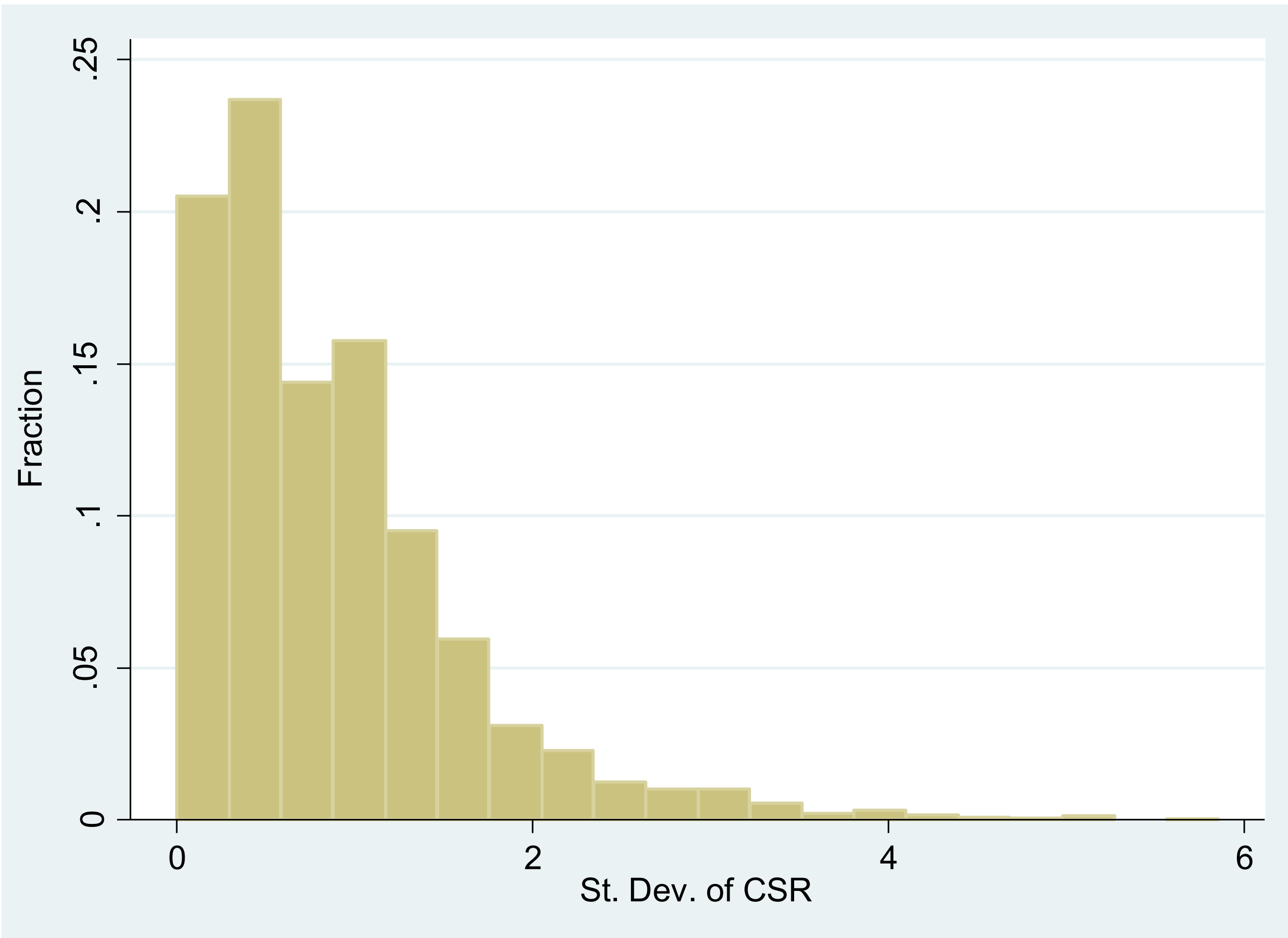

Table I. Summary Statistics for Corporate Social Responsibility

This table presents summary statistics for social responsibility data obtained from MSCI ESG (environment, social, governance), formerly KLD Research & Analytics. The sample years are from 2003 through 2011. The aggregate corporate social responsibility (CSR) score is the sum of six categories: community, diversity, employee relations, environment, product, and human rights. We exclude governance from the aggregate score calculation. The Appendix provides details on the attributes and aggregate CSR score. Panel A reports summary statistics for CSR attributes and aggregate CSR score. Panel B reports the means for aggregate CSR score and its categories by year. Panel C reports summary statistics for aggregate CSR score by one-digit SIC codes.

