Corporate Social Responsibility and Debt Maturity Structure: Evidence from a Quasi-Natural Experiment

Abstract

In 2015, the Government of India enacted a law that requires certain Indian firms to spend at least 2% of their average net profits over the past three years on specified corporate social responsibility (CSR) activities. We exploit this regulatory intervention in an entropy-balanced difference-in-differences (Entropy-DiD) framework to isolate the implications of CSR on firms' debt maturity structure. We uncover a reduction in the use of long-term debt relative to total debt in the post-regulation period, accompanied by a decline in their operating performance. Our results are robust to firm-year covariates, firm and industry-by-year fixed effects, and a placebo test with a fake enactment year. These results suggest that mandating firms to spend on CSR activities negatively affects corporate outcomes.

JEL Codes: M14, M21, M38, M48

Keywords: corporate social responsibility; debt maturity; Section 135; difference-in-differences

1. Introduction

A central issue in corporate finance is understanding the causes, consequences, and repercussions of firm leverage. Benlemlih (2015) posits that lenders use price and non-price terms to *address* borrower risk. Price terms refer to financing costs, whereas non-price terms pertain to qualitative aspects of leverage, such as covenant restrictions, debt priority, and debt maturity. A large body of literature has examined the *ex-post* consequences of corporate social responsibility (CSR) on price terms (see, for instance, Sharfman and Fernando, 2008; Girerd-Potin et al., 2011; Goss and Roberts, 2011; Cooper and Uzun, 2015; Du et al., 2017; Bhuiyan and Nguyen, 2019). However, previous research has largely overlooked evaluating the influence of CSR on non-price terms. This paper focuses on a particular facet of this issue and investigates the *ex-post* implications of CSR engagement on firms' debt maturity structure[1]. For this purpose, we exploit the enactment of a CSR regulation in India, which mandates certain firms to allocate a predetermined fraction of their net profit to designated CSR activities.

In the financial year (FY)[2] 2015, the Government of India (GoI) incorporated Section 135 (the regulation) into the Indian Companies Act of 2013 (the Act). Under this regulation, firms that surpass designated thresholds for profits, sales, or net worth[3] are required to spend at least 2% of their average net profits from the preceding three years on CSR activities specified in Schedule VII of the Act (hereafter referred to as the mandatory CSR regulation). As a result, Section 135 exogenously increased the proportion of firms participating in CSR

[1] Corporate debt maturity refers to the length of time before a firm's debt obligations must be repaid. It is a crucial component of a firm's capital structure, affecting its liquidity, financial flexibility, and cost of capital (Myers, 1977). Several factors influence debt maturity decisions, including agency conflicts (Myers, 1977), tax considerations (Brick and Ravid, 1985), information asymmetry (Flannery, 1986), and credit risk (Diamond, 1991).

[2] A financial year (FY) in India has a span of 12 months from April 01st of the current year to March 31st of the subsequent year.

[3] The specific eligibility criteria include: (1) "a net profit of Indian Rupee (INR) 50 million or more"; (2) "sales of INR 10,000 million or more"; or (3) "a net worth of INR 5,000 million or more." An exchange rate of 63INR = 1US$ is assumed for the conversion of INR to US$. This was the prevalent exchange rate when the regulation was promulgated.

activities and the total amount spent on CSR initiatives in India. Rajgopal and Tantri (2023) support this assertion, observing that firms subject to the regulation that had previously spent less than 2% of their net profits on CSR (i.e., low-CSR firms) increased their CSR spending from 0.7% of net profit before the mandate to 2.2% afterwards. Furthermore, they note that the regulation prompted many firms that had not previously engaged in CSR activities (no-CSR firms) to spend on CSR, contributing to an 82% increase in CSR expenditure during the post-regulation period. Figure 1 plots the amount of CSR expenditure incurred by Indian firms following the introduction of Section 135 in 2015. Consequently, the introduction of Section 135 primarily impacted firms that had previously allocated minimal or no resources to CSR activities. Therefore, we focus on no-CSR firms in this study.

[Insert Figure 1 here]

Theoretically, from an *ex-ante* perspective, the implications of CSR for a firm's debt maturity structure are *a priori* ambiguous. For instance, Duffie and Lando (2001) argue that incomplete accounting information results in an imprecise assessment of firm value. This increases risk for lenders, as they cannot accurately assess borrowers' repayment ability. As a result, when capital markets are constrained by information asymmetry, lenders assign a high probability to adverse selection and moral hazard in their lending decisions. This prompts lenders to increase their supply of short-term debt and reduce their supply of long-term credit to mitigate potential losses stemming from the misappropriation of funds by internal stakeholders (Jensen and Meckling, 1976). In this regard, if firms disclose more information about their use of funds, they may secure more favourable terms from lenders. For example, detailed disclosures on CSR spending under the regulation can mitigate information asymmetry

by revealing how firms allocate their scarce resources. This reduction in opacity alleviates the negative effects of adverse selection and moral hazard, thereby improving market transparency (Cho et al., 2013; Zhu et al., 2014; Hoepner et al., 2016; Cui et al., 2018; Nguyen et al., 2019). Consequently, lenders may offer CSR-active firms more favourable debt contract terms, such as extended debt maturities. Therefore, a positive effect of CSR on corporate debt maturity is predicted.

Alternatively, the overinvestment hypothesis suggests that firms overspend on CSR activities to satisfy their managers' aspirations of being seen as responsible leaders, often to the detriment of the firm's shareholders (Barnea and Rubin, 2005). This behavior exacerbates agency conflict within firms, as managers divert scarce resources toward non-commercial uses to maximize their personal utility (Yermack, 2006). Consequently, lenders, facing a concave payoff structure, may perceive CSR expenditures as a wasteful diversion of scarce resources and respond by shortening debt maturities to discipline managers prone to overinvesting in CSR. Thus, CSR-active firms may face more stringent debt contract terms, such as shorter maturities. Accordingly, the overinvestment hypothesis predicts a negative relationship between CSR and corporate debt maturity.

We acknowledge that the predictions of the overinvestment hypothesis stem from managers' personal utility goals rather than regulatory compulsions. However, if firms were already engaged in CSR activities to optimize their value before the law's enactment, imposing legal requirements on their CSR choices could reduce shareholder value (Demsetz and Lehn, 1985). For instance, if a firm's marginal benefit from CSR is lower than its marginal cost at equilibrium, it would not allocate resources to CSR voluntarily. In such a scenario, mandating firms to spend 2% of their average net profit on CSR would diminish shareholder value. In other words, the mandatory CSR regulation compels firms that would otherwise abstain from CSR to invest in such activities. This dynamic heightens agency conflict within firms, as

managers seeking to avoid penalties for non-compliance divert scarce resources toward non-commercial endeavors, often to the detriment of shareholders. Thus, increased CSR spending due to enacting the mandatory CSR regulation aligns with the criteria for heightened agency conflict, as discussed by Barnea and Rubin (2005) and Yermack (2006). The resulting rise in agency costs could discourage the availability of long-term credit as lenders operating under a concave payoff structure become more concerned about the efficient utilization of borrowed funds by CSR-active firms. As a result, lenders may perceive Section 135-induced CSR expenses as a costly diversion of firm resources, prompting them to shorten the debt maturities of CSR-active firms. Considering these contrasting viewpoints, we seek to empirically examine the effect of CSR on corporate debt maturity.

We source data for our empirical analysis from the Prowess database, which is managed by the Centre for Monitoring the Indian Economy (CMIE). The dataset spans the period from 2011 to 2018, allowing us to examine the impact of the regulation over time. Our sample includes publicly traded, non-financial Indian companies with complete data available for all years before and after the regulation's implementation.

To investigate the impact of the mandatory CSR regulation on corporate debt maturity, we adopt the difference-in-differences (DiD) method of empirical inference, drawing inspiration from Rajgopal and Tantri (2023). To implement the DiD analysis, we need to identify the treatment and control firms. The treatment group consists of firms that had not engaged in CSR spending before the regulatory change but began doing so afterward due to their profits, sales, or net worth surpassing the thresholds set by the mandatory CSR regulation. In contrast, the control group comprises firms that did not allocate funds to CSR in either period, i.e., before and after the regulation. We include various firm-specific, time-varying covariates, along with firm and industry-by-year fixed effects in our regressions, to isolate the impact of the regulation on corporate debt maturity.

A fundamental requirement for employing the DiD analysis is that the exogenous shock (in this case, the mandatory CSR regulation of 2015) should assign firms to the treatment and control groups in a manner that closely resembles 'random assignment' (Atanasov and Black, 2016, 2021). In our empirical framework, however, firms are not randomly assigned to these groups. Instead, their classification depends on whether their profits, sales, or net worth cross the stipulated thresholds during the post-regulation period. To address this issue, one potential approach is to improve the balance of covariates between the treatment and control firms through matching techniques (Atanasov and Black, 2021). Accordingly, we incorporate entropy balancing into our DiD framework (Entropy-DiD).

