# The CSR Puzzle: Decrypting its influence on Financial Distress in India

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## Abstract

Financial distress, a stage between solvency and insolvency, have too high costs which cannot be ignored in the real world since there is no perfect capital market. Indian firms, with underdeveloped capital markets, face high financial constraints, if faced with financial distress, can go bankrupt. We find that as the firm's engagement in corporate social responsibility (CSR) increases, the financial distress risk decreases. This relation exists when firms engage in social-and-community and employee-welfare related activities and when firms are in the mature or older stages of the firm life cycle. Weak evidence indicates that firms that spend minimum mandated amount on CSR experience greater reduction in financial distress risk than firms that explain the reasons for not doing so. Firms engaged in social-and-community-related CSR activities have lower costs of debt and suffer from low financial constraints, which in turn reduces the financial distress risk. Spending towards the employee-welfare leads to reduction in financial constraints and improvement in credit ratings for a firm. Our study will have useful implications for policymakers, regulators, managers, investors, and employees promoting financial stability and fostering crisis free economy.

**Keywords:** Corporate social responsibility, financial distress risk, default, Z-Score, India, emerging economies

**EFM Classification:** 130, 620

**JEL Classification:** G30, G32, G33, M14

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## 1. Introduction

In perfect capital market, financial distress does not affect firm value (Modigliani and Miller, 1958). Investors are not worse off if they hold shares of leverage firms. However, in real markets, the costs of financial distress and bankruptcy are too high to be ignored. The seminal paper by Jensen and Meckling (1976) on agency costs argue that when the goals of principal (shareholders) do not match with agent (managers), there exists conflict of interest known as agency costs, which can be solved with issue of debt in the form of increased monitoring of managers. However, with the introduction of leverage comes the bankruptcy cost, which further leads to a theory of optimal capital structure. The authors note that as the probability of bankruptcy increases, both the revenues and operating costs of a firm are negatively affected, for instance, paying high compensation to executives to accept higher risk. Myers and Majluf (1984) introduced the pecking order theory, in which the managers prefer debt over equity when financing an investment since the cost of debt is lower than cost of equity. The alteration in debt-equity ratio significantly affects firm's risk, investment and ultimately the shareholders wealth, therefore, optimal capital structure is the most important decision to be taken by managers (Cai and Zhang, 2011).

Corporate finance theories justify the importance of the costs involved in bankruptcy as an indicator of determining the capital structure of a firm (Acharya et al., 2017). Berk and DeMarzo (2007) discuss various direct and indirect costs associated with bankruptcy and financial distress. Direct costs include the high fees paid to legal and accounting experts. There are several indirect costs. The customers avoid purchasing products from distressed firms, for instance, avoiding booking airline tickets of distressed firm that may cease its operations in near future. Businesses with heavy dependence on trade credit suffer from loss of supplier as they avoid supplying the distressed firms with goods that may not pay for it. Employees leave firms with high financial distress risk and it is hard for such firms to hire even new ones. The

distressed firms may be engaged in fire sale of assets to quickly obtain funds to run the operations. Indirect costs accompany the direct costs for creditors, for instance, if the amount owed by distressed firm constitute a major asset for creditors, then that can lead to their chances of getting financially distressed. These costs decrease the value of the firm's assets that the investors will obtain in the end and therefore, investors avoid putting funds in firms with high levels of financial distress risk. The subject of financial distress has gained much importance since the onset of the global credit crunch of 2009 (Mselmi et al., 2017).

Myers (1977) frames a debt-overhang theory which states that firms in financial distress suffer from underinvestment due to the managers avoiding positive net present value projects. This is because the advantage flows to debt holders more than the benefit to shareholders and do not avoid any distress. Opler and Titman (1994) report that firms with high level of financial distress suffer the loss of substantial market share to those firms which are financed conservatively with low leverage. Chen et al. (2018) show for a sample of UK firms that the firms with high financial distress risk pay low levels of compensation to the executives due to increased monitoring by the creditors. The reduced compensation levels makes it difficult to retain the executives in such firms who in turn wants higher compensation as premium for higher risk. Moreover, the financially distressed firms tend to manipulate the earnings to continue financing from debt sources (DeFond and Jiambalvo, 1994). Richardson et al. (2015b) find that firms with high financial distress risk engage in more tax avoidance than their counterparts to imbibe more cash into the business. Lian (2017) report that the financial health of a firm is affected negatively if the major customer have high levels of financial distress risk. Prediction of financial distress level is seen as pertinent in the last decades as it acts as an early warning signal of bankruptcy for the investors, bankers, policymakers and other stakeholders (Khoja et al., 2019).

Financial distress is a situation where the earnings plummet to a level where a firm is unable to pay interest and principal on its debt (Gordon, 1971). It is a state of low cashflow during which the company incurs losses without going bankrupt (Purnanandam, 2008). As the probability of default increases, the customers' willingness to pay high prices declines, further having a detrimental effect on firm profitability (Titman, 1984). Moreover, the distressed firms lose their market share to their competitors with low leverage who increase their advertising or follow pricing such that the vulnerable distressed firms are wiped out of the market. Either the customers themselves avoid dealing with distressed firms or the managers cut investment, lay off employees, and suffer from the losses occurred due to downsizing. In this way, the competitors take advantage, and take hold of the market share of a distressed firm (Opler and Titman, 1994).

Consequently, firms with high levels of financial distress are risky and generate lower stock returns, thus making it difficult for these firms to raise funds through capital markets (Campbell et al., 2008). A firm has to incur pre-bankruptcy and bankruptcy costs if went bankrupt (Elkamhi et al., 2012). The pre-bankruptcy costs are the costs incurred to save the firm from bankruptcy, for instance, costs to obtain lost sales, and the bankruptcy costs include both direct and indirect costs incurred at or after bankruptcy as discussed earlier in this section.

The costs are not limited to the firms, but financial distress also imposes costs on the economy in the form of increased unemployment, and decreased output due to the closure of operations of firms. The largest bankruptcies in the last decades for the world included WorldCom, Enron, among several others, pointing the failure of even large stock companies.[1] These bankruptcies shook the investor confidence, lead to fall in the stock prices in US, and affected the economy adversely. For the emerging economies, the regulatory mechanisms are

[1] Retrieved on December 23, 2023 from https://247wallst.com/special-report/2023/04/16/the-25-biggest-bankruptcies-in-american-history/.

less developed. India suffers from lax corporate governance mechanisms than the US in the form of ownership concentration by family boards, lack of information transparency, and improper enforcement processes (Jaiswall and Bhattacharyya, 2016). Moreover, the capital markets in emerging economies suffers from illiquidity and is often underdeveloped (Rojas-Suarez, 2014). A developed capital market aids in absorbing financial risks caused due to firms in financial distress. In light of underdeveloped capital markets in emerging economies and lax governance mechanisms in India, it is important to study financial distress, since the bankruptcy of a firm affects managers, financial institutions, lenders, banks, and government. High financial distress risk impacts the stock performance. Gao and Zhang (2015) find that as credit risk of firm increases, the stock performance of firm declines for a sample of US firms. Thus, it motivates us to explore factors that can reduce the financial distress risk and the associated costs.

