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Impact of CSR Dimensions on Firm Value

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Declarations of Authenticity and Author's Right

'This thesis is the result of the author's original research. It has been composed by the author and has not been previously submitted for examination, which has led to the award of a degree.'

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Abstract

In this study, we explore the differential impact of two dimensions of corporate social responsibility (CSR), environmental CSR and social CSR, on firm capital market-based valuation. Using manually collected actual firm-level CSR expenditure data, we find that relative to social, greater monetary expenditure on environmental CSR projects leads to a higher market valuation of the firm. We establish this causality by exploiting a mandatory CSR regulation in India as an exogenous shock. The results of the quasi-natural experiment validate that when a CSR-mandated firm spends more on environmental CSR than social CSR, it increases the firm value. Further, we find that the valuation impact is more significant when a CSR-mandated firm spends more on environmental CSR in a state other than its registered state.

Keywords: *Environmental CSR; Social CSR; Firm Value; S-135 Regulation; Emerging Market*

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1 Introduction

The growing global concerns towards the environment and social sustainability have prompted a trend that necessitates the firms to disclose their corporate social responsibility (hereafter, CSR) activities. Remarkably, this trend of CSR disclosure is of interest to regulators, investors, and stakeholders (Chen et al., 2018). On the one hand, firms are taking initiatives to go beyond regulatory requirements and actively meet societal needs (Torugsa et al., 2013). For instance, firms issue financial instruments called green bonds, aiming to improve environmental and social sustainability (Tang & Zhang, 2020). On the other hand, investors incorporate information about a firm's environment and social performance (two dimensions of CSR) in investment decisions (Dyck et al., 2019). In this study, we examine how investment in different CSR activities affects firm value. Specifically, we investigate if there is a differential impact of environmental-related CSR expenditure and social activities-related CSR expenditure on firm value.

Extant literature proposes that CSR has a positive impact on attracting and retaining higher quality employees (Greening & Turban, 2000), improved access to valuable resources (Cochran & Wood, 1984), and enhanced stock market liquidity due to greater transparency (Diamond & Verrecchia, 1991; Matten & Crane, 2005). However, the current studies are contradictory and inconclusive regarding the impact of CSR on firm value (Garcia-Castro et al., 2010). Some studies show a positive impact of CSR on firm value (Orlitzky, 2001; Orlitzky et al., 2003; Van Beurden & Gössling, 2008), while others show either a negative or insignificant impact of CSR on firm value (McWilliams & Siegel, 2000; Servaes & Tamayo, 2013). This contradictory and inconclusive evidence of CSR impact on firm value motivates us to explore if the different dimensions of CSR, environment, and social, have a differential impact on firm value.

Flammer (2013) argues that when a firm spends on environmental sustainability, such as using sustainable technology, processes, and products that are more efficient and environment-friendly (Porter & Van der Linde, 1995), it effectuates new and competitive resources for the firm. Developing new and competitive resources leads to heterogeneity of resources in the firm, which is a propeller of competitive differences within an industry (Flammer, 2013). The heterogeneity of resources yields a competitive advantage in the firm and causes higher profit (Flammer, 2013). Further, Michael and William (1976) posit that environmentally responsible firms inevitably become more transparent when they incur environmental CSR expenditure, which reduces the information asymmetries between the firms and investors, thereby diminishing financial risk.

On the contrary, the extant literature suggests that when a firm spends on social CSR, it has an inconsequential impact on its financial risk (Zhou et al., 2021) and a negative impact on shareholder value (Hillman & Keim, 2001). Further, it portrays that social CSR, such as charitable donations, is negatively correlated with the firm's financial performance (measured as the ratio of net income to revenues, total assets, and equity) (Galaskiewicz, 1997). The rationale is that the competitors could copy the resources and policies of the firms toward social issues; hence it does not provide any competitive advantage to the firm (Hillman & Keim, 2001). Moreover, Zhou et al. (2021) argue that firms use social CSR as a whitewashing tool to deflect public attention from hidden risks or bad news. Based on these arguments, in this study, we posit that when a firm spends more on environmental CSR than social CSR, it positively impacts the firm value.

To empirically test the above conjecture, we collect data from two sources. First, we collect detailed project-level data on CSR expenditure by each firm in India from a publicly available database maintained by the Ministry of Corporate Affairs of India. Second, we collect information on the characteristics of non-financial listed companies from Prowess, a widely

used database managed by the Centre for Monitoring Indian Economy (CMIE). Our main dependent variable is the firm value measured using Tobin's Q, and the two main independent variables are environmental CSR expenditure and social CSR expenditure.

Our baseline regression model for 2015-2021 shows a strong positive relationship between environmental CSR expenditure and firm value. In contrast, it does not reveal any significant impact of social CSR expenditure on firm value. Economically, a 1% increase in environmental CSR expenditure results in a 9.6% increase in the firm value. As the project-level CSR data also reveal information on the location of the CSR expenses, we also test whether the location of the environmental and social CSR expenditure matter. We find that firms that spend more on environmental CSR in a different state (other than the firm's registered state) have higher firm value. Economically, we find that a 1% increase in environmental CSR in a different state increases the firm value by 9.6%. On the contrary, a 1% increase in social CSR in a different state (a state other than the firm's registered state) causes a 3.7% decrease in firm value.

We also conduct a quasi-natural experiment to ensure that our findings are causal. In our empirical analysis, we exploit a mandatory CSR regulation S-135 (part of the Companies Act, 2013) of India as an exogenous shock. The S-135 regulation mandates firms satisfying certain size thresholds to spend at least 2% of the average of the previous three years' net profit in the prescribed CSR activities (Dharmapala & Khanna, 2018; Manchiraju & Rajgopal, 2017; Marshall et al., 2022). The regulation exogenously determines a firm that needs to comply and firms that do not, which allows us to identify a treated and a control firm. We denote a treated firm that needs to comply with the S-135 CSR regulation and has invested more in environmental CSR than social CSR. We identify all other firms as control firms. We use propensity-score matching (PSM) to identify matched treated and control firms with similar firm-level characteristics.

Further, we use difference-in-differences (PSM-DiD) as an empirical identification strategy for 2012-2017. Our quasi-natural experimental design yields findings supporting our baseline results and establishing causality between environmental CSR and firm value. We find that, on average, compared to the control firms, the treated firms experience a significant increase in firm value in the post-S-135 period compared to the pre-S-135 regulation period. Our main estimations are robust to several checks, including two alternative definitions of CSR (environment and social) expenditure and the placebo test.

Our study makes the following contributions to the literature. First, existing literature shows the contradictory and inconclusive relationship between CSR expenditure and firm value (Garcia-Castro et al., 2010; McWilliams & Siegel, 2000; Orlitzky, 2001; Orlitzky et al., 2003; Servaes & Tamayo, 2013; Van Beurden & Gössling, 2008). We address this issue in this study by arguing that different dimensions of CSR expenditure could drive contradictory or inconclusive evidence. While the social aspect of CSR expenditure is considered less valuable to firm (Brown et al., 2006; Di Giuli & Kostovetsky, 2014; Masulis & Reza, 2015), the environmental aspect of CSR expenditure is given prominence by investors and are considered more valuable to firms (Derwall et al., 2005; Flammer, 2013; Porter & Van der Linde, 1995). We empirically show that environmental CSR expenditure positively impacts the firm value, whereas social CSR does not significantly impact firm value. This is our fundamental contribution.

Second, we contribute to the literature that shows and investigates the locational advantage of CSR expenditure. Husted et al. (2016) establish a relationship between location and the CSR engagement of a firm by showing that the location of a firm in an area of high CSR density lowers the cost of equity. We extend this literature in this study by showing that when a firm spends more on environmental CSR in a different state (a state other than the registered state), it positively impacts firm value. On the contrary, when a firm spends more on social CSR in a

different state (a state other than the firm's registered state), it negatively impacts firm value. Altogether, our estimations suggest that when a CSR mandate firm spends more on environmental CSR as compared to social CSR, it positively impacts the firm value. From the empirical point of view and to the best of our knowledge, this is the first study to use a unique project-level CSR expenditure of each firm and exploit a CSR regulatory mandate to investigate: i) differential impact of CSR dimensions (environment and social) on the firm value, and ii) differential impact of location of CSR dimensions (environment and social) on firm value.

We organise the rest of the paper in the following manner. Section 2 highlights a brief discussion of the Indian CSR regulation S-135. Then, we explain the classification of CSR in section 3. Section 4 provides a review of related literature and the development of the hypothesis. Section 5 presents a detailed discussion of the data and variables. Section 6 demonstrates the empirical strategy (baseline regressions and quasi-natural experiment technique PSM-DiD) and reports the empirical results. Finally, section 7 concludes the paper.

