Carbon Neutrality

ORIGINAL ARTICLE

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The impact of ESG on financial performance: a revisit with a regression discontinuity approach

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Abstract

This study revisits the question of "whether firms are doing well by doing good?". We examine shareholders-sponsored corporate socially responsible (CSR) proposals related to Environmental, Social, and Governance (ESG) that are voted to pass or fail by a small margin. The adoption of those "close call" proposals is regarded as equivalent to a random assignment of CSR policies and, therefore, provides a quasi-experimental setting to capture the causal influence of CSR on firm performance. We apply the regression discontinuity design (RDD) and find that CSR proposals' passage leads to a significant positive abnormal return on the voting day. The results are robust with both parametric and non-parametric approaches of RDD and different polynomial orders. However, we fail to identify a significant change in financial performance in the long-term. One possible reason is that passing a CSR proposal could be symbolic, rather than substantial.

Keywords: Corporate social responsibility, Regression discontinuity, Financial performance

1 Introduction

Growing concern about climate change, environmental risk, social welfare, and other sustainability issues leads to increased attention on Corporate Social Responsibility (CSR) in the business world. Being sustainable, caring about the environment and the welfare of vulnerable groups, and other good causes are all considered as the right things to do, not only from an individual perspective but also from a corporate citizen perspective [17]. According to the Global Sustainable Investment Alliance,[1] the socially responsible investing assets experienced a 34% increase from 2016 to 2018, rising from $22.9 trillion to $30.7 trillion in the top five major markets. The number was only around $8 trillion in 2010. Institutional investors particularly care about CSR and are identified as a significant driving force of CSR [57].

Nowadays, more firms chose to voluntarily disclosure their social and environmental externalities, both positive and negative, and many big companies such as Apple and Starbucks publish CSR statements regularly [34]. The scope and scale of corporate social responsibility have been growing at a fast speed.

Academic research on CSR also evolves over time. Early research focuses on the debate 'should CSR exist?' Friedman [79] argues that the social responsibility of business is just to make profits. Based on the social management perspective, Wartick and Cochran [166] argue that CSR benefits business and the society as researchers should take the implications of corporate actions into consideration.

With the evolvement of CSR research, the focus started to shift from 'should CSR exists?' to 'why does

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[1] Global Sustainable Investment Alliance published the 2018 Global Sustainable Investment Review. See: http://www.gsi-alliance.org/wp-content/uploads/2019/03/GSIR_Review2018.3.28.pdf

CSR exist?' Bénabou and Tirole [17] discuss three visions on CSR: 1) Delegated philanthropy, 2) insider-initiated cooperate philanthropy, and 3) doing well by doing good. According to the delegated philanthropy view, corporations can serve as a channel to convey the values of citizens (2010). Stakeholders especially care about socially responsible behaviors [50]. These behaviors might be driven by genuine social concerns or tax deduction purposes. The insider-initiated cooperate philanthropy reflects the desire of managers and board members to do good on their own initiative instead of simply responding to stakeholders' demands. Compared to delegated philanthropy view, insider-initiated cooperate philanthropy might give rise to agency problems [35], as CSR engagement is not necessarily in line with shareholders' wishes and benefits. Doing well by doing good can be interpreted as being socially responsible can help a firm make morse profit [76, 154]. At the same time, many voices disagree [83]. For example, Flammer and Bansal [76] provide evidence that imposing CSR long-term incentives in the design of executive compensation increases the firm value and operational performance and investment, so long-term orientation through incorporating CSR is value-enhancing.

Previous research presents mixed findings on the relation between CSR and corporate financial performance (CFP). Some document a positive relationship [75, 76, 154], while others find a negative relationship [83]. One explanation is that CSR is endogenously correlated with firm-level characteristics such as financial performance. For example, a firm could adopt CSR at the time when good financial performance is expected in the forthcoming years due to use of cutting-edge technology, so CSR does not result in good CFP.

Ideally, we would wish to arrange a random assignment of firms into a high CSR engagement group and a low CSR engagement group and then compare the financial outcomes. However, the reality of the business world does not allow us to conduct such a costly experiment, so an appropriate identification strategy is needed. The discontinuity on the outcome of CSR shareholder proposals' votes provides a solution to address the two challenges mentioned above. In the annual meeting, shareholders can sponsor proposals and vote to pass or reject. Intuitively, we should not observe a systematic difference between proposals that marginally pass with, say, 51% of the votes and those marginally fail to pass with 49% of the votes. The passage of those "close call" proposals is regarded as equivalent to a random assignment of CSR policies and, therefore, provides a quasi-experimental setting to capture the causal effect of CSR on firm performance [10, 44, 75]. Regression discontinuity design (RDD) compares the stock market reaction to CSR proposals that marginally passed or failed, which enables us to draw inference on the causality between CSR and CFP.

Using data collected between 2006 and 2018, we apply the regression discontinuity design (RDD) to investigate the effect of passing a CSR proposal on firm performance. We find that CSR proposals' passage leads to a significant positive abnormal return on the voting day. In particular, on the shareholder voting day, a company with a CSR proposal that marginally passed yields a 1.22% higher abnormal return compared to a company with a CSR proposal that is marginally rejected. The results, which are robust with both parametric and nonparametric approaches of RDD and polynomial order, are consistent with Flammer [75] reporting that the passage of close call CSR proposal yields an abnormal return of 0.92% on the voting day. However, we fail to find that firms adopting CSR proposal have superior firm performance during one to four years after the voting. In contrast, Flammer [75] shows that ROA and Tobin's Q increase in the first year and 12–24 months after the passage of CSR proposal by a narrow margin. One possible explanation is that in recent years (2012–2018), there is no significant change in sales growth and labor productivity after the adoption of CSR proposal. Further investigation of the issue is beyond the scope of our study, and we consider it a promising research question for the future.

This study contributes to the literature supporting the "win-win" view of CSR [17, 129]. Although Flammer [75] first applied RDD to examine the effect of CSR on firm performance using the data from 1997 to 2012 and document a positive relationship, it is still worthwhile re-investigating this question due to several reasons. First, CSR has become increasingly popular. In this fast-changing world, the "green topic" receives tremendous attention in recent years. ESG investment almost doubled from 2016 to 2019, according to the Global Sustainable Investment Alliance; voluntary and regulatory CSR disclosure increased dramatically, and companies' efforts to cut carbon emissions under the pressure of climate change. Second, this paper applies both parametric and nonparametric regression discontinuity design that complement each other. It ensures that the estimation results are not driven by undesired reasons such as model misspecification.

This paper is structured as follows. Section 2 reviews the relevant literature and draws on stakeholder theory [55, 78] and institutional theory [52] to develop the hypotheses. Section 3 describes the shareholder proposals data and introduces the

regression discontinuity design as the identification strategy. Section 4 discusses the empirical results. Section 5 concludes.

2 Related literature and hypothesis development

Since Moskowitz [127] published the first study on CSR and firm performance, a large volume of empirical studies investigate the relationship between them, but the findings remain inconclusive. Many studies show that a firm with higher CSR engagement is associated with higher reputational capital [77], higher consumer evaluations and loyalty [27], stronger market position [13], superior financial performance [75], lower cost of capital [51, 67] and better performance on innovation [169]. Other studies document a negative relationship between CSR and CFP [83]. We draw on the stakeholder theory [78] and institutional theory [52] to discuss the relationship between CSR and CFP.

Stakeholders are defined as "any group or individual who can affect or are affected by the achievement of the firm's objectives"; for example, employees, customers, and shareholders are common subgroups of stakeholders [78]. This study mainly relies on the instrumental stakeholder theory, which focuses on the causal influence of CSR practices on firm performance [18, 55]. Instrumental stakeholder theory regards stakeholders as an essential part of the external environment that a firm could manage to assure profits and the shareholders' benefits. By developing and keeping tight relationships with primary stakeholders, firms can acquire the resources controlled by them, such as human resources [141], and ultimately achieve superior performance than their rivals. Based on the instrumental stakeholder theory and resource-based view, empirical studies further document that CSR can not only help firms acquire the resources from the primary stakeholders [164] but also reduce the risk of losing such resources that are already under control [81]. The following section analyzes how different subgroups of stakeholders could help firms gain a competitive advantage over their rivals.