We observe that firms affected by the regulation reduce their use of long-term debt by 6.9% compared to control firms during the post-regulation period, while maintaining total debt constant. We interpret this as evidence that laws mandating firms to spend on CSR initiatives compel them to overinvest in CSR activities beyond their equilibrium, prompting lenders to shorten debt maturities. Thus, mandatory CSR negatively affects corporate debt maturity. This outcome implies that mandatory CSR regulation causes an inward shift in the supply curve of long-term debt. Holding other factors constant, an inward shift in the supply curve of long-term debt should increase the cost of long-term credit. Conversely, if total debt remains unchanged, a decline in the supply of long-term debt must be offset by an increase in the supply of short-term credit. Consistent with this reasoning, an increase in the supply of short-term debt should, *ceteris paribus*, reduce the cost of short-term credit. In line with our expectations, Aswani (2024) finds that the implementation of the mandatory CSR regulation resulted in a 43-basis-point increase in yield spreads for firms subject to the mandate. Taken together, the evidence suggests that the mandatory CSR regulation decreases firms' debt maturity in the post-regulation period.

To validate our results, we examine cross-sectional heterogeneity in the treatment effects of the regulation. We find that, holding total debt constant, larger firms experience a smaller decline in access to long-term credit than smaller firms in the post-regulation period. Rajan and Zingales (1995) assert that large firms face lower levels of information asymmetry. Consequently, they can obtain long-term funding from various sources at lower costs than smaller firms (Ferri and Jones, 1979; Rajan and Zingales, 1995; Thorburn, 2000). In addition, smaller firms may have less incentive to disclose additional information due to the cost-effectiveness of such efforts in reducing their overall cost of capital (Petersen and Rajan, 1997). As a result, larger firms experience a smaller decrease in their debt maturity than smaller firms.

At this stage, the welfare consequences of shorter debt maturity remain ambiguous. Increased availability of short-term debt allows firms to quickly access funds, enabling them to seize immediate growth opportunities or cover operational expenses without the long-term commitment of long-term debt. This flexibility can be particularly beneficial for managing working capital needs and smoothing cash flow fluctuations, thereby enhancing operational efficiency and profitability. According to Harris and Raviv (1991), the strategic use of short-term debt can reduce agency costs and align the interests of managers and shareholders, leading to improved financial performance. However, excessive reliance on short-term debt can create liquidity risks and heighten financial instability, potentially offsetting profitability gains. Therefore, while short-term debt can enhance profitability (Harris and Raviv, 1991), it must be managed prudently within the firm's overall capital structure strategy.

To address this conflict, we investigate the impact of the mandatory CSR regulation on the operating performance of treatment firms, primarily through the debt maturity channel. We posit that a reduction in debt maturity serves as a mechanism through which the mandatory CSR regulation deters treatment firms from investing in risky ventures. This, in turn, is expected to negatively affect their operating performance and survival probability. Consistent

with our hypothesis, we observe that reduced access to long-term debt, while total debt remains constant, adversely impacts the operating performance of treatment firms, leading to a 1.398% decline relative to control firms during the post-regulation period. Thus, shorter debt maturity acts as a mechanism by which the mandatory CSR regulation discourages treatment firms from undertaking risky ventures, potentially limiting profitable opportunities.

In this study, we argue that forced CSR spending, resulting from the enactment of mandatory CSR regulation, reduces corporate debt maturity, adversely affecting firms' operating performance. However, one might contend that our results are driven by a pre-existing trend in our dependent variable, i.e., the fraction of long-term debt in total debt. To address this concern, we conduct a placebo test using a fictitious regulation year (2013) during the pre-regulation period. If the observed reduction in corporate debt maturity is indeed attributable to the mandatory CSR regulation, we should find no difference in the debt maturity of treatment firms relative to control firms during the pre-regulation period. Conversely, if a difference exists, any post-regulation decline in corporate debt maturity cannot be causally linked to the enactment of the regulation. Statistically, we expect the coefficient on our variable of interest to be insignificant in the placebo test. Our results align with this expectation, confirming that the reduction in corporate debt maturity stems from the mandatory CSR regulation rather than a prior trend in the dependent variable. This strengthens the reliability of our key findings.

Our study adds to the literature on the *ex-post* consequences of CSR on corporate debt maturity. In this regard, Benlemlih (2015) finds that CSR engagement shortens firms' debt maturity, suggesting that high-CSR firms prefer short-term debt over long-term debt to mitigate agency conflicts arising from CSR overinvestment and to signal their quality to creditors. In contrast, Nguyen et al. (2020) report that CSR engagement lengthens firms' debt maturity, as CSR activities help alleviate information asymmetry, reduce adverse selection and moral

hazard problems, and enable firms to secure long-term debt at lower costs. These conflicting findings may stem from endogeneity concerns, particularly simultaneity and omitted variable bias. We suspect the presence of these biases due to the fact that both Benlemlih (2015) and Nguyen et al. (2020) focus on firms that voluntarily engage in CSR activities. This makes it difficult to rule out the possibility that some omitted variable, correlated with both voluntary CSR and corporate debt maturity, biases their regression coefficients, or that corporate debt maturity itself affects firms' decisions to engage in CSR activities. We address these issues by leveraging the 2015 implementation of mandatory CSR regulation in India within a quasi-experimental framework. By examining the influence of this regulatory change, we provide robust evidence on how CSR affects corporate debt maturity, offering fresh prospective into the intricate relationship between CSR activities and corporate financing decisions.

Furthermore, we investigate the heterogeneous treatment effect of the mandatory CSR regulation by considering firm-specific attributes such as growth, profitability, liquidity, tangibility, and size. This analysis allows us to identify the channels through which the mandatory CSR regulation affects firms' debt maturity structures. Moreover, we examine the implications of this regulation for firms' operating performance through the debt maturity channel, providing insight into whether mandatory CSR engagement enhances or hinders firm performance.

This study also contributes to the broader body of research on the cost and benefits of mandatory CSR regulations. While prior studies highlight the positive effects of such mandates—including improved stock liquidity (Roy et al., 2022), increased innovation (Jadiyappa and Chauhan, 2023), and enhanced long-term firm value (Jadiyappa et al., 2021)—other studies emphasize the drawbacks, such as reduced shareholder value (Manchiraju and Rajgopal, 2017; Dharmapala and Khanna, 2018), strategic accounting adjustments to offset CSR costs (Shaw et al., 2021), deterioration in operating performance (Rajgopal and Tantri,

2023), and higher yield spreads (Aswani, 2024). Aligning with concerns raised by Aswani (2024) that mandatory CSR regulation increased the yield spread for mandated firms relative to non-mandated firms, our study provides further evidence that such policies lead to a substitution of long-term debt with short-term credit. We posit that the forced allocation of resources to CSR initiatives results in overinvestment in CSR activities, which exacerbates agency problems and incentivizes lenders to shorten corporate debt maturity. This shift towards short-term debt ultimately hampers firms' ability to secure long-term financing for profitable investments, negatively impacting their operating performance. By offering a comprehensive analysis of the financial consequences of mandatory CSR regulations, our research enhances the understanding of how such policies influence corporate debt structures and firm performance.

The remainder of the paper is organized as follows: Section 2 provides an overview of the mandatory CSR regulation, Section 3 discusses the data and methodology, Section 4 presents the empirical findings, Section 5 conducts a placebo test to assess the robustness of the results, and Section 6 offers concluding remarks, followed by the references.

2. India's Mandatory CSR Regulation

When firms engage in irresponsible behavior, they often transfer a portion of their production costs onto society, a practice known as externalizing costs (Goss and Roberts, 2011). Heal (2005) argues that externalizing costs creates an implicit contract between society and firms regarding who bears these costs. While firms are not legally required to absorb these costs, societal pressures can prompt legislative changes and impose penalties on firms for their past practices. Government mandates on CSR practices are an example of such a legislation.

Before 2011, countries such as South Africa, Malaysia, Denmark, and China mandated firms to disclose sustainability-related information. Building on these precedents, Brazil,

Finland, Hong Kong, and Sweden introduced similar regulations after 2012 (Ioannou and Serafeim, 2017). The Government of India (GoI) went beyond disclosure requirements by introducing Section 135 in the Indian Companies Act of 2013, which mandates certain firms to spend a predetermined fraction of their net profit on CSR activities (referred to as the mandatory CSR regulation). The stated intent of this legislation was to align corporate practices with the UN Sustainable Development Goals (SDGs) and promote community development through corporate participation.

