CORPORATE SOCIAL RESPONSIBILITY AND THE ALLOCATION OF

PROCUREMENT CONTRACTS: EVIDENCE FROM A NATURAL EXPERIMENT

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ABSTRACT

This study examines whether corporate social responsibility (CSR) influences the allocation of procurement contracts. To obtain exogenous variation in companies' social engagement, I exploit a quasi-natural experiment provided by the enactment of state-level constituency statutes, which allow directors to consider stakeholders' interests when making business decisions. Using constituency statutes as instrumental variable (IV) for CSR, I find that companies with higher CSR receive more procurement contracts. The effect is stronger for more complex contracts and in the early years of the government-company relationship, suggesting that CSR helps mitigate information asymmetries by signaling non-opportunistic behavior and trustworthiness. In addition, I find that the effect is stronger in competitive industries, indicating that CSR can serve as a differentiation strategy to compete against other bidders.

Keywords: procurement contract; corporate social responsibility; non-market strategy; information asymmetry; instrumental variables.

INTRODUCTION

Government procurement is big business: Every year, large sums of taxpayers' money are spent by governments on goods and services that are of importance to the economy and society at large. Government procurement of goods and services accounts for approximately 15-20% of the gross domestic product (GDP) in developed and developing countries, in many countries this percentage is much higher (World Trade Organization, 2014). This constitutes significant business opportunities for companies, not only nationally but also internationally. For example, the members of the Agreement on Government Procurement (GPA)—which includes Canada, Hong Kong, Israel, Japan, Singapore, Switzerland, USA, the European Union, and many others—have opened procurement activities worth an estimated $1.7 trillion annually to international competition from GPA member countries (World Trade Organization, 2014).

Public procurement projects include a broad range of projects such as the building of airports, schools, stadiums, and tunnels, the construction of military equipment, as well as investments in medical and technical innovations. These projects are typically of high complexity, large scale, and often span multiple years, requiring numerous rounds of project adaptations and contract renegotiations due to unforeseen changes after the contract is awarded and the project has started (Bajari, Houghton, and Tadelis, 2014). Reasons for project adaptations include design failures, unanticipated site and environmental conditions, unforeseen changes in regulatory requirements, etc.

While these changes are difficult to predict for both the government and contractor, the contractor is likely to have superior information about the costs and methods to implement changes (Bajari and Tadelis, 2001). As a result, procurement contracts entail a potentially severe agency problem—contractors have an incentive to exploit their informational advantage at the

expense of the government (e.g., by overstating the costs of the project adaptations). The resulting agency costs are borne by the government, and hence the taxpayers.

This challenge with procurement contracts has received much attention in the economics literature (e.g., Anton and Yao, 1987, 1992; Bajari and Tadelis, 2001; Baron and Besanko, 1987; Holt, 1980; Laffont and Tirole, 1993). This literature focuses on the optimal contract and auction design. In contrast, very little is known on how corporate strategies affect the allocation of procurement contracts and, in particular, whether companies' socially responsible behavior serves as a signaling and differentiation strategy to compete against other bidders. This paper examines this question by theorizing and empirically testing whether companies' social responsibility serves as a strategic tool to obtain procurement contracts.

To derive theoretical predictions on the relationship between companies' social engagement and the allocation of procurement contracts, I draw from different strands of literature. Specifically, I argue that corporate social strategies help mitigate the aforementioned information asymmetry problem by signaling long-term orientation and non-opportunistic behavior. Both are important factors that enhance government's trust in companies' quality standards and cost-reducing efforts. Hence, I posit that companies' social engagement fosters trust and improves their competitiveness in obtaining public procurement contracts.

To examine this question empirically, I start by documenting a positive relationship between corporate social responsibility (CSR)—as measured by the Kinder, Lydenberg, and Domini (KLD) index of social performance—and the allocation of procurement contracts. This evidence suggests that CSR has a positive influence on the award of government contracts. Nevertheless, a caveat of this analysis is that a company's social engagement is likely endogenous with respect to the allocation of procurement contracts. In other words, unobserved

characteristics may drive a spurious correlation between the two. For example, long-term thinking CEOs may be more inclined to develop social capital. At the same time, their companies may deliver better quality and hence offer a more appealing bid to the government. As this example illustrates, estimating the impact of CSR on the allocation of procurement contracts hinges on finding an empirical context in which variation in CSR arises exogenously.

To overcome this obstacle, I exploit a quasi-natural experiment provided by the staggered introduction of constituency statutes in seven U.S. states between 1991−2013. These statutes allow corporate directors to take stakeholders' interests into consideration when making business decisions. Hence, they provide exogenous variation in the way U.S. public corporations address the needs of their stakeholders (Flammer and Kacperczyk, 2014; Orts 1992).

To estimate the effect of these "treatments" on the KLD-index—the first stage regression in a two-stage least squares (2SLS) framework—I use a difference-in-differences approach. Specifically, the "treatment" group is composed of states that have adopted the statutes, and the "control" group of states that have not. I compute the difference in the KLD-index before and after the enactment of the statutes in the treatment group. I then compare this difference with the corresponding difference in the "control" group. Using this difference-in-differences approach, I find that the enactment of constituency statutes leads to a significant increase in the KLD-index. Accordingly, constituency statutes can be used as an instrumental variable (IV) for the KLD-index.

In the second-stage regression, I estimate the effect of the KLD-index on the allocation of procurement contracts, using the instrumented KLD-index from the first-stage regression. Intuitively, this regression relies on variation in the KLD-index that is induced by the constituency statutes—i.e., the exogenous component of the KLD-index. I find that the

(instrumented) KLD-index has a positive effect on the allocation of procurement contracts. This finding, which holds under a large battery of robustness checks, indicates that CSR does indeed positively influence the award of government contracts.

I further document that the effect of CSR is stronger for more complex projects such as i) multi-year, ii) large-scale, and iii) cost-plus projects.[1] Arguably, more complex projects are more prone to information asymmetries. Hence, this evidence supports the view that CSR helps mitigate information asymmetries by signaling non-opportunistic behavior and trustworthiness.

Next, I examine whether the effect of CSR depends on past interactions between the government and the supplier. Government agencies face lower information asymmetries with suppliers they have been interacting with for a long time, which mitigates companies' need to signal non-opportunistic behavior. Consistent with this argument, I find that the effect of CSR is larger in the earlier years of the government-supplier relationship.

