Asia-Pacific Financial Markets (2022) 29:221–252
https://doi.org/10.1007/s10690-021-09347-3

ORIGINAL RESEARCH

Corporate Social Responsibility: Is Too Much Bad?—Evidence from India

Ved Dilip Beloskar[1,2] · **S. V. D. Nageswara Rao**[1]

Accepted: 1 August 2021 / Published online: 2 September 2021
© The Author(s), under exclusive licence to Springer Japan KK, part of Springer Nature 2021

Abstract

Over the years, firms have been using Corporate Social Responsibility (CSR) as a strategic tool to improve their competitiveness and ultimately benefit their stakeholders. The evidence on the impact of CSR on firm performance, as documented in the literature, is mixed. This paper aims to examine the relationship between socially responsible behaviour and firm value in the Indian context. We use the natural research setting created by the Indian Companies Act, 2013, which mandates a category of firms to spend at least 2% of their net profits on CSR activities. Over the years since the introduction of the mandatory CSR regime in India, few firms have continued to spend more than the statutory minimum on CSR activities. Using Regression Discontinuity Design (RDD), we have examined the impact of CSR spending in excess of the statutory minimum on the short-term and long-term performance of firms. Using a sample of listed Indian firms which incurred CSR spending in at least one out of the preceding five financial years ending on March 31, 2019, we find that firm's choice of spending more than the required minimum on CSR negatively affects its short-term financial performance. The evidence on the impact of excess CSR spending on long-term financial performance of such firms is mixed. Overall, our study provides evidence that CSR spending in excess of the statutory minimum imposes social burden on the business activities of the firms at the expense of returns to the shareholders. The findings of our study may help firms design their CSR policies and expenditure. The evidence may also help policymakers in determining the level of mandatory CSR spending.

Keywords Corporate social responsibility · Regression discontinuity design · Shareholder value · Financial performance · Indian companies act 2013

✉ Ved Dilip Beloskar
ved.beloskar@gmail.com

S. V. D. Nageswara Rao
sonti@iitb.ac.in

1 Shailesh J. Mehta School of Management, Indian Institute of Technology, Bombay, Mumbai 400076, India

2 Anil Surendra Modi School of Commerce, NMIMS Deemed to be University, Mumbai 400056, India

JEL Classification G32 · M14 · M40 · M41 · M48

1 Introduction

The Companies Act, 2013, enacted in India, requires a category of firms to spend 2% of their average net profits of the prior three years on CSR activities. Such an obligation requiring firms to spend on CSR is perhaps unique in the world. We use this natural setting created by the Indian regulation on CSR to study the impact of CSR spending in excess of the statutory minimum on financial performance.

Existing literature provides two conflicting views on CSR by firms. According to Friedman (1970), the only responsibility of businesses is to maximize shareholder value. On the other hand, Freeman (2015) focused on stakeholder value maximization and argued that strategic CSR spending could increase firm value. While existing literature provides mixed evidence on the impact of voluntary CSR spending on firm performance, it suffers from methodological issues like potential endogeneity, reverse causality, or omitted variables problem (Margolis et al., 2012). Hence, it is difficult to conclude if the observed relationship between CSR and firm performance (i) is causal, or (ii) is due to model misspecification because of the influence of unobserved firm-level heterogeneity related to CSR (Himmelberg et al., 1999).

The Indian Companies Act, 2013 requires a category of firms to spend 2% of their net profit on CSR activities. Since the implementation of this in FY 2014–15, many firms have spent more than the required minimum. The extant literature does not address the impact of such excess CSR spending on financial performance. We, therefore, attempt to study the impact of CSR spending above the statutory minimum amount on the financial performance of firms. For the purpose of our study, firms that spend more than the statutory minimum amount on CSR are considered as socially responsible. Other firms which spend less than or just the required minimum amount on CSR may be largely driven by the motive of complying with the legal requirements. The extant literature suggests many tangible and intangible benefits of CSR to firms in the long run. We use the statutory obligation of spending 2% of average net profits of the preceding three years on CSR activities and employ RDD to examine the impact of excess CSR spending on financial performance. The RDD is a close approximation of a randomized experiment near an exogenously imposed threshold (Lee & Lemieux, 2010).

The discontinuity in our study arises from the threshold created by the regulation to spend 2% of net profits on CSR activities. This discontinuity classifies firms that are obliged to spend on CSR into *AFFECTED* (those who spend more than the required minimum) and *UNAFFECTED* (those who spend less than or just the required minimum). We examine the short-term and the long-term financial performance of *AFFECTED* and *UNAFFECTED* firms during 2014–19. The short-term financial performance of *AFFECTED* firms is lower than that of *UNAFFECTED* firms, suggesting an economically significant negative relation between CSR and shareholder value. We find that, on average, the *AFFECTED* firms experienced an annual decline in ROA and ROCE of 0.28 and

0.41%, respectively, during the period 2014–19. However, the impact of excess CSR spending on long-term financial performance [(Long Term Investor Value Appropriation) LIVA/Total Revenue, Enterprise Value (EV)/ Total Assets and Tobin's Q] of *AFFECTED* firms is mixed. The results suggest that the firm's choice of spending more than the required minimum on CSR imposes significant costs leading to a decline in shareholder value. We also conduct additional tests to confirm the assumptions of RDD.

We make several contributions to the extant literature on CSR and firm value. Our study establishes a potential relationship between the choice of firms to spend more than the required minimum on CSR and firm value. Studies of CSR and firm value are replete with inferential problems like endogeneity and reverse causality. To overcome this problem, we use RDD to mitigate the possible effects of endogeneity. We find a negative relationship between the choice of firms to spend more on CSR and firm value. The negative impact of excess CSR spending on financial performance can be attributed to the additional financial burden at the cost of returns to shareholders. Valuable financial and human resources are diverted for the welfare of other stakeholders at the cost of shareholders of the firm. This, in our opinion, is not a Pareto-efficient outcome. Our study is also one of the first attempts to examine the impact of statutory minimum CSR spending. Our results demonstrate that spending more than the required minimum on CSR has negative consequences for shareholders.

The results of this study, though derived from Indian CSR regulations, can be helpful to other countries where the introduction of mandatory CSR is under consideration. The findings of our study have implications for the CSR spending choices of firms. In the context of the current "comply or explain" CSR legislative regime in India, the results of our study suggest that spending the required minimum on CSR is beneficial to the shareholders.

The paper is organized as follows. Section 2 includes an introduction to the mandatory CSR regime in India. The extant literature is reviewed in Sect. 3, while the hypotheses are defined in Sect. 4. The research design is presented in Sect. 5, and the results are discussed in Sect. 6. The conclusions are presented in Sect. 7, while a brief discussion of limitations and areas for further research are included in Sect. 8.

2 Background to the Mandatory CSR Legislation in India

The socio-economic problems continued to persist despite economic progress even after 70 years since India became a republic. Adoption of mixed economy model with frequently changing government policies and procedures led to structural problems in the Indian economy. Over time, it has become clear that efforts of the government may be inadequate given the size of Indian population and their needs. With the implementation of economic reforms in India and the consequent growth of private sector, the government has realized that CSR can be an effective tool to eradicate social evils like poverty, hunger, illiteracy, etc. This has an advantage of the huge power of influence that business houses hold over the common public (Khandelwal & Bakshi, 2014).

India replaced the 60-year old legislation on August 29, 2013, by enacting the Companies Act, 2013. The new legislature is more rule-based and hence provides an opportunity to make Indian corporate regulations more contemporary. The Companies Act, 2013 introduced a slew of provisions that would change the way Indian companies carried on their business activities. The regulations governing CSR made India one of the few countries to mandate certain categories of firms to spend a specified percentage of their profits on socially responsible activities or provide explanation for failing to do so. The concept of CSR, which was voluntary earlier, was made mandatory under the law for the first time.

Section 135 of the Companies Act, 2013 (effective from the financial year 2014–15) lays down the framework for mandatory CSR in India. This section applies only to companies that meet at least one of three requirements in any financial year, viz., net worth of INR 500 crore (~USD 66 million) or more, turnover of INR 1000 crore (~USD 133 million) or more or a net profit of INR 5 crore (~USD 6,60,000) or more.[1] If a firm satisfies any of these criteria, then it shall undertake the following:

i. Constitute a CSR Committee of the Board consisting of three or more directors, out of which at least one director shall be an independent director.
ii. Disclose the composition of the CSR Committee in the Board's report.
iii. CSR committee shall formulate a CSR policy which shall indicate the activities to be undertaken by the company, the amount of expenditure to be incurred.
iv. Board of the company shall approve the CSR policy and disclose the same after considering recommendations of the CSR committee and ensure activities mentioned therein are undertaken.
v. Board to ensure that the company spends at least 2% of average net profits (during the preceding three years) in pursuance of the CSR policy; in case of failure to do so, reasons for the same shall be specified.

Schedule VII of the Companies Act, 2013 lists the activities which may be included by companies in their CSR policies. The list under schedule VII is broad and covers many socially responsible activities like eradication of hunger and poverty, promoting healthcare, sanitation, education and gender equality, ensuring environmental sustainability, protection of national heritage, rural development, etc. This list gives choice to firms to spend on various activities.

The main events which led to the passage of Sect. 135 of the Companies Act, 2013 and further evolution of responsible business conduct in India are summarized in Table 1.

Companies that are mandated to spend a minimum of 2% of their average net profits on CSR activities but are not able to do so were required to explain the reasons for CSR expenditure lesser than the statutory minimum. In January 2021, the Indian government notified penalty provisions for flouting the CSR

[1] The figures in USD are based on the exchange rate 1 USD = INR 75.50.