Initially, the Companies Bill presented to the Indian Parliament in 2009 did not include any CSR provisions. However, following recommendations from the finance standing committee of the parliament, a mandatory CSR proposal was introduced in 2010. Due to significant objections, this requirement was temporarily made voluntary but was later reinstated in the 2012 Bill, which ultimately became the Companies Act of 2013. Figure 2 illustrates the sequence of events that culminated in the implementation of the mandatory CSR regulation.

[Insert Figure 2 here]

Effective from April 1, 2014, Section 135 mandates that firms crossing specific thresholds for profits, sales, or net worth allocate at least 2% of their average net profit from the past three years to CSR activities outlined in Schedule VII of the Act. A firm qualifies if it meets any of the following criteria: (1) net profit of at least INR 50 million (approximately USD 0.79 million), (2) sales of INR 10,000 million (approximately USD 158.73 million) or more, or (3) net worth of INR 5,000 million (approximately USD 79.36 million) or higher.

Additionally, eligible firms must establish a CSR committee with at least three directors, including at least one independent director, to formulate and disclose the firm's CSR policy.

India's mandatory CSR regulation is unique in requiring firms to spend on CSR activities (Roy et al., 2022). Non-compliant firms must explain their reasons in their annual reports, following the "comply or explain" regulatory model. However, the Act does not specify evaluation criteria for these explanations, granting regulatory authorities interpretive flexibility. The Ministry of Corporate Affairs (MCA) has issued show-cause notices to over 1,000 firms for alleged CSR regulation breaches.[4] Even if firms provide explanations instead of complying, insufficient justifications can still result in notices. Notably, while Section 135 does not impose direct penalties for non-compliance, firms can be charged under Section 134 for directors' responsibilities regarding financial statements, which carry severe penalties. Consequently, firms often find it more practical to comply with CSR requirements than to provide explanations (Rajgopal and Tantri, 2023). Thus, the enactment of mandatory CSR regulation in 2015 provides a natural laboratory to investigate its implications for corporate debt maturity.

3. Data and Methodology

3.1. Description of data

Our sample includes publicly traded, non-financial companies operating in India. We exclude unlisted firms from our sample because it is difficult to obtain reliable information on their financial statements (Chopra et al., 2021). Furthermore, we do not include financial institutions because the high leverage typical of these entities might not carry the same

[4] The article can be accessed at https://www.business-standard.com/article/economy-policy/govt-issued-notices-to-1-018-firms-for-csr-non-compliance-117031500891_1.html.

implications as it does for non-financial firms, where elevated leverage often signals financial distress (Fama and French, 1992).

We collect financial statement data for our sample firms from the Prowess database, maintained by the Centre for Monitoring the Indian Economy (CMIE), covering the years 2011 to 2018. Researchers have widely used this database for empirical studies on India (e.g., Vig, 2013; Manchiraju and Rajgopal, 2017; Tantri, 2020; Bose et al., 2021; Rajgopal and Tantri, 2023).

This study spans eight years, divided into the pre-regulation period (2011–2014) and the post-regulation period (2015–2018), enabling us to analyze the regulation's impact over time. To minimize the influence of outliers, we winsorize all variables at the 1% level on both ends of the distribution. The final dataset includes 15,923 firm-year observations for most variables reported in Table 1, except for Size and Growth, which have 15,833 and 14,378 firm-year observations, respectively.

3.2. Variables Definition

Building on Jadiyappa and Shette (2024), we classify the sample into treatment and control groups. The treatment group includes firms that initiated CSR activities from 2015 onward in response to the mandatory CSR regulation. We define this group using two criteria. First, firms must have consistently incurred CSR expenses during the post-regulation period (2015–2018). Second, they must not have spent on social or environmental projects before the regulation, as any pre-regulation CSR activities were voluntary. Thus, the treatment group consists of firms with no CSR expenditures before the regulation but positive spending afterward.

The control group includes firms that did not engage in CSR spending during either the pre- or post-regulation periods. To identify treatment firms in our regressions, we construct a

binary variable, *Treatment*, which equals 1 for treatment firms and 0 for control firms. Table 1 describes the other variables, while Table 2 presents summary statistics for the variables used in the study.

[Insert Tabel 1 here]

[Insert Table 2 here]

3.3. Research Design

We use the difference-in-differences (DiD) technique to isolate the implications of the mandatory CSR regulation on firms' debt maturity structure. A prerequisite for conducting the DiD analysis is that the exogenous shock, such as introduction of the mandatory CSR regulation in 2015, should effectively categorize firms into the treated and control groups akin to 'random assignment' (Atanasov and Black, 2016, 2021). However, in our empirical framework, firms in the sample are not randomly assigned to the treatment and control groups. Instead, they are classified based on whether their profits, sales, or net worth exceed the thresholds specified in the regulation during the post-regulation period. One approach to mitigate this concern is to enhance the balance of covariates between the treated and control firms through matching (Atanasov and Black, 2021). Therefore, we incorporate entropy balancing[5] into our analysis.

[5] Entropy balancing is often preferred over propensity score matching (PSM) in DiD analysis due to its ability to better address issues related to covariate balance and its robustness in settings where the functional form of the propensity score model is misspecified. While PSM attempts to match treated and control units based on estimated probabilities (propensity scores), it relies on the assumption that the propensity score model is correctly specified. However, if the model is misspecified, PSM can produce biased estimates. In contrast, entropy balancing directly adjusts the weights of treated and control units to achieve balance on covariates without relying on parametric

In the context of the DiD analysis, entropy balancing is a technique used to create balanced samples that account for covariate imbalances between the treatment and control groups. The goal is to make the distribution of covariates similar between the groups before applying the DiD methodology. The entropy balancing process can be formalized through an optimization problem, where the objective is to find weights for the control group observations such that the weighted sample balances the covariates with the treatment group. Thus, entropy balancing can be formally expressed as:

$$\min_w \sum_{i \in control} w_i \log(w_i)$$

subject to

$$\sum_{i \in control} w_i x_i = \sum_{i \in treatment} x_i$$

$$\sum_{i \in control} w_i = 1$$

$$w_i \geq 0 \ \forall i \in control \quad (1)$$

Here, i indexes firms, t indexes years, and $w = (w_1, w_2, \ldots, w_n)$ represents the weights assigned to control group observations. The vector x includes firm-year covariates such as *Growth*, *Liquidity*, *Tangibility*, and *Size*.[6]

assumptions (Hainmueller, 2012). This approach minimizes the imbalance in covariates across treatment and control groups and does so in a way that is less sensitive to model misspecification, making it a more robust choice for ensuring the validity of DiD estimates (Diamond and Sekhon, 2013). Moreover, entropy balancing provides a more transparent way to check balance, as it allows for explicit weight adjustments, which enhances the interpretability and reliability of causal inference. This can be particularly important in DiD analysis, where the goal is to isolate the effect of a policy or intervention while accounting for time-varying confounders.

[6] We do not include *ROA* in our vector of firm-year covariates, *x*, to avoid issues related to non-convergence in the distribution of covariates. This issue arises because treatment and control firms differ fundamentally—treatment firms are mandated by the CSR regulation to spend on CSR, whereas control firms are unaffected by this regulation. Since profitability is a criterion for inclusion in the mandated group, treatment and control firms exhibit significant differences in *ROA*, as documented in Table 5 (Section 4.1). Consequently, any attempt to balance the distribution of *ROA* between the two groups results in non-convergence. Therefore, we exclude *ROA* from *x*. However, to mitigate potential bias in our empirical analysis, we rely on the conditional independence assumption (Angrist and Pischke, 2009) and explicitly include ROA along with other control variables in our regressions. This approach helps address selection bias in our results to a large extent.

The first constraint ensures that the weighted mean of each covariate in the control group matches its mean in the treatment group. The second constraint normalizes the weights to sum to one, and the third constraint ensures non-negative weights. Table 3 presents data on the mean, variance, and skewness of covariates for the treatment and control groups before and after entropy balancing.

[Insert Table 3 here]

Table 3 shows that after entropy balancing, the first three moments of the covariates are identical between the treatment and control groups. This indicates that entropy balancing effectively aligns the distribution of covariates across the groups, thereby mitigating potential biases in the DiD estimation. As a result, we can confidently proceed with our DiD analysis.

Next, we assess the parallel trend assumption necessary for the DiD analysis. Figure 2 plots the unconditional mean of our dependent variable, *Long-Term Debt*, for the treatment and control firms over the study period (2011–2018). The graph shows that *Long-Term Debt* followed a parallel trend for both groups during the pre-regulation period (2011–2014). However, following the implementation of the mandatory CSR regulation in 2015, *Long-Term Debt* declined more for treatment firms than for control firms in the post-regulation period. We attribute this divergence in *Long-Term Debt* trends to the introduction of Section 135 in the Indian Companies Act of 2013.