CSR might help companies to attract employees and gain critical human resources. Greening and Turban [85] provide evidence of the positive relationship between firms' CSR rankings and employment attractiveness by instigating students' self-reported willingness to pursue certain positions. Apart from prospective employees, the relationship also holds for the current employees. Peterson [131] further finds that employees in socially responsible companies express higher work commitment and positive work attitudes. Therefore, CSR serves as a firm strategy to attract a high-quality labor force and, in turn, provides a competitive advantage.

Despite employees, customers could also put a firm in an advantageous position due to socially responsible consumption. CSR can serve as a product differentiation strategy and help to build brand loyalty. Marketing researchers such as Brown and Dacin [27] document that CSR information (even experimentally manipulated) significantly affects customers' perception and willingness to buy such products. According to a consumer perception survey conducted by McCluskey and Loureiro [117], consumers are willing to pay more for organic and socially responsible products, especially wine. Roe et al. [139] also provide evidence that consumers are willing to pay a 20% price premium for green electricity in the United States.

Another benefit of CSR engagement is to attract investment. According to Morgan Stanley Institute for Sustainable Investing,[2] 85% of individual investors express interests in socially responsible investing (SRI). 52% of the general investors and 67% of millennial investors participate in at least one socially responsible investing activity.

CSR engagement also helps firms to access government resources. It is especially true in emission-intensive sectors. Innes and Sam [94] find that firms that joining the voluntary pollution reduction program are rewarded by future relaxed regulatory oversight. Additionally, Decker [47] provides evidence that regulators issue permits for major projects more quickly to firms that comply with environmental restrictions. In contrast, plants with discharges below the legally permitted levels are asked to further reduce discharges beyond the amount required by law, even after fines. The sanction might even affect other plants within the same company [147].

Although employees, consumers, investors, and governments discussed above are the primary visible groups to motivate CSR engagements, the invisible social norms and pressures could also affect the business environment. Specific industries and geographical areas may share some norms and values, which disciplines companies to act responsibly [112]. For instance, at the geographic level, institutional investors from countries with high CSR awareness could drive the investing firms' environmental and social performance [57]. By doing so, institutional investors pass their social norms, the belief of the importance of environmental and social issues worldwide. At the sector level, electricity companies share the same social norms of the importance of green

[2] See Sustainable Signals: Individual Investor Interest Driven by Impact, Conviction and Choice, published by Morgan Stanley Institute for Sustainable Investing https://www.morganstanley.com/pub/content/dam/msdotcom/infographics/sustainable-investing/Sustainable_Signals_Individual_Investor_White_Paper_Final.pdf

engagements. They are keen on disclosing efforts made on utilizing green energies, as such green energies not only improve resource efficiency but also generate a significant amount of profits as consumers are willing to pay a price premium [139].

Evidence suggests that around 10% of big companies experienced boycotts, protests, or citizen suits between 1971 and 2003 [66]. Event studies results show that targeted firms generally experienced significant price declines due to consumer boycotts [45]. Since the market effects are large and significant, more than one-third of targeted companies take subsequent actions to meet the activists' aims [66]. Not only targeted companies, even firms in the same industry undergone boycotts are more likely to take subsequent actions such as joining pollution reduction programs [94]. Experiencing such social activism harms firm value and reputation, which puts firms in a disadvantaged position when attracting investors, employees, and customers. In this case, CSR provides insurance-like protection for firms [81, 82], especially in reputation risk [125]. For example, when reacting to eco-harmful events, firms with higher levels of environmental CSR ranking are associated with smaller negative returns [74]. In the extreme cases, such as the 2008 financial crisis, firms with high CSR intensity recorded higher stock returns and superior financial performance [108]. In sum, CSR could serve as a firm strategy to hedge against negative events.

To summarize, CSR engagement through passing CSR proposal enables firms to 1) maintain tight relationship with primary stakeholders such employees and customers; 2) acquire the resources controlled by stakeholders; and 3) secure government support. Based on the discussion, we formulate the following hypotheses:

> *Hypothesis 1: Adopting a CSR shareholder proposal leads to significant positive abnormal returns.*
> *Hypothesis 2: Adopting a CSR shareholder proposal leads to superior firm performance in the long term.*

3 Research design

3.1 Data and sample

Data on shareholder proposals are obtained from the Institutional Shareholder Services (ISS, formally RiskMetrics) Governance database, which covers Russell 3000 companies since 2006. They are two resolution types of proposals, SRI (socially responsible initiative) and GOV (governance initiative). SRI proposals are of interest referred to as CSR proposals in the following discussion. Our sample contains 11,434 voted proposals from 2006 to 2018, with 2586 CSR proposals and 8848 Governance proposals. Table 1 shows the sponsor types of shareholder proposals, namely who brought up the proposals. 'Individuals' and 'Other' bring proposals to the shareholder meeting most frequently in both CSR and Governance resolution types. They are still the majority types of Governance proposals that marginally fail or pass, but for CSR proposals that marginally fail or pass, public pensions and SRI funds become the major forces, which is consistent with the fact that more institutional investors care about CSR and can drive a firm's CSR ratings [57]. There are no individually sponsored types here. The different distribution of shareholder proposals' sponsor types shows that large institutions like pension funds pay more attention to CSR. 177 CSR proposals

Table 1 Shareholder proposals' Sponsor types

Full sample			Vote outcome ± 10%		
Panel A. CSR proposals					
Sponsor type	Frequency	Percent	Sponsor type	Frequency	Percent
NULL	679	24.65	Public Pension	64	32.16
SRI Fund	468	16.99	SRI Fund	35	17.59
Public Pension	402	14.59	Religious	23	11.56
Religious	376	13.65	Fund	17	8.54
Special Interest	283	10.27	Special Interest	15	7.54
Individual	161	5.84	Company	11	5.53
Fund	139	5.05	NULL	10	5.03
Other	113	4.1	Individual	8	4.02
Union	107	3.88	Other	8	4.02
Company	27	0.98	Union	8	4.02
Total	2755	100	Total	199	100
Panel B. CSR proposals					
Sponsor type	Frequency	Percent	Sponsor type	Frequency	Percent
NULL	5698	57.93	Individual	625	36.02
Individual	2141	21.77	NULL	533	30.72
Union	713	7.25	Union	238	13.72
Fund	397	4.04	Fund	110	6.34
Public Pension	339	3.45	Public Pension	87	5.01
Other	281	2.86	other	69	3.98
Religious	96	0.98	Religious	23	1.33
SRI Fund	66	0.67	SRI fund	22	1.27
Company	62	0.63	Company	20	1.15
Special Interest	43	0.44	Special interest	8	0.46
Total	9836	100	Total	1735	100

This Table displays the frequency of shareholder proposals brought by different sponsors. Panel A is the summary of all governance proposals voted during shareholder meetings, and panel B is the summary of CSR proposals voted during shareholder meetings

