The Impact of Mandatory CSR Spending on Systematic Risk: New Evidence from India

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Abstract

This paper investigates the effect of mandatory Corporate Social Responsibility (henceforth CSR) spending regulation on firms' systematic risk. Using a difference-in-differences identification technique, we find that firms subject to CSR regulation incur greater levels of systematic risk than firms not subject to CSR regulation. Furthermore, our analyses reveal that the degree of operating leverage is a potential mechanism via which mandatory CSR spending enhances systematic risk. Overall, our findings show that a CSR-induced differentiation strategy is ineffective if all firms are mandated to engage in CSR. Instead, it imposes societal costs on firms at the expense of shareholders.

Keywords: *CSR; Systematic risk; Mandatory CSR regulation: The degree of operating leverage; Beta*

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Abstract

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Introduction

Corporate Social Responsibility (CSR) 's value significance is open to debate. On the one hand, advocates promote the "doing well by doing good" thesis and argue that CSR may increase business value[1]. On the other hand, opponents, such as Nobel laureate Milton Friedman, argue that the social duty of a corporation is to maximize profits, so spending on CSR initiatives might reduce corporate value (Friedman, 1970)[2]. While expenditure on CSR is expected to be a voluntary activity and thus has been implemented by various firms as a differentiation strategy[3] (Hart, 1995; Russo & Fouts, 1997; Schnietz & Epstein, 2005; Albuquerque et al., 2019), Indian regulators have gone a step further and enacted a law mandating firms above certain thresholds to spend on CSR activities. Such a mandatory CSR law may diminish the benefits of voluntary CSR-induced differentiation strategies and impose obligations on firms, which is equivalent to a backdoor method of increasing corporate tax. (Karnani, 2014). Manchiraju and Rajgopal (2017) concur with

[1] Freeman (1984); Baron (2001); McWilliams and Siegal (2001), Benabou and Tirole (2010), Margolis et al. (2009), and Kitzmueller and Shimshack (2012) are some papers that review the literature on "doing well by doing good."

[2] Anecdotal evidence provided by Springkle and Maines (2010) suggests that the costs of CSR include immediate cash outflows and the opportunity cost of spending on CSR, while the benefits include tax deductions, public image, a way to attract, motivate, and retain talented employees, and most importantly, a reduction in firm risk.

[3] McWilliams and Siegel (2001) define CSR as activities that appear to serve some social benefit beyond what is required by law

this viewpoint and find that such the announcement of mandatory CSR resulted in a 4% decline in shareholder value of Indian firms. This study explores the role of mandatory CSR spending regulation in determining a firm's systematic risk.

Albuquerque, Koskinen, and Zhang (2019) construct an industry equilibrium model in which firms endogenously adopt CSR based on consumer spending on CSR goods. If consumer spending on CSR goods is sufficiently low, the proportion of CSR firms will be limited. In such a scenario, CSR firms benefit from CSR as a product differentiation strategy, which results in higher profit margins and reduced price elasticity of demand, inducing lower systematic risk. However, increased profit margins may cause more firms to implement CSR practices. In addition to eliminate CSR-induced differentiation strategies, a large proportion of CSR firms may raise CSR adaptation costs, vulnerability to economic-wide shocks, and thus systematic risk relative to non-CSR firms. We investigate a regulatory intervention that exogenously increases the number of CSR firms in the economy without increasing consumer spending on CSR goods[4]. Given the widespread adoption of CSR activities in India due to regulation, we posit that CSR as a strategy to differentiate between CSR firms and non-CSR firms may not be effective. As a result, mandatory CSR spending may yield insignificant economic gains but incur additional (fixed) costs (Albuquerque, Koskinen, and Zhang, 2019). Our viewpoint is consistent with Harjoto's (2017) study, which posits that CSR expenditure increases firms' operational leverage by increasing variable or fixed expenses if they cannot pass on the costs to their stakeholders. A rise in operating leverage increases the systematic risk (see, Gahlon and Gentry, 1982).

[4] During our sample period, approximately 25% of publicly listed companies and owe about 75% of the total assets, were subject to this regulation.

The Indian Parliament enacted Clause 135 of the Companies Act 2013 in 2013, mandating that Indian firms above the specific thresholds must spend at least 2% of their average net profit over the previous three years on CSR-related initiatives. These thresholds are based on net profit (more than Rs 50 million), net worth (more than Rs 5 billion), or revenue (more than 10 billion). This legislation also includes sanctions for firms and managers who do not comply. These predetermined thresholds enable us to build an identification technique for establishing causality between mandatory CSR spending regulation and system risk

We attempt to establish the causal relationship between mandated CSR spending and systematic risk using the difference-in-differences (DiD) approach. We select firms that did not spend on CSR activities before the regulatory intervention but began spending after regulation (above pre-thresholds) as the treatment group. The control group consists of firms that did not spend in CSR both the pre-period and post-period of the CSR regulation. To isolate the marginal effect of mandatory CSR spending on systematic risk, we incorporate several control variables and firm and year fixed effects. Our analyses show that the systematic risk of firms subject to regulatory intervention increases significantly in the post-regulation period relative to the systematic risk of firms in the control group. For example, during the post-CSR regulation period, we find that the equity *Beta* (systematic risk) of mandated CSR firms (treatment firms) is 7.7 percent higher than non-mandated firms (control firms).

To validate our main results, we undertake additional robustness tests. First, we use the propensity score matched DiD (PSM-DID) to account for any (observed) selection bias when creating treatment and control samples. Our findings and conclusions are consistent when accounting for these issues. Second, we confirm our baseline results using a regression discontinuity design and observe consistent results. Third, previous research shows that investment

in CSR yields positive returns amid market turmoil (Lin et al., 2017; Arora, Sur, and Chauhan, 2020). These studies are based on the notion that investing in CSR helps firms to amass social capital, which earns them a premium valuation under unfavorable market conditions. We examine this hypothesis in the context of an external (systematic) financial shock, specifically the COVID-19 epidemic. If our notion holds true under the mandatory CSR framework, the stock price reaction of treatment firms to the COVID-19 pandemic would be more intense than control firms. This is an alternative test for our general hypothesis that firms exposed to mandatory CSR spending are more susceptible to systematic risk. Our analyses suggest that the pandemic adversely impacted mandatory firms' stock prices more than control firms. This result is consistent with our baseline finding.

To complete our story, we find that mandated CSR firms have higher operational leverage than non-mandated CSR firms in the post-regulation period. This result implies that following the rule's enactment, firms' earnings become more sensitive to sales/revenues. We further investigate operational leverage as a mechanism via which mandatory CSR spending raises systematic risk. We find that mandatory CSR firms with greater operational leverage are more susceptible to systematic risk than firms with lower operating leverage. We next establish that the operating performance of mandated CSR firms is more sensitive to economic cycles than the operating performance of non-mandated CSR firms in the post-regulation period. These results confirm our hypothesis that the earnings of mandated CSR firms become more susceptible to aggregate shocks in the post-regulation period, which increases their systematic risk in the post-regulation period.

We make several contributions to the growing literature on the effects of mandatory CSR investment. First, our analysis concurs with Albuquerque et al.'s (2019) model that the fraction of CSR firms in the economy impacts the relative riskiness of CSR versus non-CSR firms.

Albuquerque et al. (2019) assume in their empirical research that consumer spending on CSR goods is small, and therefore a limited fraction of firms are engaged in CSR, resulting in decreased systematic risk. We take advantage of a regulatory intervention that requires firms to spend on CSR if they exceed a certain threshold. We contend that mandated CSR spending regulation increases the proportion of CSR firms exogenously without increasing consumer spending. As a result, the benefits of CSR spending are reduced, and these costs become fixed costs, which increases systematic risk. To our knowledge, this is the first study to explore the risk-increasing costs of CSR spending when the proportion of firms adopting CSR investment increases in the economy.

Second, our study belongs to the body of research investigating the causes and effects of firms' socially responsible actions. CSR theories that presume voluntary CSR suggest that firms invest in CSR to gain a competitive advantage (see Carroll, 1979; McWilliams and Siege, 2001; Porter and Kramer, 2006; Dahlsrd, 2008). In contrast, our research investigates a system in which firms spend on CSR because they are mandated to do so by law. Recent research by Rajagopal and Tantri (2021) shows that implementing mandatory CSR spending regulation is equivalent to 2% higher taxes on Indian firms, which is associated with an adverse stock price reaction, which implies that firms may not embrace mandatory CSR investment effectively (see Reid and Toffel, 2009; Wang et al., 2016). Our study contributes significantly to the growing research on the impact of CSR under mandated systems.

Our findings also contribute to the literature examining CSR's role in influencing firm risk. Prior research has shown a negative correlation between voluntary CSR spending and firm risk (cost of equity); however, these studies are susceptible to endogeneity issues since they are conducted in an environment where firms choose to invest in CSR (Christensen, Hail, and Leuz,

2019). Albuquerque et al. (2019) apply a model with instrumental variables and demonstrate a negative association between CSR and systematic risk. In contrast, Farah, Li, Zhiccheng, and Shamsuddin (2021) observe a U-shaped association between CSR and systematic risk. Our analysis uses a regulatory intervention that mandates all firms above a certain income level to spend on CSR. As such, our findings are not susceptible to endogeneity issues from the perspective of causality. In addition, we identify the degree of operating leverage as the channel via which mandatory CSR spending raises systematic risk.