Panel A: Corporate Social Responsibility and its attributes

Variable	Firm-years (2003-2011)	Mean	Std. dev.	Min	25%	Median	75%	Max
CSR	23,803	-0.362	2.162	-9	-2	-1	0	18
Community	23,803	0.051	0.486	-2	0	0	0	5
Diversity	23,803	-0.038	1.377	-3	-1	0	1	7
Employee	23,803	-0.193	0.792	-4	-1	0	0	5
Environment	23,803	0.009	0.715	-5	0	0	0	5
Product	23,803	-0.151	0.560	-4	0	0	0	2
Human	23,803	-0.039	0.228	-3	0	0	0	1
Governance	23,803	-0.261	0.747	-4	-1	0	1	2

Panel B: Distribution by years

Year	Firm-years	CSR	Community	Diversity	Employee	Environ-ment	Product	Human	Gover-nance
2003	2,565	-0.181	0.043	0.206	-0.163	-0.071	-0.138	-0.059	-0.005
2004	2,583	-0.362	0.053	0.170	-0.241	-0.110	-0.142	-0.092	-0.119
2005	2,599	-0.339	0.036	0.190	-0.271	-0.091	-0.164	-0.040	-0.160
2006	2,588	-0.362	0.039	0.181	-0.281	-0.086	-0.176	-0.039	-0.240
2007	2,560	-0.338	0.017	0.198	-0.241	-0.077	-0.192	-0.043	-0.257
2008	2,673	-0.332	0.006	0.176	-0.230	-0.056	-0.187	-0.041	-0.248
2009	2,712	-0.357	0.001	0.173	-0.246	-0.057	-0.189	-0.038	-0.233
2010	2,803	-0.616	0.120	-0.797	-0.068	0.278	-0.142	-0.006	-0.220
2011	2,720	-0.347	0.135	-0.752	-0.014	0.312	-0.033	0.006	-0.842
Total	23,803								

Panel C: Distribution by industries

SIC code	Industry	Firm-years	% of sample	CSR mean	CSR std. dev.	CSR min	CSR max
100-900	Agriculture and Fishing	63	0.26%	-1.651	2.178	-8	3
1000-1700	Mining and Construction	1,278	5.37%	-1.409	1.768	-9	5
2000-2900	Manufacturing I	3,418	14.36%	-0.235	2.636	-8	16
3000-3900	Manufacturing II	5,658	23.77%	-0.309	2.269	-8	18
4000-4900	Transportation and Utilities	2,223	9.34%	-0.695	2.085	-9	9
5000-5900	Wholesale Trade and Retail Trade	2,201	9.25%	-0.396	2.088	-7	12
6000-6700	Finance, Insurance, and Real Estate	5,294	22.24%	-0.162	1.822	-6	14
7000-7900	Services I	2,748	11.54%	-0.107	2.139	-5	14
8000-8900	Services II	883	3.71%	-0.639	1.533	-5	9
9000-9900	Public Administration	37	0.16%	-0.405	3.227	-6	6
Total		23,803	100.00%				

Table II. Correlation Coefficients Between CSR Categories

This table presents correlation coefficients between aggregate CSR score, its categories, and the sin dummy variable. The categories are community, diversity, employee relations, environment, product, and human rights. We also include the category governance, which is not part of our aggregate CSR score. The sample years are from 2003 through 2011. The sin dummy variable takes the value of one if a firm has one of the sin concerns and 0 otherwise. The concern categories are: firearms, gambling, military, nuclear, tobacco, and alcohol. The Appendix provides details on the categories, aggregate CSR score and sin dummy. The numbers in parentheses are probability levels at which the hypothesis of a zero correlation can be rejected. The superscripts *, **, *** indicate significance at the 10%, 5%, and 1% levels, respectively.

	Sin	Community	Diversity	Employee	Environ-ment	Product	Human	Gover-nance
Community	-0.026***							
	(0.00)							
Diversity	0.064***	0.287***						
	(0.00)	(0.00)						
Employee	-0.028***	0.113***	0.082***					
	(0.00)	(0.00)	(0.00)					
Environment	-0.120***	0.274***	0.146***	0.100***				
	(0.00)	(0.00)	(0.00)	(0.00)				
Product	-0.120***	-0.068***	-0.211***	0.067***	0.082***			
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)			
Human	-0.087***	-0.004	-0.109***	0.056***	0.144***	0.155***		
	(0.00)	(0.50)	(0.00)	(0.00)	(0.00)	(0.00)		
Governance	-0.019***	-0.003	-0.0220***	-0.002	0.075***	0.153***	0.082***	
	(0.00)	(0.63)	(0.00)	(0.79)	(0.00)	(0.00)	(0.00)	
CSR	-0.055***	0.521***	0.713***	0.500***	0.558***	0.177***	0.143***	0.058***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)

Table III. Summary Statistics of Main Variables

This table presents summary statistics (mean, standard deviation, minimum, 25th, 50th (median) and 75th percentiles and maximum) for the main variables. The sample is the merged set between COMPUSTAT, CRSP, and MSCI ESG (environment, social, governance) formerly KLD Research & Analytics. The Appendix provides details on the definition of the variables. The sample years are from 2004 through 2012 for Firm β and Tobin's Q, and from 2003 through 2011 for all other variables (independent variables are lagged with respect to the dependent variables). All variables, except for aggregate CSR score, are winsorized at the 1% and 99% levels.