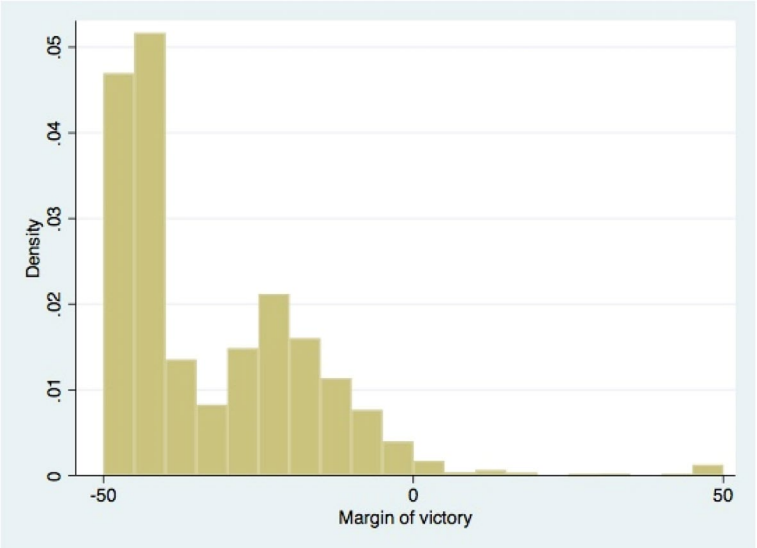

Fig. 1 Distribution for CSR Shareholder Proposals

marginally fail or pass by 10% around the minimum level of votes to pass a CSR proposal, accounting for 6.84% of the total CSR proposals. The ratio of governance proposals (the number of proposals that marginally fail or pass out of the total number of governance proposals) is much higher, 16.33%, suggesting that the votes of governance proposals are more centered around 50%, the passage rate. More extreme cases in CSR proposal vote distributions and are more likely to be rejected or passed.

KLD (now part of MSCI[3]) is an information intermediary specializing in quantifying stakeholder relations of publicly listed firms. It relies mainly on publicly available information gathered through customized press searches and has been widely used in academic research investigating firms' CSR performance [100, 107]. One important source of information is news stories about corporate events that have welfare implications for the firm's stakeholders. Examples of these events include a newspaper article about poor labor relations at one of the firm's plants or a critical report published by a non-governmental organization regarding toxic waste disposal. In general, KLD classifies CSR-related events into one of the following seven stakeholder issue areas: 1) Community, 2) Corporate governance, 3) Diversity, 4) Employee relations, 5) Environment, 6) Human rights, 7) Product. In each of the seven-issue areas, KLD has defined a set of binary indicator variables: either positive (Strengths) or negative (Concerns). For example, a positive indicator might be concerned with the work-life benefits a company offers to its employees, and a negative employee relations indicator could be concerned with poor union relations. In essence, KLD's analysts match publicly available information with the most appropriate positive or negative indicator.[4]

In this paper, we use five dimensions of KLD issue areas: community, diversity, employee relations, environment, and product. We exclude corporate governance and human rights issue areas as we focus on the CSR shareholder-initiated proposals and try to crowd out the effects of governance proposals. Previous literature also suggests that the disclosure of governance ratings is different and should be excluded [100, 128]. The human rights dimension only applies to limited firms. The exclusion is in line with Flammer [75] and Nofsinger et al. [128].

Figure 1 shows the distribution of CSR shareholder proposals. As can be seen, most proposals fail to pass and receive less than 10% of the total votes. Figure 2 shows the raw scatter plot between abnormal return and victor margin. Abnormal returns on the voting day above the threshold are higher than the observations below the threshold. However, the simple mean comparison does not show a causal relationship. We further conduct RDD in the following section.

[3] Kinder, Lydenberg, and Domini Research and Analytics was acquired by the RiskMetrics Group in November 2009. In turn, MSCI (http://www.msci.com), a leading provider of investment decision support tools.

[4] See the KLD STATS manual at http://wrds.wharton.upenn.edu for more information on the different binary indicators and issue areas

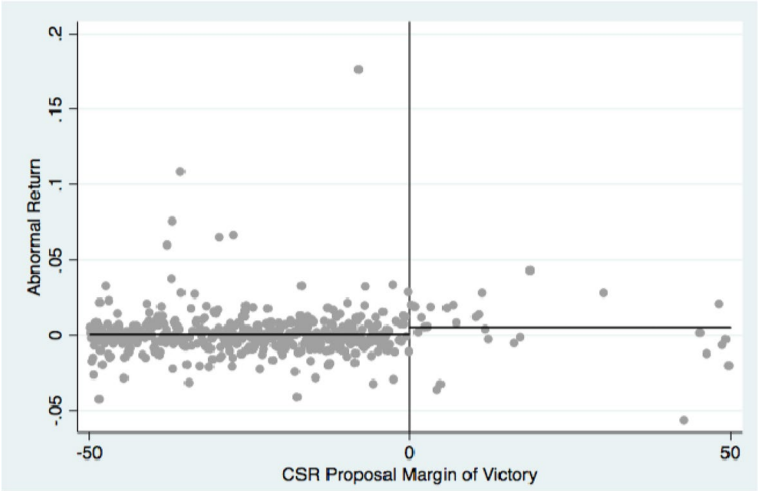

Fig. 2 Abnormal returns on the day of the vote

Table 2 shows the sample breakdown of CSR shareholder proposals by years, there is a slightly declining trend in the number of proposals brought to shareholder meetings from 2006 to 2018, but the proportion of favorable votes increased. It seems that the sponsors of CSR proposals became slightly more cautious. When initiating a proposal, they tend to bring up a proposal that is more likely to be accepted. There are 73 proposals that lie in the victor margin range of [−5%, 5%] (the favorable votes from 45% to 55%), and 177 proposals lie in the victor margin range of [−10%, 10%] (the favorable votes from 40% to 50%).

The 2586 CSR proposals yield 1204 firm-year observations. Table 3 provides the summary statistics for key variables of interest. They mainly come from the Compustat database. We follow Bach and Metzger [10] and [75] to construct financial ratios. We include ROA (return on assets), ROE (return on equity), NPM (net profit margin), Tobin's Q, Labor Productivity, CapEx (capital expenditures), and Sales Growth. All continuous variables are winsorized at 5%.

3.2 Regression discontinuity design

To capture the effect of passing a CSR proposal sponsored by shareholders on firm value, the Regression Discontinuity Design (RDD) is applied. It is a widely used method to estimate the treatment effects of a nonexperimental setting where treatment depends on whether a running variable (also known as forcing variable or assignment variable) exceeds a certain cut-off point. The rationale behind the design is to compare firms with CSR proposal votes just below the cut-off and those firms with CSR proposal votes just above the cut-off.

Regression Discontinuity Design was first introduced by Thistlethwaite and Campbell [156] to investigate whether students receive merit awards that have an impact on future academic achievements. This method started to be popular among economists in the late 1990s. Angrist and Lavy [8] applied RDD to estimate the impact of the class size of primary school on the academic scores and find that students can benefit from a smaller class size. Similarly, Black [22] compares the test scores of children living in similar areas, and the only difference is that some areas have better elementary schools than others. They find that if parents are willing to pay around 2.5% of the housing price premium to live in the areas with better elementary schools, their children are associated 5% higher in test scores. Apart from the research topic on education, economists have applied RDD in many other research areas such as the political economy and labor market. Card et al. [28] make use of the discontinuities ineligibility to apply for severance and unemployment insurance benefits in Austria and find that both severance pay and unemployment insurance benefits reduced job-finding rates. Lee [103] and Lee [104] investigated the congressional elections in the United States and provided evidence that incumbency is associated higher probability of success in the subsequent election. In the finance and management research field, Cuñat et al. [44] first applied RDD to capture the effect of governance proposals on firm value by comparing the market reaction to governance proposals that marginally passed or failed. Flammer [75] applied a similar method to estimate the effect of CSR proposals on firm value using the data from 2006 to 2012. This paper applies the same methodology

