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Does CSR Regulation affect Financial Policy: A Quasi-Natural Experiment Approach

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Does CSR regulation affect financial policy: A quasi-natural experiment approach

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Abstract

This study examines how mandatory CSR spending regulation implemented in India in 2014 impacted the financial policy of corporate firms in a quasi-natural experiment setup. The analysis shows that the debt level of treated firms decreased significantly following the CSR regulation; however, no corresponding change was observed in control firms. This decrease in debt can be attributed to the greater value that the equity of such firms commanded in capital markets following the regulation. Further, we show that this positive change in the relative importance of equity compared to debt in the post-regulation period helped firms move toward their target capital structure faster. These results remain robust for various model specifications, estimators, and sample selection procedures. Overall, these results conform to the predictions of the stakeholder and legitimacy based theories on CSR.

Introduction

Regulating CSR activities of corporate firms have gained traction across the world. Countries like India and Indonesia have implemented regulations that stipulate firms meeting some criteria to invest in CSR activities compulsorily. The consequences of such regulations for policy formulation and evaluation cannot be understood using the existing CSR literature as the existing studies have implicitly assumed that CSR activities are voluntary, i.e., firms begin CSR activities independently without any external regulatory pressure. The important question in this context is, what are the consequences of mandatory CSR regulation, especially on firms' financial policy? Examining the impact on financial policy is important because financial policy affects all other activities like investment, growth, dividend, etc., and thus affects firm value in capital markets. Therefore, in this study, we examine the impact of mandatory CSR regulation implemented in India in 2014 on the financial policy of corporate firms.

Indian mandatory CSR regulation, i.e., Section 135 of the Indian Companies Act, 2013, requires that firms meeting any of the following three criteria spend at least 2% of their average net profit of the preceding three years on the specific CSR activities listed in a schedule to the Act. The criteria are a firm that has 1) Rs.10 billion or more in sales, 2) Rs. 5 billion or more in net worth, and lastly, 3) Rs. 50 million or more in net profit. These firms must report their expenditure on CSR activities under this section in financial reports or explain why such CSR expenditure is not incurred. Qualified application of the regulation allows us to divide firms into treatment firms (firms that met one of the criteria and hence were affected by the regulation) and control firms (firms that were not affected by the regulation). Comparing the changes in the financial policy of mandatory and control firms between the pre and post-regulation period using the Difference in Differences (DiD) approach would help us establish a cause-and-effect relationship between mandatory CSR and financial policy.

There is no clear evidence in the literature regarding how CSR regulation would likely affect corporate firms' financial policy. Competing theories predict contrasting results. For example, the stakeholder and social trust theories predict that CSR activities negatively impact the cost of equity and debt (Kim et al., 2012; Cho et al., 2013). While a negative impact on the cost of equity has a negative effect on the use of debt, a negative impact on the cost of debt has a positive impact. Therefore, it is an empirical question as to which of these effects dominate the real world. Even the literature on the agency problem provides contradicting insights. On the one hand, some researchers argue that improving relationships with stakeholders decreases the degree of agency problems. Hence, CSR activities decrease the usefulness of

debt in controlling managerial entrenchment (Werbel and Carter, 2002). On the other hand, other researchers argue that CSR activities themselves represent managerial entrenchment in the presence of free cash flows. Hence, shareholders can manage such entrenchment activities by borrowing more. Therefore, the net impact of CSR on financial policy is an empirical question with predicted results in both directions.

Theoretically, CSR regulation is expected to affect the financial policy of firms for three reasons. First, the literature has reported that CSR activities decrease the degree of information asymmetry between the firm and various stakeholders, including the creditors (Dhaliwal et al., 2012). Second, it is also expected to provide insurance-like protection to firms, decreasing firms' risk exposure (Robinson et al., 2008; Starks, 2009). Lastly, CSR activities are expected to decrease the degree of agency problems, thereby decreasing the role of debt in managing agency issues (Barnea and Rubin, 2010). Therefore, using the leverage ratio, i.e., total debt to total assets ratio, as a proxy to measure financial policy, we examine the relative change in the leverage ratio of treated firms with control firms between pre- and post-regulation periods. While we observed a statistically significant decrease in the leverage ratio of treated firms, no such decrease was observed for control firms between the pre and post-regulation periods. The results remain robust even after controlling for year and industry-fixed effects.

Next, we conduct a series of robustness tests to examine the validity of the negative impact of CSR regulation on the leverage ratio. First, we use the fixed effects estimator to estimate the parameters of the regression model. This estimator estimates the parameters after controlling for firm-specific time-invariant heterogeneity. We find qualitatively very similar results to the OLS estimator. Second, there is a reasonable probability that our scheme of dividing the sample firms into treatment and control groups may have selection bias. For example, as regulation is applied only to large and profitable firms, the large and more profitable firms are automatically selected for the treatment group. Therefore, to account for such selection issues in our analysis, we use the propensity score matching (PSM) approach to select treatment and control firms. Even in these PSM-matched sub-samples, we find a negative impact of CSR regulation on the leverage ratio. Lastly, we test the robustness of the observed negative impact by using an alternate leverage ratio measure, i.e., market leverage ratio. Again, the results are qualitatively very similar to what has been observed for the book leverage ratio. Overall, these robustness tests show that the results are robust for various model specifications, estimators, sample selection procedures, and alternate financial policy measures.

Next, we examine one of the possible reasons for the decline in the debt level. The pecking order theory argues that the undervaluation impact of information asymmetry is highest for equity. Therefore, the impact of the negative influence of CSR on information asymmetry cost should be greater for equity than debt. In other words, CSR makes equity relatively cheaper than debt due to its negative impact on information asymmetry. Hence, it is expected that firms would finance their project more with equity than debt in the post-regulation period, thereby decreasing the debt level. To test this, we examine the relative change in the equity value of control and treated firms between pre- and post-periods. We expect CSR regulation to have a greater positive impact on the value of treatment firms' equity than control firms. Our analysis shows that while there was a positive and statistically significant change in the equity value of treated firms, no such change was observed for control firms. This result suggests that the increase in the value of equity in stock markets could be the reason behind the observed decline in the debt levels of treated firms.