[Insert Figure 3 here]

To formally evaluate the parallel trend assumption, we apply the statistical test developed by Lemmon and Roberts (2010) to our sample data. Specifically, we regress our dependent variable, *Long-Term Debt*, in its first-difference form on the treatment variable, *Treatment*, for the pre-regulation period (2011–2014). For the parallel trend assumption to hold, the coefficient on the treatment variable should be statistically insignificant (Singh et al., 2023). The following specification is employed for this purpose:

$$\Delta\ Long\text{-}Term\ Debt^{i}_{t} = \alpha + \beta_1\ Treatment^{i} + \varepsilon^{i}_{t} \quad (2)$$

The above specification (2) is estimated through the pooled OLS method. This is because our regressor is a binary variable, equal to 1 for treatment firms and 0 for control firms. As a consequence, *Treatment* will be completely absorbed by firm fixed effects. To avoid this fate, we use the pooled OLS method. The result of this regression is presented in Table 4.

[Insert Table 4 here]

The insignificant coefficient on the *Treatment* variable in Table 4 reaffirms that the parallel trend assumption holds for our sample data.

We use the following panel specification to empirically test our hypothesis:

$$Long\text{-}Term\ Debt^{i}_{t} = \alpha + \beta_1\ Reg_t \times Treatment^{i} + \sum^{6}_{k=2} \beta_k X^{i}_{kt} + (Firm\ and\ Industry \times Year)\ fixed\ effects + \varepsilon^{i}_{t} \quad (3)$$

Where, *Long-Term Debt* is the dependent variable for firm *i* in year *t*, *Reg* is a binary variable that is 1 for the post-regulation period and 0 otherwise, *X* is a vector of firm-year

covariates, such as *Growth, ROA, Liquidity, Tangibility,* and *Size*, and ε is the residual. In specification (3), *Reg* × *Treatment* is the variable of our interest. By explicitly including the vector X in our regressions, along with relevant fixed effects, we effectively control for variables that influence firms' demand for long-term debt. This allows us to interpret the coefficient on *Reg* × *Treatment* as the change in the supply of long-term debt, holding total debt constant, in response to the mandatory CSR regulation.

We also mitigate the risk of systematic cross-sectional differences in our sample influencing our results by controlling for firm fixed effects. Because standard DiD analysis nullifies the impact of omitted variables arising from "pretreatment time-invariant differences between the treatment and control groups and aggregate time trends" (Alok et al., 2022: 10), we do not include year fixed effects separately in our regressions. However, the enactment of the mandatory CSR regulation may have been correlated with industry-specific trends over time. To address this concern, we incorporate industry × year fixed effects into our specification. This non-parametric approach, which does not rely on specific parameter, helps control for time-varying shocks unique to each industry. By doing so, our regression estimates are identified from within-firm and within-industry variation around the implementation of the mandatory CSR regulation in 2015. Consequently, the inclusion of industry × year fixed effects accounts for and neutralizes any industry-specific time-varying differences that may be correlated with the enactment of the regulation.

In the preceding specification (3), note that we do not include separate coefficients for *Reg* and *Treatment*. This is because the inclusion of firm fixed effects would completely absorb the firm-invariant variable *Treatment*. Similarly, the coefficient on *Reg* would be fully absorbed due to the inclusion of industry × year fixed effects. Nevertheless, including firm and industry × year fixed effects does not absorb the coefficient β_1 on our variable of interest, *Reg*

× *Treatment*. This is because *Reg* × *Treatment* is the product of two binary variables: *Reg* and *Treatment*. While *Reg* is invariant within a year but varies across firms, *Treatment* is invariant within a firm but varies across years. As a result, their interaction *Reg* × *Treatment* captures both the within-firm variability of *Reg* and the within-year variability of *Treatment*. Consequently, the inclusion of firm and industry × year fixed effects in our panel specification (3) does not eliminate the coefficient β_1 due to the within-firm and within-year variability of *Reg* × *Treatment*. Based on this discussion, it is evident that our coefficient of interest is the DiD operator β_1.

A significantly positive (negative) β_1 would indicate that the implementation of the mandatory CSR regulation increased (decreased) the debt maturity of treatment firms compared to control firms during the post-regulation period.

We estimate specification (3) using fixed effects regression analysis. Moreover, we cluster standard errors at the firm level to obtain heteroscedasticity robust standard errors.

4. Empirical Results

4.1. Analysis of Descriptive Statistics

Table 5 reports the descriptive statistics for the variables analysed in this study. The univariate DiD analysis shows that, holding total debt constant, the use of long-term debt in the post-regulation period is 3.03% (standard error = 0.006, t-statistic = -4.52) lower for our treatment firms compared to control firms. Thus, the univariate analysis demonstrates a reduction in corporate debt maturity in response to the implementation of the mandatory CSR regulation. We explore this in greater detail in Section 4.2.

[Insert Table 5 here]

4.2. Baseline Results

We perform the DiD analysis to examine our intuition regarding the effects of the mandatory CSR regulation on firms' debt maturity structure. We present the result of our empirical analysis in Table 6.

There are three columns in Table 6. Column 1 neither matches the treatment and control firms on firm-year covariates nor includes relevant fixed effects in the estimation. Column 2 uses entropy balancing to match the treatment and control firms but does not include industry × year fixed effects. Column 3 not only matches the treatment and control firms but also includes the relevant fixed effects. In columns 1, 2, and 3, the coefficient on the variable of interest, *Reg* × *Treatment* (i.e., β_1), is negative and significant at the 1% level. This suggests that our estimate of β_1 is robust to both entropy balancing and fixed effects. We focus on the estimates in column 3, as this specification is the most rigorous and has the highest adjusted R-squared value of 0.8208.

[Insert Table 6 here]

The coefficient on *Reg* × *Treatment*, in column 3, indicates that our treatment firms utilize 6.9% less long-term debt than our control firms in the post-regulation period while maintaining a constant debt level. We contrast this reduction with the mean value of long-term debt before the enactment of the mandatory CSR regulation (6.5%), indicating that treated firms borrow an

economically meaningful 44.85% (calculated as 6.9% of 6.5%) *less* in long-term debt compared to our control firms, in the post-regulation period.

We interpret this finding as a response to the obligation imposed by the mandatory CSR regulation, which requires firms to allocate funds to specified CSR activities. As a result, firms tend to overinvest in CSR activities relative to their equilibrium, increasing their agency costs of debt and incentivizing lenders to shorten borrowers' debt maturities in the post-regulation period. Consequently, firms subject to this regulation exhibit a reduced reliance on long-term debt. Thus, our results align with the overinvestment hypothesis.

In Section 4.3, we next examine cross-sectional heterogeneity in the treatment effects of the regulation.

4.3. Cross-Sectional Heterogeneity Analysis

We analyze cross-sectional heterogeneity in the treatment effects of the mandatory CSR regulation. Specifically, we examine whether the regulation's impact on debt maturity varies among treated firms based on attributes such as growth, profitability, liquidity, tangibility, and size. For this purpose, we estimate the below specification on our panel data:

$$Long\text{-}Term\ Debt^{i}_{t} = \alpha + \beta_1\ Reg_t \times Treatment^{i} + \sum^{6}_{k=2} \beta_k\ X^{i}_{kt} + \beta_7\ Reg_t \times Treatment^{i} \times CorporatePolicy^{i}_{t} + (Firm\ and\ Industry \times Year)\ fixed\ effects + \varepsilon^{i}_{t}$$

Where,

$$CorporatePolicy^{i}_{t} = \{Growth,\ RoA,\ Liquidity,\ Tangibility,\ Size\} \quad (4)$$

Similar to baseline specification (3), *Long-Term Debt* is the dependent variable for firm i in year t, *Reg* is a binary variable that is 1 for the post-regulation period and 0 otherwise, X is a vector of firm-year covariates, such as *Growth, ROA, Liquidity, Tangibility,* and *Size*, and ε is the residual. In specification (4), *Reg* × *Treatment* × *CorporatePolicy* is the variable of our

interest, which captures the cross-sectional heterogeneity in the treatment effects of the mandatory CSR regulation. The results of our cross-sectional heterogeneity analysis are reported in Table 7.

[Insert Table 7 here]

We find that, in the post-regulation period, the decline in debt maturity was less pronounced for larger firms within our treatment group (see column 2 of Table 7). Previous research indicates that investors in large firms typically face less information asymmetry because these firms are closely monitored by a wide range of analysts and investors, providing them with multiple financing options (Ferri and Jones, 1979; Rajan and Zingales, 1995; Thorburn, 2000). In contrast, small firms attract less attention from analysts and investors, leading to greater information asymmetries that hinder their ability to secure capital. As a result, larger firms are at a lower risk of financial distress compared to smaller firms, which alleviates creditors' concerns about the inefficient use of funds and incentivizes creditors to avoid shortening the debt maturity of larger firms relative to smaller ones in the post-regulation period.