Prior literature has evidenced various determinants of financial distress risk of firms. Boubaker et al. (2020) highlight that firms with higher growth opportunities attract more investors, thus it becomes easy to raise the funds and this lowers the financial distress risk. Also, the authors show that investors view firms with high volatility of returns as risky and positively linked with financial distress risk. Moreover, Sharpe and Stadnik (2007) show that as the return on equity increases, the investment returns for investors also increases which makes the financial access easier (attract more investors due to high investment returns) and hence, reduces the financial distress risk. Hsu et al. (2015) document that larger firms are most likely to have greater debt ratios, and problem in monitoring of managers, resulting in a higher probability of defaults and an increased likelihood of financial distress risk. Zhang (2015) argues that spending on research and development (R&D) expenses increases the level of financial distress risk as it increases the idiosyncratic volatility due to the uncertainty of payoffs from the project in the future. Furthermore, it increases information asymmetry between

managers and investors as firm do not disclose the R&D projects so that their competitors do not use this information for their advantage. Kane et al. (2005) find that at adverse times, firms reduce wages, which enables them to use saved funds for other business activities and avoid costs of financial distress.

Identifying factors that can help reduce the financial distress risk is essential to bring financial stability of firms, and hence, promoting more stable economies. Boubaker et al. (2020) find that reduction in financial distress for a sample of US firms helps to build an attractive corporate environment and more stable economy. Gordon (1971) report that financial distress is a stage before the bankruptcy of firms. Therefore, it put at risk the existence of firms and the lenders lending to such firms. Gupta and Mahakud (2023) note for a sample of Indian firms that firms with high financial distress have low investments, small cashflows and sales than firms with low financial distress risk. An emerging economy is characterized by less developed capital markets, weak legal environment, and poor monitoring mechanisms (Gupta and Mahakud, 2023). It is therefore important to study factors reducing financial distress risk for firms in emerging economies in order to build a stable economy otherwise bankruptcy of firms can affect the stability of economy.

Farah et al. (2021) assert that to produce significant economic and social welfare outcomes both at the macroeconomic and corporate level, corporate social responsibility (CSR) has been recognized as a critical preliminary requirement. For protecting the firms from going into bankruptcies, firms can invest in CSR activities. Prior literature (Waddock and Graves, 1997; Gao and Zhang, 2015; Bhattacharyya and Rahman, 2019) provides evidence that CSR improves firm performance. Opler and Titman (1994) find that reduction in sales and profitability is a direct cause of financial distress of firms. While firms engaged in CSR have better firm performance which can help in reducing the financial distress risk. Khurana et al. (2006) argue that the problem of financial constraints is more prominent in countries with

underdeveloped capital markets like India. The developed economies significantly differ from the emerging economies. The capital markets in emerging markets is less developed than advanced economies and always pose a challenge for financing activities (Bekaert and Harvey, 2003). Moreover, Shleifer and Wolfenzon (2002) report the legal and regulatory shortcomings in developing countries. Due to the capital market and regulatory differences in developed and emerging economies, the findings of research for financial distress risk cannot be extended to emerging economies. So, studying India, whose results can be generalized to similar emerging economies can help in reducing the financial distress risk in these countries.

Prior literature provide evidence indicating how important CSR is in reducing the cost of capital and building strong relationships with stakeholders including employees, customers, suppliers, and investors (El Ghoul et al., 2011; Goss and Roberts, 2011). There is limited evidence on how CSR activities would affect the financial distress risk in developed economies (Al Hadi et al., 2017; Boubaker et al., 2020). This scant literature on CSR and financial distress risk use the ESG ratings or scores to proxy for CSR which suffer from many limitations (Avramov et al., 2022; Berg et al., 2022). Avramov et al. (2022) and Berg et al. (2022) show that the correlations among the six major ESG ratings are very low, which highlights that different ratings used in empirical research generates different results and conclusions. This divergence in ESG ratings brings variations in the decisions based on such ratings and hence, decision makers should exercise caution while relating these with actual CSR commitment. Thus, we fill this gap in the literature by analyzing the impact of CSR on financial distress risk for non-financial firms in an emerging economy with actual expenditure on CSR for a large dataset from 2000 to 2022, which brings novelty to the field of CSR research. These studies are based on developed economies, and there is a need to study the impact of CSR expenditure on the financial distress risk for an emerging economy since the financial markets varies in such economies (Fan et al., 2011).

The primary purpose of our study is to investigate how firms' commitment towards CSR activities influence the financial distress risk. We focus on India, which is an emerging market, to identify factors that can reduce the chances of financial distress and bankruptcy. Our study finds that the amount spent on CSR helps to reduce the financial distress risk. In the wake of the Covid-19 outbreak and business failures across the world, our study is relevant in a way that firms with high financial distress risk can obtain credit in light of spending towards CSR even in distressed scenarios.

Few prior studies investigate how CSR affects risk of financial distress. For instance, Goss and Roberts (2011) document that the firms engaged more in CSR enjoy ease of access to financing and a lower likelihood of financial defaults as their cost of debt is lower than firms with little involvement in CSR activities. Moreover, Jiraporn et al. (2014) show that an increase in engagement in CSR improves the firm's credit ratings and reduces the default risk. They argue that CSR builds reputational capital, which shields the firms in adverse scenarios, and this benefit of CSR is reflected in better credit ratings and hence lower default risk. Al-Hadi et al. (2019) show an inverse relationship between CSR and financial distress risk for Australian firms. The authors argue that CSR creates reputational capital by creating strong relationships with customers, which gets reflected in their purchases, even when the firm is otherwise having difficulty in selling their products during adverse situations such as during recession. Boubaker et al. (2020) find that firms with higher involvement in CSR activities are rewarded with a lower cost of capital and face less financial constraints, thus reducing the chances of financial distress. Lastly, Lin and Dong (2018) find that U.S. firms with a rich history of CSR engagement in prior years are less likely to suffer from bankruptcy. The authors use theoretical arguments and do not test the relation using empirical analysis. They argue that CSR creates moral capital, the stakeholders moderate the negative reaction during a negative event and support the firm in such adverse scenarios, therefore, CSR acts as a risk management technique

for the firm. Thus, the evidence documented in prior studies suggest that CSR improves the firm's credit ratings, gives better access to financial markets, lowers financial default due to lower cost of equity and debt capital, and hence reduces the financial distress risk.

Firms in developed economies differ significantly from those in emerging economies in various ways, such as organizational structure, government interference, and not fully developed financial markets (Fan et al., 2011). There is a mandatory spending provision for spending on CSR in India than voluntary disclosure in the US and the capital market is less developed in India than the US. Investors will support those firms with a positive image that is created by spending on CSR activities in India. Moreover, the government imposes certain penalties as per the Companies Act 2013 for firms who do not spend on CSR. This mandated provision differentiates the impact of CSR on financial distress in India as compared to developed markets like US.