Table 1 Historical perspective of the CSR legislation in India *Source:* www.pib.gov.in, CSR Voluntary Guidelines (2009), Report of the High-Level Committee on Corporate Social Responsibility (2018) accessed at https://www.mca.gov.in/Ministry/pdf/CSRHLC_13092019.pdf, various media reports and Dharmapala and Khanna (2018)

Date/ Month-Year	Particulars
2009	Voluntary guidelines on CSR, 2009 were notified by the Ministry of Corporate Affairs (MCA)
August 2010	The first announcement of mandatory CSR requirement using the specific size thresholds
September 2010	Parliamentary Standing Committee recommends mandatory CSR
December 2010	News of relaxation from mandatory CSR to comply or explain requirement
2011	MCA released National Voluntary Guidelines on Social, Environmental and Economic Responsibilities of Business (NVGs)
2012	Securities and Exchange Board of India (SEBI) mandates top 100 listed companies by market capitalisation to file Business Responsibility Reports (BRR) based on NVGs
December 18, 2012	The Companies Bill, 2012 (containing the CSR provisions) is passed by the Loksabha (lower house of the Indian Parliament)
August 08, 2013	The Companies Bill, 2012 (containing the CSR provisions) is passed by the Rajyasabha (upper house of the Indian Parliament)
August 29, 2013	President gives his assent to the Companies Bill, 2012, thereby leading to the enactment of Companies Act, 2013
September 2013	MCA issues rules on CSR for the Companies Act, 2013
April 01, 2014	Section 135 becomes effective w.e.f. FY 2014–15
2015	SEBI extends BRR reporting to top 500 companies by market capitalisation
2018	Zero Draft of National Action Plan on Business and Human Rights released by MCA
2019	National Guidelines on Responsible Business Conduct released

obligations. Companies which now fail to comply with the provisions relating to CSR expenditure will be punishable with a penalty equal to twice the unspent amount or Rs. 1 crore, whichever is less. Further, every officer of such company who defaults in the compliance will be liable for a penalty equal to one-tenth of the unspent amount or Rs. 2 lakhs, whichever is less. Additionally, the government has also mandated impact assessment of large CSR projects by companies by independent agencies. These steps have been taken in the right direction by the Government of India to ensure CSR implementation in the right spirit.

CSR related disclosures made in the Director's report include details of the CSR policy and the CSR initiatives undertaken during the year. India's CSR reporting survey 2019 by KPMG has studied the disclosures made by the 100 largest listed Indian companies by market capitalization as on March 31, 2019. The survey applauds the increasing quality of disclosure by Indian firms since the introduction of the CSR regulations. It highlights the efforts taken by a few companies to carry our voluntary social audits at regular intervals to monitor the impact of CSR. This clearly outlines that Indian firms intend to look beyond

donations and grant making, thereby creating goodwill among their stakeholders by disclosing such details. Also, 49% of the companies under study have spent more than the statutory minimum amount on CSR activities in FY 2018–19, up from 33% in FY 2014–15.

3 Review of Literature

Traditional finance theories have focused on the concept of shareholder value maximization. As per this, the main focus of any business should be to increase net profits and thereby maximize returns to shareholders. The shareholder value maximization view asserts that the social responsibility of any business is to increase its profits (Friedman, 1970). Friedman argued that corporations, unlike individuals, are artificial persons and cannot have "responsibilities". These theories have considered expenditure on Corporate Social Responsibility (CSR) as a drain on the firm's valuable resources. A few studies have considered CSR as a "donation" from shareholders to stakeholders that reduce profits (Aupperle et al., 1985; Freedman & Jaggi, 1982).

In contrast to the shareholder value maximization concept, the stakeholder value maximization concept propounded by Freeman (2015) is more inclusive. It argues for consideration of the interests of all stakeholders who substantially affect (or are affected by) the welfare of the firm. The instrumental stakeholder theory argues that CSR efforts are directed for the benefit of stakeholders with the ultimate goal of benefiting shareholders; i.e., CSR is "instrumental" to firm performance. Over the years, there have been numerous motivations proposed in literature behind companies spending resources on CSR. Strategically motivated CSR can be profitable for the firm and hence is termed in literature as "doing well by doing good" (Benabou & Tirole, 2010; Kitzmueller & Shimshack, 2012; Margolis et al., 2012). Companies may engage in CSR to improve their competitiveness (Marín et al., 2012), e.g., their corporate brand image, reputation, and trust reposed in the company by employees and customers. The CSR efforts may signal the quality of firm's products and draw new socially conscious customers ("green" customers) (Harjoto & Jo, 2011), reduce the cost of capital (El Ghoul et al., 2011), and reduce the company's risk (Jo & Na, 2012). Through CSR activities, companies aim to create a favourable standing for themselves in the performance of business activities (Jensen & Meckling, 1976). The economic rationale behind CSR is that it reduces the cost of transacting with stakeholders. It can also generate moral capital which may provide shareholders with insurance-like protection during a negative event, thereby preserving firm value (Godfrey, 2005). Firms undertaking CSR activities tend to develop a good reputation for themselves in transactions with their stakeholders. Wu and Hu (2019) found that firms with higher CSR score experience lower stock price crash risk, especially in employee protection, environment protection, and production quality control. For example, Volkswagen's emission scandal in 2015 shows its insensitivity towards the environment and has cost the company dearly in terms of finance and reputation. This is a classic example of corporate social irresponsibility.

The evidence on the impact of CSR on firm performance is mixed. The meta-analysis of 251 studies presented in 214 manuscripts by Margolis et al. (2012) documented a positive effect of CSR on firm performance in some studies while the remaining studies recorded a negative impact. Bhattacharyya and Rahman (2019), Barnett (2007), and Servaes and Tamayo (2013) have documented the positive impact of CSR on firm performance. Kubik et al. (2012) have found that firms spend more on CSR activities only when they excel financially. A firm's current performance could be the reason for its higher future CSR expenditure, not the other way round (Margolis et al., 2012). The 'slack resource theory' developed by Campbell (2007) states that firms with surplus resources may be inclined to spend on CSR. Thus, a majority of the existing literature on CSR and firm performance suffers from the problem of endogeneity.

Recent studies have used the Regression Discontinuity Design (RDD) to address the problem of endogeneity/ reverse causality. The RDD typically compares the outcomes just above and just below a discontinuous threshold, and attributes any differences in the outcome variable to the intervention that creates the discontinuity, assuming that firms above and below the threshold in the outcome variable are similar but for the intervention. Because the intervention is exogenously imposed, firms have no control over whether they will be affected by the intervention or not. Hence, there is an equal probability that the firm might be assigned on either side of the threshold, thereby making RDD a close approximation of a randomized experiment near the threshold (Lee & Lemieux, 2010). Manchiraju and Rajgopal (2017) employed the RDD to study the shareholder value implications of the mandatory CSR in India. They adopted an event study approach and found that cumulative abnormal returns around key events leading to the passage of the mandatory CSR rule in India is negative for firms affected by the regulation. On an average, the decline in stock price of firms forced to spend on CSR accumulated over eight important event dates is about 4.1%. They have concluded that the mandatory CSR rule imposes significant costs on firms that are required to comply. Mandatory CSR activities can impose social burdens on businesses at the expense of shareholders. Firms, on their own, can choose their optimal level of CSR spending designed to maximize their value.

Ding et al. (2016) found that above average to high levels of responsible behaviour are associated with increased firm value, while average to low levels of responsible behaviour are not significantly correlated with value. The findings of their study suggest the existence of an industry specific relationship between CSR and firm value. A study of value implications for different types of shareholders by Chen and Gavious (2015) concluded that marginal investors on the exchange accord a positive value for firm's commitment to social responsibility while the long term institutional investors and those interested in mergers and acquisitions are unaffected by the CSR efforts of the firms. In contrast, Meng and Wang (2019) showed that long-term institutional investors promote CSR engagement, while short-term investors discourage it. They found that presence of long-term institutional investors is positively associated with dividend payout, discourages managerial misbehaviors and enhances firm valuation, only for firms with high CSR performance. Daszyńska-Żygadlo et al. (2016) examined the relationship between Corporate

Social Responsibility Performance (CSP) and Corporate Financial Performance (CFP) in ten Global Industry Classification System (GICS) sectors. They concluded that corporate governance and social pillars of CSP create additional market capital measured by Tobin's Q only in the case of few industries. Environmental performance hurt firm performance in majority of the sectors. Managers must realize that targeting excessive environmental goals systematically reduces the market value of the firm. On the contrary, Sardana et al. (2020) found a direct relationship between firm's orientation towards environmental sustainability and firm performance while supplier sustainability did not significantly impact firm performance.

In the context of mandatory CSR in India, Bhattacharyya and Rahman (2019) have documented that mandatory CSR obligation is a significant but not the sole determinant of CSR spending by firms; rather, firm-specific economic factors such as size, level of cash balance, and cash flow from operations have a moderating effect. They have also reported that current mandatory CSR expenditure affects subsequent firm performance. In contrast, Lys et al. (2015) argued that CSR is not a form of corporate charity, nor does it improve future financial performance. Private information about future firm performance leads firms to undertake current CSR expenditures, thereby signalling future financial performance. Dharmapala and Khanna (2018) found a substitution effect between advertising and CSR. They also found that firms initially spending less than 2% increased their spending, and large firms spending more than 2% reduced their CSR expenditure after Sect. 135 came into effect. The legislation obliging large Indian firms to spend on CSR activities has harmed their profitability (Mukherjee et al., 2018). Further, this negative impact has been higher for those companies that had not spent on CSR activities before the legislation. Mukherjee and Bird (2016) surveyed 223 Indian companies of different legal status, size, industries, and regions to investigate the drivers and barriers of CSR expenditure, determine the attitude of corporates towards CSR activities, and the impact of making CSR spending mandatory. They have found that the main drivers of CSR are the company's concern for its social responsibility, improving its public image, and improving its relationship with the public. The barriers to CSR spending are lack of resources and know-how, the lack of support from the government, and the lack of belief that these expenditures will have a favourable impact on the firm value.

Recent literature has also focused on the relationship between CSR and stock market performance. The CSR reputation contributes positively to a firm's short-term equity performance. However, abnormal returns decline as the market gradually learns about the value of firms' social performance (Li et al., 2019). Bird et al. (2016) also reported a similar phenomenon whereby Indian investors viewed the announcement of making CSR mandatory as positive, but investor enthusiasm waned over time.

4 Hypotheses

The evidence on the relationship between CSR and financial performance is mixed. Waddock and Graves (1997) have noted that it is possible to argue for a positive, negative or no relationship between CSR and firm value. There may be a positive relationship when firms enjoy benefits in the form of increased product demand and customer loyalty, ability to recruit and retain talent, less or no reputational damage due to insurance-like shield created by CSR, etc. A negative relationship may be observed if the costs of CSR, both in terms of finance and managerial time, exceed the benefits. The past studies have primarily focused on the voluntary nature of CSR.

Extending the rationale presented by Manchiraju and Rajgopal (2017), if firms were already spending on CSR before the law was enacted, imposing regulatory constraints on their CSR choices would lead to a decline in their shareholder values. If the marginal costs of CSR are higher than its marginal benefits, then the firms will choose not to spend on CSR or spend just the statutory minimum as mandated under the law. In such a case, firms that spend more than the level of mandatory CSR expenditure should experience a decline in shareholder value due to such overspending. This view supports the neo-classical theory of CSR spending by Friedman (1970). Thus, excess CSR spending may put the firm at a competitive disadvantage which may negatively impact its short-term financial performance. We take advantage of the natural research setting created by the mandatory CSR regulations in India and hypothesise the following:

Hypothesis 1 Firms whose CSR spending is more than the required minimum experience significantly lower short-term financial performance compared to that of those which spend the required minimum or less.