4.4. Debt Maturity Channel for Deterioration in Firm's Operating Performance

At this point, the welfare implications of shorter debt maturity remain uncertain. The increased accessibility of short-term debt enables firms to swiftly secure funding, allowing them to capitalize on immediate growth opportunities or address operational costs without the long-term obligations associated with extended debt maturities. This financial flexibility is particularly advantageous for managing working capital and stabilizing cash flow, ultimately improving efficiency and profitability. Harris and Raviv (1991) suggest that strategically

utilizing short-term debt can help mitigate agency costs and align managerial and shareholder interests, thereby enhancing financial performance. However, an overreliance on short-term debt may expose firms to liquidity risks and greater financial volatility, potentially negating profitability benefits. Consequently, firms may become more cautious in using short-term debt to finance high-risk yet profitable projects, balancing the trade-off between flexibility and financial stability.

We examine how the mandatory CSR regulation influences the operating performance of firms via the debt maturity channel. We argue that a decline in debt maturity acts as a conduit through which the regulation discourages treatment firms from engaging in high-risk investments. Consequently, this is expected to have adverse effects on their operating performance.

To assess the effect of a decline in debt maturity on firms' operating performance, we use return on total assets (ROA) as a proxy for firm performance (Bose et al., 2021; Rajgopal and Tantri, 2023). To empirically investigate this relationship, we estimate the following regression specification within an entropy balanced DiD framework:

$$ROA^{i}_{t} = \alpha + \beta_1 Reg_t \times Treatment^{i} + \beta_2 Reg_t \times Treatment^{i} \times Long\text{-}Term\ Debt^{i}_{t} + \sum^{7}_{k=3} \beta_k X^{i}_{kt} + (Firm\ and\ Industry \times Year)\ fixed\ effects + \varepsilon^{i}_{t} \quad (5)$$

Where, *ROA* is the dependent variable for firm *i* in year *t*, *Reg* is a binary variable that is 1 for the post-regulation period and 0 otherwise, *Long-Term Debt* is the fraction of long-term debt in total debt, *X* is a vector of firm-year covariates, such as *Growth, ROA, Liquidity, Tangibility,* and *Size*, and ε is the residual. In specification (5), *Reg* × *Treatment* × *Long-Term Debt* is the variable of our interest, which captures the effect of regulation-induced changes in corporate debt maturity on operating performance. The results from estimating specification (5) are presented in Table 8 below.

[Insert Table 8 here]

First, we find that the coefficient β_1 on the variable *Reg* × *Treatment* is positive and significant at the 1% level (column 1, coefficient = 1.613, standard error = 0.405, t-statistic = 3.98). This implies that the enactment of the mandatory CSR regulation in 2015 increased the operating performance of our treatment firms relative to the control firms in the post-regulation period.

Next, we document that the coefficient on *Reg* × *Treatment* × *Long-Term Debt* is negative and significant at the 1% level. Specifically, the coefficient β_2 is estimated at -1.398 (with a robust standard error of 0.546 and a t-statistic of -2.56). This suggests that the regulation-induced decrease in debt maturity weakened the operating performance of our treatment firms relative to the control firms. Thus, we argue that a regulation mandating firms to spend on CSR activities shortens corporate debt maturity, which dissuades firms from investing in profitable yet risky ventures.

5. Placebo Test

To assess the robustness of our results, we conduct a placebo test using a fictitious enactment year for the mandatory CSR regulation during the pre-regulation period (i.e., 2011–2014). If the observed shortening of debt maturity for treatment firms relative to control firms is indeed due to the regulation, there should be no change in corporate debt maturity in the pre-regulation period. Otherwise, the post-regulation decline in debt maturity cannot be causally attributed to the regulation's implementation. Statistically, the coefficient on our variable of interest in specification (3), *Reg* × *Treatment*, should be insignificant for the fictitious enactment year.

For this placebo test, we assume 2013 as the placebo enactment year, implying that 2011 and 2012 represent the pre-regulation period, while 2013 and 2014 constitute the post-regulation period. We follow Jadiyappa and Shette (2024) to identify our treatment and control firms. The treatment group consists of firms that did not engage in CSR spending before the regulation but started allocating funds to it afterward. In contrast, the control group includes firms that did not participate in CSR spending during either period.

To ensure that our sample allocation into treatment and control groups resembles random assignment, we incorporate entropy balancing (as exemplified in specification 1). This process yields a sample of 5,758 firm-year observations for the variables reported in Table 1, except for *Size*, which has 5,757 firm-year observations. These observations correspond to unique firms for the period 2011–2014. We then re-estimate specification (3) within the DiD framework, treating 2013 as the placebo regulation year.

Before conducting the DiD estimation, we test the parallel trend assumption by re-estimating specification (2) for 2011 and 2012. The coefficient on the treatment variable (*Treatment*) is -0.006 (with a robust standard error of 0.008), which is statistically insignificant. We also plot the unconditional mean of our dependent variable (*Long-Term Debt*) for treatment and control firms from 2011 to 2014 in Figure 4. The parallel trend in *Long-Term Debt* is evident for 2011 and 2012.

[Insert Figure 4 here]

It is interesting to note that, contrary to the trend of *Long-Term Debt* in Figure 3, the behavior of our dependent variable for the treatment and control firms in Figure 4 remained unaffected around the placebo enactment year (i.e., 2013). This supports our intuition that

corporate debt maturity exhibited no change from 2011 to 2014, i.e., the pre-regulation period in our baseline estimates.

Given that the parallel trends assumption holds for our data, we re-estimate specification (3) for the period 2011–2014, treating 2013 as the regulation year. The estimated coefficient on *Reg* × *Treatment* is -0.017 (standard error = 0.113, t-statistic = 1.30), which is statistically insignificant. This re-estimation of our empirical model (3) with the placebo enactment year reinforces our intuition that our results are driven by the enactment of the mandatory CSR regulation in 2015 rather than by any pre-existing trend in our dependent variable. This enhances the credibility of our main findings.

6. Conclusion

This study examines how corporate social responsibility (CSR) affects the debt maturity structure of firms. To explore this relationship, we utilize the introduction of a mandatory CSR requirement in India, i.e., Section 135 of the Indian Companies Act, 2013. Under this regulation, firms that exceed predefined thresholds for profits, sales, or net worth are required to allocate at least 2% of their average net profit over the preceding three years to CSR initiatives.

In the aftermath of Section 135's implementation, we observe a reduction in debt maturity among affected firms. However, this effect is less pronounced among larger firms subject to the regulation in the post-enactment period. Further, we find that the shift from long-term to short-term debt, prompted by the CSR mandate, discourages treated firms from engaging in high-risk, high-return investments, ultimately leading to a decline in their operating performance.

Our findings indicate that mandatory CSR obligations negatively influence firms' ability to secure long-term financing, which may, in turn, diminish shareholder wealth over the long

run. These insights highlight the unintended consequences of CSR regulations, offering valuable implications for Indian policymakers and regulators as they consider future legislative reforms. From a theoretical standpoint, our study sheds light on how CSR-related policies influence corporate financial decision-making.

References

Alok, S., Kumar, N., and Wermers, R. (2022). Do fund managers misestimate climatic disasters? *Review of Financial Studies*, 35(1), 1–36.

Angrist, J. D., and Pischke, J-S. (2009). *Mostly Harmless Econometrics: An Empiricist's Companion*. Princeton University Press.

Aswani, J., (2024). Debt Markets Retort to Mandatory Corporate Social Responsibility. *SSRN*.

Atanasov, V., and Black, B. (2016). Shock-Based Causal Inference in Corporate Finance and Accounting Research. *Critical Finance Review*, 5, 207-234.

Atanasov, V., and Black, B. (2021). The trouble with instruments: The need for pretreatment balance in shock-based instrumental variable designs. *Management Science*, 67(2), 1270–1302.

Barnea, A., and Rubin, A. (2010). Corporate social responsibility as a conflict between shareholders. *Journal of Business Ethics*, 97(1), 71–86.

Benlemlih, M. (2015). Corporate social responsibility and firm debt maturity. *Journal of Business Ethics*, 144(3), 491–517.

Bhuiyan, M.B.U. and Nguyen, T.H.N. (2020), Impact of CSR on cost of debt and cost of capital: Australian evidence, *Social Responsibility Journal*, 16(3), 419-430.

Bose, U., Stefano F., and Sushanta M. S., (2021). Does Bankruptcy Law Improve the Fate of Distressed Firms? The Role of Credit Channels. *Journal of Corporate Finance*, 68:101836.

Brick, I.E., and Ravid, A. (1985). On the Relevance of Debt Maturity Structure. *The Journal of Finance*, 40(5), 1423-1437.

Cho, S.Y., Lee, C., Pfeiffer, R.J., (2013). Corporate social responsibility performance and information asymmetry. *Public Policy*, 32(1), 71–83.