If CSR regulation has impacted the financial policy of corporate firms, then its impact should also be seen in the speed of adjustment (SOA) towards their target capital structure. CSR regulation is expected to affect the SOA since a lower debt ratio in the post-regulation period is expected to have a negative impact on their target debt ratio. This means that firms have a lower gap between the actual and target debt ratios to cover in the post-regulation period. Therefore, we expect firms, especially the treatment firms, to have a greater SOA in the post-regulation period than in the pre-regulation period. Using the partial adjustment model suggested by Flannery and Rangan (2006), we find that CSR has a positive impact on the SOA of affected firms and the results remain qualitatively the same for both book and market leverage measures.

Our study contributes to the existing literature from three aspects. First, it extends the scope of the definition of CSR activities to include CSR activities mandated by regulation. Hitherto, all prior studies that have examined the relationship between CSR and financial policy have considered voluntary CSR activities. This aspect addresses the question, do mandated or involuntary CSR activities behave the same way voluntary CSR activities do? Second, we examine the consequence of CSR regulation on the financial policy of corporate firms, and no such study has been conducted so far in the literature[1]. Therefore, this study provides a possible channel through which CSR regulation has impacted the firm

[1] We have come across studies which have examined the impact of CSR regulation on firm value, cash holdings, tax aggregation and liquidity

value. Such a policy evaluation would let policymakers know how their policy is working so that any corrective measures, if necessary, could be taken. Also, such policy evaluation attempts help policymakers in other countries, who are contemplating implementing a CSR regulation, know what would be the likely consequences of CSR regulation. Lastly, we examine the impact of CSR on financial policy in an emerging market context, i.e., India, characterized by underdeveloped financial and legal institutions (Allen et al., 2012). All previous studies have examined this relationship in the developed world, where financial and legal institutions are relatively well-developed.

The remainder of the paper is organized as follows. The context of CSR regulations in India is discussed in the second section. We provide a theoretical framework and develop hypotheses to be tested in the third section; data and methodological issues are discussed in the fourth section. The results are presented and discussed in the fifth section, and lastly, in the sixth section, we conclude with our results.

2 CSR regulations in India

The Indian government has experimented with soft and hard law approaches to making corporate firms socially responsible. The main objective of these laws is to use the CSR activities of corporate firms as a development tool to achieve the social and environmental objectives of the nation. In this regard, Gatti et al. (2019) write, "given the gravity of environmental and social problems in India and the impossibility of the GOI[2] resolving the situation alone, business CSR policies in India are currently considered developmental tools." Given this objective, regulators have tried different approaches to bring the desired changes in the CSR behavior of corporate firms.

Before 2013, regulators used mainly the soft law approach, which deals with the disclosure of CSR-related activities, which called for voluntary disclosure of CSR activities undertaken by the firms to the public. For example, 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, i.e., clause 55, in the listing agreement which calls for enhanced disclosure under business responsibility reports. In 2013, the GOI adopted a hard law approach and inserted a new section, i.e., Section-135, to the Companies Act, 2013. This section applies to all the firms working in India which meet at least one of the three thresholds mentioned in the Act. They are,

[2] Government of India

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

Section 135 requires that a firm meeting any 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. 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 was not implemented or an unsatisfactory explanation was given for non-implementation[4].

3 Hypotheses development

Modigliani and Miller's irrelevance hypothesis predicts no association between CSR and leverage ratio. However, bankruptcy costs and other market imperfections, such as information asymmetry and agency problems, make CSR relevant in financial decisions. Various theoretical extensions and analytical frameworks have been proposed to explain how CSR activities affect information asymmetry, bankruptcy costs, and agency problems. We discuss some of these aspects below to develop hypotheses for testing.

The stakeholder and legitimacy theories have been used extensively in the prior literature to explain the CSR phenomenon and its influence on various policy decisions. According to these theories, CSR helps legitimize the existence of firms in their society by building stronger relationships with various stakeholders like customers, lenders, investors, employees, and suppliers (Du and Vieira, 2012; Godfrey, 2005). Building stronger relationships with lenders and equity investors is particularly important from the financial policy perspective. Dhaliwal et al. (2011) show that through building stronger networks, CSR activities help bridge information asymmetry between the firm and various stakeholders, including investors. This decrease in the degree of information asymmetry should then affect the relative attractiveness of equity and debt in the capital markets. In line with this prediction, prior studies in the literature have reported that stronger relationships with investors and other stakeholders have had a negative impact on the cost of equity (El Ghoul et al., 2011), the cost of debt (Gong et al., 2021), and

[3] I USD=70 Rs
[4] For more information on Section-135, please refer to Getti et al., (2019)

the overall cost of capital (Bhuiyan and Nguyen, 2019). Additionally, it has also been observed that CSR activities positively impact the liquidity of equity securities in the stock markets (Roy et al., 2022).

Further, Albuquerque et al. (2019) argue that CSR activities make their demand more inelastic in product markets as CSR firms enjoy better brand equity and reputation in the product markets (Oikonomou et al., 2012). This more inelastic demand with better brand equity and reputation should decrease the probability and the cost of bankruptcy and thus affecting the financial policy decisions. Finally, there are a specific group of investors looking to invest particularly in socially and environmentally responsible firms, i.e., ESG investors (Amel-Zadeh and Serafeim, 2018), which should make financial securities of CSR firms attract more demand in the financial markets (Roy et al., 2022). All these things combined have two major impacts from the financial policy perspective. First, CSR increases a firm's future cash flows; second, it decreases the uncertainty associated with future cash flows, thus impacting financial policy (Mishra and Modi, 2012; Albuquerque et al., 2019). Since these arguments are applied equally well to debt and equity instruments, the direction of the impact is thus an empirical question. Therefore, we propose to test the following hypothesis under the DiD framework

H1: The impact of CSR regulation on financial policy is greater for mandatory firms compared to the control firms

In India, two things will determine the direction of the impact of mandatory CSR on the financial policy, i.e., leverage ratio. First, Indian equity markets are relatively well-developed compared to debt markets (Allen et al., 2012; Jadiyappa et al., 2016). Second, even within the debt markets, banks dominate over bond markets. Given these two facets of the Indian financial system, incorporating CSR information into valuation would be much better and faster in equity markets compared to the debt market. Hence, we believe that equity markets would respond to the CSR activities of mandatory firms more prominently than debt markets. Even from the pecking order perspective, the undervaluation impact of information asymmetry is greater for equity than debt. Therefore, when the degree of information asymmetry is reduced, then the response of equity instruments would be greater than debt instruments. Hence, the relative value of equity, compared to debt, would become much greater in the post-regulation period compared to the pre-regulation period resulting in equity becoming cheaper for the firms to finance their projects than debt. This allows firms to use more equity to finance their operations in the post-regulation period leading to an overall decrease in the leverage ratio. Therefore, in H2, we examine the change in the equity value of mandatory and control firms between pre and post-regulation periods.