The paper is organized in the following ways. Section 2 reports mandatory CSR spending regulation. Section 3 lays out the literature review and testable hypothesis. Section 4 explains the data and methodology used in the paper. Finally, section 5 reports empirical results, and Section 6 concludes.

2. Mandatory CSR spending regulation in India

The Indian government has initiated both soft law and hard law measures in an effort to make Indian firms socially responsible and accountable. The primary purpose of the law is to use Indian firms as a vehicle for national social and environmental development. In this regard, Gatti et al. (2019) claim that "considering the severity of environmental and socioeconomic problems in India and the GOI's inability to resolve the crisis on its own, company CSR initiatives in India are now seen as development instruments." To achieve this goal, authorities have used various strategies to effect the needed changes in the CSR activities of firms.

Before 2013, authorities mostly used the soft law method, encouraging firms to disclose CSR-related activities to the public voluntarily. For instance, voluntary CSR guidelines were issued in 2009, CSR and sustainability guidelines for public sector companies were issued in 2010, and the Securities and Exchange Board of India (SEBI) introduced a new clause, clause 55, in the

listing agreement requiring enhanced disclosure in business responsibility reports. However, in 2013, the Government of India embraced a hard law approach and added Section 135 to the Companies Act of 2013. This clause applies to all companies operating in India that fulfill at least one of the following three statutory standards:

1. Sale of Rs.10 billion (approximately 142 million USD[5])
2. Net worth of Rs. 5 billion (approximately 71 million USD)
3. Net profit of Rs. 50 million (approximately 7 million USD)

Section 135 mandates that a firm meeting any one of these thresholds spend at least 2% of their preceding three years' average net profit on specific CSR activities listed in Schedule VII of the Companies Act, 2013. In addition, section 135 requires all qualifying firms to constitute a CSR committee consisting of three directors, including one independent director, to formulate and oversee the implementation of CSR activities of the firm. It also imposes a fine on responsible persons if the CSR program needs to be implemented or a satisfactory explanation is provided for non-implementation.[6], [7]

3. Literature review and hypothesis development

3.1.Systematic risk and its determinants

Systematic risk captures the vulnerability of a firm's profits to aggregate (economic-wide). Theoretical studies imply that systematic risk consists of three major components: operating risk, financial leverage, and the degree of operating leverage (Beaver, Kettler, and Scholes, 1970; Hamada, 1972; Lev, 1974; Mandelker and Rhee, 1984). The primary drivers of operational risk are industry dynamics and business cycles. The capital structure decisions of a firm determine the

[5] I USD=70 Rs
[6] Rs. 10000 on the first day and Rs.1000/day thereafter
[7] For more information on Section-135, please refer to Getti et al., (2019)

level of financial leverage. In addition, a firm's cost structure dictates its degree of operating leverage. In this study, we examine the impact of mandatory CSR spending regulation on systematic risk via the lens of operating leverage. The ratio of fixed expenses to variable costs determines the degree of operating leverage. The proportionate increase in fixed operational expenses in a firm's cost structure raises the degree of operating leverage, increasing its profit sensitivity to sales and increasing the firm's systematic risk (Hamada, 1970; M. Gahlon, 1981).

Mandatory Vs. Voluntary CSR

Extant research has investigated two major viewpoints on CSR (Friedman, 1970; Shank et al., 2005; Dhaliwal et al., 2011). CSR proponents argue that "doing well by doing good" through CSR investment boosts corporate value (Freeman, 1984; Baron, 2001; McWilliams and Siegal, 2001). On the other hand, opponents, including Milton Friedman, argue that a corporation's social duty entails increasing its profit and share price, implying that spending on CSR initiatives may reduce the firm value (Frieman, 1970). Notwithstanding these disagreements, proponents and opponents maintain that CSR should be voluntary and not mandated by legislation (Dahlsrud, 2008; Mc Williams and Siegel, 2001, pp x).

To make corporations socially accountable, policymakers in several nations have enacted CSR spending regulations. Globally, CSR-related regulations often take one of two forms. The first form pertains to the mandated CSR disclosure. While such rules force firms to report CSR-related information to investors, they do not affect a firm's selection of CSR activities. Prior research has demonstrated that firms subject to such regulation have an enhanced information environment post-regulation (see Wang, Cao, and Ye, 2016; Liu and Tian, 2019; Ni and Zhang, 2019; Xu et al., 2019; Zhang, 2022).

As an example of the second kind of CSR regulation, Indian regulators have gone a step further and passed legislation mandating spending on CSR activities and controlling the selection of CSR activities by firms. In 2013, the Indian government introduced laws requiring "qualifying" corporations to spend 2% of their average net profit over the preceding three years on corporate social responsibility (CSR) programs. In addition, this law requires "qualifying" firms to establish a CSR Committee to ensure compliance with the new legislation. Karnani (2013) argues that mandated CSR spending is comparable to a "backdoor tax" placed on firms. Consistent with this viewpoint, Manchiraju and Rajgopal (2017) find that mandated CSR spending regulation decreases shareholder value by 4.1%. In addition, Rajgopal and Tantri (2021) find that firms that voluntarily spent on CSR during the pre-regulation period reduced their CSR spending during the post-regulation period[8]. Overall, these studies suggest that mandatory CSR spending regulation dilutes the strategic value of voluntary CSR[9].

3.2.Mandatory CSR spending and Systematic risk

We derive our testable hypothesis from the literature, which posits that CSR investment depicts firms as socially responsible entities and generates reputational capital. This reputational capital helps firms to differentiate themselves from non-CSR firms and, as a result, promotes corporate performance sustainability (see Lins, Servaes, and Tamayo, 2017; Chauhan et al., 2022). Prior research has documented several positive effects of CSR. For instance, Cahan, Chen, Chen, and Nguyen (2015) report that CSR firms obtain more favorable media attention. Dutordoair, Strong, and Sun (2018) find that CSR firms are associated with less negative SEO stock price responses. Boubaker, Cellier, Manita, and Saeed (2020) demonstrate that CSR firms are less likely

[8] Rajgopal and Tantri (2021) suggest that one of the reasons for decline in CSR expenditures is compliance costs associated with the law.
[9] In Section 2.3, we provide various examples of strategic value of voluntary CSR.

to encounter financial difficulties. Luo and Bhattacharya (2006, 2009) show that CSR firms have more customer loyalty, which increases the pricing power of these firms. Creyer and Ross (1997), Auger et al. (2003), Pelsmacker et al. (2005), Elfenbein and McManus (2010), Elfenbein et al. (2012), Ailawadi et al. (2014), and Hilger et al. (2019) indicate that customers are willing to purchase or pay extra for CSR-focused products.

Capturing the essence of the above literature, Albuquerque et al. (2019) present a model in which firms adopt CSR as a product differentiation strategy that helps them to reduce the demand elasticity of their product, which in turn makes CSR firms' profits less sensitive to economic-wide shocks and reduces systematic risk. However, these authors presume that only a small percentage of firms participate in CSR efforts. We use a governmental intervention that requires all firms hitting certain profit levels to devote at least 2% of their earnings to CSR efforts. Appendix A provides the percentage of publicly listed firms exposed to this regulation in the post-regulation period. During our sample period, approximately 25% of publicly listed companies, which hold approximately 75% of total assets, were subject to this regulation[10]. Given the widespread recognition of CSR activities enforced by the legislation, firms cannot utilize CSR as a tactic to differentiate themselves from non-CSR peer firms. As a result, mandatory CSR spending may not result in economic gains for firms but may impose additional costs on them.

We further contend that the mandatory CSR spending is fixed in nature that firms must incur, irrespective of their profitability. In support of this assertion, we examine the CSR spending by firms subject to CSR regulation with negative profitability in our dataset in the post-regulation period (269 firm years). However, even while these firms were incurring losses, their CSR

[10] CSR regulations apply equally to all registered unlisted companies. Therefore, the table figures underestimate the true effect of CSR laws on the proliferation of CSR initiatives among Indian firms.

spending (0.4 percent of total sales, on average) continued uninterrupted. This pattern implies that, generally, firms do not halt CSR investment even if they incur losses. We provide two potential explanations for this practice. One, CSR firms may be susceptible to damage their brand and reputation if they reduce CSR spending. Two, CSR firms will have created a permanent infrastructure to support CSR operations, which will become obsolete if they discontinue CSR efforts due to periodic fluctuations in sales. Therefore, it is expected that CSR firms will continue to invest in CSR initiatives regardless of their financial situation, which implies that CSR costs are fixed for all intents and purposes, increasing their operating leverage.

Harjoto (2017) argues that CSR might boost operating leverage if the rise in fixed expenses attributable to CSR activities exceeds its overall marginal contribution. Accordingly, we postulate that the degree of operational leverage (DOL) is the channel via which mandatory CSR spending raises firms' systematic risk. As a continuation of the preceding debate, we hypothesize that since mandatory CSR spending regulations require all firms over the threshold to spend on CSR, these firms may not transform their CSR participation into intangible assets, as noted by Albuquerque et al. (2019). Consequently, firms cannot pass on increased CSR spending to their stakeholders, raising their fixed costs and operational leverage. Consequently, a higher degree of operating leverage will result in an increased systematic risk for firms subject to mandatory CSR spending. Based on the above discussion, we state our main hypothesis:

> **Hypothesis*:*** *Firms exposed to mandatory CSR spending regulation would experience higher levels of systematic risk compared to firms not exposed to mandatory CSR spending regulation in the post-regulation period.*

4. Data, variable formation, and methodology

4.1. Data

We obtain data for the study from the Centre for Monitoring Indian Economy's Prowess database (CMIE). Our sample includes all Indian nonfinancial enterprises listed between 2010 and 2019. Since our analysis evaluates the effect of regulatory intervention on systematic risk through DiD, our final sample consists only of firms for whom data are available for at least three years of the pre-regulation period and three years of the post-regulation period. Our final sample consists of 8671 firm-year observations representing 930 distinct firms, of which 6332 firm-year observations representing 662 unique firms are in the treatment group, and 2339 firm-year observations representing 268 unique firms are in the control group.