Lastly, I examine the moderating role of product market competition. The previous arguments imply that CSR helps signal trustworthiness. Accordingly, companies can use CSR to differentiate themselves from their competitors. This differentiation strategy is especially important in industries with multiple bidders, where firms need to differentiate themselves to increase the chances of obtaining government contracts. In support of this argument, I find that the effect of CSR on the allocation of procurement contracts is larger in more competitive industries.

In the following, I develop the theoretical arguments, describe the data and methodology, present the empirical results, and conclude.

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[1] Cost-plus contracts (as opposed to fixed-price contracts) are the preferred type of contract for complex projects (Bajari and Tadelis, 2001). See the data section for details.

THEORY AND HYPOTHESES

Corporate Social Responsibility as Signaling Tool

A long-standing literature in economics, strategic management, and organization theory examines the role of trust—and conversely opportunistic behavior—in business relationships, and in particular how trust can mitigate issues of information asymmetries.[2]

At the core of organization economics is the concept of transaction costs, i.e. costs associated with conducting exchange (Coase 1937). Such transaction costs arise from the difficulty to specify all contingencies in a contract, an issue known as "incomplete contracting" (Williamson 1985). Incomplete contracts—which are more prevalent for complex projects, such as procurement projects—are prone to strategic behavior (Williamson, 1971, 2005), leading to increased costs of negotiations and renegotiations (Bajari *et al.*, 2014). Limiting these costs is essential for the efficiency and performance of the exchange relationship.

Scholars have long argued that reputation and trust help mitigate issues of information asymmetry, thus lowering transaction costs (e.g., Arrow, 1974; Banerjee and Duflo, 2000; Fama, 1980; Jones, 1995; Ring and Van de Ven, 1992; Williamson, 1973, 1991; Zaheer *et al.*, 1998). In particular, organizational trust reduces information asymmetries as information is more openly and honestly disclosed by the contracting parties (e.g., Dyer and Chu, 2003; Malmgren, 1961). Also, trust mitigates opportunistic behavior when unforeseen contingencies arise, resulting in decreased transaction costs of exchange (Bromiley and Cummings 1995). Moreover, trust and trustworthiness among contracting parties can be beneficial and a source of competitive advantage (Barney and Hansen, 1994; Dyer and Chu, 2003; Hill, 1990; Jones, 1995; McEvily,

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[2] Interorganizational trust is commonly defined as an organization's expectation that another organization will not act opportunistically (Bradach and Eccles, 1989; Bromiley and Cummings, 1995; Gulati and Nickerson, 2008; Zaheer, McEvily, and Perrone, 1998).

Perrone, and Zaheer, 2003; Obloj and Zemsky, 2014; Zaheer *et al.*, 1998).[3] For instance, organizational trust plays an important role in mitigating issues of moral hazard (Holmstrom, 1979) and hold-up (Klein, Crawford, and Alchian, 1978), hereby improving the efficiency of the collaboration (Barney and Hansen, 1994; Hill, 1990).

In sum, the above arguments suggest that trust plays an important role in mitigating information asymmetries in business relationships. In the more specific context of buyer-supplier relations, buyers need to determine the trustworthiness of potential suppliers in order to make purchasing decisions and long-term relational commitments. To infer the trustworthiness of suppliers, buyers rely on credible signals such as reputation or other observables.

If suppliers' non-opportunistic behavior is observable to the buyer (based on past transactions), suppliers may build trust through reputation (Banerjee and Duflo, 2000; Doney and Cannon, 1997). As firms' reputation entails significant investment, takes time to evolve, and represents a valuable intangible asset (Barney, 1991; Dasgupta, 2000; Hall, 1992), suppliers are reluctant to jeopardize their reputation by acting opportunistically (Williamson, 1993).

In contrast, if suppliers' past behavior is not observable to the buyer, buyers need to rely on alternative signals. Studies on business-end consumer relationships suggest that the extent to which sellers show responsibility and concern for their stakeholders—e.g., in the form of charity and other socially responsible practices—can serve as valuable signal of the seller's quality and non-opportunistic behavior (e.g., Du, Bhattacharya, and Sen, 2011; Elfenbein, Fisman, and McManus, 2012; Kotler, Hessekiel, and Lee, 2012; McWilliams and Siegel, 2001).[4] Moreover,

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[3] While trust characterizes the relationship between contracting partners, trustworthiness is an attribute of the individual contracting partners, i.e. a contracting partner is trustworthy when she is worthy of the trust of others (see, e.g., Barney and Hansen, 1994).

[4] An activity is considered to be socially responsible if it goes beyond the firm's maximization of its (single) bottom line and legal requirements and contributes to the social good (e.g., McWilliams and Siegel, 2001).

socially responsible companies tend to be more committed to the long run (Flammer and Bansal, 2014), suggesting that they are less likely to act opportunistically in the short run.

While the existing literature has focused on i) business-to-business (B2B) relationships (B2B) and ii) business-to-consumer (B2C) relationships, trust and trustworthiness likely play an important role in business-to-government (B2G) relationships as well. Hence, in the context of procurement contracts, I argue that governments are more likely to engage with companies that signal trustworthiness through their socially responsible practices. Accordingly—and this is the other side of the coin—companies can improve their prospect of obtaining procurement contracts by stepping up their socially responsible practices. Therefore, I posit a positive relationship between companies' CSR and the allocation of procurement contracts:

Hypothesis 1. Companies with higher CSR are more likely to obtain government procurement contracts.

Naturally, the alternative hypothesis is that companies' socially responsible practices have a negative (or no) influence on the award of government procurement contracts. This argument would be consistent with, e.g., Friedman's shareholder theory (Friedman, 1962, 1970) which views social responsibility as an unnecessary cost of doing business and an inefficient use of companies' resources. In this vein, addressing social issues may reflect a mismanagement of corporate resources and hence deter the government from making socially responsible companies a partner of choice.

Heterogeneity

The core tenet of my theory is that companies' socially responsible practices signal trustworthiness and positively influence the award of government procurement contracts. In this section, I discuss several extensions.

Project Complexity

Procurement projects come in various degrees of complexity, ranging from simple projects (e.g., the provision of office supplies) to complex projects (e.g., the development of new technologies). For more complex projects, information asymmetries are likely more severe (Bajari *et al.*, 2014). Hence, I expect a higher sensitivity to suppliers' trustworthiness.