H2: The CSR regulation would have a positive impact on the market value of equity of mandatory firms compared to the control firms

Lastly, we examine how CSR regulation has impacted the speed of adjustment toward the target capital structure. Theoretically, any change in the target leverage should also change SOA. A decrease in the leverage ratio is expected to allow firms to achieve their target leverage faster. Therefore, we test the following hypothesis

H3: The CSR regulation would have a positive impact on the SOA of mandatory firms compared to the control firms

4 Data and methodology

4.1 Identification strategy

The DiD design requires dividing our sample firms into treatment and control groups. The prowess database provides information on mandatory CSR expenditure of individual firms. By following the prior literature, we group all those firms which have positive expenditure on mandatory CSR activities in the post reforms period in the treatment group[5]. Also, we require that these firms have zero expenditure on social and environmental-related expenditures[6] in the pre-regulation period as these activities fall under CSR activities and thus may confound the impact of CSR regulation. The firms with zero expenditure on social and environmental activities in the pre-regulation period and no expenditure on CSR activities in the post-regulation period form our control group.

4.2 Data

The data required to test our hypotheses are taken from the Prowess database, a widely used database on Indian corporate firms. We start with all non-financial firms listed on National Stock Exchange and then exclude all firm-year observations with missing data. Also, we exclude all firms with less than six observations during the study period, i.e., 2010 through 2019. Following this procedure, we have 8452 firm-year observations for 905 unique firms. Of these, 6284 observations for 661 unique firms belong

[5] We require that firms should have positive CSR expenditure in at least two years of the four post-regulation period.
[6] Manchiraju and Rajgopal (2017) treat social and environmental expenses in the pre-regulation period essentially as CSR expenses under a different accounting head

to the treated group, and 2168 firm-year observations for 244 unique firms belong to the control group. The summary statistics of the winsorized (at 2% on both ends) variables are presented in Table 1.

Table 1 Here

The average debt ratio of our sample firms is about 25.6%, comparable to what has been reported for Indian firms in the literature (Jadiyappa et al., 2016). In Table 2, we have separately provided the summary statistics for treatment and control sub-groups. This table shows that control firms are more levered (36.8%) than treatment firms (21.7%). The difference in leverage between these two groups is statistically significant too. The same trend is observed in market leverage. Overall, this table shows that the treatment firms are bigger, have better performance, their equity is valued more in capital markets, have greater sales growth rates, are older, and command a greater market share in their respective industries. However, we find no difference between these groups in Tangibility, RD_Ratio, and Industry competition (Ind_HHI).

Table 2 Here

4.3 Model specification

We use the following DiD equation as the baseline model to test our hypotheses. This model involves interacting the Reg_Dummy with Treat_Dum to get differential intercept for the treated firms for the post-regulation period.

$$Leverage\_Ratio_{it} = \alpha_i + \beta_1 Reg\_Dummy_t + \beta_2 Treat\_Dum_i + \beta_3 Reg*Treat\_Dum_i + \beta_4 Size_{it} + \beta_5 ROA_{it} + \beta_6 Tangibility_{it} + \beta_7 RD\_Ratio_{it} + \beta_8 Age_{it} + \beta_9 Market\_Share_{it} + \beta_{10} Ind\_HHI_{it} + + \beta_{11} GDP\_Growth_t + \epsilon_{it} \quad (1)$$

The coefficient of interest is the DiD operator, i.e., β3, which interacts the effect of CSR regulation with the treatment group. We add firm Size, ROA, Tangibility, RD_Ratio, firm age, and market share as firm-level control variables. We also add industry, i.e., industry competition, and macroeconomic factors, i.e., GDP growth rate, as additional control variables. The impact of time-invariant industry

heterogeneity is controlled by adding industry dummies. The impact of time-specific events is controlled by adding industry dummies. We use the pooled OLS estimator to estimate the coefficients of the regression model. We also use the fixed effects estimator in a robustness test to control for time-invariant firm-specific factors affecting our results.

4.4 Parallel trend in the dependent variable

The most important assumption of the DiD approach is that treatment and control firms should have the same trend in the dependent variable before the regulation. It requires that the leverage ratio of treatment and control firms change at the same rate before the regulation; only then could any difference in the rate of change in the post-regulation period be attributed to CSR regulation. Therefore, we examine whether our data fulfills this requirement or not.

To examine this, we first calculate the change in leverage ratio (Delta_Leverage) for all years in the pre-regulation years and test whether there is any statistically significant difference in Delta_Leverage for all pre-regulation years individually. We do this by individually interacting Treat_Dum with an indicator variable representing years from 2011 to 2014. The coefficient of this interaction variable would tell us whether there is any significant difference in the Delta_Lev of treatment firms compared to control firms in that particular year. The results are presented in Table 3. Our analysis shows that of four pre-regulation years, the change in leverage ratio was the same in three years and different in only one year, i.e., 2013. We ignore the results of 2013 because it may not be a part of a larger trend. Therefore, we believe that our data satisfy the parallel trend assumption of the DiD approach.

Table 3 Here

5 Results and discussion

The results of hypothesis H1 analysis are presented in Table 4. In the first two columns, we examine the absolute changes in the leverage ratio of treated and control firms between pre-and post-regulation periods. In these columns, while we observe a significant decrease in leverage ratio for treated firms, no change was observed for control firms. In column three, we examine the relative change in the leverage ratio of treated and control firms using the DiD design. Consistent with the results presented in the first two columns, while the coefficient of the interaction variable is negative and statistically significant, the coefficient of Reg_Dummy is not, implying that the impact of CSR regulation is statistically different

for control and mandatory firms. Note that these results are obtained after controlling for year and industry-fixed effects. Overall, these results show that CSR regulation had a negative impact on the leverage ratio of Indian firms and thus supports the findings of Sheikh (2009)[7].