In the long run, we expect a negative impact of excess CSR spending on financial performance using market-based proxies. Superior long-term financial performance is a result of the firm's ability to improve its future earnings by building and strengthening higher production and service capabilities, and gaining a competitive edge over its peers. Excess CSR spending may lead to diversion of monetary and human resources necessary to gain such competitive edge required for superior long term financial performance. Hence, we hypothesise the following negative relationship between excess CSR spending and long-term financial performance.

Hypothesis 2 Firms whose CSR spending is more than the required minimum experience significantly lower long-term financial performance compared to that of firms which spend the required minimum or less.

Table 2 Descriptive statistics of the full sample

Year	Annual CSR expenditure (INR crores)					Annual CSR expenditure (as a percentage of average net profits of the last three years)				
	Mean	Median	SD	P25	P75	Mean	Median	SD	P25	P75
Panel A: Descriptive statistics on annual CSR expenditure by firms										
2015	23.53	0.00	152.04	0.00	0.00	0.22	0.00	0.57	0.00	0.00
2016	95.35	8.05	396.17	2.60	33.58	1.97	2.00	0.13	1.99	2.01
2017	90.70	7.20	398.08	2.20	30.30	1.89	2.00	0.45	1.99	2.01
2018	90.11	7.00	418.39	2.00	29.70	1.87	2.00	1.02	1.42	2.11
2019	101.68	9.20	457.84	2.50	38.20	1.93	2.00	0.29	1.99	2.00

Year	Number of companies spending on CSR (as a percentage of their average net profits)		
	Less than or equal to 2%	More than 2%	Total
Panel B: Descriptive statistics on the level of CSR expenditure			
2015	746	36	782
2016	480	432	912
2017	553	501	1054
2018	496	601	1097
2019	592	521	1113

5 Research Design

5.1 Data

The primary source of data is the Prowess database from the Centre for Monitoring Indian Economy (CMIE). Researchers have widely used it for conducting firm-level analysis of Indian companies (Dharmapala & Khanna, 2018; Manchiraju & Rajgopal, 2017; Mukherjee et al., 2018).

The sample consists of listed firms that incurred CSR expenditure at least in one year out of the five financial years ending on March 31, 2019. The firms whose data on level of mandatory CSR, paid up equity capital, market capitalization, average net profits for preceding three financial years or return on net worth was missing were excluded from the sample. The final sample includes 1262 unique firms and 4958 firm-year observations for the period 2014–19. There are 2091 firm year observations (42% of the sample) where the annual CSR spending is more than the required minimum prescribed under the Companies Act, 2013 while in case of 2867 firm year observations (58% of our sample), it is equal to or below the said level. We have classified the firms into 11 industries, viz., Materials, Energy, Financials, Industrials, Utilities, Communication Services, Consumer Discretionary, Consumer Staples, Health Care, Information Technology and Real Estate based on Global Industry Classification System (GICS) as is done in literature (Daszyńska-Żygadlo et al., 2016; Hua Fan & Michalski, 2020; Yu et al., 2020).

In panel A of Table 2, we describe the CSR spending by firms in the full sample during the period 2014–19. Mandatory CSR was implemented in India w.e.f. FY 2014–15. The average CSR spending has been rising steadily since then and has crossed INR 100 crores (INR 1000 million) in FY 2018–19. The average and median CSR spending as a percentage of average net profits of preceding three years is around 2% for FY 2018–19 indicating that most of the companies have started meeting the obligation. The panel B of Table 2 shows that over the years, there has been an increase in the number of companies who voluntarily spend more than 2% of their average net profits on CSR activities. Around 47% of the companies spent more than the required minimum on CSR in FY 2018–19. This figure was a mere 4.6% in FY 2014–15. Over the years, many firms have also spent less than the required minimum on CSR. This is due to the nature of the regulation whereby companies have to explain the reasons for spending less on CSR ('comply or explain' nature).

To implement RDD, we focus on firms that are just below and just above the cut-off mentioned previously. We select firms whose forcing variable ranges between – 1 and +1%. We refer to this sample as RDD sample and it comprises 3757 firm year observations from 2014–19. Of these total observations, 1944 (52% of RDD sample) are classified as "treatment group" and 1813 (48% of RDD sample) are classified as "control group".

5.2 Regression Discontinuity Design (RDD)

The RDD is a quasi-experimental method with a pretest-posttest design. It helps to compare trends in an outcome across a forcing variable below and above a cut-off (or threshold). It was first conceptualized by Thistlethwaite and Campbell (1960) in their study which examined the impact of merit-based awards on future outcomes of students. In their study design, students at or above a particular test score (cut-off) received a merit-based award while the others didn't. The process of granting awards based on test scores generates a sharp discontinuity in the treatment variable (which is receiving the award) as a function of the forcing variable[2] (which is test score, in this case). The receipt of treatment is denoted by dummy variable $D \in \{0, 1\}$ where $D = 1$ if forcing variable > cut-off and $D = 0$ otherwise. The observations above the cut-off form the treatment group and those below the cut-off form the control group. Since these two groups are close to each other, we can control for all other confounding variables except the treatment. Hence, any difference in the outcome variable can be attributed to the presence of the treatment. The relationship between the outcome variable (Y) and the forcing variable can be estimated using the following regression model.

For cut-off *j* and forcing variable *k*:

$$Y_{j,k} = \beta_0 + \beta_1(k - j) + \beta_2 D + \beta_3 D(k - j) + \varepsilon_{j,k} \tag{1}$$

where 'β_2' captures the effect of the treatment on the outcome variable. $D \in \{0, 1\}$ where $D = 1$ if CSR spending as a percentage of average net profits of preceding three years > 2%, and $D = 0$ otherwise.

[2] The forcing variable is also referred to as rating variable, exposure variable or assignment variable in literature.

The inferences drawn using RDD approach are considered credible because the assignment of individuals to treatment and control groups is "as good as randomized" given that individuals cannot precisely control the assignment variable near the exogenously determined cut-off (Lee & Lemieux, 2010). The RDD assumes that firms which are just above or below the cut-off are similar except for the outcome variable. In the above example on test scores and merit-based awards, students with marks just above or below the cut-off will have similar fundamental characteristics. Since RDD compares observations just above and below the cut-off, it estimates "Local Average Treatment Effect" (LATE).

The RDD has been widely used in other disciplines such as medicine and economics. Despite its limited use in finance, the RDD has great potential for evaluation and program research. From a methodological point of view, inferences drawn from a well-implemented RDD are comparable to conclusions from randomized experiments in terms of internal validity. Thus, the RDD is a strong competitor to other randomized designs when causal hypotheses are tested. Some recent applications of RDD in finance, among others, include:

i. Akey (2015) estimated the market value of firm's political connections by comparing post-election abnormal equity returns of firms that donated to winning/losing candidates.
ii. Flammer (2015) studied the impact of CSR proposals that pass/fail by a small margin of votes on financial performance.
iii. Iliev (2010) studied the impact of Sect. 404 of the Sarbanes–Oxley Act (SOX) on U.S. firms and foreign firms above/under a specified threshold.

Our study focuses on Indian firms which are obliged to spend on CSR under the Companies Act, 2013. The firms which spend more than the required minimum on CSR (2% of average net profits of preceding three years – cut-off for the purpose of the study) can be classified as "treatment group", and those which spend less or just the required minimum can be classified as "control group". Assuming that firms which are just above and below the cut-off are fundamentally similar, unobservable firm characteristics are less likely to influence the relation between CSR spending and firm value. There is no reason to believe that a firm is more likely to spend more than the cut-off on CSR compared to other firms, thereby mitigating the possibility that firms may self-select themselves into treatment or control groups based on their private information about future profitability as suggested by Lys et al. (2015).

6 Results and Discussion

6.1 Assumptions of RDD

The first assumption underlying RDD is that the intervention should not be subject to potential manipulation. Individuals should not be able to manipulate the forcing variable and self-select themselves into treatment and control groups. For example, if firms

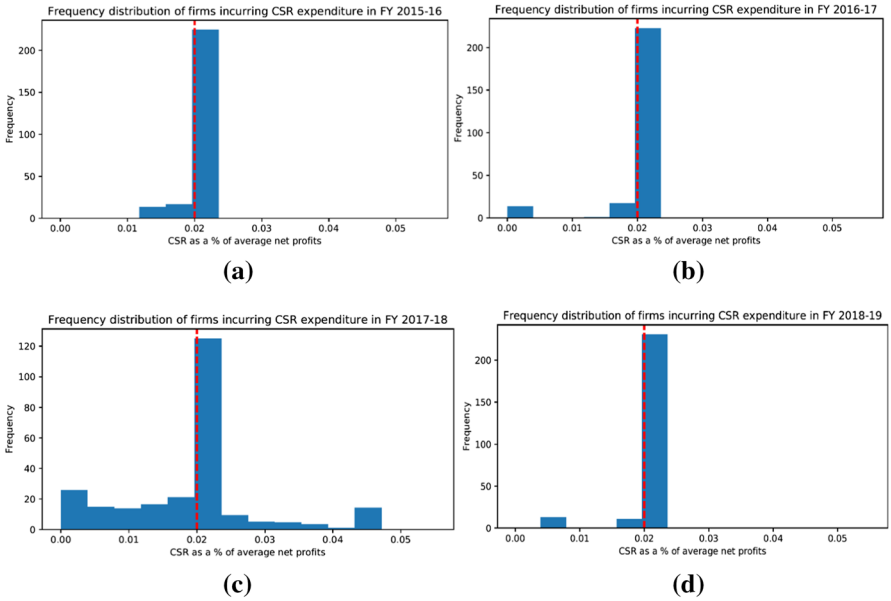

Fig. 1 Frequency distribution of firms around the cut-off (2% of average net profits)

were able to systematically manage their CSR spending above 2% of average net profits, then inferences based on RDD would be invalid because the assignment of firms to treatment and control groups is not as good as randomized. To examine this possibility, we graph the frequency of firms around the cut-off for four years ending on March 31, 2019. Any abnormal jump in the frequency of firms to the right (or left) of the cut-off would indicate that firms have deliberately managed their CSR spending in view of certain expectations like increase (decrease) in financial performance, etc. Fig. 1a–d do not depict such abnormal jumps and hence this assumption seems to hold true.