Accordingly, I argue that the signaling value of CSR is higher for complex contracts such as contracts that are i) long-term, ii) large-scale, and iii) cost-plus.[5] This motivates the following hypothesis:

> *Hypothesis 2. Companies with higher CSR are more likely to obtain government procurement contracts that are i) multi-year, ii) large-scale, and iii) cost-plus.*

Trust Relationship over Time

To determine the trustworthiness of potential suppliers, the buyer (i.e., the government) relies on credible signals. As discussed above, a seller's socially responsible behavior can serve as a signal of the seller's quality and non-opportunistic behavior (e.g., Du *et al.*, 2011; Kotler *et al.*, 2012).

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[5] Most procurement contracts are variants of "cost-plus" and "fixed-price" contracts. In fixed-price contracts, the supplier is offered a pre-specified price. In cost-plus contracts, no price is pre-specified, but the supplier is reimbursed for the costs plus a fee. In general, cost-plus is the preferred type for complex projects (Bajari and Tadelis, 2001). For more details, see the data section.

This signal is particularly important for new sellers (Elfenbein *et al.*, 2012). In contrast, as the buyer-supplier relationship matures, suppliers can build trust through reputation (Doney and Cannon, 1997; Ring and Van de Ven, 1992).

In line with this argument, I expect that CSR as a signaling tool is particularly important at the beginning of the government-supplier relationship. This leads to the following hypothesis:

Hypothesis 3. The positive relationship between CSR and the allocation of procurement contracts is stronger at the beginning of the government-supplier relationship.

Corporate Social Responsibility as Differentiation Strategy

The above arguments imply that CSR serves as a signaling strategy. Relatedly, companies can use this signal to differentiate themselves from their competitors. This differentiation strategy is especially relevant in industries with multiple bidders, where firms need to differentiate themselves to increase the chances of being selected.

Accordingly, I expect that CSR as a differentiation strategy is especially valuable to firms in competitive industries. This motivates the following hypothesis:

Hypothesis 4. The positive relationship between CSR and the allocation of procurement contracts is stronger in competitive industries.

DATA

Sample Selection

The sample used in this study is obtained by merging the KLD database with Standard & Poor's

Compustat. The KLD database contains annual ratings of companies' social and environmental

performance as of 1991; Compustat contains accounting information as well as additional firm-

level information (e.g., industry classification, state of incorporation, etc.) for U.S. public

companies. I exclude observations with missing accounting information, as well as companies

that are incorporated outside of the U.S. These criteria lead to a sample of 31,574 firm-year

observations from 1991-2013.

Procurement Contracts

The process of awarding procurement contracts begins when an agency of the federal

government identifies a need for the purchase of a good or service. The agency posts a

solicitation on the Federal Business Opportunities website, called a "request for proposal" (RFP).

Companies then submit their proposals, which are reviewed by agency personnel who evaluate

the alternative proposals and make the final decision (for more details on this process see

Halchin, 2012).

Procurement contracts can be classified into two broad categories: "fixed-price" and

"cost-plus" contracts (see FPDS-NG, 2014). In fixed-price contracts, the seller is offered a pre-

specified price by the buyer for completing the project. In cost-plus contracts, no price is pre-

specified, but the supplier is reimbursed for the costs plus a fee. In general, cost-plus contracts

are preferred for projects that are more complex and whose costs are difficult to determine ex

ante (Bajari and Tadelis, 2001). Once the contract is signed and the project has started,

unforeseen changes may lead to renegotiations and modifications of the contract, resulting in substantial adaptation costs (Bajari *et al.*, 2014).

The data on procurement contracts are obtained from the Federal Procurement Data System-Next Generation (FPDS-NG). The FPDS-NG lists all procurement contracts awarded by the U.S. government that exceed a minimal transaction value threshold.[6] Exceptions to this reporting requirement are the U.S. Postal Service as well as legislative and judicial branch organizations. For each contract, the FPDS-NG reports detailed information about the contractor, the type of project, and the pricing agreement (fixed-cost versus cost-plus).

I match procurement contracts to corporations in Compustat by company names.[7] I then aggregate the dollar amount of procurement contracts for each firm and each year. The average company in my sample receives procurement contracts in the amount of $34 million per year (see Table 1). In auxiliary analyses, I further distinguish between contracts that are i) fixed-cost versus cost-plus, ii) multi-year versus single-year, and iii) large versus small (a contract is coded as large if the dollar amount is greater than the average across all contracts awarded in the same year).

Corporate Social Responsibility

The CSR data are obtained from the KLD database. KLD is an independent social choice investment advisory firm that compiles ratings of how companies address the needs of their stakeholders. For each stakeholder group, strengths and concerns are measured to evaluate positive and negative aspects of corporate actions toward stakeholders. These ratings are

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[6] Prior to 2004, the reporting threshold was $25,000 per transaction. As of 2004, any transaction that exceeds $2,500 is reported.

[7] The matching is done using a fuzzy matching algorithm (based on the items "vendor name" in the FPDS-NG and "CONM" in Compustat). I manually reviewed all matches in which the company names were not identical (e.g., "Dell Incorporated" and "Dell Inc.").

compiled from multiple data sources including annual questionnaires sent to companies' investor relations offices, firms' financial statements, annual and quarterly reports, general press releases, government surveys, and academic publications (see KLD, 2010). KLD ratings are widely used in CSR studies (e.g., Chatterji and Toffel, 2010; Flammer, 2014b).

I consider all CSR strengths with respect to employees, customers, the natural environment, and society at large (community and minorities). I then construct a composite KLD-index by adding up the number of CSR strengths along these dimensions.[8]

Control Variables

In my baseline specification (see the methodology section), I control for a vector of firm- and industry-level characteristics that may affect the allocation of procurement contracts. In the following, I briefly describe these variables.

Accounting Variables. The accounting data are obtained from Compustat. *Size* is the natural logarithm of the book value of total assets. *Return on assets* (ROA) is the ratio of operating income before depreciation to the book value of total assets. *Tobin's Q* is the ratio of the market value of total assets (obtained as the book value of total assets plus the market value of common stock minus the sum of the book value of common stock and balance sheet deferred taxes) to the book value of total assets. *Cash holdings* is the ratio of cash and short-term investments to the book value of total assets. *Leverage* is the ratio of debt (long-term debt plus debt in current liabilities) to the book value of total assets. To mitigate the impact of outliers, all ratios are winsorized at the 1st and 99th percentiles of their empirical distribution.