This study investigates how CSR expenditure is related to the financial distress risk for a sample of publicly listed non-financial Indian firms. Following Roy et al. (2022), we use actual expenditure incurred on CSR activities as a proxy for a firms' commitment towards CSR. Our main dependent variable is *Z-Score* as a proxy of financial distress risk (*FDRISK)*. We find that the financial distress risk decreases as the firm's engagement in CSR increases. We conduct fixed-effects, two-stage least squares (2SLS) regression, and difference-in-difference analysis to address the endogeneity concerns and establish a causal effect of CSR on the financial distress risk. Similar results are obtained if we measure financial distress risk with several different proxies namely, *O-Score, ZM-Score,* and *Revised Z-Score*. We follow Ohlson (1980) and Griffin and Lemmon (2002) to measure *O-Score.* To calculate the *ZM-Score,* we follow Zmijewski (1984). The higher these two scores, the higher are the chances of bankruptcy for a firm. Altman (2017) revised the existing *Z-Score* measure for both public and private firms and manufacturing and non-manufacturing firms and we use the *Revised Z-Score*

in our additional analysis. The empirical evidence suggests that the negative relation between CSR spending and financial distress risk is stronger for old and mature firms than young firms.

India offers a unique setting to examine how CSR expenditure affects the financial distress risk. Section 135 of the Companies Act, 2013 requires companies with a net worth, turnover, or profit above a certain threshold to spend a certain minimum amount on the CSR activities.[2] The new provision came into effect on 1st April 2014. Weak evidence indicates that for a given level of CSR spending, *Comply-firms* experience a greater reduction in financial distress risk compared to *Explain-firms*. Firms that spend more than the minimum mandated amount do not get any additional benefit in terms of reduced financial distress risk.

It is the spending on community-and-employee-welfare-related activities that reduces the financial distress risk and spending towards the environment does not benefit the firm. With given spending on social-and-community-related activities, as the financial constraints increases, the financial distress risk decreases. How employee-welfare related CSR spending affects financial distress risk is sensitive to the level of financial constraints faced by firms. Cost of debt is a channel through which spending on social-and-community-related activities negatively affects the financial distress risk. Our finding suggests that improvement in total credit ratings is a potential mechanism, which explains why financial distress risk reduces as firms spend more funds on the welfare of their employees.

Prior studies find mixed evidence on how CSR affects corporate behavior. For instance, Di Giuli and Kostovetsky (2014) and Masulis and Reza (2015) find that CSR negatively affects firm performance whereas Waddock and Graves (1997), and Gao and Zhang (2015) document that CSR helps in improving firm performance. We contribute to the finance literature by

[2] Retrieved on December 23, 2023 from https://www.mca.gov.in/Ministry/pdf/AMENDMENTACT_01082019.pdf.

showing that committing funds towards CSR benefits the firm in reducing the financial distress risk. CSR is effective in reducing the financial distress risk when firms have high financial constraints, high cost of debt, and lower credit ratings. We complement the prior literature available on factors affecting financial distress risk (e.g., Hsu et al., 2015; Zhang, 2015). Hsu et al. (2015) find that as firm size increases, the financial distress risk increases, and Zhang et al. (2015) report that spending on R&D activities lead to jump in the levels of financial distress risk. On the other hand, we find another determinant of financial distress risk. We report that as the firms' commitment towards corporate social responsibility increases, the financial distress risk decreases.

Then, we contribute to the literature (Al-Hadi et al., 2019; Boubaker et al., 2020) on the relationship between CSR and the financial distress risk of non-financial corporations. Al-Hadi et al. (2019) report a negative relationship between CSR performance of Australian firms and financial distress risk with moderating effect of the firm life cycle. We complement the findings of this study by documenting that CSR plays a more effective role in reducing the financial distress risk when the firms are either in the mature or old stages of their lifespan than in the younger stage. Boubaker et al. (2020) find that the firms with better CSR practices have an opportunity to raise funds in the capital market easily and that leads to lower levels of financial distress for firms. Our findings that engagement in CSR leads to condensed cost of debt, reduced financial constraint, and improvement in the credit ratings in emerging markets, add to the findings of Boubaker et al. (2020). In line with this study, we find that firms' commitment of funds towards the environment protection do not significantly affect the financial distress risk. In contrast to these studies, we use the CSR expenditure as a proxy to measure corporate social responsibility rather than using ESG scores or index.

Next, we add on to the literature available on emerging economies (Bhattacharyya and Rahman, 2019; Feng et al., 2022; Roy et al., 2022). Spending on CSR positively affects the

firm performance (Bhattacharyya and Rahman, 2019), CSR ratings is negatively linked to the stock price crash risk (Feng et al., 2022), and stocks of firms that are mandated to spend on CSR are more liquid than those firms that are not mandated to spend on CSR (Roy et al., 2022). By highlighting the importance of CSR in reducing financial-distress risk, we complement the literature on the capital markets in emerging economies. We show that firms that spend an optimal amount on CSR experience a decrease in financial distress risk.

We contribute to the literature available on employee treatment and corporate performance (Kane et al., 2005; Verwijmeren and Derwall, 2010; Dai et al., 2022). By documenting that spending on employee-welfare related CSR activities reduce the problem of financial constraints and improve the credit ratings; leading to reduction in the financial distress risk, we complement the findings of Kane et al. (2005). Verwijmeren and Derwall (2010) considers the well-being of employees when considering the bankruptcy risk and choose to go for lower leverage. In line with this study, we observe that engagement of funds towards employee-welfare schemes can help reduce the financial distress and bankruptcy of firms in emerging markets.

We complement the findings on reputation literature (Cao et al., 2015; Brahmana et al., 2022). Cao et al. (2015) find that US firms with high reputation experiences lower cost of equity and the results are stronger for firms with higher information asymmetry. Similarly, we show that spending on CSR-related activities creates reputation, reduces the financial constraints, and the level of financial distress risk. In contrast, a study by Brahmana et al. (2022) find that firms with high reputation do not significantly affect the default risk in emerging economy of Indonesia.

We add to the literature on cost of debt (Goss and Roberts, 2011; Ye and Zhang, 2011). Goss and Roberts (2011) find that US firms committing funds towards CSR enjoy lower cost

of debt. The authors argue that since firms engaged in CSR have lower firm risk, the bank offers favorable terms of contract in form of lower interest rates (cost of debt) to such firms. Ye and Zhang (2011) report a U-shape relationship between CSR and cost of debt financing, suggesting that it is the optimal level of CSR that reduces the cost of debt in China. In addition, we find that spending on social-and-community-related activities (component-analysis) lowers the cost of debt for emerging economies.

Another contribution comes from the examination of the impact of different components of CSR on the credit ratings of the firms. Prior literature report positive relationship between CSR and credit ratings. Attig et al. (2013) and Jiraporn et al. (2014) find that commitment towards community-and-employee-welfare activities leads to improvement in credit ratings in developed markets, in contrast to our study that show that it is the spending on employee-welfare schemes that upgrades the credit ratings in emerging economies.

The rest of the study proceeds as follows. Section 2 discusses the related literature and develops hypotheses. Sections 3 and 4 explain the data and research methodology employed in the study, respectively. Section 5 presents our empirical findings. Sections 6 and 7 report the result from additional analyses and channels involved. Finally, Section 8 concludes the study.