Variable	Firm-years	Mean	Std. dev.	Min	25%	Median	75%	Max
Firm β	23,803	0.914	0.409	0.168	0.572	0.917	1.212	2.205
Tobin's Q	23,803	1.927	1.419	0.524	1.114	1.442	2.215	10.020
CSR	23,803	-0.362	2.162	-9	-2	-1	0	18
Operating leverage	23,803	-0.986	3.694	-6.440	-0.690	-0.990	-0.280	4.290
Profitability	23,803	0.016	0.134	-0.699	0.005	0.032	0.074	0.267
R&D	23,803	0.035	0.076	0.000	0.000	0.000	0.031	0.455
Advertising	23,803	0.009	0.027	0.000	0.000	0.000	0.004	0.175
Leverage	23,803	0.189	0.202	0.000	0.010	0.132	0.301	0.899
CAPEX	23,803	0.041	0.054	0.000	0.008	0.024	0.053	0.307
Cash	23,803	0.482	1.625	0.000	0.031	0.100	0.335	5.474
Sales growth	23,803	0.158	0.483	-0.734	-0.006	0.086	0.209	5.462
ME	23,803	1.293	1.310	0.037	0.430	0.895	1.655	7.111
Size	23,803	7.232	1.703	3.676	5.996	7.117	8.286	11.964
Dividend yield, %	23,803	1.416	2.500	0.000	0.000	0.000	1.994	15.270
Age	23,803	2.303	0.884	0.000	1.609	2.302	2.639	3.912
Earnings variability	23,803	2.302	0.347	0.332	0.447	2.412	7.816	37.559
Diversification	23,803	4.260	0.450	1.000	2.000	4.000	5.000	16.000
State tax	23,803	0.068	0.038	0.000	0.050	0.071	0.090	0.120
Hoberg&Phillips product similarity	15,001	0.0773	0.143	0.010	0.128	0.216	0.501	10.001

Table IV. Panel Regressions of Firm β on CSR and Its Attributes with Control Variables, Firm Fixed Effects and Year Fixed Effects

This table reports the results of panel regressions of *Firm* β on aggregate CSR score (governance excluded), its categories (community, diversity, employee relations, environme product, and human rights) and other controls. Specification 10 includes governance in the CSR score calculation. Specification 11 controls for the sin dummy. The regressions a run using the panel of firm-year observations from 2003 through 2012. All independent variables are lagged by one year. Every regression includes firm and year fixed effec Standard errors are clustered by firms and years to adjust for arbitrary heteroskedasticity, cross-sectional, and time-series correlation. The numbers in parentheses are *t*-statisti The superscripts *, **, *** indicate significance at the 10%, 5%, and 1% levels, respectively. All variables except for CSR are winsorized at the 1% and 99% levels. The Appenc contains a detailed description of all the variables.