Table 2 CSR Shareholder Proposals

Year	CSR Proposals	Passed proposals	Passed proposals (%)	Average vote outcome	Vote outcome SD.	Vote outcome ± 1.5%	Vote outcome ± 2.5%	Vote outcome ± 5%	Vote outcome ± 7.5%	Vote outcome ± 10%	Vote outcome ± 15%
2006	261	2	0.77%	12.71	11.20	1	2	2	3	4	8
2007	279	4	1.43%	13.95	13.07	1	2	5	7	8	20
2008	216	2	0.93%	13.35	11.91	0	1	2	2	2	16
2009	176	2	1.14%	16.72	13.57	1	1	4	5	10	21
2010	175	3	1.71%	19.17	15.52	2	2	4	8	16	28
2011	161	5	3.11%	20.65	16.23	2	2	7	14	18	30
2012	169	1	0.59%	18.78	13.59	1	2	5	10	13	25
2013	199	3	1.51%	17.46	15.47	1	1	5	7	12	28
2014	204	4	1.96%	18.53	14.95	2	5	6	13	20	31
2015	202	6	2.97%	19.99	18.46	1	1	5	8	11	20
2016	199	11	5.53%	20.98	20.34	4	5	7	14	21	29
2017	183	5	2.73%	19.65	15.71	2	5	10	14	20	37
2018	162	11	6.79%	21.66	18.78	3	6	11	19	22	39
2019	170	9	5.29%	20.97	18.42	3	4	11	17	23	37
Total	2756	68	2.47%	18.18	15.77	24	39	84	141	200	369
					Percent	0.87%	1.42%	3.05%	5.12%	7.26%	13.39%

This Table displays the frequency of shareholder proposals from 2006 to 2019 in total, and proposals pass or fail by different margins of votes

Table 3 Summary Statistics

Variable	N	Mean	Median	SD	10th percentile	90th percentile
Abnormal return on the meeting day	1870	0.001	−0.001	0.020	−0.015	0.017
Size	1789	115,785	35,994.000	285,361.900	3472.663	242,082.000
ROA	1720	0.146	0.144	0.079	0.065	0.264
ROE	1574	1331.472	781.869	1250.745	1.159	2918.275
NPM	1720	0.223	0.198	0.136	0.066	0.425
Tobin's Q	1584	0.983	0.688	0.932	0.150	2.240
Labor productivity	1731	779	508	681	182	2141
Capital expenditures	1728	0.056	0.048	0.041	0.008	0.115
Leverage	1785	0.273	0.256	0.166	0.053	0.508
Sales growth	1694	0.042	0.045	0.145	−0.159	0.226

Abnormal return on the voting day is estimated from the Carhart [30] four-factor model. Size is the book value of assets. ROA is return on assets. ROE is return on equity. NPM is net profit margin. Tobin's Q is the ratio of the market value of assets to the book value of assets. Labor productivity is sales divided by the number of employees. Capital expenditures are the ratio of capital expenditures to total assets. Sales growth is the growth in sales compared with the previous fiscal year. Leverage is the ratio of debt in current liabilities and long-term debt to total assets. All ratios are winsorized at 5%

to capture the effects of passing a CSR proposal on firm financial outcomes.

The basic assumption of RDD is that it is a random event whether one observes the passage or rejection of a CSR proposal around the cut-off, which means that the distribution of the vote share should be continuous around the cut-off. Figure 1 also provides a visualized test of this assumption. The distribution of vote share is smooth around the cut-off, indicating that the probability of observations falling on each side of the cut-off is continuous, so the main assumption holds. The second assumption of RDD is that all other variables determined before the assignment should not be significantly different just above and just below the cut-off.

3.3 The parametric approach

When Regression Discontinuity Design was first introduced, Thistlethwaite and Campbell [156] assume the regression model to be linear. In this setting, the equation is listed below

$$Yit = \beta_0 + \beta_1 Pass + f(Vicmargin) + \varepsilon_{it} \quad (1)$$

where:

β_0 = the average value of the outcome for those in the treatment group after controlling for the running variable;

Y_{it} = the outcome measure for firm i at time t (e.g., abnormal returns).

Pass = 1 if a CSR proposal is voted to pass and is assigned to the treatment group, and 0 otherwise;

Vicmargin = the distance between the actual percentage votes and the minimal requirement percentage votes to pass a proposal, known as "running variable";

ε_{it} = a random error term;

The function *f (Vicmargin)* represents the relationship between the running variable and the outcome. A variety of functional forms can be tested to determine which fits the data best. For example, different polynomial orders of the running variable could be chosen (normally, k takes the values from 1 to 4, that is, adding linear, quadratic, cubic, and quartic forms in the equation). Adding the interaction terms of the treated status and the running variable is another option, allowing the slope and intercept to be different on each side of the cut-off point.

$$f(Vicmargin) = \sum_0^k \delta_j Vicmargin_{it}^k$$
$$or$$
$$f(Vicmargin) = \sum_0^k \delta_j Vicmargin_{it}^k + \sum_0^k \gamma_j Pass * Vicmargin_{it}^k$$

The RDD aims to estimate the difference in the average of Y_{it} between proposals that pass or fail by a small margin of votes. An efficient estimate of β can be obtained by using all proposals by approximating the continuous relationship between Y_{it} and *Margin votes of victory* with a polynomial in *Margin votes of victory,* allowing for a discontinuous jump at the majority threshold. This polynomial flexibly captures the underlying relationship between any variable that is continuously affected by the vote share and the outcome variable. Only the discontinuous effects at the threshold are captured by β. The model can allow for a different polynomial for observations below the threshold and above the threshold.

The estimation models using eq. (1) could also add a set of time-varying firm characteristics as controls, such as Leverage, ROA, Cash, Sales growth, Advertising, R&D intensity, Labor productivity. As long as the RDD assumptions are fulfilled, it won't generate many different results [105].

This approach "borrows strength" from observations far from the cut-off point and uses every observation in the sample to estimate the outcome. A disadvantage of the approach, however, is that it provides global estimates of the regression function overall values of X, while the RDD depends instead on local estimates of the regression function at the cut-off point. The fact that polynomial regression models use data far away from the cut-off point to predict the value of Y at the cut-off point is not appealing. Hence, Lee and Lemieux [105] suggest trying more flexible specifications by adding different polynomials in X as regressors is an important and useful way of assessing the robustness of the RDD estimates of the treatment effect.

3.4 Nonparametric approach

The nonparametric approach was first introduced by Hahn et al. [87]. It regards the estimation of treatment effects as local randomization and only includes observations that lie around the cut-off point. The nonparametric approach relies on local polynomial methods to fit observations only near the threshold. Hence, local here means around the cut-off point. It could also allow different polynomial functions at two sides of the threshold, i.e., control and treatment groups.

$$Y_{it} = \beta_0 + \beta_1 Pass + f(Vicmargin) + \varepsilon_{it} \quad (2)$$

where:

x^*- $h_1 \leq$ Vicmargin $\leq x^* + h_2$, h_1, and h_2 are the bandwidths on the left and right side of the cut-off point x^* respectively.

β_0= the average value of the outcome for those in the treatment group after controlling for the running variable;

Y_{it} = the outcome measure for firm i at time t (e.g., abnormal returns).

Pass = 1 if a CSR proposal is voted to pass and is assigned to the treatment group, and 0 otherwise;

Vicmargin = the distance between the actual percentage votes and the minimal requirement percentage votes to pass a proposal, known as "running variable";

ε_{it} = a random error term;

This approach only uses observations between x^*-h_1 and $x^* + h_2$ ($h_1 > 0$, $h_2 > 0$), and it could be a common bandwidth ($h_1 = h_2$) or two distinct bandwidths ($h_1 >$ or $< h_2$). It determines the number of observations around the threshold to be added in the empirical RDD analysis. Within such bandwidth, observations are weighted depending on how close they are to the cut-off x^*. Observations closer to x^* are assigned more weight than those further away, and the weights are determined by a kernel function K. Cattaneo et al. [34] suggest three types of functions, Uniform kernel, Triangular kernel, and Epanechnikov kernel. Uniform kernel $K(u) = 1$, ($|u| \leq 1$), assigns equal weight to all observations within the bandwidth interval [x^*-h_1, $x^* + h_2$]. Triangular kernel function, $K(u) = (1 - |u|)$, ($|u| \leq 1$), assigns a higher weight to observations closer to the threshold x^* and less weight to observations further away from the threshold x^*. Epanechnikov kernel, $K(u) = (1 - u^2)$ ($|u| \leq 1$) assigns a quadratic decaying weight within the bandwidth interval [x^*-h_1,$x^* + h_2$]. All kernel functions assign zero weight to observations falling outside of the interval [x^*-h, $x^* + h$].