Chopra, Y., Subramanian, K., and Tantri, P. L. (2021). Bank cleanups, capitalization, and lending: Evidence from India. *The Review of Financial Studies*, 34(9), 4132–4176.

Cooper, E. W., & Uzun, H. (2015). Corporate Social Responsibility and the Cost of Debt. *Journal of Accounting and Finance*, 15, 11-29.

Cui, J., Jo, H., Na, H., (2018). Does corporate social responsibility affect information asymmetry? *Journal of Business Ethics*. 148 (3), 549–572.

Demsetz, H. and Lehn, K. (1985) The Structure of Corporate Ownership: Causes and Consequences. *Journal of Political Economy*, 93, 1155-1177.

Dharmapala, D., and Khanna, V. (2018). The impact of mandated corporate social responsibility: Evidence from India's Companies Act of 2013. *International Review of Law and Economics*, 56, 92–104.

Diamond, D. W. (1991). Debt Maturity Structure and Liquidity Risk. *The Quarterly Journal of Economics*, 106(3), 709-737.

Du, X., Weng, J., Zeng, Q., Chang, Y., and Pei, H. (2017). Do Lenders Applaud Corporate Environmental Performance? Evidence from Chinese Private-Owned Firms. *Journal of Business Ethics*, 143(1), 179-207.

Duffie, D., and Lando, D. (2001). Term structures of credit spreads with incomplete accounting information. *Econometrica*, 69, 633–664.

Fama, E.F. and French, K.R. (1993) Common Risk Factors in the Returns on Stocks and Bonds. *Journal of Financial Economics*, 33, 3-56.

Ferri, M. G., and Jones, H. W., (1979). Determinants of Financial Structure: A New Methodological Approach. *Journal of Finance*, 34(3), 631-644.

Flannery, M. J. (1986). Asymmetric Information and Risky Debt Maturity Choice. *The Journal of Finance*, 41(1), 19-37.

Girerd-Potin, I., Jimenez-Garces S., and Louvet, P. (2011). The Link between Social Rating and Financial Capital Structure. *Finance, Presses universitaires de Grenoble*, 32(2), 9-52.

Goss, A., and Roberts, G. S. (2011). The impact of corporate social responsibility on the cost of bank loans. *Journal of Banking and Finance*, 35, 1794–1810.

Harris, M., and Raviv, A. (1991). The theory of capital structure. *The Journal of Finance*, 46, 297–355.

Heal, G. (2005) Corporate Social Responsibility: An Economic and Financial Framework. *The Geneva Papers on Risk and Insurance Issues and Practice*, 30, 387-409.

Hoepner, A., Oikonomou, I., Scholtens, B., Schröder, M., (2016). The effects of corporate and country sustainability characteristics on the cost of debt: an international investigation. *Journal of Business Finance and Accounting*. 43(1–2), 158–190.

Jadiyappa, N., Joseph, A., Sisodia, G., Krishnankutty, R., and Shrivastav, S. (2021). Corporate social responsibility and cash holdings in India: Evidence from a natural experiment. *Finance Research Letters*, 39, 101581.

Jadiyappa, N., and Rachappa S., (2024). CSR regulation and the working capital management policy. *Global Finance Journal*, 59, 100934.

Jensen, C. M., and Meckling, H.W., 1976. Theory of the firm: Managerial behavior, agency costs and ownership structure. *Journal of Financial Economics*, 3(4): 305-36.

Manchiraju, H., and 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.

Myers, S. C. (1977). Determinants of Corporate Borrowings. *Journal of Financial Economics*, 5(2), 147-175.

Nguyen, V. N., Choi, B., and Agbola, F. W. (2020). Corporate social responsibility and debt maturity: Australian evidence. *Pacific-Basin Finance Journal*, 62, 101374.

Petersen, M. A., and Rajan, R. G., 1(997). Trade Credit: Theories and Evidence. *The Review of Financial Studies, Society for Financial Studies*,10(3), 661-691.

Rajan, R. G., and Zingales, L. (1995). What do we know about capital structure? Some evidence from international data. *The Journal of Finance*, 50(5), 1421–1460.

Rajgopal, S., and Tantri, P. L. (2023). Does mandated corporate social responsibility crowd out voluntary corporate social responsibility? Evidence from India. *Journal of Accounting Research*, 61(1), 415–447.

Roy, P. P., Roy, S., and Zhu, M. (2022). Mandatory CSR expenditure and stock market liquidity. *Journal of Corporate Finance*, 202, 158.

Sharfman, P. M., and Fernando, C.S. (2008). Environmental risk management and the cost of capital. *Strategic Management Journal*, 29(6), 569-592.

Shaw, T. S., Raithatha, M., Krishnan, G. V., and Cordeiro, J. J. (2021). Did mandatory CSR compliance impact accounting conservatism? Evidence from the Indian Companies Act 2013. *Journal of Contemporary Accounting and Economics*, 17(3), 100280.

Singh, R., Chauhan Y., and Jadiyappa, N., (2023). Does an effective bankruptcy reform increases collateralized borrowing? Evidence from a quasi-natural experiment in India. *Journal of Regulatory Economics*, 63(1), 74-86.

Tantri, P. L. (2020). Creditor Rights and Strategic Default: Evidence from India. *Journal of Law and Economics*, 63(3), 411-447.

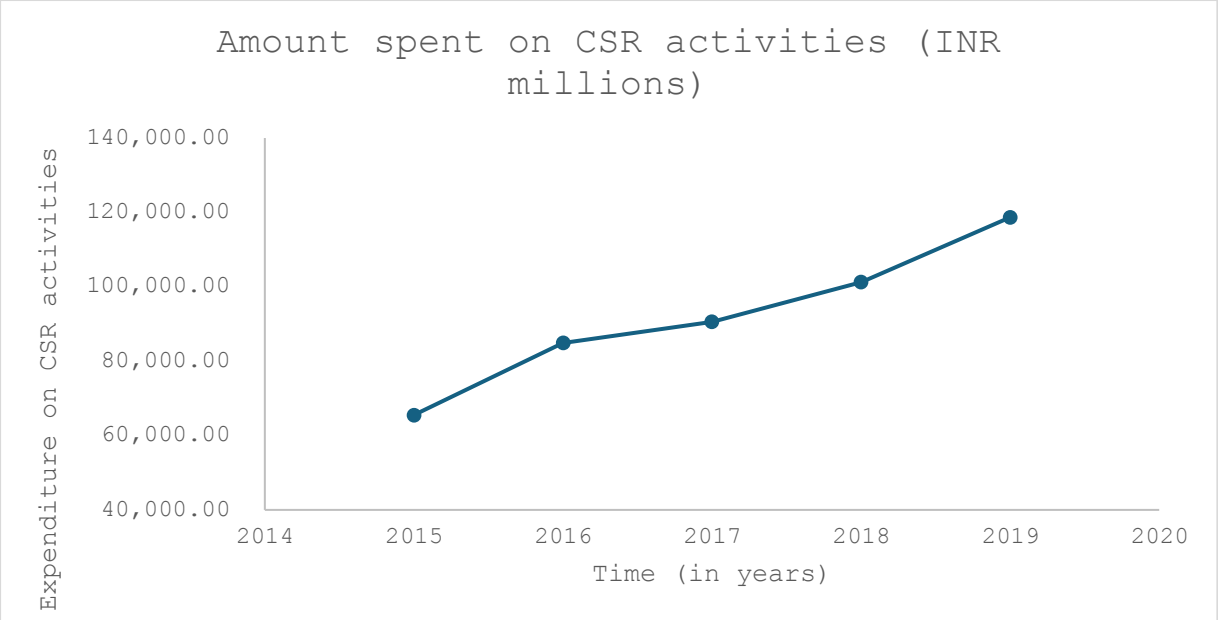
Thorburn, K.S., (2000). Bankruptcy auctions: costs, debt recovery, and firm survival. *Journal of Financial Economics*, 58(3), 337-368.

Vig, V. (2013). Access to Collateral and Corporate Debt Structure: Evidence from a Natural Experiment. *Journal of Finance*, 68, 881-928.

Yermack, D. (2006). Flights of fancy: Corporate jets, CEO perquisites, and inferior shareholder returns. *Journal of Financial Economics*, 80(1), 211–242.