Specification	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**1**
Dependent variable						***Firm β***					
CSR variable included in the regression		**CSR**	**Community**	**Diversity**	**Employee**	**Environment**	**Product**	**Human**	**Governance**	**CSR (with Gov.)**	**C**
lagged **CSR variable**		-0.0159***	-0.0323***	-0.0192***	-0.0116**	-0.0340***	0.0014	-0.0804***	0.0027	-0.0110***	-0.01
		(-6.59)	(-3.32)	(-4.25)	(-2.06)	(-5.84)	(0.15)	(-4.35)	(0.47)	(-5.47)	(-6.
lagged **Sin dummy**											0.0
											(1.
lagged **Operating leverage**	0.0058	0.0041	0.0054	0.0052	0.0045	0.0044	0.0050	0.0422	0.0049	0.0040	0.0
	(0.81)	(0.65)	(0.74)	(0.80)	(0.69)	(0.63)	(0.76)	(0.72)	(0.80)	(0.72)	(0.
lagged **profitability**	-0.2518***	-0.2524***	-0.2526***	-02549***	-0.2503***	-0.2508***	-0.2518***	-0.2524***	-0.2523***	-0.2501***	-0.25
	(-6.51)	(-6.53)	(-6.53)	(-6.59)	(-6.47)	(-6.49)	(-6.51)	(-6.53)	(-6.52)	(-6.47)	(-6.
lagged **R&D**	-0.4817***	-0.4783***	-0.4695***	-0.4784***	-0.4860***	-0.4942***	-0.4863***	-0.4830***	-0.4815***	-0.4814***	-0.49
	(-3.77)	(-3.68)	(-3.71)	(-3.69)	(-3.63)	(-3.73)	(-3.80)	(-3.81)	(-3.74)	(-3.78)	(-3.
lagged **Advertising**	-0.0214	-0.0213	-0.0214	-0.0212	-0.0202	-0.0193	-0.0198	-0.0186	-0.0181	-0.0196	-0.0
	(-0.46)	(-0.44)	(-0.37)	(-0.39)	(-0.38)	(-0.36)	(-0.33)	(-0.27)	(-0.28)	(-0.26)	(-0.
lagged **Leverage**	0.2290***	0.2236***	0.2210***	0.2161***	0.2234***	0.2231***	0.2303***	0.2332***	0.2413***	0.2424***	0.25
	(4.60)	(4.59)	(4.59)	(4.65)	(4.58)	(4.59)	(4.66)	(4.70)	(4.61)	(4.58)	(4.
lagged **CAPEX**	-0.0657	-0.0748	-0.0749	-0.0708	-0.0641	-0.0578	-0.0667	-0.0747	-0.0702	-0.0787	-0.0
	(-0.32)	(-0.30)	(-0.25)	(-0.32)	(-0.41)	(-0.49)	(-0.54)	(-0.51)	(-0.60)	(-0.54)	(-0.
lagged **Cash**	0.1900***	0.1915***	0.1926***	0.2017***	0.2035***	0.2011***	0.2104***	0.2094***	0.2174***	0.2176***	0.22
	(4.44)	(4.48)	(4.40)	(4.30)	(4.27)	(4.34)	(4.41)	(4.45)	(4.40)	(4.38)	(4.
lagged **Sales growth**	0.0060	0.0067	0.0144	0.0193	0.0197	0.0090	0.0040	0.0047	-0.0020	0.0044	0.0
	(1.35)	(1.43)	(1.43)	(1.43)	(1.45)	(1.50)	(1.45)	(1.44)	(1.50)	(1.57)	(1.
lagged **ME**	0.0489***	0.0488***	0.0567***	0.0601***	0.0577***	0.0655***	0.0582***	0.0616***	0.0659***	0.0599***	0.05
	(6.31)	(6.33)	(6.25)	(6.33)	(6.26)	(6.33)	(6.36)	(6.33)	(6.39)	(6.47)	(6.

Table IV Continued.

lagged **Size**	0.0075	0.0071	0.0148	0.0122	0.0175	0.0105	0.0104	0.0006	0.0067	0.0056	0.0
	(0.60)	(0.65)	(0.68)	(0.73)	(0.76)	(0.84)	(0.86)	(0.93)	(0.90)	(1.00)	(1.
lagged **Dividend yield**	0.3349**	0.3397**	0.3315**	0.3275**	0.3294**	0.3376**	0.3469**	0.3455**	0.3478**	0.3424**	0.34
	(2.45)	(2.37)	(2.34)	(2.36)	(2.42)	(2.48)	(2.39)	(2.38)	(2.43)	(2.33)	(2.
lagged **Age**	0.0082	0.0098	0.0090	0.0185	0.0266	0.0203	0.0274	0.0303	0.0373	0.0343	0.0
	(0.65)	(0.59)	(0.60)	(0.64)	(0.62)	(0.55)	(0.58)	(0.63)	(0.58)	(0.60)	(0.
lagged **Earnings variability**	0.0138	0.0214	0.0161	0.0103	0.0140	0.0086	0.0015	0.0059	0.0019	0.0106	0.0
	(0.35)	(0.41)	(0.41)	(0.49)	(0.40)	(0.35)	(0.41)	(0.44)	(0.47)	(0.51)	(0.
lagged **Diversification**	0.0072***	0.0083***	0.0080***	0.0069***	0.0079***	0.0097***	0.0087***	0.0094***	0.0086***	0.0087***	0.00
	(3.25)	(3.32)	(3.24)	(3.25)	(3.24)	(3.29)	(3.20)	(3.24)	(3.22)	(3.13)	(3.
lagged **State tax**	0.1130	0.1085	0.1006	0.1084	0.1130	0.1114	0.1044	0.0998	0.0942	0.1010	0.0
	(1.00)	(1.04)	(1.06)	(0.98)	(0.93)	(0.98)	(0.92)	(0.83)	(0.76)	(0.78)	(0.
Firm and year fixed effects	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	y
Number of firm-years	23,803	23,803	23,803	23,803	23,803	23,803	23,803	23,803	23,803	23,803	23,
R^2	0.545	0.546	0.545	0.545	0.545	0.545	0.545	0.545	0.545	0.545	0.5

Table V. Panel Regressions of Firm β on CSR Conditional on Differentiated Goods Industry, Product Similarity, and Industry top-CSR Market Capitalization