The choice of bandwidth h determines how wide the interval is and how many observations around the cut-off are needed to fit the local polynomial. A smaller interval around the cut-off (such as 50.1% and 49.9% of votes) makes the comparison between just below and just above the threshold more precise. However, it might also simultaneously increase the variance of the estimated coefficients as fewer observations will be available around the cut-off. Empirical evidence suggests that a smaller h will reduce the misspecification error (or so-called "smoothing bias") of the local polynomial approximation. Choosing a wider interval around the cut-off (such as 70% and 30%) makes more observations available, while the comparison is relatively less precise. In sum, a bias-variance trade-off exists when choosing the bandwidth interval, and it is fundamental to find an appropriate h in the RD design.

Previous literature [33, 105] suggests that it is better to select h in a data-driven automatic way instead of manually picking an h such as 10% or 20%. The data-driven way is called the "Plug-In" procedure. The relevant components of this distribution can then be estimated and plugged into the optimal bandwidth function. The formula for the optimal bandwidth in an RD design is the following, Eq. 4.7 in Imbens and Kalyanaraman [93].

$$\hat{h}_{opt} = C_k \cdot \left(\frac{2 \cdot \frac{\hat{\sigma}^2(c)}{\hat{f}(c)}}{\left(\hat{m}_+^{(2)}(c) - \hat{m}_-^{(2)}(c) \right)^2 + \left(\hat{r}_+ + \hat{r}_- \right)} \right)^{1/5} \cdot N^{-1/5}$$

where:

C_k is the kernel function (this equation takes uniform kernel function as an example);

$\hat{\sigma}^2$ is the estimated conditional variance function of the rating variable at the cut-off point to the weighting function in use;

c is the cut-point value;

$\hat{f}(c)$ is the estimated conditional variance function of the running variable at the cut-off;

$\hat{m}_+^{(2)}$(c) as well as $\hat{m}_-^{(2)}$ (c) is the second derivative of the relationship between the outcome and running variable;

$\hat{r}_+$ and $\hat{r}_-$ is the regularization term to the denominator in the equation to adjust for the potential low precision in estimating the second derivatives.

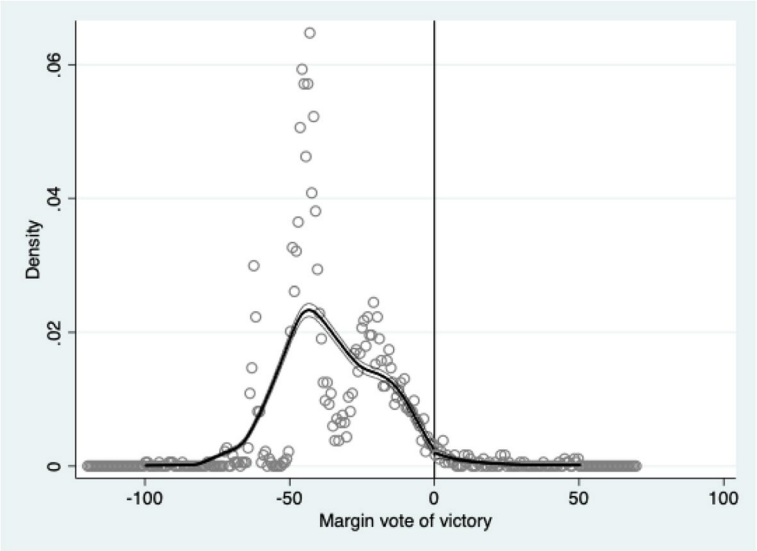

Fig. 3 McCrary [118] test for continuity. This figure presents a graphic outlook of McCrary's [118] test for the continuity of vote share distribution around the cut-off. The null hypothesis is continuous distribution around the cut-off. With a *p*-value of 0. 29), the null fails to be rejected

N is the number of observations.

A limitation of this RDD is that the effect is identified by a subgroup of proposals with vote outcomes near the cut-off point. Although this limitation is common in any RDD design, it requires additional attention in this setting due to the relatively limited number of close call proposals. Accordingly, a potential caveat is that companies around the discontinuity may not be representative of the companies far from the discontinuity, which would limit the external validity of our findings.

In sum, the parametric approach tries to pick the right model to fit a given data set, while the nonparametric approach tries to pick the right data set to fit a given model. Specifically, the parametric approach focuses on finding the optimal functional form between the outcome and the rating variable to fit the full set of data. At the same time, the most commonly used nonparametric regression analysis for RDDs — local polynomial regression — searches for the optimal data range within which a simple linear regression can produce a consistent estimate.

When choosing between these two strategies, the trade-off between bias and precision must be taken into consideration. Since the parametric/global approach uses all available data in the estimation of treatment effects, it can potentially offer greater precision than the nonparametric local approach. However, it is often difficult to ensure that the functional form of the relationship between the conditional mean of the outcome and the rating variable is specified correctly over such a large range of data, and thus the potential for bias is increased. The nonparametric/local strategy substantially reduces the chances that bias will be introduced by using a much smaller portion of the data, but in most cases, it will have more limited statistical power due to the smaller sample size. We applied both approaches to estimate the effect of passing a CSR proposal on abnormal returns and financial outcomes to have a robustness check.

Before jumping to regression discontinuity results, we first test the RDD assumption that whether data around the majority threshold can be regarded as random. First, we test whether the distribution of the votes is continuous around the cut-off. If there is a sharp change in the distribution around the cut-off, the main assumption is not likely to hold. Figure 3 presents the McCrary [118] test for the continuity of the running variable, shareholder votes here, around the cut-off. The null hypothesis is the continuous distribution around the cut-off. With a *p*-value of 0.4249, we fail to reject that the distribution is continuous. As can be seen from the graph, there is no evidence of a discontinuous jump. The distribution is in line with the data distribution in Cuñat et al. [44]; Flammer [75], who also report shareholder proposals' distribution. Unlike shareholder proposals, Listokin [109] shows that management proposals (which are not included in our analysis) disapply a sharp discontinuity around the majority threshold, which suggests that management teams strategically withdraw proposals that are less likely to pass. Eventually, the final management proposals rarely fail.

Second, we compare the pre-existing differences between companies with CSR proposals passed and those

Table 4 Pre-existing differences between companies

	Passed CSR proposals		Rejected CSR proposals		
Variables	**Observation**	**Mean2**	**Observation**	**Mean**	**Difference in Mean**
Size	56	0.034	2280	0.033	0.001
ROA	56	0.004	2258	−0.003	0.007
ROE	52	0	2018	0.031	−0.03
NPM	56	0.027	2258	−0.005	0.032
Tobin's Q	51	−0.041	2029	−0.006	−0.036
Labor productivity	56	−25.494	2274	7.412	−32.906
Capital Exp	56	−0.005	2265	−0.001	−0.003
Leverage	56	0.002	2269	0.009	−0.007
Cash	56	0.001	2277	−0.001	0.001
Sales growth	55	0.037	2276	−0.018	0.054
M/B	55	−0.053	2272	−0.005	−0.048