## 2. Related literature and hypothesis development

Financial distress is a stage of business which precedes bankruptcy (Gordon, 1971). Boubaker et al. (2020) report that with decrease in the financial constraints, the level of financial distress risk decreases. The authors empirically show that decreased financial constraints leads to increased access to funds, which mitigates the likelihood of financial distress. García and Herrero (2021) report that women on board lowers the cost of debt, with an increased probability of raising short-term debt and helps firms to solve the financial access problems. This suggests that low cost of debt removes the problem of access to funds and

lowers the chances of financial default. Becker and Milbourn (2011) contend that higher credit ratings lead to information dissemination in the financial market and lowers the probability of default on financial commitments. Armitage and Marston (2008) find that corporate reputation eases the process to retain customers, attract external capital, and it reduces the riskiness of cashflows in future. These arguments indicate that a firm with decreased financial constraints, low cost of debt, and enhanced credit ratings and reputation suffers from a lower likelihood of financial default or financial distress risk.

Prior literature provides mixed evidence on whether firms engagement in CSR activities helps firms to improve firm performance and reduce risk, or does it increases information asymmetry and agency costs. Bénabou and Tirole (2010) advocate the use of CSR as an instrument for ensuring that firms are profitable in the long-term. The authors argue that often managers focus on short-term profits, for example, firing of employees. It discourages skilled employees from working in such firms. The investors support firms that engage in CSR as long-term investors. Contrary view suggests that firms' engagement in CSR activities leads to increased agency costs. The managers may invest in CSR activities promoting their personal benefits, such as donating to organizations that favor political connections.

The evidence documented in prior studies suggest that CSR reduces firm risk (Godfrey, 2009; Attig et al., 2013; Jiraporn et al., 2014). For instance, Godfrey (2009) and Attig et al. (2013) argue that CSR allows firms to build better relationships with the stakeholders and ensures that the business is sustainable in the long term. It signals efficient resource allocation within an organization and a firm is likely to incur fewer costs associated with high attrition rate, penalties and fines imposed because of poor environment related policies. The better relationships build with stakeholders creates reputation and improves the access to raise funds from financial market. Jo and Na (2012) document that CSR reduces information asymmetry, and makes access to capital markets frictionless, which reduces firm risk. Jiraporn et al. (2014)

find that with an increase in commitment towards CSR, there is an improvement in credit ratings, which further leads to a reduction in the default risk. They highlight that CSR builds reputational capital, which protects the firms in negative events, and this benefit of CSR is reflected in better credit ratings and hence lower default risk. Albuquerque et al. (2019) argue that firms engaged in CSR have product differentiation due to their CSR policies, better loyalty of customers, and, therefore, less elastic demand for their products. This demand leads to higher profit margins and lower elasticity of profits to abnormal market shocks. This suggests that CSR helps in maintaining the profits and lowers the likelihood of default. The prior literature, thus, indicates that the riskiness of a firm reduces and the access to capital market smoothens when firms commit funds towards CSR activities.

Firms with higher commitment of funds towards CSR have better access to financing and a lower likelihood of financial defaults as their cost of debt is lower than firms with low commitment towards CSR (Goss and Roberts, 2011; Boubaker et al., 2020). This is because firms involved in controversies related to CSR, for instance, polluting the environment attract penalties, making such firms susceptible to increased costs. Lenders charge a high rate of interest (cost of debt) to compensate them for the high default risk due to such increased costs (penalties). Moreover, La Rosa et al. (2018) document that firms with better corporate social responsibility practices attract lenders, making access to finance easier for such firms and lowers the cost of debt. The authors support their results with theoretical underpinnings that CSR reduces the information asymmetry, agency costs of debt, and build reputation.

El Ghoul et al. (2011) show that U.S. firms with higher CSR commitment have lower cost of equity. The authors argue that low CSR firms have a smaller investor base and higher perceived risk as conscious investors prefer not to include low CSR companies in their portfolios. The smaller investor base leads to a rise in the cost of equity for low CSR firms compared to high CSR firms. This suggests that high CSR firms have a larger investor base,

low perceived risk, and low cost of equity capital. Furthermore, Dhaliwal et al. (2014) document the impact of CSR disclosure on the cost of equity capital for a sample of 31 countries. The authors find that CSR disclosure decreases the cost of equity, and this inverse relationship is more evident in countries that are stakeholder-oriented such as India and the US. CSR disclosure plays a major role in reducing information asymmetry among the stakeholders, creates reputation, proving a stronger effect on cost of equity in stakeholder-oriented countries. Cao et al. (2015) further strengthens the argument that companies with higher reputation than peer firms enjoy low cost of equity relatively due to higher investor recognition and risk sharing by large number of investors. This suggests that CSR entices investors, builds a large base of investors, reduces the cost of equity, and leads to better access to financial markets. Boubaker et al. (2020) empirically reports that US firms with better CSR engagement have better access to funds and therefore suffer from low levels of financial distress risk.

Furthermore, Al-Hadi et al. (2019) report that Australian firms that are engaged in better CSR practices such as devising employee friendly policies encounter a reduction in their financial distress risk. The authors argue that CSR acts as a risk reduction mechanism as it helps to create reputation amongst the stakeholders which protects the firms from getting trapped into financial constraints due to strong linkages created. This ultimately mitigates the financial distress risk. Lin and Dong (2018) show that firms in the U.S. with a history of engagement in CSR are less likely to file for bankruptcy when in the stage of extreme financial distress. Again, the authors support the view that CSR acts as a risk reduction mechanism with no empirical tests to reveal the channels through which CSR affects financial distress. Nonetheless, it remains open question whether spending towards CSR activities reduces financial distress risk in emerging economies.

In summary, firms' engagement in CSR activities help them to reduce the cost of debt, alleviates the hassle to raise funds from capital markets, enhances reputation, and credit ratings.

Based on the above discussion, we propose our main hypothesis that the financial distress risk of firms reduces with increasing CSR expenditure.

## 3. Data

We collect the stock market and financial data from Prowess dx. Our sample consists of all publicly listed Indian firms that report spending on CSR activities. The stock market data is available from 1997 onwards. We drop 1998 and 1999 from our sample because there were only 9 and 58 observations for CSR expenditure for these two years, respectively. We exclude financial firms from our sample as different regulations govern the financial firms. Observations with missing data required to calculate financial distress risk and control variables are removed. We drop the observations for which data on CSR expenditure either equals zero or is missing. The final sample consists of 14,713 firm-year observations from 1,353 unique firms, for the period from 2000 to 2022.