2 Section 135: Indian CSR Regulation

The mandatory CSR regulation Section 135 (S-135) came into effect on 1st April 2014 for the fiscal year ending 31st March 2015. According to this regulation, the firms that satisfy at least one of the following three thresholds in any financial year (from 1st April 2014), i) have a net worth of Indian Rupees (INR) 5 billion or more, ii) sales of INR 10 billion or more, or iii) a net profit of INR 50 million or more, are subject to the following provisions: i) set up a CSR committee of three directors of which one should be independent, ii) disclose the composition of the committee, iii) the CSR committee must formulate and monitor a CSR policy for the recommended CSR activities, iv) the board should approve and publicize the CSR policy, v) the board must ensure that the firm spends at least 2% of average net profits (over the last three years) on CSR activities, as approved by MCA (Ministry of Corporate Affairs), or explain non-

compliance (Dharmapala & Khanna, 2018; Marshall et al., 2022). The first four provisions are mandatory. However, the fifth provision allows 'comply or explain' CSR expenditure amount (2% of average net profits before tax), which implies that if a firm fails to meet the prescribed amount of CSR expenditure, it must provide an acceptable explanation for the non-compliance or partial compliance. Violating any of these provisions would result in severe penalties for the affected firm and responsible personnel (Marshall et al., 2022).

It must be noted that once a firm meets the compliance under S-135 regulation, it remains complied with the regulation for the successive three years, and only if none of the thresholds is met in any of the three consecutive years shall the firm not requisite to comply with S-135 regulation (Marshall et al., 2022).

3 Classification of CSR

Following the S-135 CSR regulation in India, it is a pre-requisite for complying firms to disclose complete information about their CSR activity each year under various development sectors specified and allowed under the S-135 regulation. The firm's CSR activity information includes the amount of CSR spent each year, the place (state and district) where it is spent, and the type of project (with the development sector) in which it is spent. Accordingly, we classify the development sectors into environmental CSR and social CSR while carefully observing all the projects under each development sector. Table 2 describes the classification of CSR dimensions into environmental and social CSR. For instance, we classify 'Animal Welfare' under social CSR because of its projects, such as animal healthcare, donations to the animal care centre, and assistance to improve need-based farm facilities of dairy farmers (Masulis & Reza, 2015).

Similarly, we classify 'Livelihood Enhancement Projects' under social CSR as per the projects, including contributions to the State Disaster Management Authority, National Institute of

Women Child & Youth Development, Noida Deaf Society, Self Employed Women's Association, Society for Development Alternative, Society of Public Safety & Habitat Management and, Aroha Multipurpose Society (González-Rodríguez et al., 2015). On the other hand, we categorise 'Conservation of Natural Resources' under environmental CSR as it inculcates projects such as tree plantation, lake revival, and energy conservation (González-Rodríguez et al., 2015). In the same way, we put Swachh Bharat Kosh (Clean India) under environmental CSR, as it includes projects such as moving cleanliness drives, installation of dustbins, waste management, and maintenance of toilets in schools (Roy et al., 2020).[1] Likewise, we classify 'NEC/Not Mentioned' under social CSR as it comprises projects such as healthcare; the construction of a labour room at a community health centre; the supply and installation of solar lights in villages, and; the construction of a library and classrooms in schools.

[**Table 2 about here**]

4 Related Literature and Development of Hypothesis

The literature embodies various definitions of CSR. If we penetrate the literature, it depicts a remarkable shift in the perspective of CSR from mere shareholder value maximization (Zenisek, 1979) to investing in varied dimensions of CSR (Saridakis et al., 2020). The concept of CSR evolved from the stakeholder theory, which posits that firms must focus not only on shareholder wealth maximisation but also on the benefits of other stakeholders of the firm (Freeman, 2010). The other stakeholders of the firm include employees, customers, suppliers, the community, and the natural environment (Freeman, 2010), who directly or indirectly add

[1] However, we also classify 'Sanitation' and 'Safe drinking water' under environmental CSR as we considered both to be an environmental issue. The rationale behind this statement is that if the companies focus on keeping the environment clean as part of their corporate social responsibility, while not dumping the wastes into rivers and lakes (sources of drinking water) and build toilets and sewage treatment plants, these issues shall never turn into a social issue (Russo & Fouts, 1997). 'Sanitation' incorporates projects such as construction of toilets and borewells, water and sanitation projects including sewer lines, cleaning of mechanised sanitation vehicles and installed portable toilets. Whereas 'Safe drinking water' encompasses water resource development projects, installation of water purifiers, distribution of water coolers, water management projects and, so on.

value to a firm's wealth creation (Cordeiro & Tewari, 2015). Baron (2001) and McWilliams and Siegel (2001) posit that social, environmental, or ethical preferences of stakeholders strategically motivate CSR activities that can be profitable for the firm. The economic-based rationale for profitable CSR is that expenditure in such activities diminishes transaction costs with the stakeholders, providing net benefits to the firm (Manchiraju & Rajgopal, 2017). The management literature calls this theory 'doing well by doing good' (Bénabou & Tirole, 2010; Kitzmueller & Shimshack, 2012). In recent years, CSR has become an essential and integral part of investors' portfolio selection (Bénabou & Tirole, 2010). Socially Responsible Investing (SRI) theory suggests that socially responsible investors tend to invest in only those companies that highly engage in CSR (Berry & Junkus, 2013).

Existing literature suggests that CSR has a positive impact on attracting and retaining higher-quality employees (Greening & Turban, 2000), improved access to valuable resources (Cochran & Wood, 1984), and enhanced stock market liquidity due to greater transparency (Diamond & Verrecchia, 1991; Matten & Crane, 2005). However, the current studies are contradictory and inconclusive regarding the impact of CSR on firm value (Garcia-Castro et al., 2010). Some studies show a positive impact of CSR on firm value (Orlitzky, 2001; Orlitzky et al., 2003; Van Beurden & Gössling, 2008), while others show either a negative or insignificant impact of CSR on firm value (McWilliams & Siegel, 2000; Servaes & Tamayo, 2013). Albuquerque et al. (2019) propose that firms with strong CSR performance benefit from higher profit and product prices. This is because good CSR performance of the firms reduces the impact of economic shocks on the firm, which may also minimise the price elasticity of demand (Albuquerque et al., 2019). At the same time, Lys et al. (2015) posit that there is a possibility that the CSR activities of firms possess inefficient signalling and investment in inefficient CSR projects. The CSR expenditure may also reflect necessary consumption by firm executives in the form of spending on pet projects with a CSR component; hence, the CSR

expenditure of the firm could not produce higher profit (Lys et al., 2015). Byun and Oh (2018) examine different aspects of CSR and finds that those CSR expenditures that directly benefit stakeholders create shareholder value.

Further, Galema et al. (2008) argue that the aggregate effect of CSR execution is far disparate from the impact of its distinct dimensions due to the complexity and multi-dimensional construct of CSR. Hence, due to the conflicting evidence of CSR, it is natural to ask if different CSR dimensions impact firms' market value differently. To our knowledge, no empirical study examines the differential impacts of CSR dimensions on firm value.

While the initial focus of CSR was on "social" responsibility (expenditure in community-based programs, employee development programs, health, and education) (Torugsa et al., 2013), however, there was an inclusion of "environmental responsibility" that became an integral part of CSR (Flammer, 2013). Environmental CSR is progressively vital in the corporate world (Flammer, 2013). The environmental responsibility and social responsibility of a firm are an indispensable part of both Environment, Social, and Governance (ESG) and Corporate Social Responsibility (CSR) (Gillan et al., 2021). The investors influence firms to improve their environmental and social CSR by using mechanisms such as the threat of exit or the threat of selecting only those firms with strong environmental and social CSR policies (Dyck et al., 2019). Further, there has been rising consensus among governments, firms, and financial institutions that economic entities must conduct their economic activities in a socially and environmentally responsible manner (Zhou et al., 2021). However, some studies show contradictory evidence for the two crucial dimensions of CSR, environment and social, which are discussed elaborately in the following paragraphs.

Environmental CSR is the responsibility of a firm towards the environment, which includes eco-efficiency, innovation, conservation of scarce natural resources and biodiversity, recycling

programs, promotion of renewable sources of energy, minimising the waste of resources, and preventing pollution (Buysse & Verbeke, 2003; González-Rodríguez et al., 2015). Whereas the social dimension of corporate social responsibility involves the firm's positive engagement towards social issues such as health, education, women empowerment, socio-economic inequalities, poverty, and charitable donations (Brown et al., 2006; Di Giuli & Kostovetsky, 2014; González-Rodríguez et al., 2015; Masulis & Reza, 2015).