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[8] In addition to CSR strengths, the KLD database also contains a list of CSR weaknesses, labeled "concerns". Accordingly, an alternative approach is to construct a "net" KLD index by subtracting the number of concerns from the number of strengths. However, recent research suggests that this approach is methodologically questionable. Because KLD strengths and concerns lack convergent validity, using them in conjunction fails to provide a valid measure of CSR (e.g., Johnson-Cramer, 2004; Mattingly and Berman, 2006). Nevertheless, I show in robustness checks that my results are similar if I use this net KLD-index.

Competition. To measure the degree of product market competition, I compute the Herfindahl-Hirschman index of industry concentration (henceforth "Herfindahl"). This index is calculated as the sum of squared market shares of all companies in a given 2-digit SIC industry and year. Market shares are computed from Compustat based on firms' sales. Note that higher values of the index represent lower competition.

Political contributions. To measure companies' political connections, I focus on donations from corporate Political Action Committees (PAC) to politicians' campaign committees (e.g., Cooper, Gulen, and Ovtchinnikov, 2010). PACs are organizations that raise and spend funds for political campaigns. A corporate PAC can give a maximum contribution to a candidate campaign committee of $10,000 per election, and these funds must be raised exclusively from the firm's executives, shareholders, and their families.[9] I obtain data on PACs from the Federal Election Commission (FEC). The FEC data cover all campaign contributions made by corporate PACs to each candidate as of 1979. I match corporate PACs to corporations in Compustat by company name. I then aggregate the dollar amount of all campaign contributions made by each firm in each year.

Summary Statistics

Table 2 provides summary statistics for all variables described in this section, along with the correlation matrix. As can be seen, there is a positive correlation between the KLD-index and the value of procurement contracts (11.2%). This positive correlation is suggestive of Hypothesis 1, according to which companies with higher CSR are more likely to receive procurement

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[9] Note that corporations themselves cannot contribute to candidate campaign committees directly, nor may they contribute funds to PACs aside from covering the administrative and fundraising costs of affiliated PACs. These constraints have been substantially relaxed by the Supreme Court's 2010 Citizens United ruling. For further details on regulations before Citizens United, see Ansolabehere, de Figueiredo, and Snyder (2003) and Federal Election Commission (2007). For the regime after Citizens United, see Federal Election Commission (2011).

contracts. Interestingly, the value of procurement contracts also correlates with size (8.6%) and political contributions (16.5%). The latter is in line with Goldman, Rocholl, and So (2013) who show that political connections are an important determinant of the allocation of procurement contracts.

METHODOLOGY

OLS Regressions

To examine whether CSR affects the allocation of procurement contracts, I estimate the following regression:

$$\log(1 + procurements_{it}) = \alpha_i + \alpha_t + \beta \times KLD\text{-}index_{it} + \gamma'\mathbf{X_{it}} + \varepsilon_{it}, \tag{1}$$

where i indexes firms; t indexes years; α_i and α_t are firm and year fixed effects, respectively; *procurements* is the dollar amount of procurement contracts allocated to the company; $\mathbf{X}$ is the vector of control variables, which includes size, ROA, Tobin's Q, leverage, cash holdings, the Herfindahl index, as well as the logarithm of one plus the dollar amount of political contributions made by the company; ε is the error term. I cluster standard errors at the 2-digit SIC industry level. (The results are similar if standard errors are clustered at the firm level.) The coefficient of interest is β. Due to the logarithmic specification of the dependent variable, β measures the percentage change in the value of procurement contracts corresponding to an increase in the KLD-index by one index point.[10] Hypothesis 1 predicts that β should be positive and significant.

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[10] I construct the dependent variable as log(1 + procurements)—as opposed to log(procurements)—to account for the fact that not all companies receive procurement contracts in all years (i.e., procurements = 0), Thus, by construction, the estimate of β captures the change in the allocation of procurement contracts at both the extensive margin (i.e., when a company receives procurement contracts for the first time) *and* intensive margin (i.e., when a company receives more procurement contracts). In additional analyses (see Table 3), I examine both margins separately. Specifically, I study the extensive margin by using as dependent variable a dummy variable that indicates

The inclusion of control variables mitigates the possibility that my findings are driven by omitted variables. For example, it could be that more profitable companies are more likely to receive procurement contracts (e.g., because they are more cost-efficient). At the same time, such companies may be more CSR-friendly (e.g., because they can more easily afford to finance CSR programs). Controlling for profitability (ROA) addresses this potential confound. Similarly, the other controls alleviate concerns that my results are confounded by size, investment opportunities (Tobin's Q), financing decisions (leverage, cash holdings), competition (Herfindahl), or the company's political engagement. Relatedly, the inclusion of firm fixed effects accounts for any time-invariant firm characteristics that may affect both CSR and the award of procurement contracts.

While the controls and fixed effects help address potential confounds, they do not fully rule out the possibility that *unobservable* (time-varying) firm characteristics may drive a spurious relationship between the KLD-index and the allocation of procurement contracts. In other words, equation (1) is subject to a classic endogeneity problem―CSR reflects a firm choice, and this choice may correlate with unobservable firm characteristics that also affect the allocation of procurement contracts. In such cases, the estimate of β would be inconsistent.

To obtain a consistent estimate of β, one would need an instrument for the KLD-index— i.e., a variable that triggers exogenous changes in the KLD-index. The specific source of exogenous variation I exploit in this paper is the enactment of state-level constituency statutes. I describe this approach in the next section.

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whether the company receives procurement contracts. I then study the intensive margin by using as dependent variable log(procurements), restricting the sample to firm-year observations where procurements $\neq 0$.

Instrumental Variable (IV) Regressions

Constituency Statutes

I instrument changes in the KLD-index using the enactment of constituency statutes as a quasi-natural experiment. This follows the methodology of Flammer and Kacperczyk (2014), who use constituency statutes to study the effect of stakeholder orientation on corporate innovation.