Another pre-requisite for RDD to work is that all other variables should evolve smoothly through the threshold. If other variables also exhibit discontinuity at the cut-off, the LATE estimated by RDD may be biased. To test the validity of this assumption, we test for equality of mean and median values of other characteristics (other than CSR spending) of firms in the treatment and control groups. The results are included in Table 3. The variables used in Table 3 are described in Table 8 in the Appendix. The indicators of short-term financial performance (ROA, ROCE, and RONW) are discontinuous at the cut-off. Tobin's Q, EV/Total Assets and LIVA/Total Revenue which are indicators of long-term financial performance, appear to be discontinuous at the cut-off. The variables leverage, and book-to-market value also appear to be discontinuous at the cut-off; however, the difference in their means and medians is not significant. The companies in the treatment and control groups appear to be similar in other firm characteristics that are likely to affect firm value such as capital expenditure, cash holdings, advertisement expenditure, research and development expenditure, assets, and cash flow from operations. We estimate RDD given these results as the assumptions are not violated.

Table 3 Results of the tests for equality of mean and median for the full sample

Variables	Companies spending more than 2% of average net profits on CSR			Companies spending up to 2% of average net profits on CSR			Difference in mean	Difference in median
	N = 2091			N = 2867				
	(1)			(2)				
	Mean	Median	SD	Mean	Median	SD	(1)–(2)	(1)–(2)
RONW	13.5943	11.7100	14.7234	12.2824	11.5700	16.2990	1.3119**	0.1400
ROCE	10.0235	7.8000	10.3783	9.3545	7.4100	10.7902	0.6689*	0.3900*
ROA	6.98018	5.3900	6.8367	6.5084	5.2900	6.9507	0.4717*	0.0999*
Tobin's Q	2.2445	1.5539	2.0916	2.1560	1.4416	2.2132	0.0884	0.1122**
EV by Assets	1.7027	1.0006	2.1051	1.6604	0.9499	2.2081	0.0423*	0.0414 .
LIVA by Total Revenue	– 28.5048	– 1.0821	204.5094	– 40.6909	– 1.0648	720.9622	12.1861*	– 0.0173
MCap	107,048	10,627	399,703	98,472	8,552	390,459	8,576	2,075*
Leverage	0.0784	0.0309	0.1109	0.0869	0.0357	0.1203	– 0.0085**	– 0.0048*
Capex	0.0454	0.0259	0.0702	0.0463	0.0238	0.0817	– 0.0009	0.0021
Cash	0.0598	0.0197	0.1033	0.0565	0.0200	0.0982	0.0034	– 0.0003
Advt	0.0071	0.0002	0.0183	0.0073	0.0001	0.0193	– 0.0002	0.0000
RD	0.0046	0.0000	0.0166	0.0040	0.0000	0.0126	0.0006	0.0000
BM	0.7311	0.4651	0.9113	0.8232	0.4975	1.0641	– 0.0920**	– 0.0324**
Assets	9.3669	9.1526	1.8064	9.3461	9.0726	1.8284	0.0208	0.0800
Sales growth	13.2049	7.8967	70.2596	18.9349	6.2009	143.0688	– 5.7300	1.6958*
CFO	0.0740	0.0691	0.0891	0.0704	0.0716	0.0947	0.0036	– 0.0025

This table reports the mean, median, and standard deviation of various firm characteristics for the companies in the treatment and control groups of the full sample which comprises of 4,958 firm-year observations from 2014 to 2019. The significance of differences in means and medians are evaluated based on the t-test and Mann–Whitney test, respectively (p-values for the t-statistics and Z-statistics are two-tailed).***,** and * denote significance at 0.1%, 1% and 5% level respectively

6.2 Graphical Analysis

The graphs provide an intuitive way to understand the treatment effect under the RDD framework. We have plotted the dependent variables in our study, viz., Tobin's Q, EV/Total Assets, LIVA/Total Revenue, Return on Assets (ROA), Return on Capital Employed (ROCE), and Return on Net Worth (RONW) for firms in the RDD sample. Tobin's Q, EV/Total Assets and LIVA/Total Revenue are appropriate measures to capture the long-term impact of firm's CSR while ROA, ROCE, and RONW capture the short-term effect of the same (Ding et al., 2016). Hence, we have used these variables as dependent variables in our RDD framework. We estimate Tobin's Q as market value of equity and liabilities over the book value of equity and liabilities. Enterprise value is estimated as the total of market capitalization and debt of the firm reduced by cash and cash equivalents. The ratio EV/Total Assets is an important indicator of long-term financial performance. We have also included a novel indicator of long-term financial performance, viz., Long Term Investor Value Appropriation (LIVA) proposed by Wibbens and Siggelkow (2020). LIVA measures the value generated by firms for their investors over the long run. We have estimated 10-year LIVA for each firm in our sample as the sum of discounted absolute excess returns to shareholders. LIVA/Total Revenue is then used as a proxy for long-term financial performance in our study. The measurement error in the dependent variable can be absorbed in the disturbance of the regression and ignored (Greene, 2012). Hence, we assume that measurement errors, if any, present in the estimation of dependent variables should not affect our analysis.

Figure 2 a–f show scatterplots of dependent variables for the treatment and control groups. The forcing variable, (CSR spending as percentage of average net profits, in this case) ranging from –1 to 1, 0 being the cut-off point is plotted on the X-axis. The forcing variable is standardized in line with Eq. (1) for the purpose of our analysis. The estimated values of dependent variables are superimposed on the plot using third-order polynomial function for Eq. (1). To estimate local linear and polynomial regressions, an appropriate number of bins is determined and the dependent variable is averaged over each bin.

Since the only difference near the cut-off is the difference in CSR spending (above or below the required minimum), any discontinuity in the dependent variable at the cut-off can be attributed to the decision of the firm to spend more (less) than the required minimum, because it imposes the threshold and creates the discontinuity.

Figure 2a–f show a slight jump at the cut-off point. This suggests that the financial performance of firms in the treatment group may be higher than that of the control group.

Lee and Lemieux (2010) suggested that if the true relation between the 'X' and 'Y' variables is non-linear, then RDD using local linear estimations will induce a bias in favour of finding a treatment effect when there is none. Hence, in addition to a local linear estimation, we have assumed the relationship between the dependent variables and the forcing variable to be second-order and third-order polynomial functions.

The magnitude of the treatment effect 'β_2' is summarized in Table 4. Panels A, B, and C of Table 4 include the coefficients of the RDD estimated using local linear

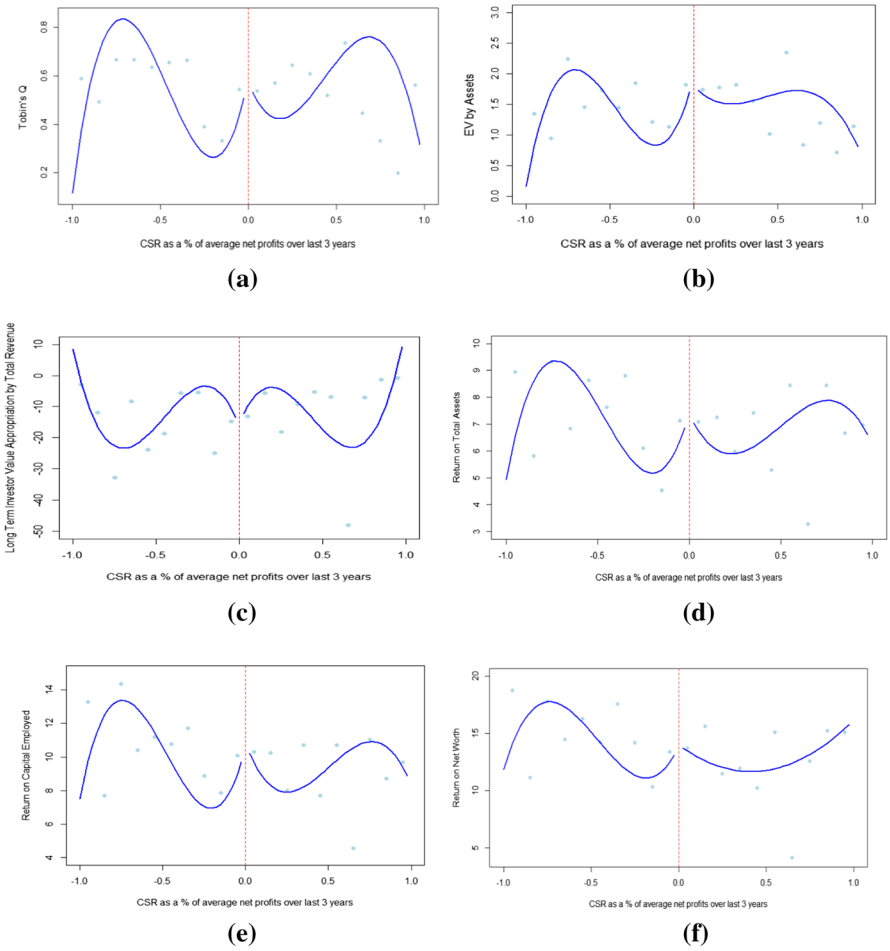

Fig. 2 Scatter plot of dependent variables (Tobin's Q, EV by Assets, LIVA by Assets, ROA, ROCE and RONW) for the RDD sample

estimation, second-order polynomial function, and third-order polynomial function respectively. We find that the level of CSR spending as a percentage of average net profits has a significant positive impact on short-term and long-term financial performance as indicated by the third-order polynomial results.

6.3 Estimation of the RDD Framework

We include other variables which may affect the dependent variable to expand our basic RDD framework. Accordingly, we estimate the following equation:

For cut-off 'j' and forcing variable 'k':

$$Y_{j,k} = \beta_0 + \beta_1(k - j) + \beta_2 D + \beta_3 D(k - j) + \sum_k \lambda_k \mathrm{Control_j} \varepsilon_{j,k} \tag{2}$$

Table 4 Financial performance–Summary of regression analysis using RDD

Depedent variables -	LIVA by Assets Co-eff	EV by Assets Co-eff	Tobin's Q Co-eff	ROA Co-eff	ROCE Co-eff	RONW Co-eff
Panel A - Local linear estimation						
Intercept	#	1.822 ***	0.543 ***	7.080 ***	10.062 ***	13.296 ***
CSR		0.670 *	– 0.005	– 0.404	– 0.801	– 2.171
Excess_CSR *(treatment effect)*		– 0.061	0.007	0.068	0.331	0.488
CSR*Excess_CSR		– 1.263 **	– 0.047	– 0.868	– 2.377	– 0.293
R– squared		0.002	0.001	0.001	0.001	0.001
No. of observations		3757	3757	3757	3757	3757
Panel B – Estimation using a second– order polynomial function						
Intercept	#	1.861 ***	0.552 ***	7.163 ***	10.230 ***	13.395 ***
CSR		2.535 **	0.437	3.566	7.228	2.592
CSR2		2.493 *	0.591	5.308	10.734	6.369
Excess_CSR *(treatment effect)*		– 0.093	0.007	0.105	0.395	0.602
CSR*Excess_CSR		– 3.382 *	– 0.850 *	– 9.793 *	– 19.954 **	– 13.85 .
CSR*Excess_CSR2		– 2.11	– 0.044	2.176	3.692	6.916
R-squared		0.004	0.001	0.002	0.003	0.002
No. of observations		3757	3757	3757	3757	3757
Panel C - Estimation using a third-order polynomial function						
Intercept	– 16.796 ***	1.962 ***	0.592 ***	7.428 ***	10.608 ***	13.785 ***
CSR	– 144.219 ***	10.998 ***	3.756 ***	25.806 ***	39.005 ***	35.280 **
CSR2	– 454.326 ***	31.615 ***	12.012 ***	81.831 ***	120.072 ***	118.839 **
CSR3	– 335.441 ***	22.420 ***	8.793 ***	58.913 ***	84.176 ***	86.587 **
Excess_CSR *(treatment effect)*	1.413	– 0.163 .	– 0.01	– 0.057	0.21	0.196
CSR*Excess_CSR	277.897 ***	– 13.989 ***	– 5.755 ***	– 39.052 ***	– 65.014 ***	– 45.420 **
CSR*Excess_CSR2	5.67	– 22.448 *	– 4.969	– 45.58	– 51.213	– 110.135 *
CSR*Excess_CSR3	681.601 ***	– 29.739 ***	– 14.207 ***	– 82.885 ***	– 129.535 ***	– 82.77 .