Chava (2014) and El Ghoul et al. (2011) find that firms that spend on environmental CSR have a lower cost of capital as compared to firms that do not spend on environmental CSR. This is because the investors willingly accept a lower return in exchange for holding assets more associated with environmental CSR expenditure to prevent pollution and fight climate change (Pástor et al., 2022). Consequently, the share prices of environmentally responsible firms go up due to an increase in investors' demand for green assets (investments considered environment friendly), along with an increase in profitability due to the rise in consumers' demand for green products (products that are environment friendly) (Pástor et al., 2022). Flammer (2013) argues that when a firm spends on environmental sustainability, such as using sustainable technology, processes, and products that are more efficient and environment-friendly (Porter & Van der Linde, 1995), it effectuates new and competitive resources for the firm. Developing new and competitive resources leads to heterogeneity of resources in the firm, which is a propeller of competitive differences within an industry (Flammer, 2013). The heterogeneity of resources yields a competitive advantage and causes higher profit (Flammer, 2013).

Similarly, Porter and Van der Linde (1995) assert that if a firm takes measures to prevent pollution as part of its environmental CSR, it ensures the efficient use of resources. When the firms use resources efficiently, it does not leave any harmful waste in the environment. Moreover, the need for efficient use of resources initiates innovative methods which bring

resource productivity (Porter & Van der Linde, 1995). Furthermore, resource productivity minimises the cost, ultimately making the firm competitive and improving corporate earnings (Derwall et al., 2005). Likewise, Godfrey (2005) and Godfrey et al. (2009) argue that spending on environmental CSR creates goodwill and provides insurance-like protection to the shareholders, reducing financial risk.

Further, Michael and William (1976) posit that environmentally responsible firms become inevitably become more transparent, which reduces the information asymmetries between the firms and investors, thereby diminishing financial risk. Finally, Sharfman and Fernando (2008) argue that firms who invest in environmental CSR benefit from improved risk management through a reduction in their cost of capital which results in a reduction of financial risk (Cai et al., 2016). Hence, environmentally conscious CSR reduces firm financial risks due to increased shareholders' wealth through insurance-like protection, appeal to consumers, improved transparency, and risk management (Cai et al., 2016).

On the contrary, the literature posits that when a firm spends on social CSR, such as charitable donations and other social issues, it does not provide any competitive advantage to the firm and has a negative impact on shareholder value (Hillman & Keim, 2001). This is because firms' policies regarding social issues can be easily copied by other firms giving no competitive advantage to the firm (Hillman & Keim, 2001). For instance, international corporate giving may add to the shareholder value in terms of tax deductions. However, this policy could be readily copied by other firms giving no competitive advantage to the firm (Hillman & Keim, 2001). Hence, it decreases the shareholder value of the firm (Brown et al., 2006; Di Giuli & Kostovetsky, 2014; Masulis & Reza, 2015). On the other hand, competitors could not easily copy the environmental policies since spending on environmental CSR requires specialised resources, skills and knowledge uniquely possessed by a firm (Flammer, 2013). For instance, if a firm wants to spend on tree plantation.

Further, Barnett and Salomon (2012) find a U-shaped relationship between corporate social performance (using the KLD measure) and corporate financial performance (in terms of ROA and net income). They argue that firms with higher corporate social performance have higher costs than firms with lower corporate social performance since it is costly to be socially responsible (Barnett & Salomon, 2012). The U-shaped relationship between corporate social performance and corporate financial performance tries to explain that firms with low to moderate corporate social performance have inadequate stakeholder influence capacity and lack the ability to convert the social investment into financial returns. However, firms with high corporate social performance possess adequate stakeholder influence capacity, which helps them transform their social investment into financial returns (ROA and net income) (Barnett & Salomon, 2012). Contrastingly, Wang et al. (2008) find an inverted U-shaped relationship between charitable giving and corporate financial performance (ROA and Tobin's Q). It reports that with the successive increase in charitable giving, the positive effect on the financial performance levels off due to a lack of stakeholder support and increased costs. Furthermore, Zhou et al. (2021) argue that social CSR has an inconsequential impact on the firm risk because social CSR expenditure is a medium of public relations initiatives and is not directly related to the firm's financial risk. Instead, firms use these as a whitewashing tool to deflect public attention from hidden risks or bad news (Zhou et al., 2021).

The literature mentioned above suggests that spending on environmental CSR reduces the cost of capital and creates a competitive advantage for the firm that causes higher profit. The rationale is that investors reward the firms for their environmental CSR expenditure toward fighting climate change. However, when a firm spends on social CSR, it does not create any competitive advantage for the firm and decreases the shareholder value of the firm. The rationale is that competitors could readily copy the social CSR policies of a firm.

Based on these arguments on environmental CSR and social CSR, we predict that when a firm spends more on environmental CSR as compared to social CSR, it positively affects the firm value. Hence, we formulate the following hypothesis:

Hypothesis 1: Relative to social CSR, greater monetary environmental CSR expenditure is associated with higher firm value.

5 Data and Variables

5.1 Data

This study uses two main data sources to analyse the differential impact of CSR dimensions (environment and social) on firm value. First, we manually collect unique, actual, and comprehensive CSR expenditure data of 1739 firms from the Ministry of Corporate Affairs National CSR Portal from the fiscal year 2015 to 2021. The MCA National CSR Portal website is maintained by the Government of India that provides detailed information on the CSR expenditure of the firms, including the amount of CSR spent each year, the location where it is spent, and the type of project in which it is spent (https://csr.gov.in). We categorise the CSR expenditure of the firms into environmental CSR and social CSR expenditure depending on the type of project and development sector. We provide a detailed description of the firms' CSR expenditure classification into environmental and social CSR expenditure in Table 2 (also see section 3).

Our second data source is the Prowess database, maintained by the Center for Monitoring Indian Economy (CMIE). We collect annual accounting-based and market-based measures for each firm. It provides data on all the firms listed on India's two major stock exchanges: the National Stock Exchange (NSE) and the Bombay Stock Exchange (BSE). Our main sample

consists of 1,382 firms with 7,217 firm-year observations for the period ranging from 2015 to 2021.

5.2 Dependent Variable

This study's key dependent variable of interest is Tobin's Q, used as a proxy for firm value. Tobin's Q is a widely used measure of firm value by researchers in corporate finance literature (Bardos et al., 2020; Dharmapala & Khanna, 2013; Villalonga & Amit, 2006). Following Dharmapala and Khanna (2013), we define Tobin's Q using equation (1):

$$Tobin's\ Q\ = \frac{Book\ value\ of\ debt + Book\ value\ of\ preferred\ stock + Market\ Capitalisation}{Book\ value\ of\ assets} \quad (1)$$

We use the Prowess variable 'long term borrowings excluding current portion' as a proxy for the *Book value of debt*. Furthermore, we use the Prowess variable 'paid up preference capital' for the *Book value of preferred stock* instead of the 'market value of the preferred stock.' The reason is that the average trading volume of preferred stock is low. Moreover, we use the Prowess variable 'total assets' as a proxy for the *Book value of assets*. Finally, we calculate *Market Capitalisation* as a 365-day average of the daily stock prices.[2]

5.3 Key Independent Variables

As the objective of this study is to analyse the differential impact of CSR dimensions, that is, environmental and social CSR on firm value, the two key independent variables of interest are *Env_csr_sales* (environmental CSR scaled by sales) and *Social_csr_sales* (social CSR scaled by sales).

[2] We use fiscal year (1st April – 31st March) instead of calendar year (1st January – 31st December).

5.4 Control Variables

Based on the previous literature, we use several control variables in this study that are associated with *Tobin's Q*. Incorporating these control variables in our regression models helps generate more accurate results with minor residual variance. We control for firm size (*Size)* as the natural logarithm of total assets (Koirala et al., 2020), ownership concentration (*Own_Con)* as the proportion of total shares held by promoters (Koirala et al., 2020), *Leverage* as the ratio of the book value of debt to book value of equity (Koirala et al., 2020), stock volatility (*Stock_volatility)* as the standard deviation of the annual stock returns, to control for the risk of firm's stock prices changes over time (Dharmapala & Khanna, 2013), operating liquidity (*Op_liquidity)* as the ratio of liquid assets to current liabilities (Koirala et al., 2020), return on assets (*ROA)* as the profit after tax divided by the total assets (Daines, 2001; Villalonga & Amit, 2006), *Sales_growth* (Villalonga & Amit, 2006) as annual growth in total sales and, exports revenue (*Exports*) by taking foreign sales as a percentage of total sales, since it is a sign of firm's efficacious performance (Dharmapala & Khanna, 2013). There are some chances that intangible assets are poorly measured in the book value of assets (while calculating *Tobin's Q* in equation 1), so research and development expenditure (*R&D*) is incorporated (Dharmapala & Khanna, 2013). Further, we also control for firm age (*Age*) as the log of the firm's age computed as incorporation year minus current year (Villalonga & Amit, 2006). We control the fixed effects at the firm and year level, and cluster standard errors are at the firm level. We include all control variables in our empirical analysis by taking one-year lagged values.