Table 1 contains the definitions of all variables utilized in the study. To eliminate the influence of extreme variables on our empirical findings, we winsorize both ends of the variables at the 2% level.

4.2. Variable measurement

Systematic risk quantifies the variance in stock returns caused by economic risk affecting all firms. For equities, *Beta* is the most prevalent proxy used in the literature to quantify systematic risk (Salama et al., 2011; Oikonomou et al., 2012; Jo and Na, 2012; Albuquerque et al., 2019). As such, we use *Beta* as a proxy for systematic risk. To estimate equity *Beta* for each firm and year, we regress daily stock returns on the market portfolio's return. The NSE Nifty 50 index serves as a proxy for the market portfolio. The market portfolio's coefficient is a proxy for systematic risk (equity *Beta*). In addition, we include several control variables, including *Firm Size* (natural logarithm of sales), *firm performance* (Profit before interest and taxes divided by total assets), *tangibility* (the ratio of net fixed assets to total assets), *leverage* (the ratio of total debt to total

assets), *firm Age* (current year minus incorporation year), *MB ratio* (the ratio of market value to book value of equity), and annual *GDP growth rate*.

4.3 Methodology

We use the enactment of mandatory CSR spending as an exogenous shock to firms' systematic risk. We test our hypothesis using the difference in differences approach. As noted previously, firms above specific thresholds must spend 2% of their average (prior) three-year net profit on CSR efforts. We include firms in the treatment group if they are subject to regulatory action and spend post-regulation on CSR initiatives. Firms in the control group did not invest in CSR initiatives before or after the regulatory action. We omit from our sample firms that voluntarily spent on CSR efforts before regulation. To test our hypothesis, we use the following OLS regression model:

$$Sys\_Risk_{it} = \alpha + \beta_1 * CSR\ Reg\ dummy + \beta_2 * Teatment\ firms + \beta_3 * CSR\ Reg\ dummy * Teatment\ firms + \beta_4\ Size_{it} + \beta_5\ ROA_{it} + \beta_6\ Tangibility_{it} + \beta_7\ MB_{it} + \beta_8\ Leverage_{it} + \beta_9\ Firm\ Age_{it} + \beta_{10}\ GDP\ growth_t + \varepsilon_{it} \quad \ldots\ldots\ldots (1)$$

Where *i*, and *t*, represent firm *i* and year *t*. The dependent variable (systematic risk) is proxied by stock *Beta*. *CSR Reg* is an indicator variable that takes the value of 1 for the years 2015-2019 and 0 otherwise. *Treatment firms* is an indicator variable that takes the value of 1 for the treatment firms and 0 for control firms. β_3 measures the change in the systematic risk of treatment firms relative to control firms in the post-regulation period. We expect β_3 to be positive under our maintained hypothesis. We also include various control variables. *Size* variable controls the effect of firm size computed as the natural logarithm of total assets. *Fixed assets divided by total assets measure tangibility*. The firm's financial risk is divided by total debt divided by total assets (*Leverage*). *Firm age* measures a firm's age from the year of incorporation. *GDP growth* measures

growth in the Indian economy. We also include year and industry-fixed effects to control time-invariant and industry (firm)-invariant factors.

5. Empirical analysis

5.1. Descriptive Statistics

Table 1 provides summary data for the study's variables. Panel A provides statistical summaries for the entire sample. The range of *Beta* values is between -0.544 and 2.09. Panel B provides separate statistical summaries for treatment and control firms for the entire period. The mean *Beta* for treatment firms is 0.885, while the mean *Beta* for control firms is 0.871. The difference between the two groups is 0.014, which is not significantly different from zero. Concerning the control variables, we find that treatment firms are larger, have superior operating performance, higher tangible assets, and less financial leverage than control firms. We add these variables as control variables to account for the observed variability between treatment and control firms.

5.2. Parallel trend and treatment homogeneity

An essential premise of the DiD technique is that the dependent variable should display a similar trend between treated and control firms before the exogenous shock. To confirm the parallel tread assumption, we employ the methodology proposed by Autor (2003), which entails examining the yearly difference in the dependent variables between the treatment and control groups before and after the exogenous shock. This test is based on the idea that if both groups exhibit a parallel trend, there should be no significant difference in the dependent variable between the two groups during the pre-regulation period.

To test the parallel trend assumption, we estimate the trend of difference in *Beta* between treatment and matched control firms by using the following regression model.

$$Beta_{it} = \alpha + \sum_{p=-4}^{p=+5} D_p * Treatment\ firms_i + Control\ variables + \gamma + \varepsilon_{it} \quad (2)$$

Where Equity *Beta* (*Beta*) is the dependent variable. *Dp* is a dummy variable whose value is 1 if the year is "p" and 0 otherwise. For instance, D_{-4} takes the value of 1 for observations in 2010 and 0 otherwise, whereas D_{+5} takes the value of 1 for observations in 2019 and 0 otherwise. 2014 (the year of regulatory involvement) serves as a point of comparison (omitted group). The dummy variable, *Treatment firm*, has a value of 1 for treatment firms and 0 for control firms. In addition, we incorporate various control variables and firm fixed effects. This method enables us to examine whether treated and control firms differed significantly in *Beta* prior to regulation. To confirm the parallel trend assumption, we anticipate that D_{-4} and D_{-1} will not be statistically different from 0.

Figure 1 depicts the point estimates and confidence intervals for the four years preceding mandatory CSR spending regulation and the five years after. In the pre-regulation period, there is no significant difference in *Beta* between treatment and control firms, except for 2019, when the coefficient value is negative. In the post-regulatory period, the coefficient value is positive and statistically significant at the 5 percent level, which indicates that the systematic risk of treatment firms increased significantly relative to control firms in the post-regulatory period. Figure 1 confirms the notion of parallel trend assumption and that DiD approach is appropriate in our setting.

Another essential assumption for DiD analysis is the exogeneity of the treatment effect, which requires that the dependent variable's regulation should be exogenous to the treatment. As

noted earlier, the legislation on CSR in India was a response to mounting concerns over social and environmental challenges in the country's growth. In this regard, Gatti et al. (2019) note that "considering the severity of environmental and socioeconomic problems in India and the GOI's inability to resolve the crisis on its own, company CSR initiatives in India are now seen as development instruments." Therefore, it is doubtful that the law was implemented to alter the systematic risk exposure of Indian firms, suggesting that mandatory CSR spending regulation is not endogenous to firms' systematic risk. Moreover, Appendix A indicates that more than 25% of publicly listed firms are affected by this regulation, showing the shock's strength. As a result, it can generate an external shock to firms' systematic risk.

5.3. Univariate analysis

Table 2 displays the univariate DiD findings. For the control sample, *Beta* increases from 0.790 to 0.954, a change of 0.164, but for mandatory firms, the rise is larger with a value of 0.276, or from 0.743 to 1.019. The univariate DiD result (0.112) indicates that treatment firms have a significantly greater rise in systematic risk (*Beta*) during the post-regulation period than control firms. It is also economically relevant since it shows that, in the post-regulation period, treatment firms have around 12,7% greater systematic risk exposure than control firms. To determine the magnitude of this influence, we divide the value of DiD (0.112) by the sample-wide mean of *Beta* (0.88). Overall, our univariate outcome supports our central hypothesis.

5.4. Multivariate analysis

Next, we discuss the outcome of the multivariate analysis conducted to test our null hypothesis. Table 3 presents the results. As indicated in Column (1), the coefficient of *CSR dummy*Treatment firms* (DiD coefficient) is positive and statistically significant at the 1% level. In Column (2) also, we find that the *CSR dummy*Treatment firms* variable has a positive

coefficient. To alleviate the concern that firm-level invariant heterogeneity may be driving our results, we re-estimate the regression model (equation 3) with firm-fixed effect, as shown in Column (3). Again, the coefficient of *CSR dummy*Treatment firms* is statistically significant and positive at the 1% level. The coefficient value (from Column 4) is 0.059, showing that in the post-regulation period, the treatment firms' *Beta* is 0.059% higher than the control firms' *Beta*. Our result is also economically relevant. When this increase is compared to the pre-regulation mean value of *Beta* (0.75), it is evident that treatment firms have around 7.8 percent (0.059/0.75) higher systematic risk than control firms. According to Manchiraju and Rajgopal (2017), treatment firms spending on CSR incur a 4.1% decline in shareholder value. Our findings suggest that systematic risk may be a potential mechanism via which mandatory CSR spending has a detrimental effect on shareholder value. Overall, our findings are consistent with our hypothesis and confirm the prediction of Albuquerque et al. (2019) that the broad adoption of CSR activities increases firms' systematic risk.