Constituency statutes allow corporate officers and directors to take into account the interests of a variety of corporate stakeholders in carrying out their fiduciary duties to the corporation. The statutes suggest that a corporation should, or at least may, be run in the interests of more groups than just shareholders. Hence, under these statutes, a corporation's officers and directors are allowed to consider the interests of employees, customers, suppliers, the environment, the local community, and any other potentially affected constituency (e.g., Orts 1992). Prior to the enactment of stakeholder statutes, corporate leaders were not permitted to consider stakeholders' interests because their fiduciary duties required them to act in accordance with shareholders' interests. Hence, the enactment of constituency statutes provided corporate leaders with a mechanism for considering stakeholder interests without breaching their fiduciary obligations to shareholders. Proponents of those statutes sought to change corporate law to reflect their belief that corporations are more than just investment vehicles for owners of financial capital (Bainbridge 1992). For example, the Pennsylvania statute reads:

> "In discharging the duties of their respective positions, the board of directors, committees of the board and individual directors of a domestic corporation may, in considering the best interests of the corporation, consider the effects of any action upon employees, upon suppliers and customers of the corporation and upon communities in which offices or other establishments of the corporation are located, and all other pertinent factors." (15 Pa. Cons. Stat. § 516(a))

Though the language may be state-specific, the core content of the legislation remains the same: constituency statutes emphasize the importance of considering the interests of non-financial stakeholders and hence pursuing interests that are not restricted to the bottom line. In fact, most statutes give corporate leaders permission to consider stakeholder interests in any circumstance, including any structural and operational decisions, or whenever corporate leaders wish to consider them.[11]

A total of 35 states in the U.S. have adopted constituency statutes (see Barzuza 2009); seven of them adopted the statutes during the sample period (1991-2013).[12] Because the enactment of the statutes does not reflect any firm's strategic decision, such "treatments" offer plausibly exogenous variation in a firm's orientation toward stakeholders.[13]

Two-Stage Least Squares

To study the effect of the KLD-index—instrumented by the constituency statutes—on the allocation of procurement contracts, I use two-stage least squares (2SLS). In the first stage, I regress the KLD-index on the enactment of constituency statutes. Specifically, I estimate the following regression:

$$KLD\text{-}index_{it} = a_i + a_t + b \times constituency\ statute_{it} + \mathbf{c'X_{it}} + e_{it}, \tag{2}$$

where constituency statute is the "treatment dummy," which is equal to one if firm i is

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[11] For more details on the constituency statutes and their institutional background, see Flammer and Kacperczyk (2014) as well as the law review articles by Bainbridge (1992), Barzuza (2009), and Bisconti (2009).

[12] These states are North Carolina (1993), North Dakota (1993), Connecticut (1997), Vermont (1998), Maryland (1999), Texas (2006), and Nebraska (2007). Two of these constituency statutes (Maryland and North Carolina) are considered especially stringent (see Barzuza 2009, pp. 2040-2041).

[13] Consistent with this argument, Luoma and Goodstein (1999) show that companies incorporated in states that have enacted constituency statutes increased stakeholder representation on their board of directors.

incorporated in a state that has enacted a constituency statute by year t. [14] Effectively, equation (2) is a difference-in-differences specification, i.e. the coefficient b measures the change in the KLD-index after the treatment (first difference) in the treatment versus control groups (second difference). This intuition can be illustrated with an example. Suppose the objective is to measure the effect of Maryland's 1999 constituency statute on the KLD-index. I would compute the difference between the KLD-index after 1999 compared to the KLD-index before 1999 for Maryland firms ("treated firms"). However, other events may have happened around 1999, which may affect companies' CSR investments. To account for such contemporaneous effect, I use a control group. For example, I could look at Virginia firms ("control firms") and compute the corresponding difference in the KLD-index before and after 1999 (no constituency statute was passed in Virginia). By computing the difference between these two differences, I then obtain an estimate of Maryland's 1999 constituency statute on the KLD-index. An important difference between this example and the regression specification in equation (2) is that the latter accounts for the fact that the introduction of the constituency statutes is staggered over time. Accordingly, the composition of both the treatment and control groups changes over time as more states are progressively treated.

In their evaluation of the difference-in-differences methodology, Bertrand, Duflo, and Mullainathan (2003) recommend that standard errors be clustered at the dimension of the treatment. Accordingly, I cluster standard errors at the state of incorporation. (The results are similar if standard errors are clustered at the 2-digit SIC level or at the firm level.)

The predicted values from equation (2) provide the "instrumented" KLD-index—i.e., the

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[14] States of incorporation are obtained from Compustat. A caveat is that Compustat only reports the state of incorporation for the latest available year. Nevertheless, this caveat is unlikely to matter for my results. Anecdotal evidence suggests that changes in states of incorporation are very rare (e.g., Romano, 1993). Along similar lines, Cheng, Nagar, and Rajan (2004) report that none of the 587 Forbes 500 firms in their panel had changed their state of incorporation during their sample period from 1984 to 1991.

exogenous component of the KLD-index. In the second stage, I then re-estimate equation (1) using *KLD-index (instrumented)* in lieu of *KLD-index*:

$$\log(1 + procurements_{it}) = \alpha_i + \alpha_t + \beta^{IV} \times KLD\text{-}index\ (instrumented)_{it} + \gamma' X_{it} + \varepsilon_{it}. \tag{3}$$

The coefficient β^{IV} provides a consistent estimate of the effect of CSR on the allocation of procurement contracts.

RESULTS

Main Results

The main results are presented in Table 2. Column (1) reports estimates from the OLS regression specified in equation (1). As can be seen, the coefficient on the KLD-index is positive and significant. The point estimate of 0.067 implies that an increase in the KLD-index by one index point—i.e., the implementation of a CSR strength—is associated with a 6.7% increase in the dollar amount of procurement contracts allocated to the company. A look at the control variables provides additional insights into the determinants of the allocation of procurement contracts. In particular, larger and more profitable firms are more likely to receive procurement contracts. The same applies to companies that make larger political contributions, consistent with Goldman *et al.* (2013) findings that political connections matter for the allocation of procurement contracts.

In columns (2) and (3), I address the potential endogeneity of the KLD-index by using 2SLS. The first-stage regression is provided in column (2). As is shown, the enactment of constituency statutes leads to a significant increase in the KLD-index. The corresponding *F*-statistic is 11.8, which lies above Staiger and Stock's (1997) threshold for "strong" instruments. In column (3), I estimate the second-stage regression. The coefficient on the (instrumented)

KLD-index is very similar to the one in column (1), suggesting that the positive relationship between the KLD-index and the allocation of procurement contracts is not driven by the endogenous choice of CSR strategies. Overall, the results presented in Table 2 are supportive of Hypothesis 1 according to which companies with higher CSR are more likely to be awarded procurement contracts.