5.5 Descriptive Statistics

Table 3 shows summary statistics for all the key variables. The sample period ranges from 2015 to 2021. The average *Size* of the firms in the sample is 28.254 INR billion, and the average age is 39 years. The mean *Leverage* ratio of 1.954 shows that the firms are highly leveraged and profitable, with a mean *ROA* ratio of 6.03%. The mean *Tobin's Q* is 1.445, which is comparable

to Dharmapala and Khanna (2013) and indicates that, on average, the market value of firms is more than their assets' book value.

[**Table 3 about here**]

Table 4 reports the correlation matrix of all variables used in the study. The correlation table depicts that there is no issue of multicollinearity among the variables.

[**Table 4 about here**]

6 Empirical Strategy and Results

6.1 Basic Regression

In this section, we present our baseline regression model, which investigates the impact of environmental CSR and social CSR on *Tobin's Q* (a proxy for firm value). Hence, we estimate this relationship using the following ordinary least square (OLS) regression model:

$$Y_{it} = \alpha + \beta(CSR\ Exp_{it}) + X_{i,t-1} + \theta_i + \vartheta_t + \varepsilon_{it} \quad (2)$$

where Y_{it} is the dependent variable, *Tobin's Q* of Indian firm *i* for the year *t*. $CSR\ Exp_{it}$ takes the value of either *Env_csr_sales* or *Social_csr_sales*. $X_{i,t-1}$ is the vector of one-year lagged control variables *Size, Own_Con, Leverage, Stock_volatility, Op_liquidity, ROA, Sales_growth, Exports, R&D, and Age.* We define all the variables in Table 1. θ_i and ϑ_t control for firm and year fixed effects, respectively. ε_{it} is the error term. We cluster standard errors at the firm level. We hypothesize that the coefficient β in equation (2), when using *Env_csr_sales* as the independent variable, is significantly positive, suggesting that higher environmental CSR expenditure increases the firm's value. Alternatively, the coefficient β, when using *Social_csr_sales* as the independent variable, is postulated to be insignificant, suggesting that higher social CSR expenditure causes no impact on the firm's value. Accordingly, when the *Env_csr_sales* is more than the *Social_csr_sales* in a firm, it increases the value of the firm.

[**Table 5 about here**]

Table 5 shows the empirical result of the basic regression model based on equation (2). In Model (1), we use environmental CSR (scaled by sales) as the main independent variable, and in Model (2), we use social CSR (scaled by sales) as the main independent variable**.**[3] In Model (1), it can be observed that the change in *Env_csr_sales* is positively and significantly related to *Tobin's Q* with β = 0.096 ($p < 0.01$). Economically, a one-standard-deviation increase in *Env_csr_sales* results in an increase in *Tobin's Q* by 0.126. The effect is economically material as it roughly translates to 8.73% of the mean *Tobin's Q.* In simpler terms, a 1% increase in *Env_csr_sales* causes a 9.6% increase in *Tobin's Q*. On the contrary, *Social_csr_sales* show an insignificant impact on *Tobin's Q*. Hence, the results support hypothesis H1 that when a firm spends more on environmental CSR compared to social CSR, it positively impacts the firm value.

We also run the robustness tests for the basic regression analysis while using alternative definitions of *Env_csr_sales* and *Social_csr_sales*. First, following Banerjee et al. (2020) and Roy et al. (2022), we use the natural log of environmental CSR and social CSR expenditure, and second, following Dharmapala and Khanna (2018), we scale environmental CSR and social CSR expenditure by total assets. For brevity, we do not report these results; however, in both cases, the estimations are in line with our main results.

6.2 Location of CSR and Firm Value

In this section, we examine whether the location of CSR expenditure matter to firm value. Following the S-135 CSR regulation in India, it is a pre-requisite for complying firms to disclose complete information about their CSR activity each year under various development

[3] We run the robustness test for the basic regression analysis while using alternative definitions of *Env_csr_sales* and *Social_csr_sales*, that is, (1) *ln_Env_csr* (natural logarithm of environmental CSR expenditure) and *ln_Social_csr* (natural logarithm of social CSR expenditure) (Banerjee et al., 2020; Roy et al., 2022) and (2) *Env_csr_assets* (environmental CSR expenditure scaled by total assets) and *Social_csr_assets* (social CSR expenditure scaled by total assets) (Dharmapala & Khanna, 2018). In both cases, the estimations are in line with our main results.

sectors specified and allowed under the S-135 regulation. The firm's CSR activity information includes the amount of CSR spent each year, the place (state and district) where it is spent, and the type of project (with the development sector) in which it is spent. Hence, we use this data to classify the states into the same state broadly (the firm's registered state) and a different state (other than the firm's registered state) for each firm, respectively. When a firm spends on CSR in a state, it improves its reputation (Tetrault Sirsly & Lvina, 2019), which further positively impacts the market value of firms (Chauvin & Hirschey, 1994). However, when a firm spends on CSR in the same state, there is no positive impact on the market value of firms. The rationale is that when a firm spends on CSR in the same state, there is a possibility that due to managerial motives, the CSR expenditure is done on pet projects, for example, in the hometown (Lys et al., 2015). Therefore, when a firm spends on CSR in a different state, it should positively impact its value.

A firm takes the value of one when the CSR expenditure (environment or social) in a different state is more than the CSR expenditure (environment or social) in the same state and zero otherwise. We run the regression model as per the following specification:

$$Y_{it} = \alpha + \beta(CSR\ Exp_{it} \times CSR\ location_{it}) + X_{i,t-1} + \theta_i + \vartheta_t + \varepsilon_{it} \quad (3)$$

where Y_{it} is the dependent variable, *Tobin's Q*, a proxy for the firm value of Indian firm *i* for the year *t*. $CSR\ Exp_{it}$ takes the value of either *Env_csr_sales* or *Social_csr_sales.* $CSR\ location_{it}$ is a dummy variable that takes the value of one when CSR expenditure (environment or social) is more in a different state (state other than the firm's registered state) than the same state (firm's registered state) and zero otherwise. $X_{i,t-1}$ is the vector of one-year lagged control variables *Size, Own_Con, Leverage, Stock_volatility, Op_liquidity, ROA, Sales_growth, Exports, R&D, and Age*, all as defined in Table 1. θ_i and ϑ_t are the firm and

year fixed effects, respectively. ε_{it} is the error term. We cluster standard errors at the firm level only.

[**Table 6 about here**]

We report the regression estimates as per specification (3) in Table 6. As observed from Model [1] of the table, the coefficient of *Env_csr_location* is positive and significant (β = 0.096, p<0.01), which indicates that when the environmental CSR of a firm in a different state is more than the same state, it positively and significantly impacts the firm value. Economically, a 1% increase in *Env_csr_location* causes a 9.6% increase in *Tobin's Q*. Whereas the coefficient of *Social_csr_location* in Model [2] is negative and significant (β = -0.037, p<0.1), which implies that when the social CSR of the firm in a different state is more than the same state, it negatively and significantly impacts the firm value. Economically, a 1% increase in *Social_csr_location* causes a 3.7% decrease in *Tobin's Q*. Altogether, the results are in line with the hypothesis H1, which states that when a firm spends more on environmental CSR as compared to social CSR, it positively impacts the firm value. The estimations also prove that if a firm spends more on environmental CSR in a different state, especially a highly dense CSR engagement state, it positively impacts firm value.

6.3 Identification Strategy: Propensity Score Matching

Although we establish a positive relationship between environmental CSR and firm value, we are yet to confirm whether this relationship is causal. Some potential concerns underlying our empirical analysis could be reverse causality and omitted variable bias. For example, it could be possible that the higher-value firm invests heavily in environmental CSR rather than social CSR. Furthermore, the firm's investment in environmental CSR and social CSR may be simultaneously affected by unobserved factors, which may potentially overestimate (or underestimate) the coefficients of OLS regressions. To establish causality and provide robust

evidence supporting our main result, we perform a quasi-natural experiment using S-135 regulation (discussed in Section 6.4) as an exogenous shock. For an efficacious execution of a shock-based quasi-experiment, we require two comparable groups of treated and control firms with equivalent expectations in treatment outcomes in the post-S-135 period (Atanasov & Black, 2016; Marshall et al., 2022). Hence, we first perform propensity score matching (PSM) to identify a matched set of treatment and control firms. To do so, we run a probit regression model for the pre-S-135 period (2012-2014) as per the following specification:

$$Treat_i = \alpha + \beta.X'_{it} + \lambda_k + \varepsilon_{it} \quad (4)$$

Where $Treat_i$ is the categorical variable that takes the value of one if the firm complied with S-135 and its environmental CSR expenditure is more than Social CSR expenditure, and zero otherwise. X'_{it} is the vector of covariates, including *Size, Own_Con*, *Leverage,* and *ROA* used for matching. We define all the covariates in Table 1. λ_k is the industry fixed effect. ε_{it} is the error term. We cluster standard errors at the firm level only. Panel A of Table 7 presents the estimates of the probit model.