Table 4 Here

This negative impact is largely consistent with various finance theories and the results of prior studies. First, the pecking order theory views that improving the information flow among various stakeholders would impact the equity value more than debt. Therefore, it is expected that when firms undertake CSR activities, a greater impact is seen on equity than debt. This result may explain the negative relationship between CSR and the cost of equity reported by El Ghoul et al. (2011). This result is also consistent with the stakeholder view on agency issues. Harjoto and Jo (2011) argue that improvements in relationships with firm equity investors lead to a better conflict-resolution process and thus experience an overall decrease in the agency cost of equity. We believe that this decreased conflict between managers and shareholders should reduce the importance of debt in managing the agency cost of equity in the post-regulation period leading to an overall decrease in the leverage ratio.

Further, this result is also consistent with Bose et al. (2022) findings. Using the same Indian mandatory regulation context, they report a positive impact of CSR regulation on the liquidity of firms affected by the regulation in stock markets. We believe that the increased value of equity coupled with increased stock liquidity may have given equity more advantage than debt. However, our results are inconsistent with Jadiyappa et al. (2021) findings that CSR regulation in India positively impacted a firm's cash holdings. One possible reason is that firms were holding more assets in cash as they had to spend on CSR activities; empirically testing this hypothesis is beyond the scope of this study. Hence, we leave this question to future researchers.

5.1 Robustness tests

In this section, we test the robustness of the negative results reported in Table 4 for the alternate estimator, leverage measure, and sample selection procedure.

In the regression models presented in Table 4, time-variant firm-specific heterogeneity was controlled by adding firm-level control variables. However, there is a possibility that the omitted time-invariant

[7] Their focus is on CSR activities, not on CSR regulation. They find firms with high CSR scores have a lower debt ratio than firms with low CSR scores

firm-specific heterogeneity, like organization culture and management philosophy, may have biased the standard errors. Therefore, Table 5 controls such omitted variables using the fixed effects estimator. The results in this table mimic the results presented in Table 4, i.e., statistically significant negative impact on treatment firms and no significant impact on control firms. Therefore, from this analysis, we conclude that our results remain robust even after controlling for time-invariant firm heterogeneity.

Table 5 Here

It has been argued in the finance literature that managers are more interested in market-based leverage than book-based leverage. Therefore, we examine whether a negative impact holds if we use the market-weighted leverage measure. We calculate market leverage as the ratio of the total book value of debt to the market value of firms. The firm's market value is the debt's book value plus the equity's market value, i.e., the market capitalization of equity. The results in Table 6 do not exactly mimic the results in Table 4. The coefficient of Reg_Dummy for control firms in columns 1 and 2 is positive and statistically significant; however, the statistical significance of this coefficient disappears when we use the fixed effects estimator (Reg_Dummy coefficient in column 6).

Further, we are more interested in the results of treatment firms. We observe qualitatively similar results for treatment firms in columns 3 and 4 and interaction coefficients in columns 5 and 6. From these results, we conclude that the results of treatment firms and hence our conclusions remain robust for market-based leverage measures.

Table 6 Here

Lastly, we select control and treated groups based on the propensity scores generated by a logit regression to avoid selection issues biasing our results. In the first stage, we generate propensity score for each observation in the pre-regulation period by logit regressing Treat_Dum on firm-specific factors included in the regression model, i.e., firm Size, ROA, Tangibility, RD_Ratio, Age, Market share, and Ind_HHI. Then for each control observation, we select all treatment observations within the caliper value of 0.01. Following this procedure, we have 753 matched treated observations for 1079 control observations in the pre-regulation period. We then select all these firms for further regression analysis. In total, we have 5,913 firm-year observations, including pre-and post-regulation observations, selected from this procedure. The summary and balance statistics of the matched samples in Table 7 show that the control and treated samples are balanced regarding all the firm-specific variables used in our study.

Table 7 Here

We then ran our regression on this matched sample, the results of which are presented in Table 8. The coefficient of interest, i.e., the interaction coefficient, is negative and statistically significant in all the models. This suggests that the results presented in previous tables are not affected by the selection biases in grouping treatment and control firms. These results imply that following the CSR regulation, only treated firms have changed their financial policy by bringing down their debt level.

Table 8 Here

5.2 CSR regulation and equity value

Next, we examine whether the observed negative change in debt level is due to a change in their equity value in stock markets. For this, we compare the change in the market value of equity of treated and control firms between the pre-and post-regulation periods. The results are presented in Table 9. As hypothesized in H2, the change equity value between pre and post-regulation periods, in columns one and two, is positive only for the treated firms. Even the DiD analysis, columns three through six, shows qualitatively the same result, i.e., positive and significant interaction coefficient. From this analysis, we may infer that an increase in their equity value may result in less dependency on debt sources for financing the projects of treated firms.

Table 9 here

5.3 CSR Regulation and speed of adjustment

In this last section, we examine the impact of CSR regulation on the speed of adjustment toward target capital structure using the partial adjustment model suggested by Flannery and Rangan (2006). The dependent variable in this partial adjustment model is the contemporary leverage ratio. The main independent variable that gives the adjustment speed is the one-year lag values of the leverage ratio (Lev_{t-1}/M_Lev $_{t-1}$). The speed of adjustment is obtained by subtracting the coefficient of Lev_{t-1}/M_Lev $_{t-1}$ from one. To get the differential speed of adjustment for treatment firms in the post-regulation period, we interact the effects of Lev_{t-1}/M_Lev $_{t-1}$ with Reg_Dummy and Treat_Dum. The negative coefficient on this triple interaction variable indicates an increase in the speed of adjustment for treatment firms following the regulation compared to control firms. The results are presented in Table 10.