This Table compares key variables between proposals that are voted to pass and proposals that are voted to fail. Δ ROA means ROAt – ROAt-1 and the same for other variables. Return on assets (ROA) is the ratio of operating income before depreciation to the book value of assets. Return on equity (ROE) and net profit margin (NPM) is defined similarly except that the denominator is the book value of equity plus deferred taxes and investment tax credit for ROE and sales for NPM. Tobin's Q is the ratio of the market value of total assets (book value of assets plus the market value of equity minus the sum of the book value of equity plus deferred taxes and investment tax credit) to the book value of assets. Labor productivity is the ratio of sales to the number of employees. Capital expenditures are the ratio of capital expenditures to total assets. Sales growth is the growth in sales compared with the previous fiscal year. Leverage is the ratio of debt in current liabilities and long-term debt to total assets. All ratios are winsorized at 5%

Table 5 Abnormal returns around the different threshold

			Vote share			
	All proposals	**Non-close**	**±15%**	**±7.5%**	**±2.5%**	**±1%**
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
Pass	0.00458*	0.000287	0.00808*	0.00957*	0.00829*	0.00980
	(1.69)	(0.07)	(1.77)	(1.81)	(1.90)	(1.27)
N	2231	1897	334	129	36	15
R-sq	0.001	0.000	0.009	0.025	0.096	0.110

This Table presents OLS regressions of the abnormal returns on the voting day of the vote on the Pass dummy which equals one if the proposal is adopted and zero if rejected. Abnormal returns are computed using the four-factor model of Carhart [30]. In column (1), the sample consists of all 2231 CSR proposals. Column (2) restricts the sample to non-close CSR proposals with a vote share more than 15% above or below the majority threshold. Columns (3)–(5) restrict the sample to CSR proposals whose vote share is within 15%, 7.5%, 2.5%, and 1% of the majority threshold, respectively. All models control for year fixed effects. Standard errors in parentheses are clustered at the firm level. Significance at the 10%, 5%, and 1% levels is indicated by ∗, ∗∗, and ∗∗∗, respectively

with CSR proposals rejected. Table 4 shows the difference in means of changes in variables from year t-1 to year t. All variables present no significant difference in means, showing that there are no systematic differences in firms that vote to pass a CSR proposal compared to those that marginally reject a CSR proposal. McCrary density test and pre-existing differences comparison results suggest that the RDD assumption holds.

4 Empirical results

Figure 2 compares the average abnormal return on the voting day between firms that adopt a CSR proposal and those which reject a CSR proposal. The average abnormal return on the voting day of firms below the threshold is around zero, which is observably lower than the average abnormal return above the threshold. The graphic comparison suggests that firms with a CSR proposal passed generally have higher abnormal returns than those with a CSR proposal rejected. However, further analysis is needed to show the causality.

Table 5 presents OLS estimates of the difference in abnormal returns between the CSR proposals being adopted and those being rejected for increasingly small margins around the threshold on the voting day. The dependent variable is the abnormal return on the day of the shareholders' meeting (t = 0), which is computed using the four-factor Carhart [30] model. The four factors

Table 6 Abnormal Returns RDD Results (The parametric approach)

	(1) Abnormal return	(2) Abnormal return	(3) Abnormal return	(4) Abnormal return	(5) Abnormal return	(6) Abnormal return
Pass	0.0122**	0.0125**	0.0131**	0.0108***	0.0109**	0.0115**
	(2.28)	(2.26)	(2.00)	(2.64)	(2.49)	(2.47)
Polynomial order	2	3	4	2	3	4
Firm Fixed Effects	YES	YES	YES	YES	YES	YES
Year Fixed Effects	YES	YES	YES	YES	YES	YES
Controls	NO	NO	NO	YES	YES	YES
N	2231	2231	2231	1870	1870	1870
R-sq	0.467	0.467	0.467	0.521	0.521	0.521

The dependent variable, abnormal return on the voting day, estimated from the Carhart [30] four-factor model. Column (1)–(3) adopt RDD without adding additional control variables. Column (4)–(6) includes the variables ROA, ROE, Net profit margin, Tobin's Q, Labor productivity, Capital expenditures, Leverage, and Sales growth. Different polynomials of orders 3, 4, and 5 are adopted to conduct a robustness check. Standard errors in parentheses are clustered at the firm level. Significance at the 10%, 5%, and 1% levels is indicated by ∗, ∗∗, and ∗∗∗, respectively

are market return, the size factor, book-to-market factor and the momentum factor. Daily stock return data are obtained from CRSP and four factors are obtained from Kenneth French's website (http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data_library.html). The coefficient of the four-factor model are estimated using an estimation period of 200 trading days that starts 20 trading days before the shareholders' meeting. A stock needs to have a minimum of 15 days with non-missing return during the 200-day estimation period.

Column (1) reports the difference on the entire sample, showing that, on average, adopting a CSR proposal is associated with 0.458% higher abnormal returns than rejecting a CSR proposal. The significant but relatively small magnitude results might be derived by the non-close proposals, which are proposals with vote share more than 10% above or below the threshold. Column (2) provides further evidence that when restricting the sample to non-close CSR proposals with vote share that pass or reject by a large margin. The difference in abnormal returns is close to zero. This finding suggests that the return of non-close proposals is predictable, and therefore the information has already been incorporated into stock prices prior to shareholder meetings. Columns (3)–(6) restrict the sample to CSR proposals that pass or fail with an increasingly small margin of votes. In column (4), for votes within 7.5% margin of the threshold, the abnormal return is 0.957% higher for CSR proposals that passed than CSR proposals failed, significant at 10% level. Given the average abnormal returns on the voting day is only around 0.1%, the difference is large. The weaker significance results in column (6) might suffer from the small number of observations bias (only 15 proposals with vote shares within 1% margin of the threshold). Overall, the results in Table 5 indicate that CSR proposals that passed marginally lead to a significant increase in shareholder value compared to those that failed marginally.

Table 6 reports RDD estimates using the parametric approach Eq. (1). Unlike the results in Table 5, this approach uses the whole sample and provide a more efficient estimate. Column (1)–(3) allows different polynomials of orders 3, 4, and 5 in the votes share on each side of the threshold. As is shown in column (1), with polynomials of order two in the vote share, the coefficient of *Pass* dummy is 1.22%, significant at 5% level, indicating that passing a CSR proposal leads to 1.22% higher abnormal returns. This estimate is consistent with Flammer [75] who reported that the passage of close call CSR proposal yielded an abnormal return of 0.92% on the voting day. Column (2) and (3) show similar results with polynomial order of three and four. We further estimate the RDD model with control variables prior to the voting date. Column (4)–(6) show the estimates with control variables are around 0.1% lower than the estimates in column (1)–(3), which is very small. RDD method assumes that there should be no significant differences in the characteristics of firms with a CSR proposal marginally passed and failed to pass.

Nonparametric RDD estimates specified in eq. (2) are reported in Table 7, which only use observations around the threshold and find out an optimal data-driven interval instead of using a pre-decided margin of vote share. Column (1)–(3) allows different polynomials of orders 3, 4, and 5 in the votes share on each side of the threshold. In column (1), the RD Estimate is 0.0198, which suggests that passing a CSR proposal leads to a 1.98% increase in shareholder value, significant at a 5% level. This number is larger than the estimates using the parametric approach, 1.22% in Table 6 column (1), mainly due to the different number of observations included (the

Table 7 Abnormal Returns RDD Results (The nonparametric approach)

	(1) Abnormal return	(2) Abnormal return	(3) Abnormal return	(4) Abnormal return	(5) Abnormal return	(6) Abnormal return
RD_Estimate	0.0198**	0.0106*	0.0150*	0.0193**	0.0185**	0.00899*
	(2.39)	(1.69)	(1.65)	(2.17)	(2.20)	(1.77)
Controls	NO	NO	NO	YES	YES	YES
Polynomial order	2	3	4	2	3	4
N	2231	2231	2231	1870	1870	1870