Table 1 Panel A shows that the manufacturing sector accounts for approximately 70% of the sample, which comprises firms from 13 different industries. Industry average (median) *Z-Score* varies from 0.103 (0.022) to 1.122 (1.073). Industry average (median) *CSREXP* varies from 0.196 (0.122) to 0.1.578 (1.781) %. Panel B shows that the CSR expenditure (as a ratio of total assets) gradually rises from 2014 to 2022 owing to the introduction of Section 135 in the Companies Act 2013. There is a consistent rise in *Z-Score* from 2000 to 2007 indicating a fall in financial distress risk. This is followed by a fall in the score from 2007 to 2010, showing rise in the levels of distress risk, due to the global financial crisis. After that, there is no observable trend in *Z-Score,* except that it decreases from 0.856 in 2020 to 0.777 in 2021 indicating an increase in the financial distress risk on the onset of Covid-19.[3]

[3] In our study, the mean *Z-Score* ranges from 0.777 to 1.097 for the sample from 2000 to 2022. On the other hand, the mean Z-score for the study by Boubaker et al. (2020) shows a range from 1.31 to 1.79. Their study finds high

[Insert Table 1 here]

Table 2 Panel A shows that the sample mean (median) *Z-Score* is 0.936 (0.845) and *CSREXP* is 0.510 (0.337)%. The *Z-Score* is positively related to CSR expenditure, as can be seen in Panel B. CSR spending is also negatively correlated with other measures of financial distress, *O-Score* and *ZM-Score*. Panel C shows that both the mean and median *Z-Score* are lower for *Low-CSR* firms than for *High-CSR* firms. The difference is statistically significant at the 1% level. The evidence from the univariate analysis provides support to our central hypothesis that CSR spending negatively influences the financial distress risk. For our data, the variance inflation factor (VIF) varies between 1 and 2, suggesting that multicollinearity is not an issue (untabulated).

[Insert Table 2 here]

## 4. Research methodology

We follow prior literature (Bugeja, 2015; Richardson et al., 2015a; Boubaker et al., 2020) to measure the financial distress risk. We follow Altman (1968) to calculate the Z-score as shown in Equation (1). The author explain the five major ratio-profiles of this score. A firm with consistent losses will have shrinking current assets over total assets, so decrease in first ratio contributes to increased distress risk. The second ratio highlights the retained earnings which highlight a firm's age. A firm is likely to go bankrupt in its initial years, consequently, the higher this ratio, lower the chance of financial distress. The earnings before interest and tax represent the productivity of firms and any decline in the third ratio implies an increase in the level of financial distress. The fourth ratio measures how many fall in the asset's value can be survived by a firm before the liabilities are greater than assets, and firm goes insolvent. Lastly,

Z-scores compared to our study and therefore, low levels of financial distress for a sample of US firms from 1991 to 2012.

the sales to total assets ratio indicates the capability of the management in dealing with competition and reduction of this ratio signifies an increase in financial distress. Overall, a high Z-score is attributable to a low financial distress risk.

$$Z - Score = 0.012 * \frac{NWC}{TA} + 0.014 * \frac{RetEarnings}{TA} + 0.033 * \frac{EBIT}{TA} + 0.006 * \frac{MVE}{TVD} + 0.999 * \frac{Sales}{TA} \quad \dots (1)$$

where, *NWC* is net working capital, *TA* is the book value of total assets, *RetEarnings* is retained profits, *EBIT* is the earnings before interest and tax, *MVE* is market value of equity capital, *TVD* is the total value of debt, and *Sales* is the net sales.

We follow prior literature and use the ordinary least squares (OLS) Model (2) to predict the impact of *CSREXP* on the financial distress risk (e.g., Al-Hadi et al., 2019; Boubaker et al., 2022). We follow prior literature to include control variables in Model (2).

$$FDRISK_{i,t} = \beta_0 + \beta_1 lnCSR_{i,t} + \beta_2 MB_{i,t} + \beta_3 STKRET_{i,t} + \beta_4 FIRMSIZE_{i,t} + \beta_5 RND_{i,t} + \beta_6 DEP_{i,t} + \beta_7 LEV_{i,t} + \beta_8 CASH_{i,t} + \beta_9 LOSS_{i,t} + \beta_{10} QUICK_{i,t} + Industry\ Dummies + Year\ Dummies + \varepsilon_{it} \quad \dots(2)$$

Where, *FDRISK* is *Z-Score*, *CSREXP*, is the expenditure on CSR activities scaled by the total assets, *MB* is the market to book value of equity, *STKRET* is the average monthly stock returns calculated over a year, *FIRMSIZE* is the natural logarithm of total assets, *RND* is research and development expenses scaled by total assets, *DEP* is the total depreciation scaled by the total assets, *LEV* is the long term borrowings scaled by total assets, *CASH* is the cash and cash equivalent to total assets ratio, *LOSS* is one if a firm reports loss and zero otherwise, and *QUICK* is the quick assets divided by current liabilities. We replace *CSREXP* with the natural log of *CSR_EXP* (*LN_CSR*) to address the skewness in the *CSR_EXP* and normalize the variable (Gonçalves and Meddahi, 2011). We calculate *t*-statistics, which are based on

heteroscedasticity-robust standard errors. Because of the presence of time-effects and firm-effects, we cluster standard errors in both firm and year dimensions. To prevent the effect of outliers, all the continuous variables are winsorized at the 1st and 99th percentiles.

## 5. Empirical results

### 5.1 Baseline regression results

Table 3 reports the results obtained by estimating the regression model (2). Column (1) shows that the coefficient on *lnCSR* is positive and statistically significant at the 1% level. This result suggests that a 1% increase in CSR spending is associated with an 0.128 increase in the *Z-Score*. In economic terms, a one-standard deviation increase in the CSR expenditure induces a 0.183 (0.128 × 1.432) increase in *Z-Score*.[4] The results are both statistically and economically significant. This result supports our main hypothesis, that the financial distress risk of firms reduces with increasing CSR expenditure.

[Insert Table 3 here]

Consistent with prior literature (Al-Hadi et al., 2019; Boubaker et al., 2020), the results reveal that financial distress risk decreases with market-to-book ratio, stock returns, and depreciation, and increases with size, research and development expenses, leverage, cash holdings, loss, and quick ratio.

### 5.2 Robustness tests

To verify the main results, we perform several robustness tests. We present the results in Table 3. In Column (2), we control for industry-year fixed effects (Claver et al., 2002) and find a positive and statistically significant coefficient on *lnCSR* at the 1% level. Alternatively, in Column (3), we report results obtained after including the square of *CSREXP* in the

[4] This indicates a 19.55% (0.183/0.936 = 0.1955 or 19.55 %) increase in the sample average *Z-Score*.

regression model. The coefficient on *CSREXP* is positive, and that on the square term is negative, both statistically significant at the 1% level. It implies that *Z-Score* decreases (increases) with *CSREXP* when *CSREXP* is greater (less) than the inflection point (3.116%).[5] The maximum value of *CSREXP* is 0.645% in our sample; therefore, the relationship between CSR spending and *Z-Score* is largely positive for this sample.

In Column (4), we conduct Fama and MacBeth (1973) regression to address the concern that the autocorrelation within the firm can lead to biasedness of the standard errors in the pooled OLS regression. The coefficient on *lnCSR* is positive and statistically significant at the 1% level, thus eradicating our concerns related to cross-sectional correlations. Furthermore, in Columns (5), we control for serial correlation of standard errors (we use the Newey-West standard errors by following Smith and McAleer, 1994), the coefficients on *lnCSR* is positive and statistically significant at the 1% level, results that are consistent with our baseline regression results.

Lastly, we divide our full sample into manufacturing and non-manufacturing firms. The coefficients on *lnCSR* are positive and statistically significant at the 1% level for both manufacturing firms in Column (7) and non-manufacturing firms in Column (8). These results show that our results are not driven by manufacturing firms, which account for approximately 71% of the sample.