4.5. PSM-based DiD

As previously mentioned, a critical prerequisite for DiD is to establish a control group that is as similar to the treatment group as feasible during the pre-shock period (Atanasov and Black, 2021, 2016). To account for observed variations between treatment and control firms, robustness analysis currently employs a non-parametric technique, propensity score matching (henceforth PSM). The primary objective of PSM is to determine the optimal match between treatment and control firms based on observable characteristics. To that end, we match each CSR-exposed firm (treatment firm) with a non-exposed firm (control firm) based on leverage, tangibility, growth rate, market capitalization, and age. During the pre-regulation period, matched samples are selected using the closest neighbor with the replacement matching approach. In addition, econometric tests

are conducted to check the balance of the matched sample for the firm-specific variables included in PSM. The post-estimation test of PSM demonstrates that the matched sample is balanced for all variables except leverage, which is marginally significant at the 10% level. This method yields 1149 matched paired observations from the treatment and control groups; we then expand the same sample for the post-regulation period. Our final sample consists of 5,258 firm-year observations for 573 distinct firms.

Next, DiD regression is applied to the matched samples. Table 4 reports the results. Again, the PSM-matched DiD corroborates the previous findings that firms exposed to mandatory CSR spending regulation experience higher levels of systematic risk in the post-regulation period. Indeed, the value of DiD (*CSR Dummy*Treatment Firms*) is greater in magnitude for PSM-matched DiD as compared with Column (4) of Table 4.

4.3. Regression discontinuity design (RDD)

Next, we employ Regression Discontinuity Design (RDD) as an additional quasi-experimental method. Since all firms above at least one of the thresholds are mandated to spend on CSR, we use a binding score multivariate Regression Discontinuity design (MRDD) (see Wong et al., 2013) using a sample of all firms in the post-regulation period. The binding-score method of MRDD permits the combination of various cutoff variables into a single rating variable and estimates the total treatment impact within a specific bandwidth. The mandatory CSR regulation stipulates three thresholds: 50 million INR in earnings, 5 billion INR in book value, and 10 billion INR in sales. We adopt Manchiraju and Rajgopal's (2017) definition of the single rating variable (*M*). First, a binding score rating variable M is created, which is defined as the minimum of the three threshold rating scores R1, R2, and R3, which are defined as (Profit - 50)/50, (Book value - 5,000)/5,000, and (sales - 10,000), respectively, and which determines whether a firm is subject to

the mandatory CSR regulation. Our RDD sample comprises firms with the variable M ranging from -0.50 to 0.50, with treatment firms having $M > 0$ and control firms having $M<0$.

Figure 2 depicts a scatter plot of equity *Beta* for treatment and control firms. Nicholes' (2007) RD command in STATA generates this graph (Figure 2). Since the legislation does not impact firms below the threshold (to the left of 0), any discontinuity in *Beta* at the cutoff (above 0) may be attributed to the regulation of mandatory CSR spending regulation. Figure 2 demonstrates a discontinuity in *Beta* at the cutoff (zero). Overall, the visual analysis reveals that mandatory CSR spending regulation increases the systematic risk of treatment firms.

To demonstrate robustness, we undertake a regression-based MRDD analysis using the RDROBUST command in STATA, developed by Calonico, Cattaneo, and Tiiunki (2014b). The MRDD findings based on regression are shown in Table 5. We find that *Beta* is 0.24 higher for treatment firms than for control firms. We offer three sets of RDD estimates: the traditional RDD, the bias-corrected standard error, and the robust standard. Overall, treatment firms appear to be more susceptible to systematic risk than control firms in the post-regulation period. The RDD results corroborate our initial hypothesis and are consistent with DiD.

4.6. Impact of mandatory CSR spending regulation on operating leverage

We demonstrate in the above analyses that in the post-regulation period, firms subject to mandated CSR spending regulations cause greater systematic risk than control firms. Nest, we examine the mechanism through which CSR spending raises the systematic risk of firms. Mandelker, Rhee, and Rubinstein (1973) and Mandelker and Rhee (1984) suggest that operating leverage, financial leverage, and operating risk are the three primary components of systematic risk. The proportion of fixed operating costs within a firm's cost structure determines its

operational leverage. As a result, fixed operational costs enhance the sensitivity of a firm's operating profit to revenues. Assuming CSR investment to be a fixed cost, we consider operating leverage to be the primary route via which CSR spending might impact systematic risk.

Albuquerque et al. (2019) propose that firms utilize CSR as a product differentiation strategy, and CSR firms' goods are less susceptible to economic shocks, reducing the firm's systematic risk. However, the CSR-induced product differentiation technique is effective when a small percentage of firms implement CSR. Since mandatory CSR spending regulation mandates all firms over the specified threshold to spend 2% of their average prior 3-year net profit on CSR, it can raise firms' fixed costs since firms subject to mandatory CSR regulation must build a system to spend on and monitor CSR activities. In addition, cutting CSR spending in response to earnings fluctuation may jeopardize the firm's reputation and image. As such, we expect CSR spending to be a relatively fixed commitment relative to the firm's revenue stream. Consequently, firms subject to mandated CSR regulation will incur greater fixed costs than those not subject to regulations. Since operational leverage indicates the ratio of fixed to variable expenses, spending on CSR will raise operating leverage, thereby raising the sensitivity of the firm's operating profit to sales. We follow Mandelker and Rhee's (1984) time-series regression-method to estimate operating leverage.

$$\ln(EBIT)_{it} = \alpha + \beta \ln(Sales)_{it} + \varepsilon_{it} \ldots\ldots\ldots\ldots (2)$$

where, $\ln(EBIT)_{it}$ is natural logarithm of earnings before interest and taxes of firm *i* and year *t*. $\ln(Sales)_{it}$ is natural logarithm of firms' sales of firm *i* and year *t*. β measures the firm's degree of operating leverage. We extend Mandelker and Rhee's (1984) time-series regression method to incorporate the impact of mandatory CSR spending on operating leverage. We use the following regression model:

$$\ln(EBIT)_{it} = \alpha + \beta_1 * CSR\ Reg\ dummy + \beta_2 * Teatment\ firms + \beta_3 * CSR\ Reg\ dummy * Teatment\ firms + \beta_4 Treatment\ firms * Ln(Sales) + \beta_5 * CSR\ Reg\ dummy * Treatment\ firms + + Control\ variables\ +\ \varepsilon_{it} \ldots\ldots (3)$$

Here, β_4 measures the difference in degree of operating leverage between treatment and control firms in pre-regulation period. β_5 measures the difference in the degree of operating leverage between treatment and control firms in post-regulation period. We expect a positive coefficient for β_5. We include various control variables, firm- and year-fixed effects, in the model. The definition of variables used in the regression model is reported in Appendix A.

Table 6 reports the results. Consistent with our expectation, we find that the coefficient of CSR *Reg dummy*Treatment firms*ln(Sales)* is positive and significant at 5% level. This suggests that treatment firms' operating profit becomes more sensitive to firms' sales compared to control firms in the post-regulation period. From Column (2), we can infer that given a 1% change in sales, treatment firms experience about 2.6% greater change in operating profit relative to control firms in the post-regulation period, holding other variables constant. We attribute this result to the cost of mandatory CSR spending imposed on firms exposed to the CSR regulation. In Column (2), we further find that the coefficient of $Treatment\ firms * Ln(Sales)$ is positive, albeit not significant. This result implies that there is no significant difference in the degree of operating leverage between treatment and control firms in the pre-regulation period.

These findings support our contention that mandatory CSR spending regulation increases firms' fixed costs and, consequently, their operational leverage. Next, we investigate operating leverage as the mechanism via which mandatory CSR spending may explain systematic risk.

4.7. The impact of "*operating leverage*" on systematic risk

We adopt a two-step technique to evaluate the direct influence of operational leverage on systematic risk. In the first stage, we use the following regression model to estimate the degree of operating leverage at the firm level. Specifically, we use the following regression model for yearly observations for each business for the entire sample period:

$$\ln(EBIT)_t = \alpha + \beta_1 * CSR\ Reg\ dummy + \beta_2 * CSR\ Reg\ dummy * \ln(Sales)_t + \beta_3 \ln(Sales)_t + \varepsilon_t \text{.....(4)}$$

Here, *t* represents the year. β_3 measures the degree of operating leverage for each firm in the pre-regulation period. β_2 measures a change in the degree of operating leverage (ΔDOL) for each firm in the post-regulation period. In the second step, we employ the following regression model to examine the influence of the degree of operating leverage on systematic risk:

$$Sys\_Risk_{it} = \alpha + \beta_1 * CSR\ Reg\ dummy + \beta_2 * CSR\ Reg\ dummy * Teatment\ firms + +Control\ variables + \varepsilon_{it} \text{.....(5)}$$

Our primary interest is the coefficient (β_4) of the triple interaction term ($CSR\ Reg\ dummy * Teatment\ firms * \Delta DOL$). A positive value of β_3 is consistent with the notion that operating leverage is a channel through which firms exposed to mandatory CSR spending regulation experience higher levels of systematic risk. We also include control variables discussed earlier and firm- and year-fixed effects. We exclude the main effect of ΔDOL from the regression since it is time-invariant and, hence, is subsumed by firm-fixed effects.