The dependent variable, abnormal return on the voting day, is estimated from the Carhart [30] four-factor model. Column (1)–(3) adopt RDD without adding additional control variables. Column (4)–(6) includes the variables ROA, ROE, Net profit margin, Tobin's Q, Labor productivity, Capital expenditures, Leverage, and Sales growth. Different polynomials of orders 3, 4, and 5 are adopted to conduct a robustness check. Standard errors in parentheses are clustered at the firm level. Significance at the 10%, 5%, and 1% levels is indicated by ∗, ∗∗, and ∗∗∗, respectively

Table 8 Abnormal Returns RDD Results Robustness Check

	(1) Abnormal return_3F	(2) Abnormal return_3F	(3) Abnormal return_3F	(4) Abnormal return_3F	(5) Abnormal return_3F	(6) Abnormal return_3F
Pass	0.0103**	0.0104**	0.0108**	0.0105**	0.0108**	0.0108**
	(2.35)	(2.23)	(2.16)	(2.38)	(2.28)	(2.16)
Polynomial order	2	3	4	2	3	4
Firm Fixed Effects	YES	YES	YES	YES	YES	YES
Year Fixed Effects	YES	YES	YES	YES	YES	YES
Controls	NO	NO	NO	YES	YES	YES
N	2126	2126	2126	1876	1876	1876
R-sq	0.527	0.527	0.527	0.549	0.549	0.549

The dependent variable, abnormal return on the voting day, is estimated from the Fama–French three-factor model. Column (1)–(3) adopt RDD without adding additional control variables. Column (4)–(6) includes the variables ROA, ROE, Net profit margin, Tobin's Q, Labor productivity, Capital expenditures, Leverage, and Sales growth. Different polynomials of orders 3, 4, and 5 are adopted to conduct a robustness check. Standard errors in parentheses are clustered at the firm level. Significance at the 10%, 5%, and 1% levels is indicated by ∗, ∗∗, and ∗∗∗, respectively

Table 9 RDD results excluding Governance proposals confounding effects

	(1) Abnormal return	(2) Abnormal return	(3) Abnormal return	(4) Abnormal return	(5) Abnormal return	(6) Abnormal return
Pass	0.0126**	0.0128**	0.0131*	0.0146**	0.0160**	0.0150**
	(2.20)	(2.15)	(1.85)	(2.22)	(2.30)	(2.03)
Polynomial order	2	3	4	2	3	4
Firm Fixed Effects	YES	YES	YES	YES	YES	YES
Year Fixed Effects	YES	YES	YES	YES	YES	YES
Controls	NO	NO	NO	YES	YES	YES
N	2137	2137	2137	1424	1424	1424
R-sq	0.459	0.459	0.459	0.573	0.573	0.574

The sample in the RD regressions below excludes all shareholder meetings in which a governance proposal received a vote share within 10% and 20%, respectively, of the majority threshold. Return on assets (ROA) is the ratio of operating income before depreciation to the book value of assets. Tobin's Q is the ratio of the market value of total assets (book value of assets plus the market value of equity minus the sum of the book value of equity plus deferred taxes and investment tax credit) to the book value of assets. ROA t + 1 is one year after the voting year, and ROAt + 2 is two years after the voting year, same for Tobin's Q. Different kernel function (uniform and triangular) and polynomial order of 3 and 4 are adopted to conduct robustness check. Standard errors in parentheses are clustered at the firm level. Significance at the 10%, 5%, and 1% levels is indicated by ∗, ∗∗, and ∗∗∗, respectively

Table 10 Long-term effects of passing CSR proposals

	(1) ROA	(2) ROE	(3) Tobin's Q	(4) NPM	(5) Sales growth	(6) Labor productivity	(7) Capital Expenditure	(8) Leverage
Panel A								
Voting year t	−0.00685	0.00712	−0.0788	−0.00914	−0.0566	−39.54	−0.00496*	−0.0134*
	(−0.73)	(0.05)	(−1.52)	(−0.42)	(−1.30)	(−0.91)	(−1.69)	(−1.77)
One year later t + 1	0.00130	0.0776	0.00689	0.0214	−0.0262	−105.5	−0.00625	−0.0108
	(0.15)	(0.57)	(0.09)	(1.53)	(−0.71)	(−1.20)	(−1.53)	(−0.78)
Two year later t + 2	0.0109	−0.116	0.0252	0.0312*	0.0394	−52.83	0.00416	0.000852
	(1.04)	(−0.44)	(0.31)	(1.78)	(0.77)	(−0.46)	(0.61)	(0.04)
Three year later t + 3	0.00839	−0.356	0.0189	0.0200	0.0520	−35.32	0.00310	−0.0107
	(0.68)	(−0.85)	(0.21)	(1.03)	(1.18)	(−0.36)	(0.36)	(−0.44)
Four year later t + 4	−0.00662	−0.734	− 0.0779	0.00345	− 0.0358	3.786	− 0.00920	0.00247
	(−0.36)	(−1.09)	(−0.63)	(0.16)	(−0.74)	(0.02)	(−0.98)	(0.09)
Meeting fixed effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Distance to meeting fixed effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Polynomial order	2	2	2	2	2	2	2	2
The different function below/above cut-off	No	No	No	No	No	No	No	No
N	9615	8659	8718	9615	9697	9696	9666	9662
R-sq	0.276	0.084	0.444	0.212	0.126	0.383	0.373	0.357
Panel B								
Voting year t	−0.00696	−0.0193	−0.0778	−0.00909	−0.0556	−47.98	−0.00488*	−0.0134*
	(−0.74)	(−0.14)	(−1.49)	(−0.42)	(−1.28)	(−1.06)	(−1.65)	(−1.77)
One year later t + 1	0.00103	0.0986	0.00181	0.0206	−0.0264	−90.09	−0.00634	− 0.0139
	(0.12)	(0.63)	(0.03)	(1.45)	(−0.71)	(−1.02)	(− 1.58)	(− 1.02)
Two year later t + 2	0.00995	−0.167	0.0126	0.0299*	0.0397	−48.54	0.00449	−0.000198
	(0.95)	(−0.63)	(0.15)	(1.70)	(0.77)	(−0.42)	(0.66)	(−0.01)
Three year later t + 3	0.00677	−0.413	−0.00228	0.0178	0.0513	−18.93	0.00370	−0.0146
	(0.54)	(−0.99)	(−0.03)	(0.92)	(1.15)	(−0.19)	(0.43)	(−0.61)
Four year later t + 4	−0.00536	−0.531	− 0.0759	0.000412	− 0.0397	58.88	− 0.00938	−0.00538
	(−0.29)	(−0.99)	(− 0.61)	(0.02)	(− 0.82)	(0.38)	(− 0.99)	(− 0.21)
Meeting fixed effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Distance to meeting fixed effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Polynomial order	2	2	2	2	2	2	2	2
Different function below/above cut-off	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	9615	8659	8718	9615	9697	9696	9666	9662
R-sq	0.276	0.084	0.445	0.213	0.126	0.384	0.380	0.358

This Table presents the long-term effect of passing a CSR proposal on firm outcomes at the year of the voting t, one year after the voting t+1, and the subsequent four years (average from t+2 to t+4). Return on assets (ROA) is the ratio of operating income before depreciation to the book value of assets. Return on equity (ROE) and net profit margin (NPM) is defined similarly except that the denominator is the book value of equity plus deferred taxes and investment tax credit for ROE and sales for NPM. Tobin's Q is the ratio of the market value of total assets (book value of assets plus the market value of equity minus the sum of the book value of equity plus deferred taxes and investment tax credit) to the book value of assets. Labor productivity is the ratio of sales to the number of employees. Capital expenditures are the ratio of capital expenditures to total assets. Sales growth is the growth in sales compared with the previous fiscal year. Leverage is the ratio of debt in current liabilities and long-term debt to total assets. All ratios are winsorized at 5%. All models control for firm fixed effects and year fixed effects. Standard errors in parentheses are clustered at the firm level. Significance at the 10%, 5%, and 1% levels is indicated by ∗, ∗∗, and ∗∗∗, respectively