[**Table 7 about here**]

Model [1] of Panel A in Table 7 presents the probit estimations of the pre-matched sample. It illustrates that the covariates are statistically significant, implying significant variation in firms' characteristics between the treatment and control groups. We have only 278 firms in our treated group whose environmental CSR expenditure is more than social CSR expenditure. At the same time, we have 1,109 firms in the control group whose social CSR expenditure is more than environmental CSR expenditure. After performing propensity score matching with the caliper of 0.001 without replacement, we ended up with 226 unique pairs of matched treated and control firms (that is, a total of 452 firms) before the enactment of the S-135 regulation. Hence, the matched treated and control group firms are now similar in all respect except the

application of the S-135 regulation. To test whether the PSM method diminished variations between treated and control groups before S-135 regulation, we ran post-match diagnostic regression as per specification (3) on matched pairs of firms. As illustrated in Model [2] of Panel A in Table 7, the covariates are statistically insignificant, implying no observable variations in firms' characteristics between the treatment and control groups.

Moreover, there is a substantial fall in pseudo-R^2 from 0.125, obtained in the pre-match probit (Model [1]), to only 0.004 in the post-match diagnostic regression (Model [2]). This implies that the explanatory power of the probit model with matched firms is significantly diminished. Panel B of Table 7 reports the estimated propensity score distributions of the matched treated and control firms. As observed in the table, the treated and control group firms are similar and have no difference in the propensity scores. Finally, we run t-tests of mean differences in firm-level covariates (*Leverage, Size, ROA, and Own_Con*) for both pre-matched and post-matched treated and control group firms in the pre-S-135 period (2012-2014). Finally, we present the results in Panel C of Table 7. The results indicate that the mean differences in the firms' characteristics between the treatment and control group firms before matching are significant. However, the mean differences in the firms' characteristics between treatment and control group firms after matching are insignificant. Overall, the diagnostic tests show that our approach of using the PSM process eliminates all significant differences between treatment and control group firms. We end up with highly comparable groups of treatment and control firms.

6.4 Propensity Score-Matched Difference-in-Differences (PSM DiD)

We begin our second empirical analysis in this study by plotting the mean *Tobin's Q* for PSM-matched treated and control firms. As shown in figure 1, the mean *Tobin's Q* for PSM-matched treated and control show a parallel trend in the pre-S-135 regulation period. However, there is a notable divergence and significant increase in the gap between treated and control firms after

the enforcement of the S-135 regulation in 2014 (Fiscal year: 1st April 2014 - 31st March 2015). Hence, the differential increase in mean *Tobin's Q* of treated firms in the post-S135 period as compared to the control firms in the pre-S-135 period shows preliminary support to the hypothesis H1, which states that when a firm spends more on environmental CSR as compared to social CSR, it positively impacts the firm value.

[**Figure 1 about here**]

Next, we run univariate difference-in-differences (DiD) analysis using the propensity score-matched (PSM) treated and control group firms for mean *Tobin's Q*. For univariate PSM-DiD analysis, the pre-S135 period is 2012-2014 and post-S-135 period is 2015-2017. We present the results in Panel A of Table 8. As in Panel A of Table 8, the univariate DiD coefficient (0.19) for mean *Tobin's Q* is positive and significant at a 1% level. This explains a significant increase in mean *Tobin's Q* by 0.19 times ($p < 0.01$), in the post-S-135 period, among treated firms compared to the control firms. Overall, the univariate PSM-DiD estimation supports hypothesis H1. While extending our empirical analysis to more precise PSM-DiD estimates, we employ multivariate regression-based PSM-DiD as per the following specification:

$$Y_{it} = \alpha + \beta\,(Treated_i \times After_t) + X_{i,t-1} + \theta_i + \vartheta_t + \varepsilon_{it} \quad (5)$$

Where Y_{it} is *Tobin's Q* (a proxy for firm value) of Indian firm *i* for the year *t*. $Treated_i$ is the dummy variable that takes the value of one for firms that complied with S-135, whose environmental CSR expenditure is more than social CSR expenditure, and zero otherwise. $After_t$ is the categorical variable that takes the value of one for the post-S-135 period and zero for the pre-S-135 period. The DiD is the interaction of $Treated_i$ and $After_t$ dummies. $X_{i,t-1}$ is a vector of one-year lagged covariates *Size, Own_Con, Leverage, Stock_volatility, Op_liquidity, ROA, Sales_growth, Exports, R&D, and Age,* all as defined in Table 1. θ_i and ϑ_t

are the firm and year fixed effects, respectively. ε_{it} is the error term. We cluster standard errors at the firm level only.

It could be plausibly argued that with time, it is empirically challenging to isolate the effect of the exogenous shock, that is, S-135 regulation from other factors, and to get more accurate results of DiD. This suggests more chances of getting precise results when the sample period is short. However, once a firm meets the S-135 regulation, it remains compliant for the next three years (Marshall et al., 2022). Therefore, we estimate specification (4) for both a longer period (2012-2017) and a shorter period (2013-2016). Accordingly, the pre-S-135 period is 2013-2014 for a shorter period and 2012-2014 for a longer period ($After_t$ = 0). Whereas the post-S-135 period is 2015-2016 for a shorter period and 2015-2017 for a longer period ($After_t$ = 1). We present the multivariate PSM-DiD regression results of both shorter period (Model [1]) and longer period (Model [2]) in Panel B of Table 8.

[**Table 8 about here**]

As observed in Panel B of Table 8, there is a significant increase in mean *Tobin's Q* by 0.096 times ($p < 0.1$) in Model [1] and by 0.119 times ($p < 0.05$) in Model [2], among the treated group firms in the post-S-135 period, as compared to the control group firms in the pre-S-135 period. Overall, the estimations of Table 8 support hypothesis H1.

6.5 Robustness Tests: Placebo

We conduct a placebo test as a robustness check of our main estimations from the PSM-DiD analysis. However, our results suggest that implementing the S-135 regulation directly caused an exogenous variation in Tobin's Q of treated firms. However, there is a possibility that these estimations are due to a cyclical trend or the effect of a shock that occurred before or after the enforcement of the S-135 regulation. To rule out this possibility, we perform a placebo test where we take two false exogenous shock years, one before the S-135 regulation year, 2012,

and one after the S-135 regulation year, 2016. We derive the regression estimates by re-running the specification (4). For the placebo test, DiD is the interaction of $Treated_i$ (as defined in Table 1) and $After_t$ (categorical dummy variable) which in Model [1] of Table 9 takes the value of one in the post-false shock period (2013-2015) and zero in the pre-false shock period (2010-2012), and Model [2] of Table 9 takes the value of one in post-false shock period (2017-2019) and, zero in pre-false shock period (2014-2016). The Model [1] and Model [2] of Table 9 report that the DiD coefficients for Tobin's Q of treated firms are insignificant in both the false shock years, 2012 and 2016. This indicates that the placebo test estimates remove any possibility that our main results, presented in Table 8, are due to other events or cyclical trends.

[**Table 9 about here**]

7 Conclusion

This study explores the differential impact of CSR dimensions (environment and social) on firm value. Theoretically, we argue that when a firm spends on environmental CSR, it reduces the cost of capital and creates a competitive advantage, thereby increasing firm value. In contrast, social CSR has an insignificant impact on firm value. The rationale is that the competitors could easily copy the resources and policies associated with social CSR, which does not provide any competitive advantage to the firm. In addition, firms could use social CSR as a whitewashing tool to deflect public attention from hidden risks or bad news.

Further, we examine the relationship between CSR dimensions (environment and social) and firm value using baseline regressions and quasi-natural experiment PSM-DiD. We find that when a firm spends more on environmental CSR than social CSR, it positively impacts its value. Furthermore, we explore a relationship between the location of the CSR dimension (environment or social) and firm value. Our findings suggest that when a firm spends more on environmental CSR in a different state (other than the firm's registered state), it positively

impacts firm value. On the contrary, if a firm spends more on social CSR in a different state, it has a negative impact on firm value.