In sum, we document robust and consistent evidence that engagement in CSR causes a reduction in the financial distress risk.

**5.3 Endogeneity**

[5] Inflection point (3.116) is obtained as 0.5 × Coefficient on *CSREXP* (0.455) divided by the Coefficient on the square term (0.073).

Our results might be prone to endogeneity, which may arise because of omitted variable bias. For instance, if the CSR expenditure varies endogenously with some of the unobserved characteristics of a firm that affect financial distress risk as well as the firm's decision to spend on CSR activities. In that case, employing pooled OLS results in biased as well as inconsistent estimates. The results from Wooldridge's (1995) robust score test and a robust regression test, reported in Panel A of Table 4, suggest that *lnCSR* be treated as an endogenous variable. Additionally, reverse causality could arise if firms with high financial distress risk spend less on CSR activities. We address these endogeneity concerns by estimating the fixed-effects model, two-stage least square (2SLS) model and performing a difference-in-difference analysis.

### 5.3.1 Fixed-effect model

The fixed effect model is used if the omitted variable does not change over time (Woolridge, 2015). This is useful in eradicating the issues concerned with the potential bias that may arise due to time-invariant unobservable heterogeneity. The fixed-effects model involves time-demeaning of all variables to remove the unobserved fixed-effect from the model. Any variable that is constant over time drops out of the analysis. The explanatory variables are strictly exogenous after taking out the unobserved effect (Woolridge, 2015). We report the results in Table 4. The coefficient on the *lnCSR* is positive and statistically significant at the 1% level. These results are consistent with the main findings reported earlier and eradicate any issues regarding the omitted variable bias, which may result from the correlation between time-constant variables in the error term and explanatory variables.

[Insert Table 4 here]

### 5.3.2 Instrumental variable regression

The amount spent by a firm on CSR activities is likely to be influenced by the amount firms spend on CSR activities in the past. Following Cui et al. (2018), we define our first instrument variable ($IV_1$) as the one-period lagged *CSREXP* differentials. We expect $IV_1$ to be correlated with *CSREXP* but it is unlikely to influence *Z-Score* directly. By following prior literature (e.g., El Ghoul et al., 2011; Attig et al., 2013; Benlemlih and Bitar, 2018), our second instrumental variable ($IV_2$) is defined as the value of *CSREXP* in the first year in which a firm appears in our sample. We argue that the initial level of expenditure on CSR activities influences the amount spent on CSR activities in future years. Therefore, we expect $IV_2$ to be correlated with *CSREXP* and it would have no direct influence on financial distress risk. The null hypothesis that the instruments are weak is rejected with the *F*-statistics of 190.516 significant at the 1% level. Also, Sargan (1958) and Basmann (1960) test statistics are statistically insignificant. These results confirm that the model is specified correctly and our instrument variables are valid instruments.

[Insert Table 5 here]

In the first stage, we regress *lnCSR* on the two instruments and control variables as in the Model (2). The 2SLS results are shown in Panel B. In Column (1), the coefficients on both the instrument variables are statistically significant at the 1% level. These results indicate that both instrument variables are highly correlated with *CSR_EXP*. In the second stage, Model (1) is estimated using the fitted values of *lnCSR* obtained from the first-stage regression. In Column (2), the coefficient on the fitted values of *CSR_EXP* is positive and statistically significant at the 1% level. These results further confirm that our main regression results are robust to endogeneity.

### 5.3.3 Difference-in-difference analysis

We perform the difference-in-difference analysis to establish a causal relationship between *lnCSR* and financial distress risk. From April 1, 2014, companies that satisfied specific criteria are required to spend a certain minimum amount on CSR activities.[6] Following Manchiraju and Rajgopal (2017) and Roy et al. (2022), we define treatment firms (*TREATMENT*) as those which satisfy any of the three thresholds prescribed in Section 135 (i.e., net worth of Rs 500 crore or more, turnover of Rs 1000 crore or more, or a net profit of Rs 5 crore or more) in any given year. The control group (*CONTROL*) comprises firms that do not meet the threshold limits and therefore are not required to spend any (mandatory) amount on CSR activities.

[Insert Table 6 here]

In a logit model, we first regress *TREATMENT* on factors that may affect firms' propensity to spend on CSR activities. We match treatment and control firms using the propensity score, obtained by using nearest neighbor method (within a caliper of 10%). We compare the change in the financial distress risk before (2014) and after (2016) the implementation of the new rule, for the treatment and control firms. The financial distress risk is expected to be reduced more for the treatment firms than for the control firms. These results will help us in establishing a causal link that CSR expenditure causes a decrease in the financial distress risk.

## 6. Additional Tests

### 6.1 Other measures of financial distress risk

We use another three accounting-based measures in our study. We use the *O-Score* to measure the financial distress risk (Ohlson, 1980; Griffin and Lemmon, 2002) as presented in

[6] Retrieved on December 23, 2023 from https://www.business-standard.com/article/companies/new-companies-act-takes-effect-114033100995_1.html.

Equation (3).[7] Then, we adopt *ZM-Score* (Zmijewski, 1984) as described in Equation (4). Higher values of *O-Score* and *ZM-Score* indicate high financial distress risk. Lastly, we use the *Revised Z-Score* by following Altman (2017).

$$O-Score = -1.32 - 0.407 * lnTA + 6.03 * \frac{TVD}{TA} - 1.43 * \frac{NWC}{TA} + 0.076 * \frac{CL}{CA} - 1.72 * TVDdummy - 2.37 * \frac{NI}{TA} - 1.83 * \frac{FFO}{TVD} + 0.285 * NLdummy - 0.521 * \frac{NI_t - NI_{t-1}}{|NI_t| + |NI_{t-1}|} \quad \dots (3)$$

$$ZM-Score = -4.336 - 4.513 * \frac{NI}{TA} + 5.679 * \frac{TVD}{TA} + 0.004 * \frac{CA}{CL} \quad \dots (4)$$

where, *CL* is current liabilities, *CA* is current assets, *TVDdummy* is one if the total value of debt is greater than the total assets, otherwise zero, *NI* is net income, *FFO* is defined as the funds flow from operations, and *NLdummy* is one, if a company reports net loss in the last two years and zero otherwise.

We report the results by replacing the dependent variable as *O-Score* and *ZM-Score* in Model (2) in Table 7. In Column (1), the coefficient on *lnCSR* is negative and statistically significant at the 1% level. It indicates that as the expenditure on CSR increases, the *O-Score* decreases. Moreover, in Column (2), the coefficient on *lnCSR* is again negative and statistically significant at the 1% level, indicating an increase in *CSREXP* is connected with a decrease in

[7] We also perform regression results using the alternative form of *Z-Score* defined in several studies (for instance, Chen and Wang, 2012; Al Hadi et al., 2017) as follows and get the same consistent results using the actual form of *Z-Score* as formulated in the original study of Altman (1968):
*Z-Score* = 1.2 * Working Capital/Total Assets. + 1.4 * Retained Earnings/Total Assets + 3.3 * Earnings Before Interest and Taxes/Total Assets + 0.6 * Market Value of Equity/Book Value of Total Liabilities + 0.999 * Sales/Total Assets

*ZM-Score.* Therefore, both results convey that with an increase in the commitment of funds towards CSR activities, there is a decrease in the levels of financial distress risk.