Table 11 Long-term effects of passing CSR proposals in different KLD ranking groups

	(1) ROA	(4) NPM	(5) Sales growth	(6) Labor productivity	(7) Capital expenditure	(8) Leverage
Pass	0.011	−0.020	−0.085	−57.285	−0.008	−0.004
	(0.523)	(−0.255)	(−1.430)	(−0.664)	(−1.338)	(−0.302)
High CSR Concerns	−0.002	0.000	0.031	−42.243	0.003	0.000
	(−0.260)	(0.008)	(1.533)	(−0.710)	(0.892)	(0.047)
Pass * High CSR Concerns	−0.485***	−0.478***	−0.515***	66.693	−0.010	0.085***
	(−20.206)	(−6.187)	(−7.434)	(0.536)	(−1.467)	(5.314)
Firm Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes
R-square	0.790	0.724	0.456	0.933	0.903	0.943
Observation	1481	1481	1488	1488	1483	1480

This Table presents the long-term effect of passing a CSR proposal on firm in high CSR concerns group measured by KLD CSR concerns. Return on assets (ROA) is the ratio of operating income before depreciation to the book value of assets. Return on equity (ROE) and net profit margin (NPM) is defined similarly except that the denominator is the book value of equity plus deferred taxes and investment tax credit for ROE and sales for NPM. Tobin's Q is the ratio of the market value of total assets (book value of assets plus the market value of equity minus the sum of the book value of equity plus deferred taxes and investment tax credit) to the book value of assets. Labor productivity is the ratio of sales to the number of employees. Capital expenditures are the ratio of capital expenditures to total assets. Sales growth is the growth in sales compared with the previous fiscal year. Leverage is the ratio of debt in current liabilities and long-term debt to total assets. All ratios are winsorized at 5%. All models control for firm fixed effects and year fixed effects. Standard errors in parentheses are clustered at the firm level. Significance at the 10%, 5%, and 1% levels is indicated by ∗, ∗∗, and ∗∗∗, respectively

nonparametric approach only uses observations around the threshold). Column (4)–(6) show the estimates with control variables, which generate similar results.

To conduct a robustness check, we compute abnormal returns using the Fama-French-three-factor model instead of the Carhart four-factor model. As reported in Table 8, the results are consistent with the results in Table 6. Thus, the estimation results support hypothesis 1a. Passing a CSR proposal yields significantly higher abnormal returns.

One potential concern is that shareholders may vote on both CSR proposals and governance proposals on the same day. As Cuñat et al. [44] document, there are more governance proposals than CSR proposals, and the passage of close-call governance proposals also leads to positive abnormal returns. It is possible that governance proposals that pass marginally tend to appear in shareholder meetings when CSR proposals also pass marginally. If so, my results might be capturing some effect of passing governance proposals. To address the confounding effect, we re-estimate the RDD specification by excluding all shareholder meetings when a governance proposal passed within a 10% margin of vote share. As shown in Table 9, the results are robust after excluding the observations with both close-call governance proposals and close-call CSR proposals.

Previously the results have covered the effect of passing a close call CSR proposal on shareholder values (short-term stock market reaction). In this part, we estimate the effect of passing a close call CSR proposal on the long-term financial outcomes. We apply the specification formed by Eq. (1) at the annual level. This model estimates the effect of passing a CSR proposal on a given financial outcome variable in the year of the voting (t), the following year (t + 1), and the following 3 years (t + 2 to t + 4). Table 10 presents the results. There is no significant change in terms of ROA, ROE, Tobin's Q, Net profit margin, Sales growth, and Labor productivity. We only observe a slight decrease in Capital expenditure and Leverage. Firms might only give signals of doing good but not actually engage in it. The results are in favor of hypothesis 2b. One explanation of the unmatched short-term abnormal return RDD results and long-term operating performance results suggest the adoption of CSR proposals might be symbolic.

The institutional theory developed by DiMaggio and Powell [52] provides a theoretical framework on how organizational structures are formed, why changes occur and what makes organizations similar eventually; more importantly, it explains why practices without obvious economic benefits emerge [122]. By definition, institutions refer to not only the formal government and corporate organizations but also norms, incentives, rules, and stable patterns of behavior [116, 130]. The increasing global popularity of CSR strategies and engagement can be viewed as one aspect of the worldwide spread of management concepts. As discussed in the previous section, CSR is rewarded by employees [131], customers [117], investors [112], and governments [94]. The fleeting trend, CSR engagement, may merely be seen as

firms' efforts to comply with such institutional pressures that do not necessarily lead to superior firm performance [143]. Based on the institutional point of view, one question arises that what leads to CSR engagement with no legal requirements and economic benefits? Let us get back to the assumption of institutional theory: organizations act to enhance and protect their legitimacy [144]. Following the leading organizations' CSR strategy and behaviors can be a smart way to gain legitimacy. Organizational practices such as appointing independent directors and CSR are considered as "the right thing to do". Although many scholars interpret it as bandwagon effect [150], practitioners tend to regard it as a signaling device, even though symbolic sometimes [88]. Studies even find some firms mislead their stakeholders by "greenwashing" themselves, however, without having actual CSR practices [16, 48]. Symbolic (talking) and substantive (walking) become the terms on how scholars distinguish greenwashes from those who actually engage in CSR practices [167]. Symbolic management is not new. It refers to the attempt to meet external expectations but do not have actual changes in the business process [9, 167]. In the majority cases, firms fail to walk the walk [111], hence symbolic CSR practices do not necessarily result in better firm performance [143].

According to institutional theory, corporates face external pressure to engage in CSR, and such behaviors make them more similar but not necessarily efficient. Besides, many firms fail to walk the talk. Thus, passing a CSR shareholder proposal does not necessarily lead to superior firm performance.

Table 11 shows the long-term effect of adopting CSR proposals on operating performance in both the high KLD strength and low KLD strength group. Firms within low KLD strength rankings experience a significant drop in Tobin's Q after the voting year. The magnitude is −0.0966 on the year of shareholder meetings and becomes larger 1 year after the shareholder meeting −1.114, and there is no significant decrease in ROA if companies have high KLD rankings. The long-term negative effects of passing CSR proposals on ROA and Tobin's Q are likely to be driven by the observations in the low KLD ranking.

5 Conclusion

This study draws on instrumental stakeholder theory [55, 78] to analyze the causal relation between CSR and CFP. We find that the passage of CSR proposals leads to a significant positive abnormal return on the voting day. However, different from Flammer [75], the adoption of a CSR proposal does not lead to superior firm performance in the long term. Unlike the past, people nowadays tend to distinguish symbolic CSR practices from substantial CSR practices. Thus, simply passing a CSR proposal does not result in better performance in the long run. Like all other RDD studies, this study is subject to the "internal versus external validity" trade-off. While the discontinuity of shareholder proposal votes provides a causal influence of the adoption of CSR proposals on firm performance, the results are based on the targeted CSR shareholder proposal. The sample firms are all included in the S&P 1500; hence all are large companies that do not necessarily represent all US public companies, let alone the rest of the world. Caution is required when generalizing the results to other companies.

Abbreviations

CSR: Corporate socially responsible; ESG: Environmental, Social, and Governance; RDD: Regression discontinuity design.

Authors' contributions

This paper is based on ZX's MPhil thesis at the University of Edinburgh. ZX identified the research question, reviewed the literature, carried out the data collection and statistical analysis under the supervision of WH and BM. RD revised the manuscript. All authors read and approved the final version of the manuscript.

Funding

This paper does not benefit from any public or private funding.

Declarations

Ethics approval and consent to participate

N/A

Competing interests

Wenxuan Hou (WH) is an editorial board member for Carbon Neutrality and was not involved in the editorial review, or the decision to publish this article. All authors declare that there are no competing interests.

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Received: 20 December 2021 Accepted: 15 June 2022
Published online: 25 August 2022

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