Table 4 (continued)

Depedent variables -	LIVA by Assets Co-eff	EV by Assets Co-eff	Tobin's Q Co-eff	ROA Co-eff	ROCE Co-eff	RONW Co-eff
R-squared	0.01	0.01	0.013	0.007	0.008	0.004
No. of observations	3757	3757	3757	3757	3757	3757

The above table presents results by estimating RDD for equation number 1. It summarises the impact of CSR on six dependent variables, viz., Long Term Investor Value Appropriation (LIVA) by Assets, Enterprise Value (EV) by Assets, natural log of Tobin's Q, ROA, ROCE and RONW. CSR is the standardised forcing variable. CSR2 and CSR3 are second-order and third-order polynomials of CSR variable. Excess_CSR is a dummy variable which is 1 if CSR > 2%, 0 otherwise. CSR*Excess_CSR is the interaction term between CSR and Excess_CSR. CSR*Excess_CSR2 and CSR*Excess_CSR3 are second-order and third-order polynomials of CSR_Excess_CSR variable. Twenty bins have been used in estimating the local linear, second-order polynomial functions as well as third-order polynomial functions.***,**,* and . denote significance at 0.1%, 1%, 5% and 10% level respectively. Co-eff: Coefficients. #These regression models are statistically insignificant and hence are not reported

where 'β_2' captures effect of the treatment on the outcome variable. $D \in \{0, 1\}$ where $D = 1$ if CSR spending as percentage of average net profits of preceding three years > 2%, and $D = 0$ otherwise.

We have estimated pooled OLS regression and fixed effects regression for Eq. (2) using all dependent variables. The coefficient 'β_2' captures the impact of CSR spending (of more than 2%) on financial performance. To capture the non-linearity in the relationship between CSR and financial performance, we have also estimated Eq. (2) by using second-order and third-order polynomial functions.

The regression model also includes control variables. We have included variables for firm size and market valuation as suggested by Fama and French (1992). We also control for leverage, book to market ratio, capital expenditure, cash holding, sales growth, cash flow from operations, advertisement spending, and research and development expenditure of the firm. These control variables are similar to those used in literature (Chen & Gavious, 2015; Dharmapala & Khanna, 2018; Li et al., 2019; Lys et al., 2015; Manchiraju & Rajgopal, 2017), and are described in Table 8 in the Appendix. We use natural log of market capitalization as proxy for the firm's size since firms with better resources may experience superior financial performance. We also control for book to market ratio, and leverage since stable firms with low risk may experience superior financial performance. We expect positive and negative co-efficients for these variables, respectively. We expect higher sales growth, higher capital expenditure, higher cash balance, and higher cash flow from operations to impact financial performance positively. In line with existing literature, we expect firms with higher advertising expenditure to exhibit superior financial performance. The expected sign of the co-efficient of research and development (R&D) expenditure may differ from industry to industry as the outcome of R&D spending may vary across industries. Table 5 presents the correlation between different variables used in the study. Table 6 includes the results from estimating Eq. (2). It is divided into three panels, A, B, and C which includes results for local linear estimation, second-order polynomial estimation, and third-order polynomial estimation respectively. Each panel further presents results of pooled OLS regression and fixed effects regression for the four dependent variables used in the study.

We have also examined the impact of excess CSR spending on financial performance across industries. We estimated the linear form of Eq. (2) for firms in the 11 industries following GICS classification. The results of the industry-wise regression models where the treatment effect is significant are reported in Table 7. The Hausman specification test suggests the use of fixed effects model for panel data regression to estimate the model. We check for the presence of multicollinearity in our models by inspecting the Variance Inflation Factors (VIFs). None of the VIFs is greater than 10, and hence multicollinearity is not a concern. We also implement Newey-West correction to all our models and report only heteroscedasticity and autocorrelation consistent estimates of standard errors (Newey & West, 1987).

Panel A of Table 6 (local linear estimation) highlights that the treatment effect is negative in the case of ROA and ROCE. Firms which spent more than 2% of net profits on CSR experienced an average annual decline of 0.28% and 0.41% in their ROA and ROCE respectively (highlighted in red in panel A of Table 6). Amongst the indicators of long-term financial performance, the fixed effects regression model in the

Table 5 Correlation table

	CSR	MCap	Leverage	Capex	Cash	Advt	RD	BM	Assets	Sales growth	CFO	RONW	ROCE	ROA	Tobin's Q	EV by Assets
CSR																
MCap	-0.02															
Leverage	0.01	0.03														
Capex	0.02	0.06***	0.15***													
Cash	0.03.	0.04*	-0.2***	-0.09***												
Advt	0.02	0.21***	-0.12***	0.04*	0.13***											
RD	-0.01	0.16***	-0.07***	0.06***	0.02	-0.02										
BM	0	-0.4***	0.07***	-0.1***	-0.1***	-0.14***	-0.1***									
Assets	-0.03*	0.85***	0.22***	0	-0.09***	0.06***	0.09***	-0.05**								
Sales growth	0.01	-0.02	-0.02	-0.02	-0.01	-0.02	-0.02	0.01	-0.02							
CFO	-0.03.	0.13***	-0.06***	0.16***	0.12***	0.11***	0.08***	-0.19***	-0.06***	-0.08***						
RONW	-0.02	0.23***	-0.09***	0.13***	0.12***	0.13***	0.06***	-0.3***	0	-0.01	0.31***					
ROCE	-0.02	0.28***	-0.26***	0.11***	0.22***	0.21***	0.1***	-0.32***	-0.03.	0	0.4***	0.83***				
ROA	-0.02	0.26***	-0.25***	0.08***	0.2***	0.16***	0.12***	-0.31***	-0.08***	0	0.4***	0.78***	0.92***			
Tobin's Q	0	0.56***	-0.21***	0.11***	0.19***	0.34***	0.14***	-0.64***	0.09***	-0.02	0.32***	0.47***	0.59***	0.58***		
EV by Assets	0.01	0.44***	-0.17***	0.07***	0.16***	0.38***	0.1***	-0.34***	0.07***	-0.01	0.3***	0.4***	0.55***	0.53***	0.8***	
LIVA by Total Revenue	0.01	-0.34**	0.05**	0.01	0.03*	-0.06**	-0.1**	0.02	-0.33**	-0.01	0.01	-0.04*	-0.09**	-0.07**	-0.1**	-0.13**

***,**,* and . denote significance at 0.1%, 1%, 5% and 10% level respectively

Table 6 Financial performance – Summary of regression analysis using RDD after including control variables

Panel A - Local linear estimation

Dependent variables -	LIVA by Assets		EV by Assets		Tobin's Q		ROA		ROCE		RONW	
	Pooled OLS Co-eff	Fixed Effects Co-eff	Pooled OLS Co-eff	Fixed Effects Co-eff	Pooled OLS Co-eff	Fixed Effects Co-eff	Pooled OLS Co-eff	Fixed Effects Co-eff	Pooled OLS Co-eff	Fixed Effects Co-eff	Pooled OLS Co-eff	Fixed Effects Co-eff
Intercept	63.511 ***	-	-0.257 .	-	0.046	-	5.340 ***	-	5.007 ***	-	8.787 ***	-
CSR	-3.696	-5.563 *	0.510 **	0.399 ***	-0.037	-0.019	-0.392	0.278	-0.961	-0.054	-2.237	-0.556
Excess_CSR *(treatment effect)*	2.173	0.29	-0.073	-0.076 *	-0.003	-0.009	-0.021	-0.279 *	0.207	-0.411 *	0.32	-0.451
CSR*Excess_CSR	3.87	10.788 **	-0.981 ***	-0.791 ***	0.015	0.064 *	-0.713	-1.482 *	-1.623	-1.627	0.299	-1.317
MCap	-5.962 ***	0.611	1.770 ***	1.445 ***	0.547 ***	0.664 ***	3.788 ***	2.815 ***	4.980 ***	3.959 ***	4.446 ***	5.452 ***
Leverage	32.801 ***	-3.063	1.526 ***	0.868 ***	0.286 ***	-0.413 ***	-3.186 ***	-0.808	-7.771 ***	-2.089	3.282 .	-1.071
Capex	1.491	-2.383	-0.461	0.185	0.045	0.108 **	1.423	2.169 *	7.636 ***	7.454 ***	10.964 ***	8.846 ***
Cash	16.216 *	-8.971	-0.117	-0.467	0.06	-0.129 *	3.691 ***	3.565 **	7.825 ***	6.094 ***	4.507 *	10.069 ***
Advt	-25.931	-54.447	17.819 ***	0.037	2.317 ***	1.231 **	-14.288 **	10.084	12.009 .	25.571	-0.36	20.737
RD	-159.208 ***	-17.3	-3.996 *	-10.021 ***	-0.585	-1.327 **	6.455	-24.067 *	-3.071	-41.597 *	-16.725	-194.593 ***
BM	-4.592 ***	-1.36 .	0.599 ***	0.399 ***	-0.037 ***	0.078 ***	0.958 ***	0.475 ***	0.994 ***	0.668 ***	-0.263	0.660 *
Assets	-2.439 *	-0.219	-1.635 ***	-1.741 ***	-0.498 ***	-0.706 ***	-3.807 ***	-1.767 ***	-4.764 ***	-3.357 ***	-4.256 ***	-5.658 ***
Sales Growth	-0.004	0.005 .	0	0	-0.000 *	0	0.001	0	0.002 .	0.002 *	0.001	0.002
CFO	13.951 .	3.918	1.364 ***	0.146	0.173 **	-0.023	15.508 ***	6.079 ***	25.016 ***	9.443 ***	25.458 ***	11.460 ***
F statistic (p-value)	47.32	1.84	450.20	94.14	1533.00	794.51	221.00	27.79	206.40	29.47	84.15	25.07
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Firm FE	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
Year FE	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
No. of observations	3757	3757	3757	3757	3757	3757	3757	3757	3757	3757	3757	3757
R^2	0141	0.01	0.610	0.326	0.842	0.803	0.434	0.125	0.418	0.131	0.226	0.110