Consistent with the prior studies, we observe a positive coefficient for Lev_{t-1}/M_$Lev_{t-1.}$ The book leverage coefficient suggests that firms can move towards their target leverage ratio at 34%, i.e. (1-0.662) every year. For market leverage, this is about 37%. The coefficient of the triple interaction variable in all the models is negative and statistically significant. This implies that the speed of adjustment has increased following the regulation for treatment firms. For example, the speed of adjustment for treatment firms in column 1 is 40%, i.e., [1- (0.66-0.06)]. This is consistent with what we hypothesized in H3.

Table 10 Here

6 Conclusions

This study examined the impact of mandatory CSR regulation on the financial policy of Indian firms and found a negative impact, i.e., firms responded to CSR regulation by decreasing their exposure to debt. We attribute this negative impact empirically to increased equity value in the capital markets. Our results offer some interesting insights into CSR in general and CSR regulation in particular. For example, prior studies have shown that CSR decreases the cost of equity and debt. However, it was unclear which of these effects dominated the real world. Our results show that the impact on the cost of equity dominates the impact on the cost of debt. Further, this result should be seen in the context of ongoing attempts to regulate CSR activities worldwide. Our results help managers understand how equity markets would react if they commence CSR activities, benefit investors in understanding the likely change in the financial policy of firms, and support policymakers in understanding the likely consequences of CSR regulation if such regulations are implemented in their jurisdiction.

However, further research is required to fully understand the relationship between CSR regulation and financial policy. The most important of these is whether CSR regulations in other countries have the same impact on the leverage ratio. Or the observed negative impact is specific to India. We believe that institutional factors may condition the impact of CSR regulation on financial policy. Therefore, cross-country comparative studies are more helpful in generalizing the impact.

Additionally, we believe that firm-level factors would also condition the impact of regulations of the financial policy. For example, does the impact depends on pre-existing governance structures? And also, it is important to test the marginal impact of CSR regulation on the cost of debt? And lastly, how do foreign investors treat firms undertaking CSR activities under mandatory regulation? Data limitations prevent us from examining these issues in the current study.

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Tables

Table 1: Variable's definition and summary statistics

Variable	Definition	Obs	Mean	SD
Dependent variable				
Leverage	Total debt/Total assets	8,452	0.256	0.207
Independent variables				
Reg_Dummy	Indicator variable with a value of one for post-regulation years (2015-2019) and zero for pre-regulation years (2010-2014)	8,452	0.513	0.500
Treat_Dum	Indicator variable with a value of one for treated (Mandatory) firms and zero for control firms	8,452	0.743	0.437
Control Variables				
Size	Log of firm sales	8,452	8.751	1.715
ROA	EBIT/Total assets	8,452	0.087	0.103
Tangibility	Net fixed assets/ Total assets	8,452	0.280	0.189
MB	Market capitalization/Book value of equity	8,452	2.461	5.079
RD_Ratio	R&D expenses/ Total assets	8,452	0.006	0.021
Age	Current year-Incorporation year (in the regression analysis, we use the log of age)	8,452	35.726	22.721
Market_Share	Firm sales/Industry sales, computed for each industry each year	8,452	0.054	0.119
Ind_HHI	1-Sum of the squared market share of individual firms calculated for each industry each year	8,452	0.093	0.116
GDP_Growth	The growth rate in GDP taken from the world bank database	8,452	6.596	1.361

Table 2: Summary statistics for control and treatment firms

Dependent variable: Lev is the ratio of total debt to total assets, Mlev is the ratio of the book value of total debt to the market value of firms, Size is the log of firm sales, ROA is the ratio of EBIT to total assets, Tangibility is the ratio of net fixed assets to total assets, Growth rate is the annual growth rate in sales, RD_Ratio is the ratio of R&D expenses to total assets, Log_Age is the log of firm age, Market share is the ratio of firm sales to industry sales, and Ind_HHI is (1- the sum of squared market share of each firm in a given industry). ***, **, and * denote significance at 0.01, 0.05, and 0.1 levels.

Variables	Control firms(N=2,168)		Treatment firms (N=6,284)		Difference
	Mean	SD	Mean	SD	Mean
Lev	0.368	0.231	0.217	0.183	0.151***
Mlev	0.545	0.298	0.257	0.262	0.288***
Size	7.591	1.840	9.151	1.471	-1.561***
ROA	0.019	0.109	0.110	0.091	-0.091***
Tangibility	0.268	0.206	0.284	0.183	-0.017
MB	1.199	5.530	2.896	4.838	-1.698***
Growth_Rate	0.082	0.803	0.150	0.726	-0.068***
RD_Ratio	0.005	0.024	0.006	0.019	-0.001
Age	29.740	19.056	37.792	23.505	-8.052***
Market_Share	0.018	0.049	0.067	0.133	-0.049**
Ind_HHI	0.927	0.074	0.900	0.127	0.027

Table 3: Parallel trend analysis

Dependent variable: Delta_Lev$_t$ is the change in the leverage ratio. Independent variables: Treat_Dum is an indicator variable taking the value of one for mandatory firms and zeros for control firms, Size is the log of firm sales, ROA is the ratio of EBIT to total assets, Tangibility is the ratio of net fixed assets to total assets, Growth rate is the annual growth rate in sales, RD_Ratio is the ratio of R&D expenses to total assets, Log_Age is the log of firm age, Market share is the ratio of firm sales to industry sales, and Ind_HHI is (1- the sum of squared market share of each firm in a given industry). The coefficients are estimated from the OLS estimator. The heteroscedasticity-adjusted standard errors are provided in parentheses. ***, **, and * denote significance at 0.01, 0.05, and 0.1 levels.