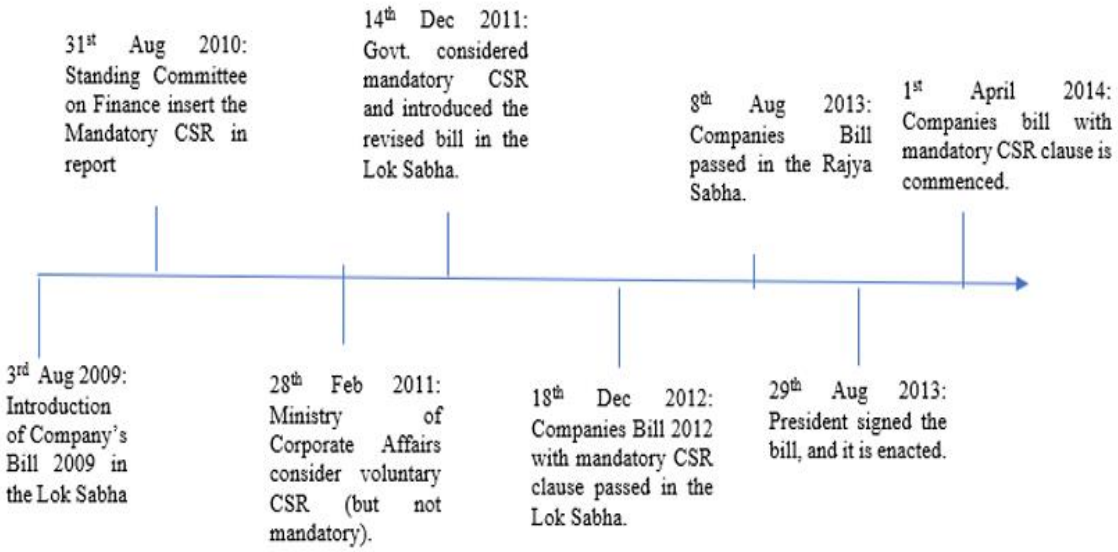
Zhu, Y., Sun, L.Y., and Leung, A.S. (2014). Corporate social responsibility, firm reputation, and firm performance: the role of ethical leadership. *Asia-Pacific Journal of Management*, 31(4), 925–947.

Figure 1: Time-Series Trend of CSR Expenditure



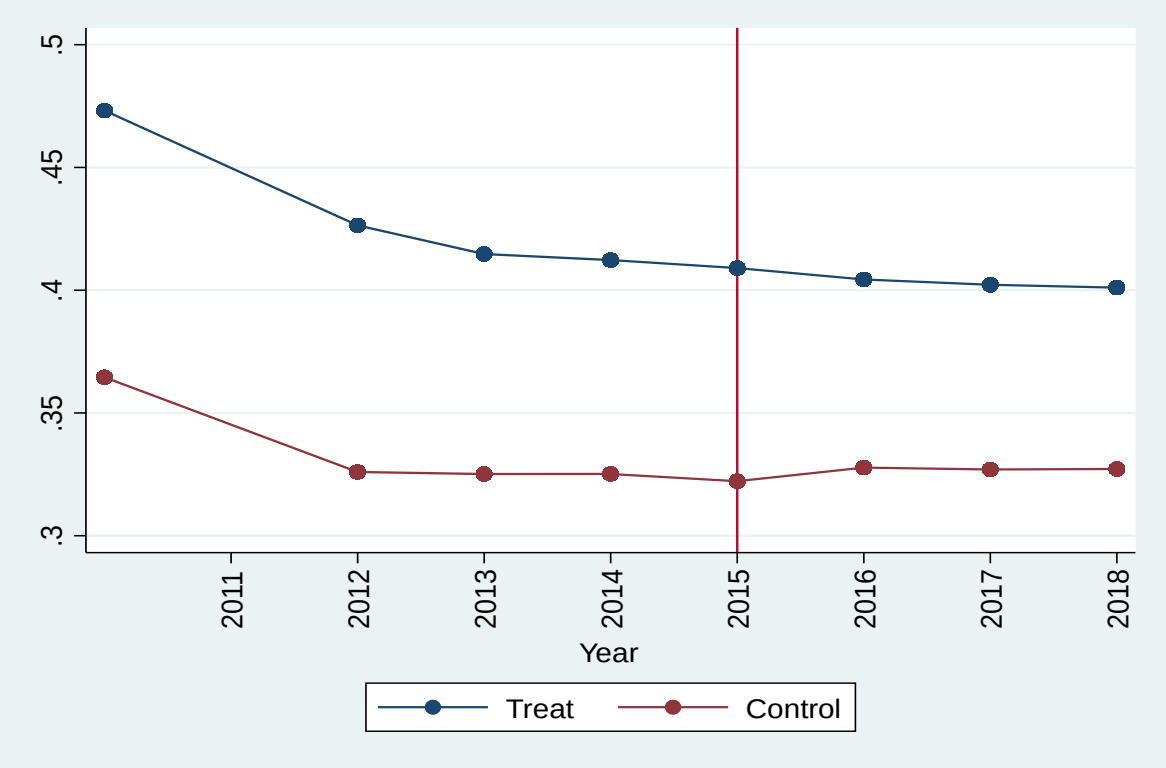
Note: This figure plots the year-wise trend of CSR expenditure by Indian firms during the post-implementation period.

Figure 2: Evolution of the mandatory CSR regulation



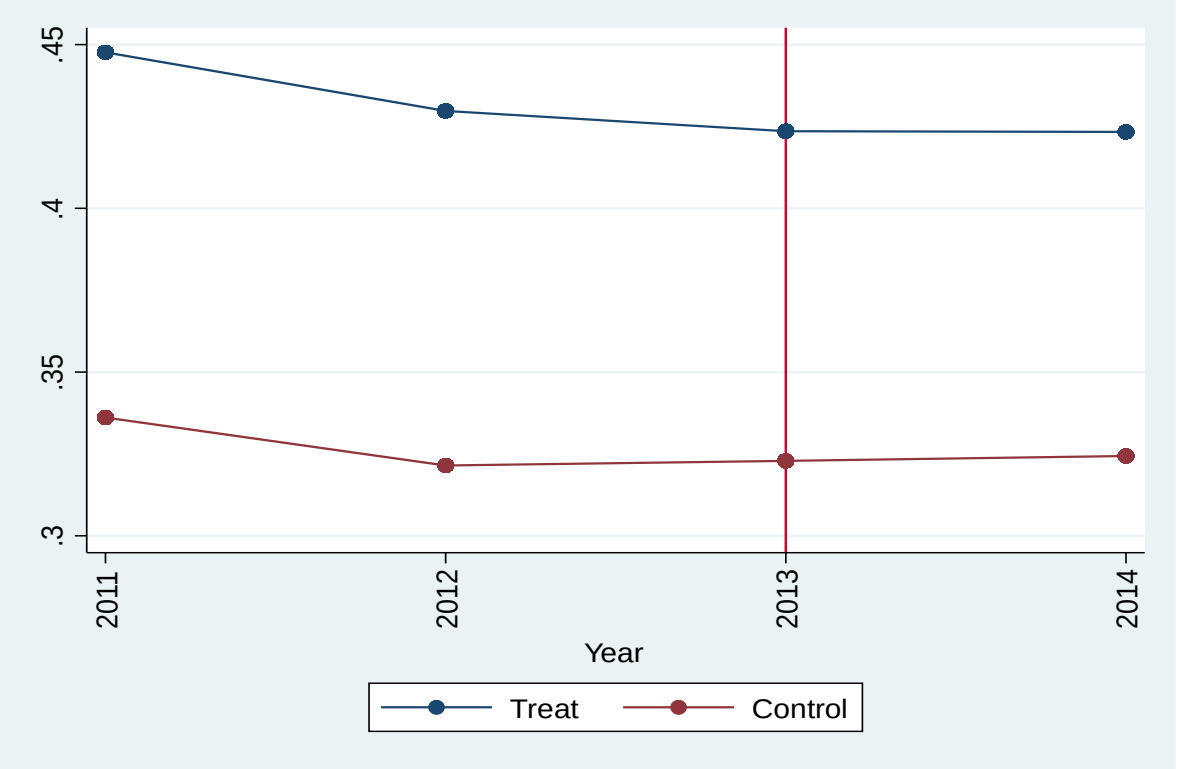
Note: This figure plots the events around the adoption of the mandatory CSR regulation. *Source:* Aswani (2024).

Figure 3: Parallel Trend Assumption



Note: This graph plots the unconditional mean of our dependent variable, i.e., *Long-Term Debt,* over the length of our study period (2011-2018) for both treatment and control groups. The vertical line indicates the year of the enactment of the mandatory CSR regulation, i.e., 2015.

Figure 4: Test of the Parallel Trend Assumption for the Placebo Data



Note: This graph plots the unconditional mean of our dependent variable, i.e., *Long-Term Debt* for both treatment and control group firms for the pre-regulation period (2011 to 2014). The fake promulgation year (i.e., 2013) is highlighted through a vertical line.