Moreover, we take advantage of an exogenous shock, CSR regulation related to S-135 that mandates firms satisfying certain size thresholds to spend at least 2% of the average of the previous three years' net profit in prescribed CSR activities (Dharmapala & Khanna, 2018; Manchiraju & Rajgopal, 2017), to identify the causal relationship between environmental CSR and firm value. Our results show that firms affected by the regulation and those that spend more on environmental CSR than social CSR have higher firm value in the years following this event. Altogether, the estimations suggest that the firms should spend more on environmental CSR projects than social CSR projects to improve their firm valuation.

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Table 1: Variable Description

This table describes all the variables used in this study for the sample period (2015-2021).

Variable	Description	Reason	Source	Citation
Dependent Variable				
Tobin's Q	The ratio of (Book value of debt + book value of preferred stock + market capitalization) and the book value of assets, as defined in equation (1)		Derived from CMIE	(Dharmapala & Khanna, 2013)
Key independent variables				
Env_csr_sales	Environmental CSR expenditure scaled by sales		Derived from MCA National CSR Portal and CMIE	
Social_csr_sales	Social CSR expenditure scaled by sales		Derived from MCA National CSR Portal and CMIE	
Key DiD variables				
$Treated_i$	The dummy variable that takes one if it complies with S-135 regulation and environmental CSR is more than social CSR and 0 otherwise		Derived from CMIE and MCA National CSR Portal	
$After_t$	Dummy variable that takes the value of 1 for four years (or three years) after 2015 (inclusive) and 0 for four years (or three years) before 2015		CMIE	(Marshall et al., 2022)
Control variables				
Size	Natural logarithm of total assets	It is positively related to firm value	Derived from CMIE	(Koirala et al., 2020)
Own_Con	The proportion of total shares held by promoters	Promoters are the founding members and insiders of a	CMIE	(Koirala et al., 2020)

		firm, and so they positively affect the firm value		
Leverage	The ratio of the book value of debt-to-equity	Leverage is negatively associated with the firm value	Derived from CMIE	(Koirala et al., 2020)
Stock_volatility	The standard deviation of the stock returns	We include this to control for the risk of a firm's stock price changes over time	Derived from CMIE	(Dharmapala & Khanna, 2013)
Op_liquidity	The ratio of liquid assets to current liabilities	The literature establishes a positive association between a firm's cash holding and firm value	Derived from CMIE	(Koirala et al., 2020)
ROA	The ratio of profit after tax to total assets	A firm's profitability positively affects its value	Derived from CMIE	(Daines, 2001) (Villalonga & Amit, 2006)
Sales_growth	Annual growth in total sales	It is positively related to firm value	Derived from CMIE	(Villalonga & Amit, 2006)
Exports	Foreign sales as a percentage of total sales	It is taken as a control since it is considered a vital sign of a firm's successful performance	CMIE	(Dharmapala & Khanna, 2013)
R&D	Research and development expenditure scaled by sales	It is an intangible asset that might be poorly calculated in the book value of assets (denominator of eq 1), and so it is included	Derived from CMIE	(Dharmapala & Khanna, 2013)
Age	Log of Age (number of years since the incorporation of the firm)	The literature establishes a negative association between a firm's age and valuation.	Derived from CMIE	(Villalonga & Amit, 2006)
Covariates for PSM matching				
Leverage	The ratio of the book value of debt-to-equity	It has a negative impact on CSR	Derived from CMIE	(Marshall et al., 2022)
Size	Natural logarithm of total assets	It positively impacts the CSR expenditure	Derived from CMIE	(Marshall et al., 2022)
ROA	The ratio of profit after tax to total assets	It has a positive impact on CSR	Derived from CMIE	(Ferrell et al., 2016)
Own_Con	The proportion of total shares held by promoters	It positively impacts the CSR expenditure	CMIE	(Marshall et al., 2022)
Other variables				
$CSR\ Exp_{it}$	It takes the value of either *Env_csr_sales* or *Social_csr_sales*		Derived from CMIE and MCA National CSR Portal	

$CSR\ location_{it}$	It is a dummy variable that takes the value of one when CSR expenditure (environment or social) is more in a different state (state other than the firm's registered state) than the same state (firm's registered state) and, zero otherwise	(Husted et al., 2016)

Table 2: Classification of CSR

This table depicts various development sectors allowed under the S-135 regulation of mandatory CSR. We classify the development sectors into the environment and social CSR.

Development Sector	CSR Classification
Agro forestry	Environment
Animal Welfare	Social
Armed forces, Veterans, War Widows/Dependents	Social
Art and Culture	Social
Clean Ganga Fund	Environment
Conservation of Natural Resources	Environment
Disaster Response	Environment
Education	Social
Environmental Sustainability	Environment
Gender Equality	Social
Health Care	Social
Livelihood Enhancement Projects	Social
NEC/Not Mentioned	Social
Other Central Government Funds	Social
Poverty, Eradicating Hunger, Malnutrition	Social
Prime Minister's National Relief Fund	Social
Rural Development Projects	Social
Safe Drinking Water	Environment
Sanitation	Environment
Senior Citizens Welfare	Social
Setting-up Homes & Hostels for Women	Social
Setting-up Orphanage	Social
Slum Area Development	Social
Socio-economic Inequalities	Social
Special Education	Social
Swachh Bharat Kosh (Clean India)	Environment
Technology Incubators	Social
Training to Promote Sports	Social
Vocational Skills	Social
Women Empowerment	Social

Table 3: Summary Statistics

This table reports the summary statistics of all the variables used in this study for the sample period (2015-2021). *Tobin's Q* (a proxy for firm value) is the dependent variable, and, *Social_csr_sales* (social CSR) and *Env_csr_sales* (environmental CSR) are the two independent variables. *Size, Own_Con, Leverage, Stock_volatility, Op_liquidity, ROA, Sales_growth, Exports, R&D and Age* are the control variables. We define all the variables in Table 1. Data sources: CMIE database and MCA National CSR Portal.

Variable	Mean	Median	SD	p25	p75	Minimum	Maximum	Count
Tobin's Q (times)	1.445	0.950	1.314	0.515	1.925	0.174	5.072	7,094
Social_csr_sales (%)	0.180	0.113	0.189	0.048	0.234	0.010	0.746	6,995
Env_csr_sales (%)	0.041	0.016	0.056	0.005	0.050	0.001	0.215	2,727
Size (INR billion)	28.254	8.345	46.881	2.988	27.202	0.972	184.632	5,835
Own_Con (%)	58.304	60.000	14.111	49.720	70.820	11.330	77.130	6,777
Leverage (times)	1.954	0.952	2.082	0.000	4.931	0.000	4.931	7,217
Stock_volatility (%)	2.938	2.836	0.896	2.238	3.497	1.851	13.147	6,752
Op_liquidity (times)	0.311	0.090	0.497	0.032	0.311	0.001	1.881	7,200
ROA (%)	6.029	5.539	5.117	2.618	9.329	-19.605	14.808	7,215
Sales_growth (%)	8.600	6.332	28.449	-3.276	16.221	-64.706	194.256	7,113
Exports (%)	12.654	0.203	21.380	0.000	14.977	0.000	68.819	7,217
R&D (%)	0.125	0.000	0.186	0.000	0.260	0.000	0.458	7,217
Age (years)	39.008	33.000	18.742	26.000	50.000	14.000	83.000	5,835

Table 4: Correlation Table

This table depicts the correlation between all the variables. Tobin's Q (a proxy for firm value) is the dependent variable, and, *Env_csr_sales* (environmental CSR) and *Social_csr_sales* (social CSR) are the two independent variables. *Size, Own_Con, Leverage, Stock_volatility, Op_liquidity, ROA, Sales_growth, Exports, R&D and Age* are the control variables. We define all the variables in Table 1. *, **, and *** denote statistical significance at the 10%, 5%, and 1% significance levels, respectively. Data sources: CMIE database and MCA National CSR Portal.

Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
(1) Tobin's Q	1.00												
(2) Env_csr_sales	-0.02	1.00											
(3) Social_csr_sales	0.00	0.88***	1.00										
(4) Size	0.13***	0.01	0.01	1.00									
(5) Own_Con	0.10***	0.01	0.02	-0.14***	1.00								
(6) Leverage	-0.29***	0.02	-0.00	0.24***	-0.14***	1.00							
(7) Stock_volatility	-0.38***	0.04*	0.03	-0.43***	0.06**	0.11***	1.00						
(8) Op_liquidity	0.21***	-0.01	0.02	-0.08***	0.07**	-0.31***	-0.13***	1.00					
(9) ROA	0.58***	-0.05*	-0.02	-0.07***	0.03	-0.34***	-0.27***	0.25***	1.00				
(10) Sales_growth	0.09***	-0.06**	-0.03	-0.01	0.04	0.02	-0.03	-0.01	0.14***	1.00			
(11) Exports	0.03	-0.01	-0.01	-0.13***	-0.05*	-0.02	0.11***	0.03	0.11***	0.01	1.00		
(12) R&D	0.27***	-0.02	-0.01	0.10***	-0.12***	-0.11***	-0.18***	0.05*	0.21***	-0.04	0.11***	1.00	
(13) Age	-0.06**	-0.04*	-0.04	0.08***	-0.11***	-0.01	-0.09***	0.04	-0.02	-0.09***	-0.11***	0.16***	1.00

Table 5: Basic Regression Table

This table reports the results from the basic regression as per the following specification:

$$Y_{it} = \alpha + \beta(CSR\ Exp_{it}) + X_{i,t-1} + \theta_i + \vartheta_t + \varepsilon_{it}$$

where Y_{it} is the dependent variable, *Tobin's Q* of Indian firm *i* for the year *t*. $CSR\ Exp_{it}$ takes the value of either *Env_csr_sales* or *Social_csr_sales*. $X_{i,t-1}$ is the vector of one-year-lagged control variables. *Size, Own_Con, Leverage, Stock_volatility, Op_liquidity, ROA, Sales_growth, Exports, R&D and, Age*. We define all the variables in Table 1. θ_i and ϑ_t are the firm and year fixed effects, respectively. We winsorize all control variables at 5% and 95% levels. ε_{it} is the error term. We cluster standard errors at the firm level only. *, ** and *** denote statistical significance at the 10%, 5% and 1% significance levels, respectively. The sample period ranges from 2015 to 2021. Data sources: CMIE database and MCA National CSR Portal.

Variable	[1]	[2]
Env_csr_sales	0.096***	
	(3.20)	
Social_csr_sales		-0.034
		(-1.60)
Size	-0.215	-0.167**
	(-1.39)	(-1.99)
Own_Con	-0.125	0.640*
	(-0.34)	(1.82)
Leverage	-0.026	-0.023*
	(-1.22)	(-1.94)
Stock_volatility	-2.722	-0.617
	(-0.84)	(-0.36)
Op_liquidity	-0.042	0.005
	(-0.56)	(0.12)
ROA	3.526***	4.455***
	(4.91)	(11.04)
Sales_growth	0.193**	0.149***
	(2.51)	(4.70)
Exports	-0.195	0.052
	(-1.18)	(0.48)
R&D	-22.40	-18.64
	(-0.93)	(-0.92)
Age	-0.741	-1.075**
	(-0.97)	(-2.43)
Firm fixed effect	Yes	Yes
Year fixed effect	Yes	Yes
Number of observations	2034	5244
R^2(Within)	0.075	0.104

Table 6: Location of CSR and Firm Value

This table reports the results of the location of the CSR dimension regression model as per the following specification:

$$Y_{it} = \alpha + \beta(CSR\ Exp_{it} \times CSR\ location_{it}) + X_{i,t-1} + \theta_i + \vartheta_t + \varepsilon_{it}$$

where Y_{it} is the dependent variable, *Tobin's Q*, a proxy for the firm value of Indian firm *i* for the year *t*. $CSR\ Exp_{it}$ takes the value of either *Env_csr_sales* in Model [1] or *Social_csr_sales* in Model [2]. $CSR\ location_{it}$ is a dummy variable that takes the value of one when CSR expenditure (environment or social) is more in a different state (state other than the firm's registered state) than the same state (firm's registered state) and zero otherwise. $X_{i,t-1}$ is the vector of one-year-lagged control variables. *Size*, *Own_Con*, *Leverage*, *Stock_volatility*, *Op_liquidity*, *ROA*, *Sales_growth*, *Exports*, *R&D*, and *Age*, all as defined in Table 1. θ_i and ϑ_t are the firm and year fixed effects, respectively. We winsorize all control variables at 5% and 95% levels. ε_{it} is the error term. We cluster standard errors at the firm level only. *, ** and *** denote statistical significance at the 10%, 5% and 1% significance levels, respectively. The sample period ranges from 2015 to 2021. Data sources: CMIE database and MCA National CSR Portal.

Variable	[1]	[2]
$Env\_csr\_sales \times CSR\ location_{it}$	0.096***	
	(3.20)	
$Social\_csr\_sales \times CSR\ location_{it}$		-0.037*
		(-1.68)
Size	-0.215	-0.167**
	(-1.39)	(-1.99)
Own_Con	-0.125	0.640*
	(-0.34)	(1.82)
Leverage	-0.026	-0.023*
	(-1.22)	(-1.94)
Stock_volatility	-2.722	-0.616
	(-0.84)	(-0.36)
Op_liquidity	-0.042	0.005
	(-0.56)	(0.12)
ROA	3.526***	4.455***
	(4.91)	(11.04)
Sales_growth	0.193**	0.149***
	(2.51)	(4.71)
Exports	-0.195	0.052
	(-1.18)	(0.48)
R&D	-22.39	-18.64
	(-0.93)	(-0.92)
Age	-0.741	-1.076**
	(-0.97)	(-2.43)
Firm fixed effect	Yes	Yes
Year fixed effect	Yes	Yes
Number of observations	2034	5244
R^2(Within)	0.075	0.104

Table 7: Propensity Score Matching (PSM)

Panel A shows the probit model for PSM as per the following specification:

$$Treat_i = \alpha + \beta.X'_{it} + \lambda_k + \varepsilon_{it}$$

Where $Treat_i$ is the categorical variable that takes the value of one if the firm complied with S-135 and its environmental CSR expenditure is more than Social CSR expenditure, and zero otherwise. X'_{it} is the vector of covariates used for matching, including Size, Own_Con, Leverage, and ROA. We define all the covariates in Table 1. λ_k is the industry fixed effect. ε_{it} is the error term. We cluster standard errors at the firm level only. Model [1] presents the probit model predicting the possibility of being a treated firm from the entire sample of firms, with all the covariates, in the pre-S-135 period, that is, 2012-2014. Model [2] presents the probit possibility model for matched treated and control firms using PSM without replacement. Panel B reports the distribution of estimated propensity scores for the treatment and control firms and the difference in estimated propensity scores post-matching. Panel C reports the univariate comparison of firms' characteristics between treatment and control groups and their corresponding *t*-statistics before and after matching in the pre-S-135 period. *, ** and *** denote statistical significance at the 10%, 5% and 1% significance levels, respectively. Data sources: CMIE database and MCA National CSR Portal.

Panel A: Pre-match propensity score regression and post-match diagnostic regression

	Pre-match [1]	Post-match [2]
Size	0.213***	-0.017
	(7.12)	(-0.36)
Own_Con	0.815***	-0.242
	(3.53)	(-0.64)
Leverage	0.000	0.009
	(0.01)	(0.28)
ROA	4.750***	1.159
	(6.53)	(0.64)
Pseudo R^2	0.122	0.002
Number of observations	2995	452

Panel B: Estimated propensity score distributions

	Firms	Mean	Minimum	25Pct	Median	75Pct	Maximum
Treated	226	0.131	0.005	0.083	0.122	0.176	0.333
Control	226	0.131	0.005	0.083	0.122	0.176	0.333
Difference		0.000	0.000	0.000	0.000	0.000	0.000

Panel C: Difference in covariates before S-135 regulation

	Before matching			After matching		
	Treated	Control	Difference	Treated	Control	Difference
Size	22.413	21.167	1.246***	22.337	22.382	-0.045
			(17.68)			(-0.37)
Own_Con	0.579	0.515	0.064***	0.579	0.587	0.008
			(9.29)			(0.55)
Leverage	2.170	1.674	0.496***	2.157	2.175	-0.018
			(6.35)			(-0.10)
ROA	0.055	0.020	0.035***	0.051	0.048	0.003
			(12.87)			(0.79)

Table 8: Propensity Score-Matched Difference-in-Differences (PSM-DiD)

Panel A provides *Tobin's Q* mean DiD estimates of PSM-matched treated and control groups from 2012 to 2017. Panel B reports the results of the propensity score matched DiD regression model as per the following specification:

$$Y_{it} = \alpha + \beta\,(Treated_i \times After_t) + X_{i,t-1} + \theta_i + \vartheta_t + \varepsilon_{it}$$

Where Y_{it} is *Tobin's Q* (a proxy for firm value) of Indian firm *i* for the year *t*. $Treated_i$ is the dummy variable that takes the value of one for firms that complied with S-135, whose environmental CSR expenditure is more than social CSR expenditure, and zero otherwise. $After_t$ is the categorical variable that takes the value of one for the post-S-135 period, 2015-2017, and zero for the pre-S-135 period, 2012-2014. The DiD is the interaction of $Treated_i$ and $After_t$ dummies. $X_{i,t-1}$ is a vector of one-year-lagged covariates. *Size, Own_Con, Leverage, Stock_volatility, Op_liquidity, ROA, Sales_growth, Exports, R&D, and Age*, all as defined in Table 1. θ_i and ϑ_t are the firm and year fixed effects, respectively. We winsorize all covariates at 5% and 95% levels. ε_{it} is the error term. We cluster standard errors at the firm level only. *, ** and *** denote statistical significance at the 10%, 5% and 1% significance levels, respectively. The study period ranges from 2013 to 2016 in Model [1] and 2012 to 2017 in Model [2]. Data sources: CMIE database and MCA National CSR Portal.