[Insert Table 7 here]

Moreover, Altman (2017) revised the existing *Z-Score* measure for both public and private firms and manufacturing and non-manufacturing firms. The *Z-Score* was calculated using the market value of business and can be applied only to the public listed firms. On the other hand, *revised Z-Score* replaced the market value of equity with book value of equity and also eradicated the sales by total assets to remove the industry specific effect (Altman, 2017). We also run our model (2) with the dependent variable as *Revised Z-Score* by following Altman (2017) for robustness.[8] The coefficient on the *lnCSR* is still positive and statistically significant at the 5% level, consistent with the main results.

**6.2 Firm life cycle stages**

Next, we explore the impact of different stages of the firm life cycle on the relationship between CSR and financial distress risk. Hsu et al. (2015) document that larger and older firms are most likely to have greater debt ratios, resulting in a higher probability of defaults and an increased likelihood of financial distress risk. We argue that old firms with high probability of default spend on CSR to reduce the likelihood of financial distress risk. On the other hand, young firms with low debt ratios, do not suffer from high default risk due to lower debt. We conjecture that as firm age increase, with high likelihood of default, the negative impact of CSR spending on financial distress risk is stronger for old and mature firms than for young firms. We divide the full sample into three sub-samples and estimate the model (2) again.

[8] The revised *Z-Score* is calculated as:
*Z-Score* = 3.25 + 6.56 * Working Capital/Total Assets + 3.26 * Retained Earnings/Total Assets + 6.72 * Earnings Before Interest and Taxes/Total Assets + 1.05 * Book Value of Equity/Book Value of Total Liabilities

Following Owen and Yawson (2010), we divide our full sample into three subsamples based on their age (young, mature, and old firms). Young (old) firms consist of firms in the lowest (fourth) quartile. The middle two quartiles are classified as mature firms. We measure firm age based on the listing and incorporation age. We present these results in Table 8.

[Insert Table 8 here]

We use the number of years for which the firm is listed on an exchange as a measure of firm age. The coefficients on *lnCSR* from Columns (1) to (3) are positive and statistically significant at the 1% levels, for young, mature, and old firms. We observe that the magnitude on the coefficient is greater for old and mature firms than for young firms. We obtain similar results, if we measure firms age as the number of years counted from the date of incorporation of the firm, as can be seen in Columns (4) - (6).

Overall, the empirical evidence suggests that the negative relation between CSR spending and financial distress risk is stronger for old and mature firms than young firms.

**6.3 Uniqueness of India**

In this subsection, we conduct various set of analysis for the uniqueness of India in terms of passing the mandatory provision of CSR spending for certain companies in India. We examine whether the mandatory provision affects the relationship between CSR spending and financial distress risk. We present the results in Table 9. We include the variable, *POST2014,* as one for mandatory-CSR regime (2015-2021) and zero for voluntary-CSR regime (2000-2014). In Column (1), the negative coefficient on the interaction term (significant at the 10% level) weakly indicates that with the introduction of the mandatory spending on CSR, spending on CSR activities increases the financial distress risk. This owes an explanation that introduction of mandatory CSR dries liquidity for the firms since it is not voluntary now and can lead to chances of financial distress.

[Insert Table 9 here]

For the next two tests, we consider the period from 2015 to 2021 because the provisions related to mandatory expenditure on CSR activities under the Companies Act became effective from April 1, 2014. We define *Comply-firms* as those that spend the minimum mandated amount on CSR activities and *Explain-only firms* as those that spend less than the minimum mandated amount and explain the reasons for the same in their annual report. We compute variable *EXPLAIN* as a dummy variable with one if the total unspent CSR amount (as defined in Prowess database) is greater than zero, and zero otherwise. In Column (2), The coefficient on the interaction term is negative and statistically significant at the 10% level. This weakly indicates that for a given level of CSR spending, *Comply-firms* experience a greater reduction in financial distress risk compared to *Explain-firms*.

Next, we include the variable *MANDATED* as one if the total amount spent on CSR is greater than the minimum mandated amount and zero otherwise. The insignificant coefficient reported in Column (3) suggests that firms that spend more than the minimum mandated amount do not get any additional benefit in terms of reduced financial distress risk.

Overall, the results indicate that the introduction of the mandatory spending provision of the Section 135 of the Companies Act hardly influences the relationship between spending on CSR and financial distress risk of Indian firms. We observe weak evidence for a given level of CSR spending, *Comply-firms* experience a greater reduction in financial distress risk compared to *Explain-firms*. Lastly, spending more than the mandated amount does not benefit the firm in terms of abridged financial distress risk.

**6.4 Components of CSR**

Brown and Dacin (1997) find that firms with better social performance are associated with higher brand value and reputation. This leads to higher consumer product evaluations and higher sales growth potential. Boubaker et al. (2020) show that the firms with higher growth opportunities attract more investors, thus ease of raising funds and lower financial distress risk. Subsequently, the amount spent on social and community-related activities reduces the risk of financial distress. Then, the firms manage their environmental risks by spending on environment-related activities such as emissions treated on site. Sharfman and Fernando (2008) argue that the reduced future environmental litigations and improved stakeholder relationships helps to reduce firm risk and lowers the cost of capital (Sharfman and Fernando, 2008). Therefore, spending on environment-related activities lowers the cost of capital, ease the access to obtain funds, and lowers the financial distress risk.

Kane et al. (2005) reports that firms that maintains good employee treatment and relations suffer from less risk of financial distress due to availing temporary labor concessions in distress scenarios. This suggests that firms spending for the welfare of employees obtain support of them in the form of reduced wages, and that is likely to reduce the likelihood of financial distress. Considering these set of arguments in prior literature, this subsection examines the impact of different components of CSR on the financial distress risk. We re-estimate Model (2) by replacing *lnCSR* with *lnSOCIAL*, *lnENVIRON* and *lnEMP*. Variable *lnSOCIAL* is estimated as the natural log of the amount spent on social and community related activities. *lnENVIRON* is defined as the natural log of the amount spent on environment-related activities undertaken by a firm, scaled by total assets. Lastly, *lnEMP* is computed as the natural log of the amount spent on employee-welfare related activities. We report the results in Table 9.

The coefficient on *lnSOCIAL* is positive and statistically significant at the 1% level, as shown in Column (4). It indicates that the firms' commitment displayed towards the society

will result in higher *Z-Score* or lower financial distress risk. Then, in Column (5), the insignificant coefficient on *lnENVIRON* shows that spending towards the environment does not result in reduction in the financial distress risk. The positive and statistically significant coefficient on *lnEMP* at the 1% level suggests that financial distress risk reduces when firms spend more funds on activities directed towards welfare of the employees.

In conclusion, it is the spending on community-and-employee-welfare-related activities that reduces the financial distress risk and spending towards the environment does not benefit the firm. In the subsequent analysis, we analyze the three components rather than combined CSR spending for detailed analysis of the channels through which CSR expenditure affect the financial distress risk.