VARIABLES	Model I	Model I	Model I	Model I
	Delta_Lev	Delta_Lev	Delta_Lev	Delta_Lev
Treat_Dum	-0.003	-0.001	-0.000	-0.001
	(-0.902)	(-0.247)	(-0.044)	(-0.192)
Dum_2011	0.002			
	(0.190)			
Treat_Dum*Dum_2011	0.007			
	(0.862)			
Dum_2012		0.021***		
		(3.236)		
Treat_Dum*Dum_2012		-0.009		
		(-1.270)		
Dum_2013			0.019***	
			(3.083)	
Treat_Dum*Dum_2013			-0.018***	
			(-2.698)	
Dum_2014				0.017**
				(2.332)
Treat_Dum*Dum_2014				-0.015
				(-1.612)
Size	0.002***	0.002***	0.002***	0.002***
	(2.923)	(2.793)	(2.701)	(2.715)
ROA	-0.155***	-0.157***	-0.155***	-0.155***
	(-6.906)	(-6.964)	(-6.888)	(-6.886)
Tangibility	-0.022***	-0.022***	-0.021***	-0.021***
	(-4.034)	(-4.081)	(-3.981)	(-3.988)
Growth_Rate	0.001	0.001	0.001	0.001
	(0.659)	(0.671)	(0.760)	(0.763)
RD_Ratio	-0.011	-0.013	-0.013	-0.012
	(-0.152)	(-0.179)	(-0.176)	(-0.165)
Log_Age	-0.001	-0.001	-0.001	-0.001
	(-0.552)	(-0.407)	(-0.543)	(-0.577)
Market_Share	0.007	0.008	0.008	0.007
	(0.691)	(0.758)	(0.806)	(0.717)
Ind_HHI	0.001	0.002	0.001	-0.001
	(0.067)	(0.155)	(0.091)	(-0.061)
Constant	0.002	-0.001	0.001	0.003
	(0.192)	(-0.079)	(0.102)	(0.266)
Observations	7,367	7,367	7,367	7,367
R-squared	0.041	0.043	0.041	0.041

Table 4: CSR regulation and financial policy

Dependent variable: Lev_t is the ratio of total debt to total assets. Independent variables: Reg_Dummy, an indicator variable takes the value of one for post-regulation years, i.e., 2015-2019, and zero for pre-regulation years, i.e., 2010-2014; Treat_Dum is an indicator variable taking the value of one for mandatory firms and zeros for control firms, Size is the log of firm sales, ROA is the ratio of EBIT to total assets, Tangibility is the ratio of net fixed assets to total assets, Growth rate is the annual growth rate in sales, RD_Ratio is the ratio of R&D expenses to total assets, Log_Age is the log of firm age, Market share is the ratio of firm sales to industry sales, and Ind_HHI is (1- the sum of squared market share of each firm in a given industry). The coefficients are estimated from the Pooled OLS estimator. The heteroscedasticity-adjusted standard errors are provided in parentheses. ***, **, and * denote significance at 0.01, 0.05, and 0.1 levels.

VARIABLES	Control firms	Treatment firms	Total firms
	Lev_Ratio	Lev_Ratio	Lev_Ratio
Reg_Dummy	0.019	-0.074***	-0.014
	(0.973)	(-9.181)	(-1.301)
Treat_Dum			-0.093***
			(-15.134)
Reg_Dummy*Treat_Dum			-0.061***
			(-6.827)
Size	0.028***	0.018***	0.026***
	(9.204)	(9.419)	(16.065)
ROA	-0.320***	-0.508***	-0.470***
	(-6.021)	(-16.436)	(-16.838)
Tangibility	0.253***	0.218***	0.226***
	(8.306)	(15.361)	(17.307)
Growth_Rate	-0.005	-0.000	-0.002
	(-1.082)	(-0.029)	(-1.078)
RD_Ratio	-0.610***	0.163	-0.319**
	(-3.585)	(1.257)	(-2.497)
Log_Age	-0.003	-0.026***	-0.017***
	(-0.370)	(-6.868)	(-4.995)
Market_Share	0.242**	-0.101***	-0.158***
	(2.207)	(-4.146)	(-6.760)
Ind_HHI	-0.113	0.150***	0.060
	(-1.516)	(2.759)	(1.528)
Constant	0.113	0.060*	0.100***
	(1.476)	(1.911)	(3.640)
Observations	2,168	6,284	8,452
R-squared	0.456	0.476	0.467
Year Dummies	Yes	Yes	Yes
Ind Dummies	Yes	Yes	Yes

Table 5: CSR regulation and financial policy-fixed effects estimator

Dependent variable: Lev_Ratio is the ratio of total debt to total assets. Independent variables: Reg_Dummy, an indicator variable takes the value of one for post-regulation years, i.e., 2015-2019, and zero for pre-regulation years, i.e., 2010-2014; Treat_Dum is an indicator variable taking the value of one for mandatory firms and zeros for control firms, Size is the log of firm sales, ROA is the ratio of EBIT to total assets, Tangibility is the ratio of net fixed assets to total assets, Growth rate is the annual growth rate in sales, RD_Ratio is the ratio of R&D expenses to total assets, Log_Age is the log of firm age, Market share is the ratio of firm sales to industry sales, and Ind_HHI is (1- the sum of squared market share of each firm in a given industry). The coefficients are estimated from the fixed effects estimator. The heteroscedasticity-adjusted standard errors are provided in parentheses. ***, **, and * denote significance at 0.01, 0.05, and 0.1 levels.

VARIABLES	Control firms	Treatment firms	Total firms
	Lev_Ratio	Lev_Ratio	Lev_Ratio
Reg_Dummy	0.031	-0.069***	0.006
	(0.974)	(-6.083)	(0.397)
Reg_Dummy*Treat_Dum			-0.057***
			(-4.907)
Size	-0.004	0.010	0.001
	(-0.523)	(1.567)	(0.172)
ROA	-0.308***	-0.297***	-0.304***
	(-5.189)	(-8.864)	(-9.275)
Tangibility	0.177**	0.118***	0.135***
	(2.340)	(4.207)	(4.406)
Growth_Rate	0.001	-0.002	-0.001
	(0.183)	(-1.001)	(-0.657)
RD_Ratio	-0.553*	0.231	-0.119
	(-1.660)	(0.703)	(-0.490)
Log_Age	-0.070	0.004	-0.018
	(-1.132)	(0.145)	(-0.637)
Market_Share	-0.303	0.090	0.036
	(-1.139)	(1.335)	(0.497)
Ind_HHI	-0.183	-0.010	-0.076
	(-1.164)	(-0.170)	(-1.289)
Constant	0.714***	0.146	0.372***
	(2.986)	(1.348)	(3.479)
Observations	2,168	6,284	8,452
R-squared	0.117	0.139	0.117
No of firms	244	661	905
Year FE	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes

Table 6: Alternate measure of leverage

Dependent variable: $MLev_t$ is the ratio of total debt to the market value of total assets. Independent variables: Reg_Dummy, an indicator variable takes the value of one for post-regulation years, i.e., 2015-2019, and zero for pre-regulation years, i.e., 2010-2014; Treat_Dum is an indicator variable taking the value of one for mandatory firms and zeros for control firms, Size is the log of firm sales, ROA is the ratio of EBIT to total assets, Tangibility is the ratio of net fixed assets to total assets, Growth rate is the annual growth rate in sales, RD_Ratio is the ratio of R&D expenses to total assets, Log_Age is the log of firm age, Market share is the ratio of firm sales to industry sales, and Ind_HHI is (1- the sum of squared market share of each firm in a given industry). The heteroscedasticity-adjusted standard errors are provided in parentheses. ***, **, and * denote significance at 0.01, 0.05, and 0.1 levels.

VARIABLES	Control firms		Treatment firms		Total firms	
	Pooled OLS	FE Estimator	Pooled OLS	FE Estimator	Pooled OLS	FE Estimator
	(1)	(2)	(3)	(4)	(5)	(6)
Reg_Dummy	0.136***	0.088***	-0.066***	-0.076***	0.033**	0.023
	(5.796)	(2.621)	(-6.035)	(-4.284)	(2.384)	(1.290)
Treat_Dum					-0.175***	
					(-20.087)	
Reg_Dummy*Treat_Dum					-0.080***	-0.068***
					(-6.889)	(-4.710)
Size	0.033***	-0.018	0.015***	-0.003	0.024***	-0.015*
	(7.860)	(-1.492)	(5.207)	(-0.284)	(9.943)	(-1.850)
ROA	-0.370***	-0.314***	-0.897***	-0.604***	-0.743***	-0.479***
	(-6.217)	(-5.332)	(-19.065)	(-10.778)	(-18.893)	(-11.441)
Tangibility	0.287***	0.220***	0.304***	0.196***	0.294***	0.197***
	(8.445)	(3.005)	(15.536)	(5.368)	(17.463)	(5.848)
Growth_Rate	-0.022***	-0.003	-0.011***	-0.006**	-0.015***	-0.005**
	(-2.789)	(-0.588)	(-2.984)	(-2.483)	(-4.358)	(-2.284)
RD_Ratio	-1.077***	-0.613	-0.321*	0.118	-0.915***	-0.214
	(-4.435)	(-1.450)	(-1.936)	(0.370)	(-5.001)	(-0.801)
Log_Age	-0.005	0.049	-0.021***	0.088**	-0.015***	0.085**
	(-0.537)	(0.670)	(-3.964)	(2.063)	(-3.097)	(2.297)
Market_Share	0.220	-0.755**	-0.140***	-0.113	-0.239***	-0.210*
	(1.505)	(-2.172)	(-4.111)	(-1.008)	(-7.064)	(-1.886)
Ind_HHI	-0.106	-0.188	0.217***	0.046	0.076	-0.056
	(-0.989)	(-1.237)	(3.215)	(0.597)	(1.346)	(-0.783)
R-squared	0.496	0.260	0.486	0.244	0.528	0.223
Year Dummies	Yes	Yes	Yes	Yes	Yes	Yes
Firm FE	No	Yes	No	Yes	No	Yes
Ind Dummies	Yes	No	Yes	No	Yes	No

Table 7: PSM diagnosis

Variable	Matched	Treated	Control	%bias	Red in %bias	t-value	p-value
Size	U	9.013	7.840	73.7		21.59	0
	M	8.271	8.303	-2	97.3	-0.41	0.678
ROA	U	0.115	0.041	83.3		24.2	0
	M	0.066	0.066	0.3	99.6	0.08	0.94
Tangibility	U	0.291	0.273	10		2.87	0.004
	M	0.278	0.287	-4.9	51	-0.93	0.35
Growth_Rate	U	0.210	0.129	9.9		2.71	0.007
	M	0.197	0.173	2.9	70.6	0.51	0.613
RD_Ratio	U	0.005	0.006	-1.5		-0.46	0.649
	M	0.005	0.006	-4	-172.5	-0.73	0.468
Log_Age	U	3.369	3.113	38.8		10.96	0
	M	3.195	3.172	3.5	90.8	0.7	0.484
Market_Share	U	0.072	0.023	46.2		11.28	0
	M	0.030	0.030	0	100	0	0.998
Ind_HHI	U	0.890	0.920	-27.2		-6.96	0
	M	0.921	0.918	2.9	89.3	0.75	0.452

Table 8: PSM regression analysis

Dependent variable: Book Lev_t is the ratio of total debt to total assets, and Market leverage; is the ratio of total debt to the market value of assets. Independent variables: Reg_Dummy, an indicator variable takes the value of one for post-regulation years, i.e., 2015-2019, and zero for pre-regulation years, i.e., 2010-2014; Treat_Dum is an indicator variable taking the value of one for mandatory firms and zeros for control firms, Size is the log of firm sales, ROA is the ratio of EBIT to total assets, Tangibility is the ratio of net fixed assets to total assets, Growth rate is the annual growth rate in sales, RD_Ratio is the ratio of R&D expenses to total assets, Log_Age is the log of firm age, Market share is the ratio of firm sales to industry sales, and Ind_HHI is (1- the sum of squared market share of each firm in a given industry). The heteroscedasticity-adjusted standard errors are provided in parentheses. ***, **, and * denote significance at 0.01, 0.05, and 0.1 levels.