In specifications 1-3 we report the results of panel regressions of *Firm β* on aggregate CSR score (governance excluded) and interactions of CSR with *Differentiated goods industry* dummy variable (specification 1), *Hoberg and Phillips product similarity*, (specification 2), and *Industry Top-CSR market capitalization* (specification 3). Specification 4 reports regression of *Profit ratio* on GDP per capita growth and two-digit SIC industry dummies. The sample years are from 2003 through 2012 (independent variables in specifications 1-4 are lagged with respect to the dependent variables). Regressions in specifications 1-3 include all control variables as in Table IV. Differentiated goods industries (24% of the sample) are taken from Giannetti et al. (2011): furniture and fixture; printing and publishing; rubber and plastic products; stone, glass, and clay products; fabricated metal products; machinery; electrical equipment; transportation equipment; instruments; miscellaneous products. Industry top-CSR market capitalization is defined at the two-digit SIC industry as market share of top-third CSR firms relative to industry total market share. Profit ratio is defined at the two-digit SIC industry as the mean net income of the firms in the top-third CSR score divided by the mean net income of the firms in the bottom-third CSR score. The Appendix provides details on the definition of the variables. Except in specification (4), standard errors are clustered by firms and years to adjust for arbitrary heteroskedasticity, cross-sectional, and time-series correlation. The numbers in parentheses are *t*-statistics. Superscripts *, **, *** indicate significance at the 10%, 5%, and 1% levels, respectively. All firm variables, except for CSR, are winsorized at the 1% and 99% levels.

Specification	**1**	**2**	**3**	**4**
Dependent variable		***Firm β***		**Profit ratio**
lagged **CSR**	-0.0170**	-0.0220***	-0.0192***	
	(-6.21)	(-5.23)	(-4.53)	
GDP growth				-0.122***
				(-6.15)
Differentiated goods industry dummy	0.1308***			
	(23.04)			
Differentiated goods × lagged **CSR**	-0.0066***			
	(-3.14)			
Hoberg&Phillips similar goods		-0.2417*		
		(-1.67)		
Hoberg&Phillips similar goods×lagged **CSR**		0.0882***		
		(4.40)		
Industry top-CSR market cap			-0.0096**	
			(-1.79)	
I**ndustry top-CSR market cap**×lagged **CSR**			0.0072***	
			(3.31)	
All control variables included	yes	yes	yes	no
Firm fixed effects	no	yes	yes	no
Industry fixed effects	no	no	no	yes
Year fixed effects	yes	yes	yes	no
Number of obs.	23,803	15,001	23,803	442
R^2	0.188	0.595	0.547	0.277

Table VI. Instrumental Variables Estimation for *Firm β*

This table reports the results of Instrumental Variables (IV) estimation for *Firm β*. The endogenous (instrumented) variable is aggregate firm CSR score. The instruments for CSR is b on state political environment where a company is headquartered (president vote, democrats; congress, democrats; state government, democrats). President vote, democrats is the propo of votes received by the democratic candidate for president election. Congress, democrat is 0.5×proportion of senators who are democrats + 0.5×proportion of representatives whc democrats. State government, democrats is 0.5×dummy if a governor is democrat + 0.25×dummy if upper Chamber is controlled by democrats + 0.25 × dummy if lower Chamb controlled by democrats. A full description of these instruments is in the Appendix. Specifications 1 and 2 are based on the full sample. In specifications 3 and 4, we exclude compa classified as geographically focused. Every regression contains all of the control variables as in Table IV including firm fixed effects and year fixed effects. Standard errors are clustere firm and year. The numbers in parentheses below the coefficient estimates are *t*-statistics for first-stage regressions and *z*-values for second-stage regressions. The superscripts *, **, indicate significance at the 10%, 5%, and 1% levels, respectively. We also report the following diagnostic tests: Low *p*-values for the *F*-statistics of the weak instruments test indicate the instruments are non-weak (or that they are relevant). The reported F-test is for instruments only. High *p*-values for the χ^2 stat of the Hansen exogeneity of instruments (overidentif restrictions) test indicate that the instruments can be treated as exogenous. R^2 for the second-stage regression is not reported because it has no meaning in IV estimation.

Specification	**1**	**2**	**3**	**4**
Sample	**Full sample**	**Full sample**	**Exclude geographically focused**	**Exclude geographically focused**
Dependent variable	***CSR***	***Firm β***	***CSR***	***Firm β***
Regression stage	**First stage**	**Second stage**	**First stage**	**Second stage**
President vote, democrats	1.086***		2.5224***	
	(3.21)		(3.00)	
Congress, democrats	0.3203		0.1693	
	(1.32)		(0.89)	
State government, democrats	0.1290***		0.1849***	
	(4.41)		(5.88)	
lagged **Instrumented CSR**		-0.1302**		-0.1551***
		(-2.14)		(-4.88)
Control variables are included	yes	yes	yes	yes
Number of firm-years	23,803	23,803	13,329	13,329
R^2	0.452		0.480	
Weak instruments test, F-stat.	23.488***		32.390***	
	(0.00)		(0.00)	
Hansen exogeneity test, χ^2 stat.		1.980		1.129
		(0.21)		(0.37)