Robustness

This section presents various robustness checks of the analysis conducted in Table 2. The results are reported in Appendix Table A.

Specification without controls. In columns (1) and (2), I re-estimate my baseline regressions without including controls. The coefficient of the KLD-index is very similar to before (in both the OLS and IV regressions). This indicates that my results are not sensitive to the inclusion of controls.

Industry trends. In columns (3) and (4), I re-estimate my baseline specifications including the full set of industry × year fixed effects, where industries are defined at the 2-digit SIC level. This specification accounts for industry trends that may drive a spurious relationship between the KLD-index and the allocation of procurement contracts.[15] As is shown, my results are robust to this inclusion.

CSR concerns. In my baseline specification, the KLD-index is constructed by summing up all CSR strengths. An alternative approach that is commonly used in the literature is to construct a "net" KLD-index by subtracting the number of CSR concerns from the number of

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[15] Such spurious relationship could arise if, e.g., the government increases spendings in industries that provide CSR-related products or services (e.g., the development of green technologies).

CSR strengths. In columns (5) and (6), I show that my results are similar if I use this alternative definition of the KLD-index.

Intensive and Extensive Margins

The results presented so far suggest that CSR plays an important role for the allocation of procurement contracts. However, the analysis does not distinguish between the extensive margin (i.e., when companies receive procurement contracts for the first time) and the intensive margin (i.e., when companies receive more procurement contracts).

In Table 3, I examine both margins separately. To study the extensive margin, I use as dependent variable a dummy that is equal to one if the company receives procurement contracts (and zero otherwise). The results are presented in columns (1) and (2). As is shown, the coefficient of the KLD-index is positive and significant in both the OLS and IV regressions. The point estimate of 0.005 implies that an increase in the KLD-index by one index point leads to a 0.5% increase in the probability of being awarded a procurement contract.

In columns (3) and (4), I examine the intensive margin. To do so, I restrict the sample to all firm-year observations in which firms have procurement contracts. I then use as dependent variable log(procurements). As can be seen, the coefficient of the KLD-index is significantly positive in both the OLS and IV regressions. The estimates of 0.031 and 0.046 imply that an increase in the KLD-index by one index point leads to a 3.1% to 4.6% increase in the dollar amount of procurement contracts.

In sum, the results in Table 3 indicate that CSR affects the allocation of procurement contracts at *both* the extensive and intensive margins.

Types of Procurement Contracts

The central tenet of my theory is that CSR helps mitigate information asymmetries by signaling trustworthiness to government agencies. To empirically assess this mechanism, I examine whether the effect of CSR is stronger for government contracts that are more prone to information asymmetries, such as i) multi-year, ii) large-scale, and iii) cost-plus contracts.

To conduct this analysis, I re-estimate my baseline specifications using alternative dependent variables. For example, to study whether higher CSR affects the allocation of multi-year procurement contracts, I use as dependent variable log(1 + *multi-year contracts*), where *multi-year contracts* is the dollar amount of multi-year procurement contracts allocated to a given company in a given year. The results are presented in Table 4. As is shown in columns (1), (3) and (5) of both panels, CSR has a significant effect on the allocation of contracts that are multi-year, larger, and cost-plus, respectively. In contrast, the estimates in columns (2), (4), and (6) show that CSR has no effect on the allocation of other types of contracts. These results lend support to Hypothesis 2.

Length of Relationship

In Table 5, I examine whether the effect of CSR at the intensive margin (columns (3) and (4) of Table 3) depends on past interactions between the government and the company—arguably, government agencies face lower information asymmetries with companies they have been interacting with for a long time.

To examine this hypothesis, I interact the KLD-index with two dummy variables indicating whether "relationship length"—that is, the number of years since the company has been receiving procurement contracts—is above and below, respectively, the median across all

companies. As can be seen, the effect of CSR is large and highly significant for companies that are relatively new to government agencies. In contrast, the effect of CSR is small and insignificant for companies that have a longer history with government agencies. This evidence is consistent with Hypothesis 3.

Product Market Competition

Finally, I examine whether the effect of CSR on the allocation of procurement contracts is larger in more competitive industries—i.e., in industries where companies have more of a need to differentiate themselves from their competitors (e.g., by signaling trustworthiness through CSR).

To examine this hypothesis, I interact the KLD-index with two dummy variables indicating whether the company operates in an industry whose Herfindahl index lies above and below, respectively, the median across all industries.[16] As can be seen in Table 6, I find that the effect of CSR is large and highly significant in more competitive industries, while it is small and insignificant in less competitive industries. This finding is supportive of Hypothesis 4.

DISCUSSION AND CONCLUSION

Does CSR influence the allocation of procurement contracts? My results indicate that the answer to this question is affirmative. Building on existing theories, I argue that CSR mitigates information asymmetries—which are inherent to government procurement—by signaling long-term orientation and non-opportunistic behavior. Accordingly, I posit that companies' social engagement fosters trust and improves their competitiveness in obtaining procurement contracts.

To examine this question empirically, I exploit a quasi-natural experiment provided by

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[16] Note that the Herfindahl index is a measure of concentration, and hence an inverse measure of competition.

the staggered introduction of constituency statutes in seven U.S. states between 1991–2013. These statutes allow corporate directors to take stakeholders' interests into consideration when making business decisions. Hence, they provide exogenous variation in the way U.S. companies address the needs of their stakeholders.

Using an instrumental variable (IV) methodology—instrumenting CSR with the enactment of constituency statutes—I find that companies with higher CSR receive more procurement contracts. This finding indicates that CSR can serve as a strategic tool to obtain government contracts. Moreover, I find that the effect is stronger for more complex projects—such as i) multi-year, ii) large-scale, and iii) cost-plus projects—and in the early years of the government-company relationship, when information asymmetries are arguably higher. Finally, I find that the effect is stronger in competitive industries, indicating that CSR can serve as a differentiation strategy to compete against other bidders.

This study contributes to the existing literature in several ways. First, my study adds to the vast literature on competitive strategies (e.g., Porter, 2008). The limelight of this literature is on the competitive positioning of companies in the business-to-consumer market. In contrast, the question of how companies can improve their competitiveness in the market for government contracts has remained largely unexplored. This is surprising given the economic importance of this market (15-20% of GDP). To the best of my knowledge, this paper is the first to examine how corporate strategy can affect the allocation of government contracts.