Table 1: Definition of variable

Variables	Description
Long-Term Debt	Fraction of 'Long-Term Borrowings' in 'Total Debt.'
Growth	Time-series change in sales, computed as $(Sales_t - Sales_{t-1})/Sales_{t-1}$.
ROA	'Return on Total Assets', computed as the ratio of 'Earnings Before Interest and Taxes' (EBIT) to 'Total Assets,' in percent.
Liquidity	Surplus or Deficit of 'Current Assets' over 'Current Liabilities' deflated by 'Total Assets.'
Tangibility	The proportion of 'Net Fixed Assets' in 'Total Assets.'
Size	Naturalized Logarithm of 'Total Assets.'

Note: This table defines the variables used in this study. INR stands for Indian Rupees.

Table 2: Summary Statistics

Variables	Obs	Mean	Std. dev.	Min	p25	p75	Max
Long-Term Debt	15923	0.356	0.293	0	0.062	0.577	0.998
Growth	14378	0.380	1.932	-1.331	-0.069	0.241	16.329
ROA	15923	1.740	11.280	-72.34	-0.18	5.96	98.88
Liquidity	15923	0.102	0.313	-1.654	-0.021	0.247	1
Tangibility	15923	0.271	0.212	0	0.093	0.409	1
Size	15833	6.987	2.353	0	5.369	8.643	12.946

Note: This table presents detailed summary statistics on the variables used in this study, including the number of firm-year observations for each variable (Obs), as well as their Mean, Standard Deviation (Std. dev.), Minimum (Min), 25th percentile (p25), 75th percentile (p75), and Maximum (Max) values.

Table 3: Entropy Balancing Diagnostics

Variables	**Panel A: Before Entropy Balancing**					
	Control firms			**Treatment firms**		
	Mean	Variance	Skewness	Mean	Variance	Skewness
Growth	0.493	5.2	5.693	0.134	0.393	20.99
Liquidity	0.092	0.124	-1.225	0.129	0.034	0.553
Tangibility	0.259	0.049	0.0843	0.290	0.032	0.497
Size	5.993	3.406	0.197	9.321	2.59	0.384
Variables	**Panel B: After Entropy Balancing**					
	Control firms			**Treatment firms**		
	Mean	Variance	Skewness	Mean	Variance	Skewness
Growth	0.134	0.393	20.99	0.134	0.393	20.99
Liquidity	0.129	0.034	0.552	0.129	0.034	0.553
Tangibility	0.290	0.032	0.497	0.290	0.032	0.497
Size	9.321	2.59	0.383	9.321	2.59	0.384

Note: This table presents the mean, variance, and skewness of firm-year covariates by treatment and control firms before and after entropy balancing.

Table 4: Formal Test of the Parallel Trend Assumption

Variables	Δ Long-Term Debt
Treatment	-0.009
	(0.004)
Constant	-0.002
	(0.002)
R-squared	0.000

Note: This table reports the estimates for the formal test of the parallel trend assumption, which is necessary for applying the DiD method (Lemmon and Roberts, 2010). Robust standard errors are enclosed in parentheses.

Table 5: Descriptive statistics

Variables	Panel A: Control group firms				Panel B: Treatment group firms			
	Pre-CSR		Post-CSR		Pre-CSR		Post-CSR	
	Mean	Standard deviation	Mean	Standard deviation	Mean	Standard deviation	Mean	Standard deviation
Long-Term Debt	0.108	0.231	0.119	0.238	0.065	0.187	0.062	0.181
Growth	0.115	1.153	0.223	1.535	0.026	0.281	0.015	0.215
ROA	-0.201	7.072	-0.302	7.001	1.137	3.851	1.106	3.709
Liquidity	0.028	0.202	0.034	0.223	0.018	0.085	0.021	0.088
Tangibility	0.088	0.181	0.092	0.181	0.045	0.127	0.045	0.127
Size	1.871	2.933	2.234	3.122	1.397	2.334	1.483	3.497

Note: This table provides information on the mean and standard deviation of firm-year covariates by treatment and control firms. Table 1 provides the definition of these variables, while Table 2 presents detailed summary statistics on these variables.

Table 6: Empirical Results

Variables	Long-Term Debt	Long-Term Debt	Long-Term Debt
	(1)	(2)	(3)
Reg* × *Treatment	**-0.0278*** **	**-0.043*** **	**-0.069*** **
	(0.006)	**(0.005)**	**(0.009)**
Growth	0.002***	0.011***	0.010***
	(0.000)	(0.003)	(0.003)
ROA	-0.000**	-0.002***	-0.001***
	(0.000)	(0.000)	(0.000)
Liquidity	0.133***	0.362***	0.341***
	(0.014)	(0.037)	(0.029)
Tangibility	0.120***	0.122***	0.146***
	(0.022)	(0.037)	(0.032)
Size	0.008*	0.044***	0.054***
	(0.004)	(0.011)	(0.012)
Constant	0.252***	-0.028	-0.122
	(0.034)	(0.104)	(0.118)
Entropy Balanced	No	Yes	Yes
Observations	14,326 firm-year observations	14,326 firm-year observations	14,326 firm-year observations
F-statistic	18.60	31.80	32.95
Adjusted R-squared	0.0212***	0.7928***	0.8208***
Firm Effects	No	Yes	Yes
Industry × Year Effects	No	No	Yes

Note: This table presents our baseline estimates of how the mandatory CSR regulation of 2015 affects corporate debt maturity. Bold values indicate the estimates of interest in each column. Robust standard errors are enclosed within parenthesis. *, **, and *** implies significance at the 10%, 5%, and 1% levels respectively.

Table 7: Heterogeneity Analysis

Variables	Long-Term Debt	Long-Term Debt	Long-Term Debt	Long-Term Debt	Long-Term Debt
	(1)	(2)	(3)	(4)	(5)
Reg × *Treatment*	-0.068*** (0.009)	-0.064*** (0.010)	-0.065*** (0.009)	-0.061*** (0.013)	-0.137*** (0.033)
Growth	0.012*** (0.003)	0.010*** (0.003)	0.010*** (0.003)	0.011*** (0.003)	0.010*** (0.003)
ROA	-0.001*** (0.000)	-0.001*** (0.000)	-0.001*** (0.000)	-0.001*** (0.000)	-0.001*** (0.000)
Liquidity	0.341*** (0.029)	0.344*** (0.029)	0.351*** (0.031)	0.342*** (0.029)	0.344*** (0.030)
Tangibility	0.147*** (0.032)	0.146*** (0.032)	0.145*** (0.032)	0.156*** (0.033)	0.143*** (0.032)
Size	0.055*** (0.012)	0.056 *** (0.012)	0.055*** (0.012)	0.054*** (0.012)	0.054*** (0.012)
Reg* × *Treatment* × *Growth	**-0.008 (0.006)**				
Reg* × *Treatment* × *ROA		**-0.001 (0.000)**			
Reg* × *Treatment* × *Liquidity			**-0.033 (0.028)**		
Reg* × *Treatment* × *Tangibility				**-0.030 (0.030)**	
Reg* × *Treatment* × *Size					**0.007** (0.003)**
Constant	-0.127 (0.118)	-0.138 (0.120)	-0.125 (0.119)	-0.123 (0.118)	-0.118 (0.118)

Entropy balanced	Yes	Yes	Yes	Yes	Yes
Observations	14,326 firm-year observations	14,326 firm-year observations	14,326 firm-year observations	14,326 firm-year observations	14,326 firm-year observations
F-statistic	28.36	28.20	28.13	28.26	28.61
Adjusted R-squared	0.8208***	0.8209***	0.8208***	0.8208***	0.8210***
Firm Effects	Yes	Yes	Yes	Yes	Yes
Industry × Year Effects	Yes	Yes	Yes	Yes	Yes

Note: This table presents our estimates for the cross-sectional heterogeneity in the treatment effects of the mandatory CSR regulation. Bold values indicate the estimates of interest in each column. Robust standard errors are enclosed within parenthesis. *, **, and *** implies significance at the 10%, 5%, and 1% levels respectively.

Table 8: Long-Term Debt Channel

Variables	Coefficient	ROA
		(1)
Reg × Treatment	β_1	1.613***
		(0.405)
Reg × Treatment × Long-term Debt	β_2	**-1.398*** **
		(0.546)
Growth	β_3	0.677***
		(0.182)
Liquidity	β_4	7.630***
		(1.158)
Tangibility	β_5	-7.268***
		(1.421)
Size	β_6	0.769
		(0.672)
Constant	α	-3.801
		(6.130)
Entropy Balanced		Yes
Observations		14,326 firm-year observations
F-statistic		24.46
Adjusted R-squared		0.7916***
Firm Effects		Yes
Industry × Year Effects		Yes

Note: This table documents the impact of the mandatory CSR regulation on the operating performance of firms via the debt maturity channel. Bold values indicate the estimates of interest in each column. Robust standard errors are enclosed within parenthesis. *, **, and *** implies significance at the 10%, 5%, and 1% levels respectively.