Table VII. Panel Regressions of *Tobin's Q*

This table reports the results of panel regressions of *Tobin's Q* on aggregate CSR score (specification 1) and interactions of firm CSR with Differentiated goods industry dummy variable (specification 2), Hoberg-Phillips product similarity (specification 3), and Industry top-CSR market capitalization (specification 4). The regressions are run using the panel of firm-year observations from 2003 through 2012. Independent variables are lagged by one year. The Appendix provides details on the definition of the variables. Specifications 1, 3, and 4 include firm and year fixed effects. Standard errors are clustered by firms and years to adjust for arbitrary heteroskedasticity, cross-sectional, and time-series correlation. The numbers in parentheses are *t*-statistics. The upper scripts *, **, *** indicate significance at the 10%, 5%, and 1% levels, respectively. All variables except for CSR are winsorized at the 1% and 99% levels.

Specification	1	2	3	4
Dependent variable		*Tobin's Q*		
lagged **CSR**	0.0599***	0.0480***	0.0472***	0.0516***
	(8.22)	(7.19)	(5.32)	(6.20)
Differentiated goods industry dummy		-0.0770**		
		(-2.14)		
Differentiated goods × lagged **CSR**		0.0249***		
		(3.17)		
Hoberg&Phillips similar goods			0.2214***	
			(7.80)	
Hoberg&Phillips similar goods×lagged **CSR**			-0.0817**	
			(-2.30)	
Industry top-CSR market cap.				0.0100
				(0.72)
Industry top-CSR mark cap. ×lagged **CSR**				-0.0086*
				(-1.92)
lagged **Operating leverage**	0.0037	0.0080	0.0052	0.0062
	(1.30)	(1.61)	(1.42)	(1.60)
lagged **profitability**	0.0987**	0.0821**	0.0940**	0.0936**
	(2.19)	(2.22)	(2.30)	(2.19)
lagged **R&D**	1.9484***	4.2987***	4.1014***	4.2188***
	(4.19)	(11.73)	(11.08)	(12.30)
lagged **Advertising**	1.3390	3.0982***	2.6529***	2.8140***
	(1.18)	(3.22)	(3.30)	(3.14)
lagged **Leverage**	-0.2090**	-0.1260	-0.1148	-0.1152
	(-1.72)	(-0.95)	(-1.10)	(-0.72)
lagged **CAPEX**	1.3034***	1.8254***	1.9821***	1.7468***
	(4.60)	(8.44)	(8.21)	(7.79)
lagged **Sales growth**	0.2139***	0.3068***	0.3019***	0.3329***
	(8.19)	(9.45)	(9.06)	(9.60)
lagged **Size**	-0.5689***	-0.1825***	-0.1845***	-0.1663***
	(-13.59)	(-14.50)	(-14.43)	(-13.88)
lagged **Age**	-0.1303***	-0.2717***	-0.3000***	-0.2472***
	(-4.38)	(-6.56)	(-6.19)	(-6.72)
lagged **Diversification**	-0.0325	-0.0167	-0.03252	-0.0216
	(-1.34)	(-1.11)	(-1.18)	(-1.25)
lagged **State tax**	-0.003	-0.004	-0.005	-0.004
	(-1.32)	(-1.30)	(-1.50)	(-1.25)
Firm fixed effects	yes	no	yes	yes
Year fixed effects	yes	yes	yes	yes
Number of firm-years	23,803	23,803	15,001	23,803
R^2	0.583	0.273	0.592	0.587

Table VIII. Instrumental Variables Estimation for *Tobin's Q*

This table reports the results of Instrumental Variables (IV) estimation for *Tobin's Q*. The endogenous (instrumented) variable is aggregate firm CSR score. The set of instruments is based on state political environment where a company is headquartered (president vote, democrats; congress, democrats; state government, democrats). President vote, democrats is the proportion of votes received by the democratic candidate for president election. Congress, democrat is 0.5×proportion of senators who are democrats + 0.5×proportion of representatives who are democrats. State government, democrats is 0.5×dummy if a governor is democrat + 0.25×dummy if upper Chamber is controlled by democrats + 0.25 × dummy if lower Chamber is controlled by democrats. A full description of these instruments is in the Appendix. Specifications 1 and 2 are based on the full sample. In specifications 3 and 4, we exclude companies classified as geographically-focused. Every regression contains all of the control variables as in Table IV including firm fixed effects and year fixed effects. Standard errors are clustered by firm and year. The numbers in parentheses below the coefficient estimates are *t*-statistics for first-stage regressions and *z*-values for second-stage regressions. The superscripts *, **, *** indicate significance at the 10%, 5%, and 1% levels, respectively. We also report the following diagnostic tests: Low *p*-values for the *F*-statistics of the weak instruments test indicate that the instruments are non-weak (or that they are relevant). The reported F-test is for instruments only. High *p*-values for the χ^2 stat of the Hansen exogeneity of instruments (overidentifying restrictions) test indicate that the instruments can be treated as exogenous. R^2 for the second-stage regression is not reported because it has no meaning in IV estimation.