Table 6 (continued)

Panel B - Estimation using a second-order polynomial function												
Dependent variables -	**LIVA by Assets**		**EV by Assets**		**Tobin's Q**		**ROA**		**ROCE**		**RONW**	
	Pooled OLS Co-eff	**Fixed Effects Co-eff**	**Pooled OLS Co-eff**	**Fixed Effects Co-eff**	**Pooled OLS Co-eff**	**Fixed Effects Co-eff**	**Pooled OLS Co-eff**	**Fixed Effects Co-eff**	**Pooled OLS Co-eff**	**Fixed Effects Co-eff**	**Pooled OLS Co-eff**	**Fixed Effects Co-eff**
Intercept	64.490 ***	-	-0.244 .	-	0.04	-	5.509 ***	-	5.319 ***	-	8.909 ***	-
CSR	11.417	-9.87	1.337 *	0.832 *	-0.141	-0.093	2.048	0.22	3.729	0.859	-1.806	-2.389
CSR2	20.202	-5.882	1.106	0.578	-0.139	-0.1	3.262	-0.066	6.269	1.246	0.577	-2.454
Excess_CSR ***(treatment effect)***	2.266	0.071	-0.108 *	-0.095 **	-0.002	-0.01	0.004	-0.24 .	0.243	-0.366 .	0.415	-0.393
CSR*Excess_CSR	-27.829	27.318 *	-1.051	-0.798	0.169	0.224 *	-6.270 *	-2.938	-11.757 *	-5.042	-4.393	-0.376
CSR*Excess_CSR2	4.718	-12.359	-2.250 *	-1.213 .	0.063	-0.027	1.422	2.326	1.911	2.488	5.838	3.784
MCap	-5.957 ***	0.506	1.771 ***	1.445 ***	0.547 ***	0.663 ***	3.788 ***	2.824 ***	4.980 ***	3.981 ***	4.445 ***	5.444 ***
Leverage	32.924 ***	-2.874	1.522 ***	0.873 ***	0.286 ***	-0.412 ***	-3.166 ***	-0.829	-7.734 ***	-2.128	3.308 .	-1.077
Capex	1.084	-2.069	-0.455	0.194	0.047	0.111 **	1.35	2.132 *	7.506 ***	7.389 ***	10.889 ***	8.830 ***
Cash	15.960 *	-9.053	-0.118	-0.472	0.062	-0.129 *	3.647 ***	3.576 **	7.744 ***	6.111 ***	4.470 *	10.081 ***
Advt	-25.227	-56.151	17.799 ***	-0.083	2.314 ***	1.224 **	-14.152 **	10.357	12.252 .	25.917	-0.199	21.085
RD	-159.953 ***	-15.882	-4.026 *	-10.092 ***	-0.581	-1.308 *	6.337	-24.121 *	-3.296	-41.893 *	-16.768	-194.255 ***
BM	-4.571 ***	-1.365 .	0.600 ***	0.400 ***	-0.037 ***	0.078 ***	0.961 ***	0.474 ***	1.000 ***	0.670 ***	-0.263	0.654 .
Assets	-2.512 **	-0.137	-1.634 ***	-1.745 ***	-0.498 ***	-0.705 ***	-3.819 ***	-1.770 ***	-4.786 ***	-3.374 ***	-4.267 ***	-5.637 ***
Sales Growth	-0.004	0.006 .	0	0	-0.000 *	0	0.001	0	0.002 .	0.002 *	0.001	0.002
CFO	13.715 .	4.143	1.373 ***	0.143	0.174 **	-0.021	15.466 ***	6.062 ***	24.942 ***	9.396 ***	25.404 ***	11.484 ***
F statistic (p-value)	41.13	1.77	390.7	81.84	1329	689.29	191.9	24.16	179.4	25.64	72.96	20.88
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Firm FE	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
Year FE	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
No. of observations	3757	3757	3757	3757	3757	3757	3757	3757	3757	3757	3757	3757
R^2	0.142	0.01	0.610	0.327	0.842	0.803	0.435	0.125	0.418	0.132	0.226	0.110

Table 6 (continued)

Panel C - Estimation using a third-order polynomial function												
Dependent variables -	**LIVA**		**EV by Assets**		**Tobin's Q**		**ROA**		**ROCE**		**RONW**	
	Pooled OLS Co-eff	**Fixed Effects Co-eff**	**Pooled OLS Co-eff**	**Fixed Effects Co-eff**	**Pooled OLS Co-eff**	**Fixed Effects Co-eff**	**Pooled OLS Co-eff**	**Fixed Effects Co-eff**	**Pooled OLS Co-eff**	**Fixed Effects Co-eff**	**Pooled OLS Co-eff**	**Fixed Effects Co-eff**
Intercept	65.813 ***	-	-0.284 *	-	0.043	-	5.880 ***	-	5.660 ***		8.969 ***	
CSR	41.795	5.334	1.818	1.459 .	0.056	-0.144	13.032 **	1.096	14.38 .	2.489	9.255	-7.672
CSR2	123.867	45.593	2.796	2.696	0.539	-0.27	40.835 **	2.835	42.714 .	6.671	38.67	-20.224
CSR3	79.393	39.401	1.319	1.619	0.522	-0.13	28.821 *	2.18	27.962	4.093	29.347	-13.526
Excess_CSR ***(treatment effect)***	2.181	-0.334	-0.154 **	-0.108 **	-0.007	-0.009	-0.108	-0.211	0.121	-0.332	0.072	-0.351
CSR_Excess_CSR	-76.563	30.135	1.202	-0.898	0.146	0.214	-18.364 **	-6.634	-22.608 *	-10.392	-0.974	5.828
CSR_Excess_CSR2	-25.539	-137.138	-15.056 **	-5.484	-1.329	0.385	-32.05	10.785	-34.112	12.029	-91.456 .	18.019
CSR_Excess_CSR3	-139.942	21.178	7.914 .	0.161	0.074	-0.071	-32.083 .	-11.544	-28.174	-16.426	19.942	16.402
MCap	-5.997 ***	0.455	1.771 ***	1.444 ***	0.547 ***	0.663 ***	3.772 ***	2.832 ***	4.966 ***	3.991 ***	4.438 ***	5.442 ***
Leverage	33.177 ***	-2.835	1.507 ***	0.873 ***	0.286 ***	-0.412 ***	-3.113 ***	-0.843	-7.689 ***	-2.148	3.262 .	-1.06
Capex	1.06	-2.076	-0.453	0.194	0.047	0.111 **	1.347	2.138 *	7.503 ***	7.399 ***	10.900 ***	8.820 ***
Cash	15.802 *	-9.226	-0.115	-0.478	0.061	-0.129 *	3.603 ***	3.585 **	7.702 ***	6.120 ***	4.450 *	10.105 ***
Advt	-25.635	-55.608	17.846 ***	-0.067	2.317 ***	1.222 **	-14.170 **	10.269	12.249 .	25.801	0.049	21.118
RD	-160.233 ***	-14.518	-4.039 *	-10.030 ***	-0.583	-1.313 *	6.241	-23.944 *	-3.391	-41.603 *	-16.913	-194.911 ***
BM	-4.564 ***	-1.398 .	0.600 ***	0.399 ***	-0.037 ***	0.078 ***	0.961 ***	0.477 ***	1.000 ***	0.673 ***	-0.262	0.657 *
Assets	-2.575 **	-0.147	-1.630 ***	-1.746 ***	-0.498 ***	-0.705 ***	-3.829 ***	-1.777 ***	-4.795 ***	-3.383 ***	-4.252 ***	-5.623 ***
Sales Growth	-0.004	0.006	0	0	-0.000 *	0	0.001	0	0.002 .	0.002 *	0.001	0.002
CFO	13.675 .	4.367 .	1.390 ***	0.152	0.175 ***	-0.022	15.490 ***	6.071 ***	24.970 ***	9.415 ***	25.517 ***	11.413 ***
F statistic (p-value)	36.35	1.69	345.6	72.28	1172	607.85	169.9	21.38	158.5	22.67	64.65	18.44
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Firm FE	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
Year FE	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
No. of observations	3757	3757	3757	3757	3757	3757	3757	3757	3757	3757	3757	3757
R^2	0.142	0.01	0.611	0.327	0.842	0.804	0.436	0.126	0.4188	0.1323	0.2272	0.1104

Table 6 (continued)

The above table presents results by estimating RDD for Eq. number 2. It summarises the impact of CSR on six dependent variables, viz., Long Term Investor Value Appropriation (LIVA) by Assets, Enterprise Value (EV) by Assets,natural log of Tobin's Q, ROA, ROCE and RONW. CSR is the standardised forcing variable. CSR2 and CSR3 are second-order and third-order polynomials of CSR variable. Excess_CSR is a dummy variable which is 1 if CSR > 2%, 0 otherwise. CSR*Excess_CSR is the interaction term between CSR and Excess_CSR. CSR*Excess_CSR2 and CSR*Excess_CSR3 are second-order and third-order polynomials of CSR_Excess_CSR variable. MCap, Leverage, Capex, Cash, Advt, RD, BM, Assets, Sales growth and CFO are control variables used in the regression model and are described in Table 8 in the Appendix. Twenty bins have been used in estimating the local linear, second-order polynomial functions as well as third-order polynomial functions. '***', '**', '*' and '.' denote significance at 0.1%, 1%, 5% and 10% level respectively. Co-eff: Coefficients.