VARIABLES	Book leverage		Market Leverage	
	Pooled_OLS	FE Estimator	Pooled_OLS	FE Estimator
Reg_Dummy	-0.008	0.007	0.049***	0.030
	(-0.609)	(0.365)	(3.084)	(1.382)
Treat_Dum	-0.105***		-0.184***	
	(-15.914)		(-20.024)	
Reg_Dummy*Treat_Dum	-0.060***	-0.054***	-0.088***	-0.076***
	(-6.338)	(-4.451)	(-7.103)	(-4.941)
Size	0.029***	0.001	0.033***	-0.012
	(14.815)	(0.167)	(11.074)	(-1.370)
ROA	-0.390***	-0.279***	-0.656***	-0.428***
	(-11.034)	(-7.990)	(-12.829)	(-9.021)
Tangibility	0.220***	0.146***	0.283***	0.197***
	(14.010)	(3.741)	(14.263)	(4.986)
Growth_Rate	-0.003	-0.000	-0.015***	-0.004*
	(-1.204)	(-0.147)	(-4.246)	(-1.710)
RD_Ratio	-0.312**	-0.139	-0.789***	-0.241
	(-2.121)	(-0.470)	(-3.866)	(-0.762)
Log_Age	-0.009**	-0.005	-0.002	0.115**
	(-2.039)	(-0.132)	(-0.357)	(2.546)
Market_Share	-0.227***	-0.126	-0.450***	-0.431**
	(-4.348)	(-1.024)	(-5.663)	(-2.317)
Ind_HHI	0.002	-0.152*	-0.062	-0.179*
	(0.044)	(-1.796)	(-0.799)	(-1.932)
Constant	0.125**	0.411***	0.341***	0.220
	(2.344)	(2.966)	(4.712)	(1.275)
Observations	5,913	5,913	5,913	5,913
R-squared	0.441	0.100	0.500	0.220
Year Dummies	Yes	Yes	Yes	Yes
Firm FE	No	Yes	No	Yes
Ind Dummies	Yes	No	Yes	No

Table 9: CSR regulation and equity value

Dependent variable: Market to book value of equity. Independent variables: Reg_Dummy, an indicator variable takes the value of one for post-regulation years, i.e., 2015-2019, and zero for pre-regulation years, i.e., 2010-2014; Treat_Dum is an indicator variable taking the value of one for mandatory firms and zeros for control firms. T-values calculated from heteroscedasticity-adjusted standard errors are presented in the parenthesis. ***,** and * denote significance at 1%, 5% and 10% respectively

VARIABLES	Control Firms	Treated Firms	Whole Sample		Matched Sample	
Dep Var: MB	Pooled_OLS	Pooled_OLS	Pooled_OLS	Fixed Effects	Pooled_OLS	Fixed Effects
	(1)	(2)	(3)	(4)	(5)	(6)
Reg_Dummy	0.192	2.404***	1.513***	1.215***	1.417***	1.208**
	(0.228)	(6.089)	(3.591)	(3.297)	(2.595)	(2.246)
Treat_Dum			0.238		0.423**	
			(1.305)		(2.177)	
Reg*Treat_Dum			0.593**	0.812***	0.501*	0.769***
			(2.251)	(3.421)	(1.685)	(2.785)
Constant	-0.104	-5.831***	-4.034***	-4.672***	0.152	-5.692**
	(-0.025)	(-4.779)	(-3.530)	(-3.469)	(0.081)	(-2.448)
Observations	2,168	6,284	8,452	8,452	5,913	5,913
R-squared	0.136	0.201	0.162	0.189	0.084	0.192
Control Variables	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Firm FE	No	No	No	Yes	No	Yes
Ind Dummies	Yes	Yes	Yes	No	Yes	No

Table 10: Speed of adjustment analysis

Dependent variable: Lev_t is the ratio of total debt to total assets. Independent variables: Reg_Dummy, an indicator variable takes the value of one for post-regulation years, i.e., 2015-2019, and zero for pre-regulation years, i.e., 2010-2014; Treat_Dum is an indicator variable taking the value of one for mandatory firms and zeros for control firms, Size is the log of firm sales, ROA is the ratio of EBIT to total assets, Tangibility is the ratio of net fixed assets to total assets, Growth rate is the annual growth rate in sales, RD_Ratio is the ratio of R&D expenses to total assets, Log_Age is the log of firm age, Market share is the ratio of firm sales to industry sales, and Ind_HHI is (1- the sum of squared market share of each firm in a given industry). The coefficients are estimated from the fixed effects estimator. The heteroscedasticity-adjusted standard errors are provided in parentheses. ***, **, and * denote significance at 0.01, 0.05, and 0.1 levels.

VARIABLES	Book Leverage		Market Leverage	
	Model I	Model II	Model III	Model IV
Reg_Dummy	0.001	-0.036	-0.047***	-0.343***
	(0.109)	(-1.255)	(-3.518)	(-10.933)
Reg_Dummy* Treat_Dum	-0.005	-0.001	0.038***	0.046***
	(-0.499)	(-0.101)	(2.768)	(3.181)
Lev_{t-1}/M_Lev $_{t-1}$	0.660***	0.663***	0.648***	0.629***
	(13.283)	(14.113)	(25.457)	(25.414)
Reg_Dummy* Lev_{t-1}/M_Lev $_{t-1}$	-0.004	-0.013	-0.025	-0.028
	(-0.131)	(-0.400)	(-1.230)	(-1.333)
Treat_Dum* Lev_{t-1}/M_Lev $_{t-1}$	0.011	-0.027	0.093***	0.091***
	(0.201)	(-0.543)	(3.170)	(3.251)
Reg_Dummy*Treat_Dum* Lev_{t-1}/M_Lev $_{t-1}$	-0.061*	-0.057*	-0.154***	-0.150***
	(-1.768)	(-1.713)	(-6.326)	(-6.219)
Size		0.003		-0.001
		(1.176)		(-0.321)
ROA		-0.267***		-0.304***
		(-8.825)		(-8.503)
Tangibility		0.032		0.038*
		(1.506)		(1.723)
Growth_Rate		-0.000		-0.002***
		(-0.529)		(-5.748)
RD_Ratio		0.100		0.028
		(0.645)		(0.174)
Log_Age		0.003		0.041***
		(0.840)		(11.015)
Market_Share		0.052		-0.075
		(1.240)		(-1.331)
Ind_HHI		-0.057		-0.048
		(-1.297)		(-0.947)
Constant	0.091***	0.038	0.131***	-1.110***
	(16.982)	(0.322)	(27.459)	(-8.843)
Observations	7,367	7,367	7,367	7,367
R-squared	0.406	0.453	0.518	0.570
Number of firms	905	905	905	905
Year FE	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes

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