The results are reported in Table 7. We observe that the coefficient of the triple interaction ($CSR\ Reg\ dummy * Teatment\ firms * \Delta DOL$) is positive and significant at a 1% level. This result implies that relative to control firms, there is a direct relation between systematic risk and the degree of operating leverage for firms exposed to mandatory CSR spending regulation. Given

that the standard deviation of ΔDOL is 2.4, the economic magnitude of triple interaction's coefficient (0.013) indicates that one standard deviation increase in ΔDOL leads to a 0.312 (0.013*2.4) increase in *Beta* of firms exposed to mandatory CSR spending regulation. Interestingly, we observe that the coefficient of *CSR dummy*Treatment firms* becomes insignificant when we include control variables, as reported in Column (2). This result indicates that CSR-exposed firms with zero value of ΔDOL do not experience any difference in systematic risk compared to control firms in the post-regulation period, holding other variables constant. Overall, our empirical results corroborate the view that mandatory CSR regulation increases firms' operating leverage and, in turn, their systematic risk.

5. Additional analysis

5.1. Mandatory CSR spending regulation and Cyclicality of profits

In this part, we provide corroborative evidence for our initial hypothesis. We propose that if firms subject to mandatory CSR spending regulation display more systematic risk in the post-regulation period, their operational profits will be more cyclical, i.e., more susceptible to changes in economic cycles, which we proxy by using the GDP growth rate. To test this proposition, we use the following regression model:

$$Change\ in\ ROA_{it} = \alpha + \beta_1 * CSR\ Reg\ dummy + \beta_2 * CSR\ Reg\ dummy * Teatment\ firms + +Control\ variables\ + \varepsilon_{it} \ldots\ldots\ldots (6)$$

Here, the dependent variable is the year-to-year change in return on assets (ROA = EBIT/total assets). We focus on the coefficient (β_3) of the triple interaction term ($CSR\ Reg\ dummy * Teatment\ firms * GDP\ growth$). If the operating profit of CSR-exposed firms becomes more

sensitive to GDP growth after the passage of CSR spending regulation, we would expect a positive value of β_3. We also include the usual control variables along with firm- and year-fixed effects

We report the results in Table 8. As anticipated, the triple interaction coefficient (*CSR_Reg dummy*Treatment_firms*GDP_growth*) is positive and statistically significant at the 5% level. This result suggests that changes in *ROA* are more sensitive to GDP growth for firms subject to mandatory CSR spending regulations, which is consistent with our baseline hypothesis that CSR regulation-exposed firms are more sensitive to systematic (economic) shocks and, consequently, show greater systematic risk.

5.2 Systematic crisis and stock returns

Next, we run further auxiliary tests to evaluate our hypothesis. Specifically, we investigate how firms subject to CSR regulation respond to an exogenous crisis relative to control firms. We hypothesize that if firms subject to CSR regulations are more sensitive to aggregate shocks, their shareholder value will be more susceptible to these shocks. To test this hypothesis, we utilize the COVID-19 epidemic as a systematic shock to the economy and shareholder value (see Arora, Sur, and Chauhan, 2021). We track three event windows corresponding to the three waves of COVID-19 in India and calculate buy-and-hold returns of each stock around these three windows. The first window is between the date of the pandemic commencement, i.e., January 30, 2020, and March 23, 2020, when the Indian stock market recorded its lowest value (i.e., the lowest NIFTY index value)[11] during the COVID era. This event window does include the announcement of the Indian government's financial budget for the fiscal year 2020-21 on February 1, 2020. This occurrence

[11] The NIFTY index is the main index of the National Stock Exchange (NSE).

may influence cumulative returns[12]. Consequently, we consider the period between February 6, 2020, and March 23, 2020, to be the second event window.

Next, we notice that Indian financial markets did not react much to the emergence of COVID-19 on January 30, 2020, since the first case was detected in an ex-pat resident, and he was swiftly isolated to prevent the disease spreading to the larger population. However, on February 28, 2020, additional incidents began to emerge when the stock market responded negatively to the COVID-19 issue. Therefore, as the third wave event window, we estimate the buy-and-hold return between February 28, 2020, and March 23, 2020. The following regression model is employed:

$$BHAR = \alpha + \beta_1 Teatment\ firms + \beta_2\, Size_{it} + \beta_3\, Tangibility_{it} + \beta_4\, MB_{it} + \beta_5\, Leverage_{it} + \beta_6\, Firm\ Age_{it} + \beta_7\, Sales\ growth_{ratet} + IndEffects + \varepsilon_{it} \ldots\ldots \quad (7)$$

Here, *BHAR* represents buy-and-hold returns over three distinct holding periods. The indicator variable, *Treatment firms*, has a value of 1 for treatment firms and 0 for control firms. In addition, industry-fixed effects are included in the regression model (7).

Table 9 reports the results. In each of the three models reflecting the three measurement windows for cumulative returns, the coefficients of *Treatment firms* are negative and statistically significant at the 1% level. This result indicates that the COVID-19 crisis causes a bigger decline in the stock values of CSR-exposed firms compared to control firms, corroborating our earlier results that CSR-mandated firms become more vulnerable to systematic shocks in the post-regulation period than control firms.

[12] Our data shows that stock market was down by 2% on the day of budget, however, stock market regained its pre-budget level within four days after the budget presentation.

6. Conclusions

According to the CSR literature, firms' investments in CSR yield intangible assets that enable them to differentiate themselves from their competitors. Our analysis uses a regulatory intervention that mandates CSR spending by all firms above a certain level. Specifically, our study demonstrates that firms subject to mandatory CSR spending regulation incur greater levels of systematic risk than firms that are not subject to such regulations. This analysis implies that large-scale adoption of CSR mandated by the government undermines CSR-induced differentiation strategies but incurs (fixed) costs for firms. Consistent with this notion, we find that mandated CSR expenditure raises systematic risk through the degree of operating leverage route.

Our research contributes to the ongoing discussion of whether CSR should be regulated. Prior research indicates that regulation mandating disclosure of CSR activity enhances firms' post-regulation information environments (see Wang, Cao, and Ye, 2016; Liu and Tian, 2019; Ni and Zhang, 2019; Xu et al., 2019; Zhang, 2022). Our study investigates a unique rule that mandates Indian firms spend 2% of their income on CSR efforts if their profits/ book value/sales exceed specific limits. Our findings imply that mandatory CSR spending regulations impose CSR duties on firms at the price of shareholder value.

References

1. Adeyeye, A. (2011). Universal standards in CSR: are we prepared? *Corporate Governance: The international journal of business in society*.
2. Albuquerque, R., Koskinen, Y., & Zhang, C. (2019). Corporate social responsibility and firm risk: Theory and empirical evidence. *Management Science*, *65*(10), 4451-4469.
3. Albuquerque, R., Koskinen, Y., Yang, S., & Zhang, C. (2020). Resiliency of environmental and social stocks: An analysis of the exogenous COVID-19 market crash. *The Review of Corporate Finance Studies*, *9*(3), 593-621.
4. Amel-Zadeh, A., & Serafeim, G. (2018). Why and how investors use ESG information: Evidence from a global survey. *Financial Analysts Journal*, *74*(3), 87-103.
5. Ayadi, M., Kusy, M. I., Pyo, M., & Trabelsi, S. (2015). Corporate social responsibility, corporate governance, and managerial risk-taking. *Corporate Governance, and Managerial Risk-Taking (January 9, 2015)*.
6. Bae, K. H., El Ghoul, S., Gong, Z. J., & Guedhami, O. (2021). Does CSR matter in times of crisis? Evidence from the COVID-19 pandemic. *Journal of Corporate Finance*, *67*, 101876.
7. Becchetti, L., Ciciretti, R., & Hasan, I. (2015). Corporate social responsibility, stakeholder risk, and idiosyncratic volatility. *Journal of Corporate Finance*, *35*, 297-309.
8. Bénabou, R., & Tirole, J. (2010). Individual and corporate social responsibility. *Economica*, *77*(305), 1-19.
9. Bouslah, K., Kryzanowski, L., & M'Zali, B. (2018). Social performance and firm risk: Impact of the financial crisis. *Journal of Business Ethics*, *149*(3), 643-669.
10. Chakraborty, A., Gao, L. S., & Sheikh, S. (2019). Managerial risk-taking incentives, corporate social responsibility, and firm risk. *Journal of Economics and Business*, *101*, 58-72.
11. Chen, Y. C., Hung, M., & Wang, Y. (2018). The effect of mandatory CSR disclosure on firm profitability and social externalities: Evidence from China. *Journal of accounting and economics*, *65*(1), 169-190.
12. Cominetti, M., & Seele, P. (2016). Hard soft law or soft hard law? A content analysis of CSR guidelines typologized along hybrid legal status. *uwf UmweltWirtschaftsForum*, *24*(2), 127-140.
13. Crifo, P., & Forget, V. D. (2015). The economics of corporate social responsibility: A firm-level perspective survey. *Journal of Economic Surveys*, *29*(1), 112-130.
14. Dahlsrud, A. (2008). How corporate social responsibility is defined: an analysis of 37 definitions. *Corporate social responsibility and environmental management*, *15*(1), 1-13.
15. Dhaliwal, D. S., Li, O. Z., Tsang, A., & Yang, Y. G. (2011). Voluntary nonfinancial disclosure and the cost of equity capital: The initiation of corporate social responsibility reporting. *The accounting review*, *86*(1), 59-100.
16. Du, S., & Vieira, E. T. (2012). Striving for legitimacy through corporate social responsibility: Insights from oil companies. *Journal of business ethics*, *110*(4), 413-427.
17. El Ghoul, S., Guedhami, O., Kwok, C. C., & Mishra, D. R. (2011). Does corporate social responsibility affect the cost of capital? *Journal of Banking & Finance*, *35*(9), 2388-2406.
18. European Commission (2011). A renewed EU strategy 2011-14 for corporate responsibility[Com(20110];Commision of the European Communities, Brussels. Retrieved February 16, 2020, from https://www.eurocommerce.eu/media/7237/position-csr-renewed_csr_strategy_2011-14-07.03.2012.pdf