Specification	**1**	**2**	**3**	**4**
Sample	**Full sample**	**Full sample**	**Exclude geographically focused**	**Exclude geographically focused**
Dependent variable	***CSR***	***Tobin's Q***	***CSR***	***Tobin's Q***
Regression stage	**First stage**	**Second stage**	**First stage**	**Second stage**
Instrument set	**Political**	**Political**	**Political**	**Political**
President vote, democrats	1.086***		2.5224***	
	(3.21)		(3.00)	
Congress, democrats	0.3203		0.1693	
	(1.32)		(0.89)	
State government, democrats	0.1290***		0.1849***	
	(4.41)		(5.88)	
lagged **Instrumented CSR**		0.3306***		0.2842***
		(11.88)		(8.39)
All control variables are included	yes	yes	yes	yes
Number of firm-years	23,803	23,803	13,329	13,329
R^2	0.452		0.480	
Weak instruments test, F-stat.	23.488***		32.390***	
	(0.00)		(0.00)	
Hansen exogeneity test, χ^2 stat.		2.120		1.820
		(0.11)		(0.20)

Table A.I. Variables, definitions, and sources.

This table presents the variable definitions and sources of data. Compustat and CRSP items are in brackets.

Variable	Definition	Source
Corporate Social Responsibility		
Aggregate CSR	It is the sum of the following CSR attributes: community, diversity, employee, environment, product, and human, all defined below. It is measured annually from 2003 through 2011.	MSCI's ESG ratings.
Community	It is the difference between community strengths and weaknesses. Community lists 3 concerns (investment, economic impact, and tax disputes) and 7 strengths (charitable giving, innovative giving, support for housing, support for education, non-US charitable giving, volunteer programs, and community engagement). It is measured annually from 2003 through 2011.	
Diversity	It is the difference between diversity strengths and weaknesses. Diversity has 3 concerns (controversies, non-representation, and board diversity) and 8 strengths (CEO quality, promotion, board of directors, work-life benefits, women and minority contracting, employment of disabled, gay and lesbian policies, and underrepresented groups). It is measured annually from 2003 through 2011.	
Employee	It is the difference between employee relations strengths and weaknesses. Employee relations has 5 concerns (union relations, health concerns, workforce reductions, retirement benefits, and supply chain) and 7 strengths (union relations, no-layoff policy, profits sharing, employee involvement, retirement benefits, health and safety, and supply chain policies). It is measured annually from 2003 through 2011.	
Environment	It is the difference between environment strengths and weaknesses. Environment lists 9 concerns (waste, regulatory problems, ozone issues, emissions, agriculture chemicals, climate change, negative impact of product, biodiversity, and non-carbon releases) and 6 strengths (beneficial product, pollution prevention, recycling, clean energy, impact of property, and management system). It is measured annually from 2003 through 2011.	
Product	It is the difference between product strengths and weaknesses. Product has 3 concerns (product safety, marketing concerns, and antitrust) and 4 strengths (quality, innovation, benefits to economically disadvantaged, and access to capital). It is measured annually from 2003 through 2011.	
Human	It is the difference between human relations strengths and weaknesses. Human rights has 7 concerns (South Africa, Northern Ireland, Burma, Mexico, Sudan, labor rights, and indigenous people relations) and 3 strengths (South Africa, indigenous people relations, and labor rights strength). It is measured annually from 2003 through 2011.	
Governance	It is the difference between governance strengths and weaknesses. Governance lists 7 concerns (high compensation, ownership, accounting, transparency, political accountability, public policy, and governance structure) and 5 strengths (limited compensation, ownership structure, transparency, political accountability, and public policy). It is measured annually from 2003 through 2011.	
Sin dummy	This is a dummy variable that takes the value of one if a firm is involved in a controversial business issue, and zero otherwise. Controversial business issues are: firearms, gambling, military, nuclear, tobacco, and alcohol. Firearms concerns include producer of civilian arms, forearms retailer or distributor, ownership of a firearms company, ownership by a firearms company. Gambling concerns include operations, support, licensor, ownership of a gambling company, ownership by a gambling company. Military concerns include weapon systems, support systems, ownership of a military company, ownership by a military company. Nuclear concerns include builders and designers, suppliers, consulting, uranium mining, distributors, repairs. Tobacco concerns include licensor, producer, distributor, retailer, supplier, ownership of a tobacco company, ownership by a tobacco company. Alcohol concerns include producer, distributor, retailer, licensor, supplier, ownership of an alcohol company, ownership by an alcohol company. It is measured annually from 2003 through 2011.	
Firm and Industry Variables		
Firm β	It is defined as the average value of estimation coefficients on market excess return and lagged market excess return in the regression of firm weekly excess return on market excess return, lagged market excess return, and the SMB and HML Fama-French factors. Each regression contains 52 observations. It is measured annually from 2004 through 2012.	CRSP.
Tobin's Q	It is measured as the ratio of the market value of equity (fiscal year-end price [PRCC_F] times number of shares outstanding [CSHO]) plus book value of debt (total assets [AT] less book value of equity [CEQ]) to total assets [AT]. It is measured annually from 2004 through 2012.	Compustat.
Ratio of CSR firm profits to non-CSR firm profits	It is measured at the two-digit SIC industry level as mean net income [IB] of the firms in the top-third CSR score divided by the mean net income of the firms in the bottom-third CSR score. It is measured annually from 2004 through 2012.	Compustat.
Operating leverage	We follow Kahl et al. (2013) to construct operating leverage. Operating leverage is measured as the sensitivity of growth in total operating costs to growth in sales. To construct it, for every firm and year, we calculate ex-ante expectations of operating costs [XOPR] and sales [SALE] based on the geometric growth rate over the previous two years.	
Profitability	It is measured by RoA (return on assets), which is defined as net income [IB] over total assets [AT]. It is measured annually from 2003 through 2011.	
R&D	It is defined as R&D expenditure [XRD] over total assets [AT]. It is measured annually from 2003 through 2011.	
Advertising	It is defined as advertising expenditures [XAD] over total assets [AT]. It is measured annually from 2003 through 2011.	