Table 7 Financial performance – Summary of industry-wise regression analysis using RDD

Industries -	Materials			Industrials	Utilities	Consumer Discretionary	Health Care
Dependent variables -	ROCE	ROA	RONW	LIVA by TR	LIVA by TR	EV by Assets	LIVA by TR
	Fixed Effects	Fixed Effects	Fixed Effects	Pooled OLS	Pooled OLS	Fixed Effects	Pooled OLS
	Co-eff	Co-eff	Co-eff	Co-eff	Co-eff	Co-eff	Co-eff
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Intercept	–	–	–	57.226***	289.846**	–	152.222***
CSR	– 0.176	0.000	0.307	3.153	– 73.916	0.721**	19.993
Excess_CSR (treatment effect)	*– 1.007***	– 0.616*	– 1.298*	6.445*	56.479**	– 0.164*	15.638*
CSR*Excess_CSR	– 0.464	– 0.642	– 0.244	– 5.837	– 71.006	– 1.015*	– 21.728
MCap	3.973***	2.914***	5.034***	– 1.956	13.918	1.785***	– 6.034
Leverage	– 6.088	– 4.096	– 5.317	47.780**	410.065***	1.494	23.599
Capex	1.108	1.131	1.782	3.796	211.171	0.11	61.561
Cash	– 2.191	– 3.786	– 11.59	– 17.691	124.86	– 4.661***	81.277*
Advt	49.364	12.899	53.609	265.618	9854.875	12.196	23
RD	– 133.304	– 69.835	– 132.967	– 290.599	34,547.476	– 12.685	75.658
BM	0.294	0.4	0.592	– 3.819	– 4.697	0.681***	1.028
Assets	– 0.951	– 0.268	– 2.782	– 5.804*	– 51.626	– 1.958***	– 13.805
Sales growth	0.002*	0.001	0.002	0.022	0.081	0.002	– 0.211*
CFO	19.517***	13.081***	27.3***	13.775	– 59.519	1.816**	– 43.505
F statistic (*p*-value)	11.77	11.29	6.71	8.25	3.78	27.39	7.34
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Firm FE	Yes	Yes	Yes	No	No	Yes	No
Year FE	Yes	Yes	Yes	No	No	Yes	No
No. of observations	895	895	895	684	61	728	222
R^2	0.206	0.199	0.129	0.138	0.511	0.422	0.315

Table 7 (continued)

The above table presents results by estimating RDD for Eq. number 2 for industries as per GICS classification. Total 132 regression models were estimated (11 industries* 12 regression models per industry). Regression models where the treatment effect is significant are only presented in the table for the sake of brevity. Estimates from other regression models are available upon request to the authors. It summarises the impact of CSR on dependent variables, viz., Long Term Investor Value Appropriation (LIVA) by Assets, Enterprise Value (EV) by Assets, ROA, ROCE and RONW. CSR is the standardised forcing variable. Excess_CSR is a dummy variable which is 1 if CSR > 2%, 0 otherwise. CSR*Excess_CSR is the interaction term between CSR and Excess_CSR. MCap, Leverage, Capex, Cash, Advt, RD, BM, Assets, Sales growth and CFO are control variables used in the regression model and are described in Table 8 in the Appendix. Twenty bins have been used in estimating the local linear, second-order polynomial functions as well as third-order polynomial functions. '***', '**', '*' and '.' denote significance at 0.1%, 1%, 5% and 10% level respectively. Co-eff: Coefficients

case of EV/Total Assets also shows a negative treatment effect. Thus, firms that spend more than the statutory minimum on CSR activities experienced an average annual decline of 0.08% (highlighted in red in panel A of Table 6) in their valuation as indicated by EV/Total Assets. The second-order and third-order polynomial terms are not statistically significant (refer to panels B and C), indicating no significant non-linear relationship between dependent variables and CSR.

Among the control variables, size measured by market capitalization, is found to be positively related to short-term and long-term financial performance. This indicates that large-sized firms experienced a significant increase in financial performance. Leverage is negatively related to the long-term financial performance of a firm, while sales growth does not seem to have any significant impact on financial performance, which is surprising. The cash flow from operations has a significant positive impact on short-term financial performance, as expected. Advertisement spending improves firm performance in the long run, while research and development expenditure has a significant negative impact on all indicators of financial performance. The presence of large cash balances negatively impacts the long-term financial performance while positively impacting the short-term performance. This may be due to the opportunity cost of keeping cash idle instead of using the same to finance positive NPV projects. Capital expenditure helps to improve short-term and long-term financial performance.

The results suggest that the choice of spending more than the required minimum on CSR negatively affects short-term financial performance. This may be due to reasons such as diversion of funds which could have been used to finance profitable projects, wastage of scarce managerial time and effort to select the CSR activities and monitor spending on the same, potential diversion of funds to a trust or foundation owned by insiders of the firm, etc. The evidence on the impact of excess CSR spending on long-term financial performance of firms is mixed. The long-term financial performance is not significantly affected by excess CSR spending when Tobin's Q and LIVA/Total Revenue are used as proxies for long-term performance. However, the excess CSR spending seems to have a negative impact on long term financial performance when EV/Total Assets is used as proxy. Tobin's Q is widely used as a measure of firm's long-term financial performance (Daszyńska-Żygadlo et al., 2016; Ding et al., 2016; Kubik et al., 2012; Manchiraju & Rajgopal, 2017). A firm's performance in the long run is determined by its ability to improve future earnings through the introduction of new products and services, improvements in existing offerings, diversification, etc., which is confirmed by the positive relationship between capital expenditure and firm performance.

Ding et al. (2016) suggested presence of an industry-specific relationship between CSR spending and firm value. The results of Eq. (2) estimated for firms in each industry following GICS classification are included in Table 7. Out of 11 industries, the results for five industries have shown a statistically significant treatment effect. During the sample period, excess CSR spending adversely affected short-term financial performance of firms from the Materials industry. This is evident from the negative co-efficient of Excess_CSR variable in columns (1)–(3) of Table 7. The long-term financial performance of firms from the Materials industry was not affected by excess CSR spending. The impact of excess CSR spending on long-term financial performance of firms across industries is mixed. The excess CSR spending has

positively impacted long-term financial performance of firms in industries such as Utilities (column 5), Health Care (column 7), and Industrials (column 4). However, excess CSR spending is negatively related to long-term financial performance measured as Enterprise Value/Total Assets of firms from the Consumer Discretionary industry (column 6). The excess CSR spending by firms from other industries such as Energy, Financials, Communication Services, Consumer Staples, Information Technology, and Real Estate does not seem to affect their long-term performance. There seems to be significant positive relationship between excess CSR spending and long term performance of firms belonging to Utilities industry. Thus, evidence on the relationship between excess CSR spending and long-term performance of firms across industries (included in the sample) is not consistent.

Data suggests that over the years, an increasing percentage of Indian firms are choosing to spend more than their statutory minimum obligation on CSR activities. By going beyond their corporate mandate, they create a more gainful impact in the society in various fields like healthcare, education and skill development, sports, poverty alleviation, etc. The prestigious Tata group companies in India, and a few public sector enterprises like the Steel Authority of India Ltd. (SAIL) and the Power Grid Corporation of India Ltd. (PGCIL) are apt examples of such generous behaviour for many decades now. Along with a genuinely positive contribution to the societal good, such generous behaviour may also be linked to commercial issues like the reversal of the negative externalities created in the course of business activities, managing reputational risks, increasing customer demand and employee loyalty and brand building. These and many other similar reasons may motivate firms to spend on CSR beyond the regulatory requirements.

7 Conclusions – "Too Much of Anything is Bad"

This research stems from the CSR regulations of the Companies Act, 2013 in India. The Act obliges a category of firms to spend a minimum of 2% of average net profits of the preceding three years on specified CSR activities. However, many firms have been spending more than the required minimum amount on CSR. We have examined the impact of such socially responsible behaviour on the financial performance of firms.

The relationship between voluntary CSR spending and financial performance has been documented in existing literature. However, most of these studies suffer from methodological issues like reverse causality between the two variables. In order to overcome the problem of reverse causality, we have used RDD to examine the impact of excess CSR spending on short-term and long-term financial performance. The choice of firms to spend more than the required minimum on CSR adversely affects their short-term financial performance. The average annual decline in ROA and ROCE was 0.28 and 0.41% during the period 2014–19. The results of our study confirm the existing evidence on decline in financial performance of firms due to CSR presented by Mukherjee and Bird (2016) and Friedman (1970). Our study

establishes the view that CSR spending in excess of the statutory limit causes a decline in the short-term financial performance of firms. This may be due to social burdens on their business activities which adversely affect returns to shareholders. The evidence is a reminder of the old adage – "Too much of anything is bad". However, the evidence on the impact of excess CSR spending on long-term financial performance of firms across industries is not consistent. Our results show that during the sample period, some firms have continued to spend more than the statutory minimum on CSR despite a decline in financial performance. Although CSR spending supports the stakeholder theory proposed by Freeman, we present Indian evidence that it may not lead to Pareto-efficient outcomes given the possible negative consequences to shareholders. The excess CSR spending seems to adversely affect the short-term financial performance irrespective of the industry which the firm belongs to. The benefits to external stakeholders of the firm seem to be at the cost of internal stakeholders. This suggests that it may be prudent for Indian firms to meet the requirements of law by spending the statutory minimum on CSR in the absence of any tangible benefits to excess CSR spending.

Our study supports the shareholder value maximization theory propounded by Friedman (1970) and refined by researchers over period of time in the extant literature. The findings of our study may be useful to a wide range of stakeholders including investors, firm managers and regulators. Profit-seeking investors may choose to stay away from companies which over-spend on CSR while values-driven investors may consider investment in such socially responsible firms. The findings of our study may assist firms to design their CSR policies, expenditure and disclosures. This may help firms to align their CSR activities to "Global Goals for Good – Sustainable Development Goals (SDGs)". Our study may also be of interest to policymakers including regulators in countries where introduction of mandatory CSR is under consideration. Such policymakers may consider the results of our study in determining the level of mandatory CSR expenditure.

8 Limitations, and Areas for further Research

This study has certain limitations related to generalizability. The CSR regulations included in Indian Companies Act, 2013 are different from the voluntary CSR across the world. CSR also has implications for the relationships with other stakeholders like customers, employees, creditors, etc. Since our study examines only the impact of excess CSR spending on financial performance, we have not explored these relationships. Hence this is not conclusive evidence on the socially responsible behaviour of firms as such behaviour also impacts other stakeholders, apart from shareholders. The examination of whether higher CSR spending helps in improving the firm's relationships with other stakeholders may offer interesting insights. However, despite these limitations, our study may help to assess the impact of excessive CSR spending on financial performance of firms.

We have examined the impact of excess CSR spending on short term and long term financial performance of selected listed firms in India. The relationship can be further examined during different periods of change in the economic and business environment in India and other countries due to changes in government policies, and by including other measures (proxies) of short term and long term financial performance. The differences in institutional infrastructure and regulatory environment across countries will make the evidence interesting. The results will also offer important insights to those planning to formulate and implement similar (mandatory) CSR policies in their jurisdictions.

We have used RDD to examine the relationship between socially responsible behaviour and financial performance. An important limitation of RDD is that it captures treatment effects localized around the threshold, and hence the results are not always generalizable to the entire population.