19. Harjoto, M., & Laksmana, I. (2018). The impact of corporate social responsibility on risk taking and firm value. *Journal of Business Ethics*, *151*(2), 353-373.
20. Gatti, L., Vishwanath, B., Seele, P., & Cottier, B. (2019). Are we moving beyond voluntary CSR? Exploring theoretical and managerial implications of mandatory CSR resulting from the new Indian companies' act. *Journal of Business Ethics*, *160*(4), 961-972.
21. Godfrey, P. C. (2005). The relationship between corporate philanthropy and shareholder wealth: A risk management perspective. *Academy of management review*, *30*(4), 777-798.
22. Jensen, M. C., & Meckling, W. H. (1976). Theory of the firm: Managerial behavior, agency costs and ownership structure. *Journal of financial economics*, *3*(4), 305-360.
23. Jo, H., & Na, H. (2012). Does CSR reduce firm risk? Evidence from controversial industry sectors. *Journal of business ethics*, *110*(4), 441-456.
24. Lemmon, M., & Roberts, M. R. (2010). The response of corporate financing and investment to changes in the supply of credit. *Journal of Financial and quantitative analysis*, *45*(3), 555-587.
25. Lins, K. V., Servaes, H., & Tamayo, A. (2017). Social capital, trust, and firm performance: The value of corporate social responsibility during the financial crisis. *the Journal of Finance*, *72*(4), 1785-1824.
26. Oikonomou, I., Brooks, C., & Pavelin, S. (2012). The impact of corporate social performance on financial risk and utility: A longitudinal analysis. *Financial Management*, *41*(2), 483-515.
27. Oikonomou, I., Platanakis, E., & Sutcliffe, C. (2018). Socially responsible investment portfolios: Does the optimization process matter? *The British Accounting Review*, *50*(4), 379-401.
28. 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.
29. McWilliams, A., & Siegel, D. (2001). Corporate social responsibility: A theory of the firm perspective. *Academy of management review*, *26*(1), 117-127.
30. Mishra, S., & Modi, S. B. (2013). Positive and negative corporate social responsibility, financial leverage, and idiosyncratic risk. *Journal of business ethics*, *117*(2), 431-448.
31. Porter, M. E., & Kramer, M. R. (2006). The link between competitive advantage and corporate social responsibility. *Harvard business review*, *84*(12), 78-92.
32. Salama, A., Anderson, K., & Toms, J. S. (2011). Does community and environmental responsibility affect firm risk? Evidence from UK panel data 1994–2006. *Business ethics: a European review*, *20*(2), 192-204.
33. Reinhardt, F. L., & Stavins, R. N. (2010). Corporate social responsibility, business strategy, and the environment. *Oxford review of economic policy*, *26*(2), 164-181.
34. Roy, P. P., Rao, S., & Zhu, M. (2022). Mandatory CSR expenditure and stock market liquidity. *Journal of Corporate Finance*, 102158.
35. Vilanova, M., Lozano, J. M., & Arenas, D. (2009). Exploring the nature of the relationship between CSR and competitiveness. *Journal of business Ethics*, *87*(1), 57-69.

Table 1: Summary statistics

The table provides summary statistics of variables used in the study. ***, **, and * indicate significance at 0.01, 0.05, and 0.10 levels. The definition of variables is provided in Appendix A.

Panel 1: Full sample summary statistics					
Variables	**Mean**	**SD**	**Min**	**Max**	
Beta	0.881	0.464	-0.544	2.090	
Size	8.707	1.751	-1.609	11.903	
ROA	0.085	0.105	-0.858	0.529	
Tangibility	0.281	0.191	0.000	0.910	
Leverage	0.261	0.212	0.000	0.999	
MB	2.408	5.069	0.009	32.008	
Age	35.524	22.690	2	156	
GDP growth	6.592	1.358	4.040	8.497	
Panel 2: summary statistics for control and mandatory firms					**Difference**
Variables	**Control firms (N=2339)**		**Mandatory firms (N=6332)**		**Mean**
	Mean	**SD**	**Mean**	**SD**	**Man-Control**
Beta	0.871	0.510	0.885	0.446	0.014
Size	7.550	1.879	9.134	1.490	1.585***
ROA	0.018	0.111	0.110	0.091	0.092***
Tangibility	0.272	0.209	0.284	0.183	0.012***
Leverage	0.376	0.238	0.218	0.184	-0.158***
MB	1.136	5.463	2.878	4.832	1.742***
Age	29.652	19.281	37.693	23.459	8.041***

Figure 1: Parallel trend assumption (Lead and Lags model)

The figure plots the difference in differences coefficients for the effect of mandatory CSR spending regulation, where the point estimate is estimated by year using the following regression model

$$DA_{it} = \alpha + \sum_{p=-4}^{p=+5} D_p * Treatment\ firms_{i+} Control\ variables + \gamma + \varepsilon_{it}$$

Where the dependent variable is $Beta$. D_p is a dummy variable that takes a value of 1 if it is "p" year and zeroes otherwise. For instance, D_{-4} takes the value of a for observations in 2010 and 0 otherwise, and D_{+5} takes the value of a for observations in 2019 and 0 otherwise. The year 2014 (regulatory intervention year) is an omitted variable. Treatment firms is a dummy variable that takes a value of 1 for treatment firms and 0 for control firms. We also include control variables and firm fixed effects. The solid points indicate points estimates, and the dashed line represents a 95% confidence interval.

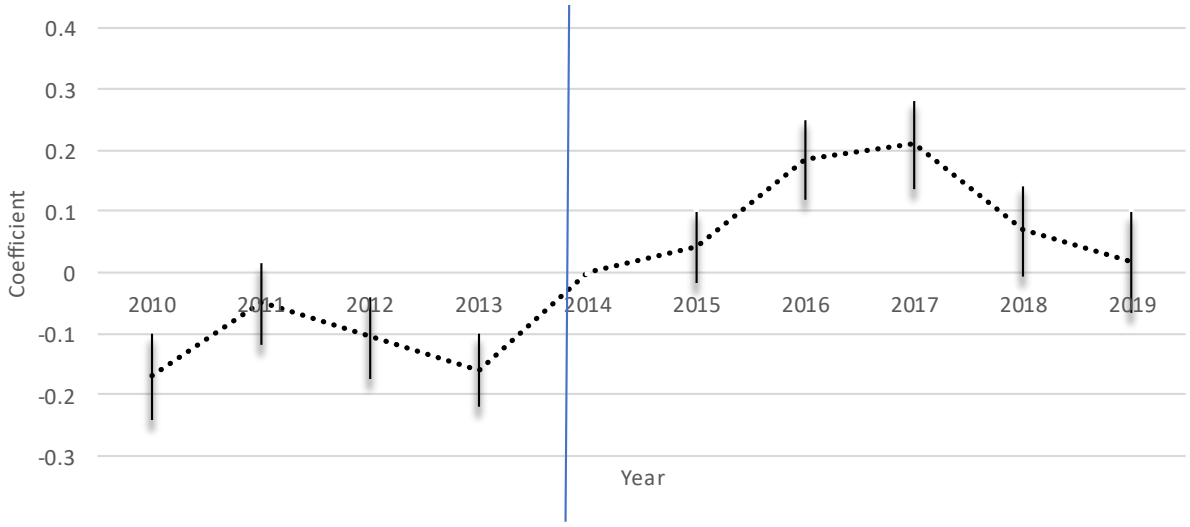

Table 2: Univariate results

Beta is estimated from the market model. Then, the statistical significance of the difference is tested using the t-statistic. ***, **, and * indicate significance at 0.01, 0.05 and 0.10 levels.

Panel 1: Summary statistics of control and treatment sample across pre- and post-CSR regulation

Variables	Control Sample			Treatment Sample		
	Pre (N=1194)	Post (N=1145)	Difference	Pre (N=3078)	Post (N=3254)	Difference
Beta	0.790	0.954	0.164***	0.743	1.019	0.276***

Panel 2: Univariate Difference in differences analysis

Variables	Pre-Regulation period			Post-Regulation period			DID
	Control	Treated	Difference	Control	Treated	Difference	
Beta	0.790	0.743	-0.047***	0.954	1.019	0.065***	0.112***

Table 3: CSR and firm-risk

The table provides the effect of mandatory CSR spending regulations on systematic risk, measured by equity Beta (*Beta*). The following regression model

$$Beta_{it} = \alpha + \beta * (Treatment\ firm * \text{Reg dummy}) + X_{it}\beta^{j} + Yreffcts + Firmeffcts + \varepsilon_{it}$$

Where $Beta_{it}$ is equity beta (*Beta*). *Treatment firm* is an indicator variable that takes a value of 1 if the firm is affected by S-135 regulation and 0 for control firms. $Reg\ dummy$ is a dummy variable that takes a value of 1 for the post-CSR mandate period (2015-2019) and 0 for the pre-CSR mandate period (2010-2014). X_{it} is the vector of control variables (*Size, ROA, Tangibility, Leverage, Sales growth rate, Firm age. GDP growth rate, Market to book value ratio)*. The definition of variables is presented in Table 1. $Yreffcts$ and $Firmeffcts$ represent the year and firm-fixed effects, respectively. t-values measured by clustered standard error at the firm level are reported in parentheses. *, **, and *** denote statistical significance at the 10%, 5% and 1% significance levels, respectively.