Leverage	It is defined as long-term debt [DLTT] over total assets [AT]. It is measured annually from 2003 through 2011.	Compustat.
CAPEX	It is defined as capital expenditures [CAPX] over total assets [AT]. It is measured annually from 2003 through 2011.	
Cash	It is defined as the ratio of cash and marketable securities [CHE] to total assets [AT] net of cash and marketable securities (Opler et al., 1999). It is measured annually from 2003 through 2011.	
Sales growth	It is defined as annual growth in sales [SALE]. It is measured annually from 2003 through 2011.	
ME	It is the ratio of market value of equity ([PRCC_F] ×[CSHO]) to total assets [AT]. It is measured annually from 2003 through 2011.	
Size	It is defined as the log of total assets [AT]. It is measured annually from 2003 through 2011.	
Dividend yield	It is defined as the dividend [DVC] per share [CSHO] over fiscal year-end price [PRCC_F]. It is measured annually from 2003 through 2011.	
Age	It is measured as the log of the number of years since IPO. It is measured annually from 2003 through 2011.	
Earnings variability	It is defined as the standard deviation of earnings [IB] per share [CSHO] using a five-year rolling window. It is measured annually from 2003 through 2011.	
Diversification	It is measured as the number of three-digit SIC industries a firm operates in. It is measured annually from 2003 through 2011.	
State tax	It is defined as the highest-bracket state corporate income tax rate. State affiliation is determined by the location of firm headquarters. It is measured annually from 2003 through 2011.	Tax Foundation.
Hoberg&Phillips product similarity	For every firm, Hoberg and Phillips (2015) perform a textual analysis of parts of 10K where companies describe their products. For every possible pair of firms *i* and *j* in Compustat, they form a vector of words describing the products and derive their similarity index. This measure is then aggregated for every firm across all other possible competitors. Larger values of this index indicate greater product similarity. The original index is divided by 10,000. It is measured annually from 2003 through 2008.	Hoberg and Phillips data website, http://www.rhsmith.umd.edu/industrydata.htm. See Hoberg and Phillips (2015) for more details.
Differentiated good industry	This dummy takes the value of 1 if the firm is in industries defined in Giannetti et al. (2011) as differentiated-product industries, and zero otherwise. The differentiated-product industries are: furniture and fixture; printing and publishing; rubber and plastic products; stone, glass, and clay products; fabricated metal products; machinery; electrical equipment; transportation equipment; instruments; miscellaneous products.	Giannetti et al. (2011).
Industry top-CSR market capitalization	Industry top-CSR market capitalization is defined at the two-digit SIC industry as market share [PRC×SHROUT] of top-third CSR firms relative to industry total market share. It is measured annually from 2003 through 2011.	
GDP growth rate	It is measures as GDP growth expressed in 2003 dollars. It is measured annually from 2003 through 2011.	World Bank's World Development Indicators.
Instrumental Variables		
President vote, democrats	This variable is the proportion of votes in the state received by the Democratic candidate for president. It is measured annually from 2003 through 2011.	Stateline database (http://www.stateline.org) and the CQ Electronic Library (http://library.cqpress.com).
Congress, democrat	It is equal to 0.5 x proportion of Senators who are Democrats + 0.5 x proportion of Congressmen who are Democrats from a particular state. It is measured annually from 2003 through 2011.	
State government, democrat	It is equal to 0.5 x dummy if a governor is Democrat + 0.25 x dummy if upper Chamber is controlled by Democrats + 0.25 x dummy if lower Chamber is controlled by Democrats. It is measured annually from 2003 through 2011.	