Second, this study is related to the economics literature on incomplete contracting (e.g., Arrow, 1974; Banerjee and Duflo, 2000; Fama, 1980). While the existing literature focuses on reputation effects, my study examines the role of alternative signals—companies' stakeholder-friendly practices—in mitigating information asymmetries.

Third, this study contributes to the literature on organizational trust and transaction cost economics (e.g., Barney and Hansen, 1994; Bromiley and Cummings 1995; Williamson, 1991; Zaheer *et al*., 1998). At the core of this literature is the role of trust in reducing information asymmetries in *inter-firm* relationships. My study expands this literature to *business-government* relationships.

Fourth, this paper is related to the few but notable studies that examine whether, from the perspective of end consumers, CSR can serve as a signal of the seller's quality and non-opportunistic behavior (e.g., Du *et al.*, 2011; Elfenbein *et al.*, 2012; Kotler *et al.*, 2012; McWilliams and Siegel, 2001). This literature focuses on end consumers' purchasing behavior. In contrast, my paper studies the signaling role of CSR in the context of government's purchasing behavior.

Fifth, this paper contributes to the large literature on CSR and financial performance (see, e.g., Flammer, 2014a; Margolis, Elfenbein, and Walsh, 2007; Margolis and Walsh, 2001, 2003; Orlitzky, Schmidt, and Rynes, 2003). Overall, this literature points toward a positive relationship between CSR and financial performance. Yet, the precise mechanisms through which CSR creates value largely remain to be explored. The study that is most closely related to mine is Cheng, Ioannou, and Serafeim (2014). The authors argue that firms with better social practices have improved access to finance as CSR helps decrease agency costs and information asymmetry through enhanced stakeholder engagement and transparency. While related, my study highlights a novel channel through which CSR may create value—improved access to public procurement contracts.

Sixth, I add to the multi-disciplinary dialogue in corporate strategy. In particular, I bridge the economics literature on incomplete contracting with the management literature on transaction

cost economics and competitive strategy. More specifically, I theorize and empirically test whether firms' social strategies can serve as a signaling and differentiation tool to mitigate information asymmetries and improve firms' competitiveness in the allocation of public procurement contracts.

Lastly, the findings of this study have relevant managerial implications. As discussed above, the market for procurement contracts is a sizeable market. The fact that CSR influences the allocation of procurement contracts implies that CSR can serve as a signaling and differentiation strategy to compete against other bidders, and ultimately achieve a competitive advantage. Accordingly, managers—particularly those operating in the B2G sector—could benefit from integrating social and environmental considerations into their strategic decision making.

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Table 1. Summary Statistics

Variable	Mean	Std. Dev.	1	2	3	4	5	6	7	8
1 Procurement contracts ($ million)	34.49	626.10								
2 KLD-index	1.367	2.232	0.112							
3 Size	7.391	1.766	0.086	0.511						
4 ROA	0.107	0.128	0.007	0.115	0.113					
5 Tobin's Q	1.948	1.350	-0.013	-0.003	-0.325	0.109				
6 Leverage	0.215	0.199	0.000	0.063	0.265	0.004	-0.181			
7 Cash holdings	0.170	0.200	-0.023	-0.090	-0.434	-0.311	0.467	-0.325		
8 Herfindahl	0.062	0.060	0.010	-0.015	-0.026	0.170	-0.022	0.034	-0.111	
9 Political contributions ($ 1,000)	12.82	65.72	0.165	0.290	0.312	0.042	-0.029	0.037	-0.071	0.047

Notes. Pearson correlation coefficients; $n = 31,574$.

Table 2. Corporate Social Responsibility and the Allocation of Government Contracts

Dependent variable	Log(1 + Procurement)	2SLS	
		KLD-index	Log(1 + Procurement)
	OLS	First-stage	IV
	(1)	(2)	(3)
KLD-index	0.067***		
	(0.021)		
KLD-index (instrumented)			0.077**
			(0.032)
Constituency statute		0.240***	
		(0.070)	
Size	0.555***	0.199***	0.553***
	(0.082)	(0.035)	(0.081)
Return on assets	0.588*	0.082	0.587*
	(0.304)	(0.198)	(0.305)
Tobin's Q	0.036	-0.022	0.036
	(0.030)	(0.014)	(0.030)
Leverage	0.577***	0.213**	0.575***
	(0.222)	(0.101)	(0.222)
Cash holdings	-0.916***	0.516***	-0.921***
	(0.254)	(0.096)	(0.254)
Herfindahl	-0.011	-0.362	-0.008
	(1.284)	(1.118)	(1.282)
Log(1 + Political contributions)	0.031**	-0.027*	0.031**
	(0.014)	(0.014)	(0.014)
Year fixed effects	Yes	Yes	Yes
Firm fixed effects	Yes	Yes	Yes
R-squared	0.80	0.75	0.80
Observations	31,574	31,574	31,574

Notes. Standard errors are in parentheses. All tests two-tailed. * $p < 0.10$; ** $p < 0.05$; *** $p < 0.01$.

Table 3. Extensive and Intensive Margins

Dependent variable	Extensive margin		Intensive margin	
	Procurement (0/1)	Procurement (0/1)	Log(Procurement)	Log(Procurement)
	OLS	IV	OLS	IV
	(1)	(2)	(3)	(4)
KLD-index	0.005***		0.031**	
	(0.002)		(0.014)	
KLD-index (instrumented)		0.005**		0.046**
		(0.003)		(0.018)
Size	0.036***	0.036***	0.463***	0.463***
	(0.006)	(0.006)	(0.063)	(0.063)
Return on assets	0.047*	0.047*	0.558	0.563
	(0.025)	(0.025)	(0.410)	(0.410)
Tobin's Q	0.004	0.004	-0.006	-0.006
	(0.002)	(0.002)	(0.026)	(0.026)
Leverage	0.043**	0.044**	0.25	0.246
	(0.019)	(0.019)	(0.199)	(0.199)
Cash holdings	-0.079***	-0.079***	0.032	0.022
	(0.021)	(0.021)	(0.231)	(0.233)
Herfindahl	0.112	0.112	-2.545**	-2.509**
	(0.104)	(0.104)	(1.114)	(1.116)
Log(1 + Political contributions)	0.001	0.001	0.026***	0.027***
	(0.001)	(0.001)	(0.010)	(0.010)
Year fixed effects	Yes	Yes	Yes	Yes
Firm fixed effects	Yes	Yes	Yes	Yes
R-squared	0.74	0.74	0.82	0.82
Observations	31,574	31,574	9,955	9,955

Notes. Standard errors are in parentheses. All tests two-tailed. * $p < 0.10$; ** $p < 0.05$; *** $p < 0.01$.