VARIABLES				
	Beta			
CSR dummy	-0.069***	0.203***	-0.064**	0.612***
	(-2.755)	(5.951)	(-2.397)	(6.461)
Treatment Firms	-0.032**	-0.039**		
	(-2.150)	(-2.489)		
CSR dummy Treatment Firms*	0.117***	0.101***	0.122***	0.059**
	(5.357)	(4.712)	(4.837)	(2.276)
Size		0.046***		0.080***
		(11.969)		(6.193)
ROA		-0.298***		-0.010
		(-5.002)		(-0.154)
Tangibility		-0.052		-0.084
		(-1.572)		(-1.356)
Leverage		0.172***		-0.080
		(5.605)		(-1.439)
Sales growth Rate		0.007		-0.000
		(1.230)		(-0.204)
Firm Age		0.000		-0.009
		(1.490)		(-1.612)
GDP growth		0.063***		-0.053***
		(7.820)		(-3.879)
Market to book value		-0.002**		0.043***
		(-1.983)		(4.907)
Constant	0.634***	-0.228**		1.466***
	(8.163)	(-2.102)		(2.961)
Observations	8,671	8,671	8,671	8,671
R-squared	0.238	0.264		0.251
Year FE	Yes	Yes	Yes	Yes
Ind FE	Yes	Yes	No	No
Firm-FE	No	No	Yes	Yes

Table 4: A propensity score matching analysis

The table provides the effect of mandatory CSR spending regulations on systematic risks using PSM-matched treatment firms and control firms as the following regression model:

$$Beta_{it} = \alpha + \beta * (Treatment\ firm * \text{Reg dummy}) + X_{it}\beta^{j} + Yreffcts + Firmeffcts + \varepsilon_{it}$$

Where $Beta_{it}$ is equity beta (*Beta*). *Treatment firm* is an indicator variable that takes a value of 1 if the firm is affected by S-135 regulation and 0 for control firms. $Reg\ dummy$ is a dummy variable that takes a value of 1 for the post-CSR mandate period (2015-2019) and 0 for the pre-CSR mandate period (2010-2014). X_{it} is the vector of control variables (*Size, ROA, Tangibility, Leverage, Sales growth rate, Firm age. GDP growth rate, Market to book value ratio)*. The definition of variables is presented in Table 1. $Yreffcts$ and $Firmeffcts$ represent the year and firm-fixed effects, respectively. t-values measured by clustered standard error at the firm level are reported in parentheses. *, **, and *** denote statistical significance at the 10%, 5% and 1% significance levels, respectively.

VARIABLES	***Beta***	***Beta***
CSR dummy	0.932***	0.197***
	(6.997)	(4.589)
Treatment Firms		-0.063***
		(-3.729)
CSR dummy Treatment Firms*	0.078**	0.100***
	(2.571)	(4.155)
Size	0.084***	0.070***
	(5.704)	(14.469)
ROA	-0.011	-0.194***
	(-0.134)	(-2.585)
Tangibility	-0.112	-0.138***
	(-1.374)	(-3.389)
Leverage	-0.091	0.059
	(-1.397)	(1.524)
Sales growth Rate	0.001	-0.000
	(0.998)	(-0.332)
Firm Age	-0.010	0.008
	(-1.513)	(1.293)
GDP growth	-0.098***	0.000
	(-5.055)	(1.282)
Market to book value	0.036***	0.074***
	(2.892)	(6.796)
Constant	2.524***	-0.332***
	(4.071)	(-2.716)
N	5,258	5,258
R-squared	0.248	0.276
Industry FE	No	Yes
Year FE	Yes	Yes
Firm FE	Yes	No

Figure 2: Regression discontinuity design plot

Figure 2 depicts RD plots. The RDD plots are built as follows: First, a binding score rating variable M is created, which is defined as the minimum of the three threshold rating scores R1, R2, and R3, which are respectively defined as (Profit - 50)/50, (Book value - 5,000)/5,000, and (sales - 10,000), and which determines whether a firm is subject to the mandatory CSR regulation. The mandatory CSR regulation stipulates three thresholds: 50 million INR in earnings, 5 billion INR in book value, and 10,000 INR in sales. If a firm's earnings, book value, or sales surpass specified limits, it must spend on CSR. Our RDD sample comprises firms with the variable M ranging from -0.50 to 0.50, with treatment firms having M > 0 and control firms having M<0. On the X-axis, the variable M is shown. The Y-axis indicates equity *Beta* (*Beta*). The solid line indicates the estimated value of a linear function of M, assessed separately to the left and right of the cutoff (0 for M). This graph was created via the RD command of STATA as developed by Nichols (2017).

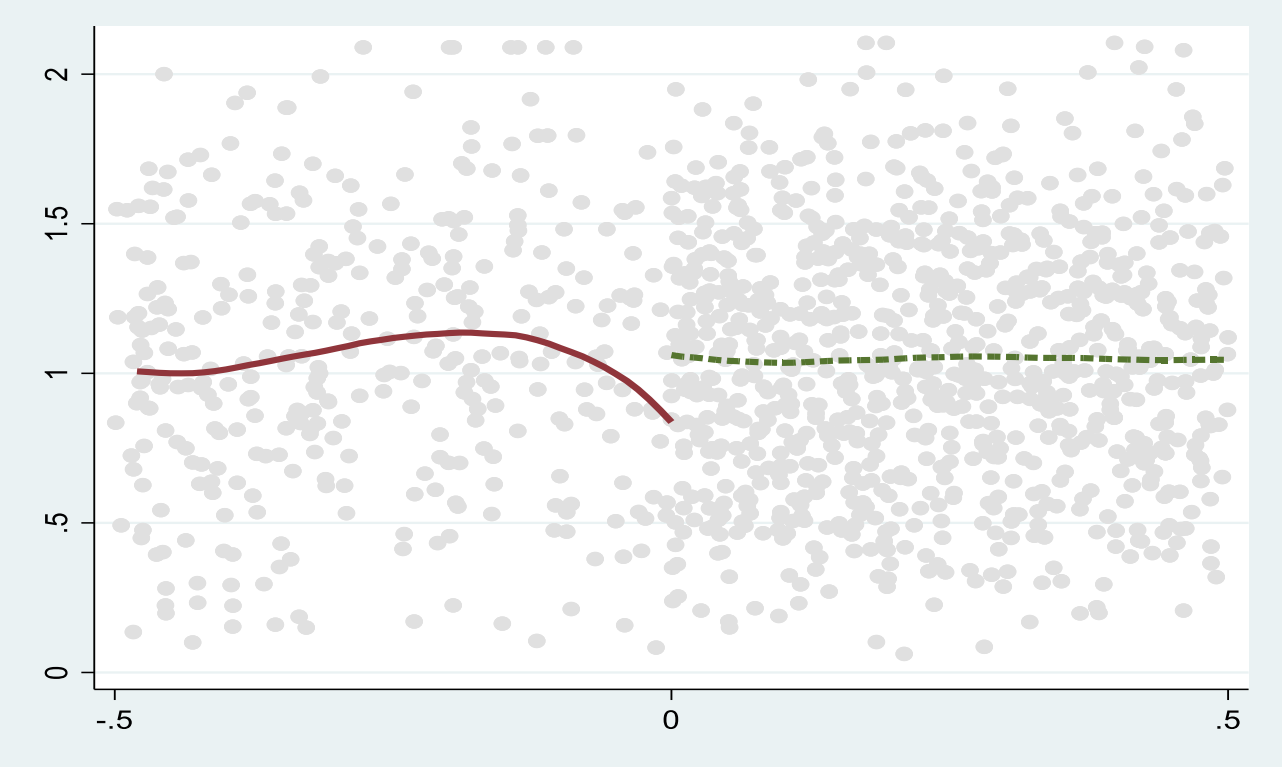

Table 5: Regression-Based MRDD

The table reports regression-based MRDD results. RD sample is constructed as follows. First, a binding score rating variable M is created, which is defined as the minimum of the three threshold rating scores R1, R2, and R3, which are respectively defined as (Profit - 50)/50, (Book value - 5,000)/5,000, and (sales - 10,000), and which determines whether a firm is subject to the mandatory CSR regulation. The mandatory CSR regulation stipulates three thresholds: 50 million INR in earnings, 5 billion INR in book value, and 10,000 INR in sales. If a firm's earnings, book value, or sales surpass specified limits, it must spend on CSR. Our RDD sample comprises firms with the variable M ranging from -0.50 to 0.50, with treatment firms having M > 0 and control firms having M<0. These estimates are generated using the STATA RDROBUST procedure provided by Calonico, Cattaneo, and Titiunik (2014 b). ***, **, and * represent significance at the 1%, 5%, and 10% level (two-tailed), respectively.