Panel A: *Mean PSM-DiD*

	Tobin's Q			
	Treated	Control	Diff (T-C)	DiD
Before	0.839	0.799	0.040	
			(0.92)	0.190***
After	1.257	1.027	0.230***	(2.68)
			(4.14)	

Panel B: *PSM-DiD regression results*

Variable	[1] (2013-2016)	[2] (2012-2017)
DiD ($Treated_i \times After_t$)	0.096*	0.119**
	(1.82)	(2.13)
Size	0.591***	0.511***
	(3.23)	(4.17)
Own_Con	0.085	0.409
	(0.18)	(1.26)
Leverage	-0.055***	-0.051***
	(-2.92)	(-3.76)
Stock_volatility	4.331*	-0.003
	(1.65)	(-0.00)
Op_liquidity	0.230***	0.183***
	(2.77)	(2.67)
ROA	1.024**	1.903***
	(2.51)	(5.45)
Sales_growth	0.064*	0.028
	(1.73)	(1.03)
Exports	-0.051	0.031
	(-0.22)	(0.23)
R&D	26.080	45.530**
	(1.56)	(2.42)
Age	-0.343	-0.131
	(-0.89)	(-0.50)
Firm fixed effect	Yes	Yes
Year fixed effect	Yes	Yes
Number of observations	1721	2575
R^2(Within)	0.100	0.138

Table 9: Placebo Test

This table reports the DiD results of propensity-matched pairs of firms as per the following specification:

$Y_{it} = \alpha + \beta\,(Treated_i \times After_t) + X_{i,t-1} + \theta_i + \vartheta_t + \varepsilon_{it}$

Where Y_{it} is *Tobin's Q* (a proxy for firm value) of Indian firm *i* for the year *t*. For the placebo test, DiD is the interaction of $Treated_i$ (as defined in Table 1) and $After_t$ (categorical dummy variable) which in Model [1] takes the value of one in the post-false shock period (2013-2015) and zero in the pre-false shock period (2010-2012), and Model [2] takes the value of one in the post-false shock period (2017-2019) and, zero in pre-false shock period (2014-2016). $X_{i,t-1}$ is a vector of one-year-lagged covariates. *Size, Own_Con, Leverage, Stock_volatility, Op_liquidity, ROA, Sales_growth, Exports, R&D, and Age*, all as defined in Table 1. θ_i and ϑ_t are the firm and year fixed effects, respectively. We winsorize all covariates at 5% and 95% levels. ε_{it} is the error term. We cluster standard errors at the firm level only. *, ** and *** denote statistical significance at the 10%, 5% and 1% significance levels, respectively. The study period ranges from 2010 to 2019. Data sources: CMIE database and MCA National CSR Portal.

Variable	[1] (Placebo year=2012)	[2] (Placebo year=2016)
DiD ($Treated_i \times After_t$)	0.034	-0.020
	(0.98)	(-0.41)
Size	0.186*	0.242**
	(1.79)	(2.28)
Own_Con	0.396*	0.000
	(1.65)	(0.00)
Leverage	-0.006	-0.032**
	(-0.82)	(-2.11)
Stock_volatility	-0.135	-0.452
	(-0.09)	(-0.29)
Op_liquidity	0.035	0.120***
	(0.70)	(2.67)
ROA	1.509***	2.948***
	(5.08)	(6.91)
Sales_growth	0.030	-0.015
	(1.42)	(-0.41)
Exports	0.196	-0.051
	(1.32)	(-0.43)
R&D	34.650**	37.796*
	(2.03)	(1.67)
Age	-0.186	-0.140
	(-0.73)	(-0.41)
Firm fixed effect	Yes	-3.843
Year fixed effect	Yes	(-1.46)
Number of observations	2077	2675
R^2(Within)	0.065	0.885

Figure 1: Average Tobin's Q of treated and control firms

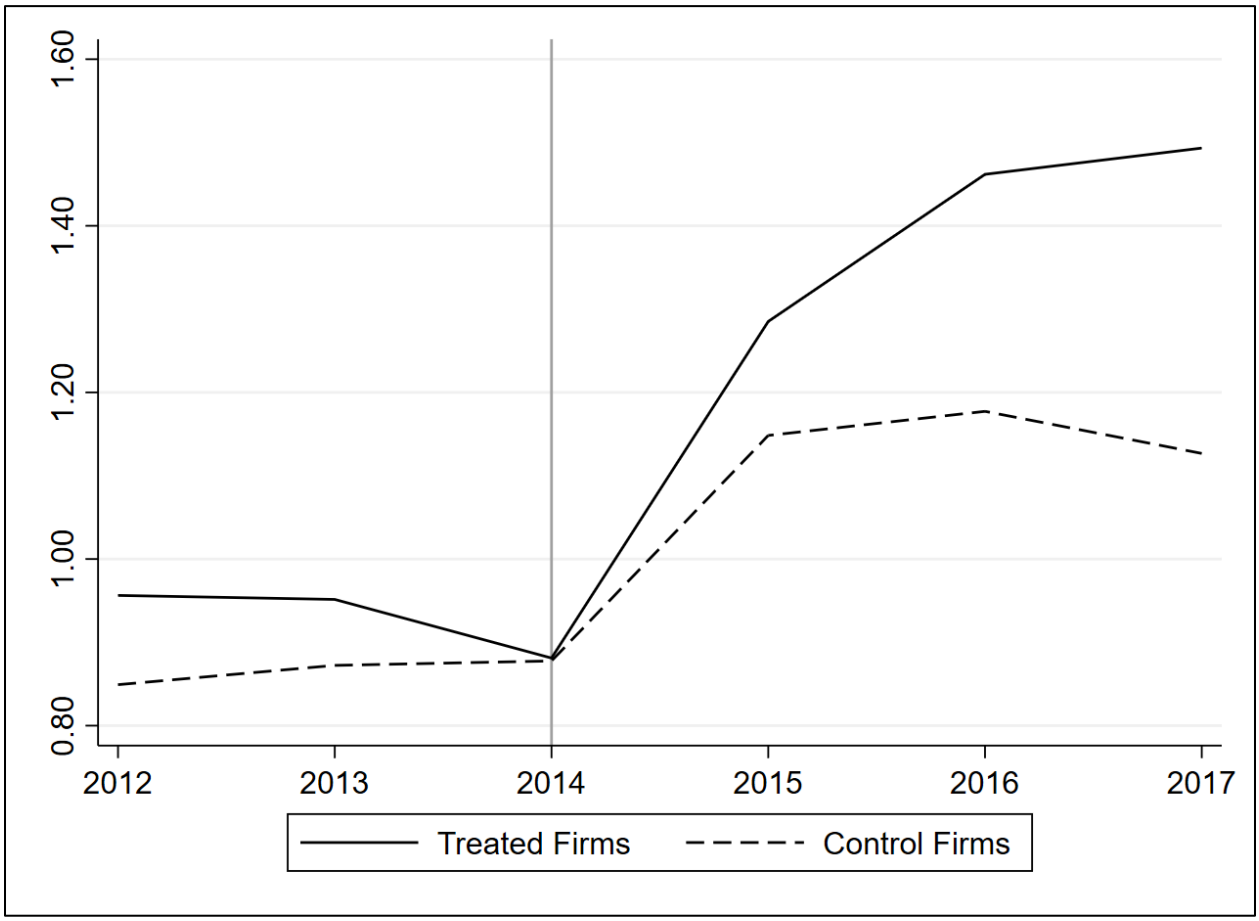

Figure 1 shows the trend of annual mean values of Tobin's Q of treated and control firms before and after the S-135 regulation of mandatory CSR enactment (the horizontal line denotes the effect year). The sample period ranges from 2012-2017.