Table 4. Types of Procurement Contracts

Panel A: OLS Regressions

Dependent variable	Duration		Scale		Pricing	
	Log(1 + Multi-year)	Log(1 + Single-year)	Log(1 + Large)	Log(1 + Small)	Log(1 + Cost-plus)	Log(1 + Fixed-price)
	(1)	(2)	(3)	(4)	(5)	(6)
KLD-index	0.061***	0.006	0.064***	0.003	0.049***	0.018
	(0.020)	(0.018)	(0.019)	(0.017)	(0.016)	(0.023)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Firm fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
R-squared	0.76	0.52	0.75	0.62	0.73	0.73
Observations	31,574	31,574	31,574	31,574	31,574	31,574

Panel B: IV Regressions

Dependent variable	Duration		Scale		Pricing	
	Log(1 + Multi-year)	Log(1 + Single-year)	Log(1 + Large)	Log(1 + Small)	Log(1 + Cost-plus)	Log(1 + Fixed-price)
	(1)	(2)	(3)	(4)	(5)	(6)
KLD-index (instrumented)	0.077**	0.000	0.074**	0.003	0.056**	0.021
	(0.033)	(0.031)	(0.029)	(0.024)	(0.024)	(0.035)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Firm fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
R-squared	0.76	0.52	0.75	0.62	0.73	0.73
Observations	31,574	31,574	31,574	31,574	31,574	31,574

Notes. Standard errors are in parentheses. All tests two-tailed. * $p < 0.10$; ** $p < 0.05$; *** $p < 0.01$.

Table 5. Length of Relationship with the Government

Dependent variable	Log(1 + Procurement)	Log(1 + Procurement)
	OLS	IV
	(1)	(2)
KLD-index × (Relationship length > Median)	0.020	
	(0.015)	
KLD-index × (Relationship length < Median)	0.073**	
	(0.023)	
KLD-index (instrumented) × (Relationship length > Median)		0.029
		(0.019)
KLD-index (instrumented) × (Relationship length < Median)		0.136***
		(0.030)
Size	0.455***	0.447***
	(0.063)	(0.063)
Return on assets	0.590	0.574
	(0.411)	(0.411)
Tobin's Q	-0.009	-0.007
	(0.026)	(0.026)
Leverage	0.268	0.266
	(0.200)	(0.200)
Cash holdings	0.039	0.028
	(0.231)	(0.234)
Herfindahl	-2.553*	-2.514*
	(1.114)	(1.109)
Log(1 + Political contributions)	0.026**	0.026**
	(0.010)	(0.010)
Relationship length > Median	0.073	0.140
	(0.079)	(0.084)
Year fixed effects	Yes	Yes
Firm fixed effects	Yes	Yes
R-squared	0.82	0.82
Observations	9,955	9,955

Notes. Standard errors are in parentheses. All tests two-tailed. * $p < 0.10$; ** $p < 0.05$; *** $p < 0.01$.

Table 6. Product Market Competition

Dependent variable	Log(1 + Procurement)	Log(1 + Procurement)
	OLS	IV
	(1)	(2)
KLD-index × (Herfindahl > Median)	0.020	
	(0.046)	
KLD-index × (Herfindahl < Median)	0.073***	
	(0.023)	
KLD-index (instrumented) × (Herfindahl > Median)		0.047
		(0.069)
KLD-index (instrumented) × (Herfindahl < Median)		0.080**
		(0.034)
Size	0.575***	0.576***
	(0.084)	(0.083)
Return on assets	0.579*	0.578*
	(0.305)	(0.305)
Tobin's Q	0.038	0.037
	(0.030)	(0.030)
Leverage	0.580***	0.576***
	(0.222)	(0.221)
Cash holdings	-0.917***	-0.918***
	(0.254)	(0.254)
Herfindahl > Median	-0.142	-0.110
	(0.120)	(0.136)
Log(1 + Political contributions)	0.032**	0.032**
	(0.014)	(0.014)
Year fixed effects	Yes	Yes
Firm fixed effects	Yes	Yes
R-squared	0.80	0.80
Observations	31,574	31,574

Notes. Standard errors are in parentheses. All tests two-tailed. * $p < 0.10$; ** $p < 0.05$; *** $p < 0.01$.

Appendix Table A. Robustness

Dependent variable	Log(1 + Procurement)					
	No controls		Accounting for industry trends		KLD strengths minus KLD concerns	
	OLS	IV	OLS	IV	OLS	IV
	(1)	(2)	(3)	(4)	(5)	(6)
KLD-index	0.072***		0.082***		0.041**	
	(0.022)		(0.017)		(0.017)	
KLD-index (instrumented)		0.090***		0.090***		0.073**
		(0.033)		(0.026)		(0.031)
Size			0.456***	0.453***	0.565***	0.563***
			(0.064)	(0.064)	(0.082)	(0.082)
Return on assets			0.443	0.447	0.588*	0.583*
			(0.331)	(0.331)	(0.304)	(0.305)
Tobin's Q			0.064**	0.064**	0.035	0.036
			(0.029)	(0.029)	(0.030)	(0.030)
Leverage			0.600***	0.597***	0.583***	0.577***
			(0.226)	(0.226)	(0.222)	(0.222)
Cash holdings			-0.729***	-0.735***	-0.903***	-0.920***
			(0.259)	(0.259)	(0.255)	(0.254)
Herfindahl			-0.309	-0.313	0.006	0.037
			(82.227)	(82.247)	(1.279)	(1.281)
Log(1 + Political contributions)			0.038***	0.039***	0.031**	0.031**
			(0.011)	(0.011)	(0.014)	(0.014)
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Firm fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Industry × year fixed effects	No	No	Yes	Yes	No	No
R-squared	0.80	0.80	0.83	0.83	0.80	0.80
Observations	31,574	31,574	31,449	31,449	31,574	31,574

Notes. Standard errors are in parentheses. All tests two-tailed. * $p < 0.10$; ** $p < 0.05$; *** $p < 0.01$.