Method	Coefficient	Std. Err	Z-value
Conventional	0.24138	0.12124	1.9909**
Bias-corrected	0.29203	0.12124	2.4087**
Robust	0.29203	0.1378	2.1193**

Table 6: CSR and the degree of operating leverage

The table provides the effect of mandatory CSR spending regulations on the degree of operating leverage. The following regression model is used,

$$\ln(EBIT)_{it} = \alpha + \beta_1 * CSR\ Reg\ dummy + \beta_2 * Teatment\ firms + \beta_3 * CSR\ Reg\ dummy * Teatment\ firms + \beta_4 Treatment\ firms * Ln(Sales) + \beta_5 * CSR\ Reg\ dummy * Treatment\ firms + X_{it}\beta^j + Yreffcts + Firmeffcts + \varepsilon_{it}$$

Where $\ln(EBIT)_{it}$ is the natural logarithm of earnings before interest and taxes of firm *i* and year *t*. $\ln(Sales)_{it}$ is natural logarithm of firms' sales of firm *i* and year *t*.*Treatment firm* is an indicator variable that takes a value of 1 if the firm is affected by S-135 regulation and 0 for control firms. $Reg\ dummy$ is a dummy variable that takes a value of 1 for the post-CSR mandate period (2015-2019) and 0 for the pre-CSR mandate period (2010-2014). X_{it} is the vector of control variables (*Size, ROA, Tangibility, Leverage, Sales growth rate, Firm age. GDP growth rate, Market to book value ratio)*. The definition of variables is presented in Table 1. $Yreffcts$ and $Firmeffcts$ represent the year and firm-fixed effects, respectively. t-values measured by clustered standard error at the firm level are reported in parentheses. *, **, and *** denote statistical significance at the 10%, 5% and 1% significance levels, respectively.

Variables	**Ln(EBIT)**	**Ln(EBIT)**
Ln(Sales)	0.740***	0.514***
	(16.764)	(14.763)
CSR dummy	0.188***	0.206***
	(3.557)	(4.713)
*CSR dummy *Treatment firms*	-0.064	0.053
	(-0.419)	(0.511)
*Treatment firms*Ln(Sales)*	-0.193***	-0.045
	(-3.224)	(-1.028)
*CSR dummy *Treatment firms*Ln(Sales)*	0.032**	0.023**
	(2.192)	(2.270)
ROA		7.810***
		(31.674)
Tangibility		-0.381***
		(-3.630)
Leverage		0.169*
		(1.712)
Market to book value		-0.001
		(-0.617)
Sales growth Rate		-0.018**
		(-2.060)
Firm Age		0.027***
		(5.138)
GDP growth		-0.016***
		(-3.979)
Constant		0.440*
		(1.838)
N	7,712	7,712
R-squared	0.25	0.603
Year FE	Yes	Yes
Firm FE	Yes	Yes

Table 7: CSR and Firm-risk: A channel of the degree of operating leverage

The table examines the degree of operating as a channel through which CSR affects systematic risk The following regression model is used:

$$Beta_{it} = \alpha + \beta_1 * CSR\ Reg\ dummy + \beta_2 * CSR\ Reg\ dummy * Teatment\ firms + \beta_3 * CSR\ Reg\ dummy * Teatment\ firms * \Delta DOL + X_{it}\beta^j + Yreffcts + Firmeffcts + \varepsilon_{it}$$

Where $Beta_{it}$ is equity beta (*Beta*). *Treatment firm* is an indicator variable that takes a value of 1 if the firm is affected by S-135 regulation and 0 for control firms. $Reg\ dummy$ is a dummy variable that takes a value of 1 for the post-CSR mandate period (2015-2019) and 0 for the pre-CSR mandate period (2010-2014). ΔDOL is estimated by regression equation (4). X_{it} is the vector of control variables (*Size, ROA, Tangibility, Leverage, Sales growth rate, Firm age. GDP growth rate, Market to book value ratio)*. The definition of variables is presented in Table 1. $Yreffcts$ and $Firmeffcts$ represent the year and firm-fixed effects, respectively. t-values measured by clustered standard error at the firm level are reported in parentheses. *, **, and *** denote statistical significance at the 10%, 5% and 1% significance levels, respectively.

VARIABLES	*Beta*	*Beta*
CSR dummy	0.018	0.577***
	(0.804)	(6.159)
*CSR dummy *Treatment firms*	0.051***	0.011
	(2.700)	(0.377)
*CSR dummy *Treatment firms*ΔDOL*	0.013***	0.013***
	(3.556)	(2.632)
Size		0.079***
		(5.602)
ROA		-0.192**
		(-2.114)
Tangibility		-0.085
		(-1.311)
Leverage		-0.106*
		(-1.735)
Sales growth Rate		-0.003
		(-0.454)
Age		-0.042***
		(-3.138)
GDP growth		0.047***
		(5.310)
Market to book value		-0.000
		(-0.020)
Constant	0.812***	1.140**
	(69.067)	(2.291)
N	7,604	7,604
R-squared	0.268	0.276
Year FE	Yes	Yes
Firm FE	Yes	Yes

Table 8: Mandatory CSR spending regulation and Cyclicality of profits

The table reports the effect of mandatory CSR spending regulation on the Cyclicality of operating profit. We use the following regression model

$$Change\ in\ ROA_{it} = \alpha + \beta_1 * CSR\ Reg\ dummy + \beta_2 * CSR\ Reg\ dummy * Teatment\ firms + X_{it}\beta^j + Yreffcts + Firmeffcts + \varepsilon_{it}$$

Here, the dependent variable is the year-on-year change in return on assets (EBIT/total assets). *Treatment firm* is an indicator variable that takes a value of 1 if the firm is affected by S-135 regulation and 0 for control firms. $Reg\ dummy$ is a dummy variable that takes a value of 1 for the post-CSR mandate period (2015-2019) and 0 for the pre-CSR mandate period (2010-2014). ΔDOL is estimated by regression equation (4). X_{it} is the vector of control variables (*Size, ROA, Tangibility, Leverage, Sales growth rate, Firm age. GDP growth rate, Market to book value ratio)*. The definition of variables is presented in Table 1. $Yreffcts$ and $Firmeffcts$ represent the year and firm-fixed effects, respectively. t-values measured by clustered standard error at the firm level are reported in parentheses. *, **, and *** denote statistical significance at the 10%, 5% and 1% significance levels, respectively.

	(1)	(2)
VARIABLES	**Change in ROA**	**Change in ROA**
CSR dummy	0.021**	0.026
	(2.306)	(0.825)
*CSR dummy *Treatment firms*	-0.045**	-0.045**
	(-2.309)	(-2.342)
*CSR dummy *Treatment firms*GDP growth*	0.007**	0.006**
	(2.296)	(2.213)
Size		0.000
		(0.174)
Tangibility		-0.021*
		(-1.668)
Leverage		-0.046***
		(-3.292)
Sales growth Rate		0.017***
		(5.920)
Age		-0.002
		(-0.379)
GDP growth		-0.008*
		(-1.675)
Market to book value		-0.000
		(-0.455)
Constant	-0.007**	0.093
	(-2.570)	(0.601)
N	7,583	7,583
R-squared	0.046	0.068
Year FE	Yes	Yes
Firm FE	Yes	Yes

Table 9: Response of mandatory and control firms during the COVID-19 pandemic crisis

Dependent variables are Buy-and hold return for the COVID-19 window. Independent variables: *Treatment firms* is an indicator variable taking value one for mandatory firms and zero for control firms, Size is the natural logarithm of sales, ROA is the ratio of EBIT to total assets, tangibility is the ratio of net fixed assets to total assets, leverage is the ratio of total debt to total assets, MB is the market to book value of equity, Growth_Rate is the annual growth rate in sales and age is the difference between the current year and incorporation year. The coefficients are estimated using the OLS estimator. Heteroscedasticity-adjusted robust t-values are presented in the parenthesis. ***, **, and * indicate significance at 0.01, 0.05 and 0.10 levels.

VARIABLES	First_wave	After_Budget	Second_Wave
	Cumulative returns	Cumulative returns	Cumulative returns
Treatment firms	-0.061***	-0.073***	-0.060***
	(-3.439)	(-4.095)	(-3.701)
Size	0.003	0.000	-0.005
	(0.655)	(0.050)	(-1.264)
ROA	0.001	-0.007	-0.013
	(0.007)	(-0.108)	(-0.206)
Tangibility	0.053	0.065	0.029
	(1.275)	(1.539)	(0.808)
Leverage	-0.067*	-0.046	-0.007
	(-1.850)	(-1.288)	(-0.204)
MB	0.002**	0.002*	0.001
	(2.286)	(1.849)	(0.624)
Sales Growth Rate	-0.022	-0.025**	-0.025**
	(-1.456)	(-1.980)	(-2.274)
Age	0.000	0.000	0.000
	(0.801)	(0.758)	(0.330)
Constant	-0.336***	-0.319***	-0.164***
	(-8.023)	(-8.299)	(-4.550)
Observations	759	759	763
R-squared	0.309	0.271	0.256
Industry Dummies	Yes	Yes	Yes

Appendix A:

Table A1: CSR firms in India

Year	Total Listed firms	No of CSR firms	% listed firms	% total assets	CSR/PAT
2016	5820	1252	0.215	0.715	0.031
2017	5745	1384	0.241	0.697	0.107
2018	5646	1472	0.260	0.851	0.042
2019	5516	1530	0.277	0.697	0.058
2020	5321	1453	0.273	0.718	0.044

Table A2: Covariate balance