Appendix

Table 8 Description of variables used in the study

Name of the variable	Description
Advt	Advertisement expenditure by the firm during the year divided by sales during the financial year
Assets	Natural log of the total assets of the firm at the end of the financial year
BM	Ratio of book value of equity to market value of equity at the end of the financial year
Capex	Capital expenditure by the firm during the year divided by total assets at the end of the financial year
Cash	Cash balance of the firm divided by total assets at the end of the financial year
CFO	Cash Flow from Operations (CFO) of the firm during the year divided by total assets at the end of the financial year
CSR	CSR expenditure for the year divided by average net profits of the last three years. This value has been further standardised by subtracting 2%
CSR_Excess_CSR	The interaction term between CSR and Excess_CSR
Excess_CSR	Dummy variable that equals 1 if the firm spends more than 2% of average net profits of the last three years on CSR activities, and 0 otherwise. This is the variable of interest in the study
Leverage	Long-term debt divided by total assets at the end of the financial year
MCap	Natural log of the market capitalisation of the firm
RD	Research and development expenditure by the firm divided by sales during the financial year
Sales Growth	Y–o-Y growth in sales of the firm
Tobin's Q	Indicator of the firm's long-term financial performance measured as the market value of the equity and liabilities over the book value of equity and liabilities. We have used the natural log of this indicator to address the skewness in the data

References

Akey, P. (2015). Valuing changes in political networks: Evidence from campaign contributions to close congressional elections. *Review of Financial Studies*. https://doi.org/10.1093/rfs/hhv035

Aupperle, K. E., Carroll, A. B., & Hatfield, J. D. (1985). An empirical examination of the relationship between corporate social responsibility and profitability. *Academy of Management Journal*. https://doi.org/10.5465/256210

Barnett, M. L. (2007). Stakeholder influence capacity and the variability of financial returns to corporate social responsibility. *Academy of Management Review*. https://doi.org/10.5465/AMR.2007.25275520

Benabou, R., & Tirole, J. (2010). Individual and corporate social responsibility. *Economica*. https://doi.org/10.1111/j.1468-0335.2009.00843.x

Bhattacharyya, A., & Rahman, M. L. (2019). Mandatory CSR expenditure and firm performance. *Journal of Contemporary Accounting and Economics, 15*(3), 100163. https://doi.org/10.1016/j.jcae.2019.100163

Bird, R., Duppati, G., & Mukherjee, A. (2016). Corporate social responsibility and firm market performance: A study of Indian listed companies. *International Journal of Business Governance and Ethics, 11*(1), 68–88. https://doi.org/10.1504/IJBGE.2016.076351

Campbell, J. L. (2007). Why would corporations behave in socially responsible ways? An institutional theory of corporate social responsibility. *Academy of Management Review*. https://doi.org/10.5465/AMR.2007.25275684

Chen, E., & Gavious, I. (2015). Does CSR have different value implications for different shareholders ? *Finance Research Letters, 14*, 29–35. https://doi.org/10.1016/j.frl.2015.07.001

Daszyńska-Żygadlo, K., Słoński, T., & Zawadzki, B. (2016). The market value of CSR performance across sectors. *Engineering Economics, 27*(2), 230–238. https://doi.org/10.5755/j01.ee.27.2.13480

Dharmapala, D., & Khanna, V. (2018). International review of law and economics the impact of mandated corporate social responsibility : Evidence from India ' s companies act of 2013. *International Review of Law & Economics, 56*, 92–104. https://doi.org/10.1016/j.irle.2018.09.001

Ding, D. K., Ferreira, C., & Wongchoti, U. (2016). Does it pay to be different? Relative CSR and its impact on firm value. *International Review of Financial Analysis, 47*, 86–98. https://doi.org/10.1016/j.irfa.2016.06.013

El Ghoul, S., Guedhami, O., Kwok, C. C. Y., & Mishra, D. R. (2011). Does corporate social responsibility affect the cost of capital? *Journal of Banking and Finance*. https://doi.org/10.1016/j.jbankfin.2011.02.007

Fama, E. F., & French, K. R. (1992). The Cross-section of expected stock returns. *The Journal of Finance*. https://doi.org/10.2307/2329112

Flammer, C. (2015). Does corporate social responsibility lead to superior financial performance? A regression discontinuity approach. *Management Science*. https://doi.org/10.1287/mnsc.2014.2038

Freedman, M., & Jaggi, B. (1982). Pollution disclosures, pollution performance and economic performance. *Omega*. https://doi.org/10.1016/0305-0483(82)90051-2

Freeman, R. E. (2015). Strategic management: A stakeholder approach. *Strategic Management: A Stakeholder Approach., 5*, 89. https://doi.org/10.1017/CBO9781139192675

Friedman, M. (1970). A Friedman doctrine - The Social Responsibility of Business Is to Increase Its Profits. *New York Times Magazine*.

Godfrey, P. C. (2005). The relationship between corporate philanthropy and shareholder wealth: A risk management perspective. *Academy of Management Review*. https://doi.org/10.5465/AMR.2005.18378878

Greene, W. W. H. (2012). *Econometric analysis* (7th ed.). Prentice Hall.

Harjoto, M. A., & Jo, H. (2011). Corporate governance and CSR Nexus. *Journal of Business Ethics*. https://doi.org/10.1007/s10551-011-0772-6

Himmelberg, C. P., Hubbard, R. G., & Palia, D. (1999). Understanding the determinants of managerial ownership and the link between ownership and performance. *Journal of Financial Economics*. https://doi.org/10.1016/S0304-405X(99)00025-2

Hua Fan, J., & Michalski, L. (2020). Sustainable factor investing: Where doing well meets doing good. *International Review of Economics and Finance, 70*, 230–256. https://doi.org/10.1016/j.iref.2020.07.013

Iliev, P. (2010). The effect of SOX section 404: Costs, earnings quality, and stock prices. *Journal of Finance*. https://doi.org/10.1111/j.1540-6261.2010.01564.x

Jensen, M. C., & Meckling, W. H. (1976). Theory of the firm manajerial behaviour, ageny cost and ownership. *Journal of Financial Economics, 3*(4), 305–360.

Jo, H., & Na, H. (2012). Does CSR reduce firm risk? evidence from controversial industry sectors. *Journal of Business Ethics.* https://doi.org/10.1007/s10551-012-1492-2

Khandelwal, M. R., & Bakshi, M. S. (2014). The new CSR regulation in India: the way forward. *Procedia Economics and Finance, 11*(14), 60–67. https://doi.org/10.1016/s2212-5671(14)00176-2

Kitzmueller, M., & Shimshack, J. (2012). Economic perspectives on corporate social responsibility. *Journal of Economic Literature*. https://doi.org/10.1257/jel.50.1.51

Kubik, J. D., Scheinkman, J. A., & Hong, H. G. (2012). Financial constraints on corporate goodness. *SSRN Electronic Journal*. https://doi.org/10.2139/ssrn.1784357

Lee, D. S., & Lemieux, T. (2010). Regression discontinuity designs in economics. *Journal of Economic Literature*. https://doi.org/10.1257/jel.48.2.281

Li, Z., Minor, D. B., Wang, J., & Yu, C. (2019). A learning curve of the market: Chasing alpha of socially responsible firms. *Journal of Economic Dynamics and Control, 109*, 103772. https://doi.org/10.1016/j.jedc.2019.103772

Lys, T., Naughton, J. P., & Wang, C. (2015). Signaling through corporate accountability reporting. *Journal of Accounting and Economics, 60*(1), 56–72. https://doi.org/10.1016/j.jacceco.2015.03.001

Manchiraju, H., & Rajgopal, S. (2017). Does corporate social responsibility (CSR) Create shareholder value? evidence from the indian companies Act 2013. *Journal of Accounting Research, 55*(5), 1257–1300. https://doi.org/10.1111/1475-679X.12174

Margolis, J. D., Elfenbein, H. A., & Walsh, J. P. (2012). Does it Pay to be good and does it matter? a meta-analysis of the relationship between corporate social and financial performance. *SSRN Electronic Journal, 5*, 87. https://doi.org/10.2139/ssrn.1866371

Marín, L., Rubio, A., & de Maya, S. R. (2012). Competitiveness as a strategic outcome of corporate social responsibility. *Corporate Social Responsibility and Environmental Management*. https://doi.org/10.1002/csr.1288

Meng, Y., & Wang, X. (2019). Do institutional investors have homogeneous influence on corporate social responsibility? Evidence from investor investment horizon. *Managerial Finance, 46*(3), 301–322. https://doi.org/10.1108/MF-03-2019-0121

Mukherjee, A., & Bird, R. (2016). Analysis of mandatory CSR expenditure in India: A survey. *International Journal of Corporate Governance, 7*(1), 32. https://doi.org/10.1504/ijcg.2016.077982

Mukherjee, A., Bird, R., & Duppati, G. (2018). Mandatory corporate social responsibility: The Indian experience. *Journal of Contemporary Accounting and Economics, 14*(3), 254–265. https://doi.org/10.1016/j.jcae.2018.06.002

Newey, W. K., & West, K. D. (1987). A Simple, Positive Semi-Definite, Heteroskedasticity and Autocorrelation Consistent Covariance Matrix Author(s): Whitney K. Newey and Kenneth D. West Source: *Econometrica*.

Sardana, D., Gupta, N., Kumar, V., & Terziovski, M. (2020). CSR 'sustainability' practices and firm performance in an emerging economy. *Journal of Cleaner Production*. https://doi.org/10.1016/j.jclepro.2020.120766

Servaes, H., & Tamayo, A. (2013). The impact of corporate social responsibility on firm value: The role of customer awareness. *Management Science*. https://doi.org/10.1287/mnsc.1120.1630

Thistlethwaite, D. L., & Campbell, D. T. (1960). Regression-discontinuity analysis: An alternative to the ex post facto experiment. *Journal of Educational Psychology*. https://doi.org/10.1037/h0044319

Waddock, S. A., & Graves, S. B. (1997). The corporate social performance-financial performance link. *Strategic Management Journal*. https://doi.org/10.1002/(SICI)1097-0266(199704)18:4%3c303::AID-SMJ869%3e3.0.CO;2-G

Wibbens, P. D., & Siggelkow, N. (2020). Introducing LIVA to measure long-term firm performance. *Strategic Management Journal, 41*(5), 867–890. https://doi.org/10.1002/smj.3114

Wu, C., & Hu, J. (2019). Can CSR reduce stock price crash risk ? Evidence from China ' s energy industry. *Energy Policy, 128*, 505–518. https://doi.org/10.1016/j.enpol.2019.01.026

Yu, E. P., Luu, Y., Van, B., & Chen, C. H. (2020). Greenwashing in environmental, social and governance disclosures. *Research in International Business and Finance, 52*, 101192. https://doi.org/10.1016/j.ribaf.2020.101192

Publisher's Note Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.