## 7. Channels through which CSR expenditure affects financial distress risk

### 7.1 Financial constraints

The prior literature highlights that CSR is negatively linked with financial constraints (for instance, El Ghoul et al., 2011; Dhaliwal et al., 2011; Zhao and Xiao, 2019). El Ghoul et al. (2011) illustrate that firms with better CSR practices are rewarded with a lower cost of equity, supporting the risk mitigation view that a firm engaged in CSR activities has a higher valuation and lower firm risk due to the support of the stakeholders even in the adverse scenarios. In addition, Dhaliwal et al. (2011) show that firms with high equity cost of capital in the preceding year enjoy a lower cost of equity when they disclose their CSR activities in the current year. Furthermore, Zhao and Xiao (2019) report a negative relationship between CSR and financial constraint in different life cycle stages of a firm. These studies suggest that CSR eases the ability of firms to raise funds, reduces financial constraints, and that leads to a reduction in the levels of financial distress risk. We conjecture and hypothesize that given the

expenditure on CSR activities, as the firms face more financial constraints, the financial distress risk decreases.

[Insert Table 10 here]

To test our conjecture, we interact the different components of CSR with measure of financial constraints. We use a measure of financial constraint (indicated by *KZ* now onwards) developed by Kaplan and Zingales (1997) as a proxy for financial constraint. We report the results in Table 10.

Column (1) shows that when we include the interaction term with *KZ* in the regression model, the coefficient on the *lnSOCIAL* still remains positive and statistically significant at the 5% level. The positive coefficient on the interaction term in Column (1) shows that for a given level of CSR spending on social-and-community-related activities, firms with greater financial constraints experience a greater reduction in the financial distress risk compared to firms with lesser financial constraints. This indicates that reduction in financial constraints appears to be a potential channel through which spending on social-and-community-related activities affects the financial distress risk.

The coefficient on *lnENVIRON* is insignificant in Column (2). These results confirm that the financial constraints does not influence how environment-related CSR spending affects the financial distress risk.

Column (3) shows interesting results for the spending on employee-related activities. The coefficient on *lnEMP* is still positive and statistically significant at the 1% level. The positive coefficient on the interaction term again indicates that given the spending on employee-welfare related activities, as the financial constraints faced by a firm increases, the financial distress risk decreases due to the benefit of spending towards the employee-related

CSR activities. The positive coefficient on *KZ* weakly indicates that with increase in financial constraints, the financial distress risk reduces.

In summary, the effect of social-and-community-related spending on financial distress risk is stronger for firms with high financial constraints. We continue to observe the insignificant effect of environment-related CSR spending on financial distress risk. How employee-welfare related CSR spending affects financial distress risk is sensitive to the level of financial constraints faced by firms.

### 7.2 Cost of debt

Goss and Roberts (2011) show that banks charge higher interest rates for firms involved in high controversies related to CSR activities such as penalties charged for polluting the environment. These penalties lead to high future costs and an increase in the probability of default of the firms. To account for default risk, the bank increase the interest rates and henceforth the cost of debt increases for the firms. La Rosa et al. (2018) show that firms with better corporate social responsibility practices attract lenders, making access to finance easier for such firms and lowering the cost of debt. The authors support their results with theoretical framework and argues that CSR reduces the information asymmetry, agency costs of debt, and build reputation. These studies suggest that CSR helps firms to access funds from the capital market and, therefore, reduces the levels of financial distress risk. Given these arguments, we hypothesize CSR reduces the cost of debt, and that leads to a reduction in financial distress risk.

To test our conjecture, that CSR reduces the cost of debt, and that leads to a reduction in financial distress risk, we replace our dependent variable *Z-Score* with the cost of debt (*KD*). We follow Ye and Zhang (2011) to estimate the cost of debt. It is calculated as the total interest expenses expressed as a percentage of the total borrowings outstanding. We use ordinary least

square regression. We control for variables that may affect the relationship between different components of CSR and cost of debt. We include, *FIRMSIZE*, defined as the natural log of the book value of total assets, then *LEV*, which is long-term borrowings scaled by total assets, *TANG*, computed as ratio of plant, property, and equipment divided by total assets, *MB*, which is the market value of equity divided by the book value of equity, *CF*, defined as the cash flows from operating activities scaled by total assets, and lastly, *SD_CF*, estimated as the standard deviation of *CF*, using data for trailing three years. We report the results in Table 11.

[Insert Table 11 here]

We note that the coefficient on *lnSOCIAL* is negative and statistically significant at the 1% level in Column (1) suggesting that companies spending on social-and-community related activities does lead to a reduction in the cost of debt. Columns (2) and (3) show insignificant effect of environment-related and employee-welfare related activities on the cost of debt.

In summary, the empirical evidence discussed in this subsection suggests that cost of debt declines with firms spending more on social-and-community-related activities. The funds that are spent either on protecting the environment or on employee welfare do not have any impact on the cost of debt. This indicates that cost of debt is a channel through which spending on social-and-community-related activities affects the financial distress risk.

### 7.3 Credit ratings

Attig et al. (2013) and Jiraporn et al. (2014) show that higher engagement in CSR helps to improve the firm's credit ratings and reduces the default risk. They highlight that CSR builds strong relationships with government and community in general and does not lead to future litigations that may impact the future profitability of firms. In this way, the firms' commitment towards CSR reduces the future costs, enhances future profitability, and improves the credit

ratings for the firms. We, therefore, hypothesize that the CSR improves the credit ratings and reduces the financial distress risk.

To test our hypothesis, we replace our dependent variable *Z-Score* with the total credit ratings score calculated by following the credit ratings for the long-term debt available in the Prowess dx database. The long-term debt is rated from high to poor rating as "highest safety," "high safety," "adequate safety," "moderate safety," "inadequate safety," "substantial risk," "high risk," and "default", we assign scores from 1 to 8 (1 for "default", and 8 for "highest safety"), and then add the scores to obtain the variable *CRTNG* for each firm, and each year. We regress *CRTNG* on the different component of CSR and control variables using the ordinary least square regression. We follow Jiraporn et al. (2014) and include control variables, *FIRMSIZE*, defined as the natural log of the book value of total assets, then *LEV*, which is long-term borrowings scaled by total assets, *EBIT/TA*, computed as the ratio of earnings before interest and taxes scaled by total assets, *RND*, estimated as the research and development expenses scaled by total assets, *ADV*, defined as the advertisement expenses scaled by total assets, *CAPEX*, which is the capital expenditure incurred divided by total assets, *DIV*, estimated as the dividend paid by the company scaled by total assets, and lastly, *TANG*, which is the ratio of plant, property, and equipment divided by total assets. The results are again presented in Table 11.

We observe that the coefficient on *lnSOCIAL* in Column (4) is positive but not statistically significant indicating that spending towards community welfare does not lead to improvement in the credit ratings. Again, in Column (5), we note a statistically insignificant coefficient on *lnENVIRON*, suggesting that spending on activities protecting the environment does not lead to enhancement in the ratings. Lastly, Column (6) shows that the coefficient on *lnEMP* is positive and statistically significant at the 5% level. These results suggest that spending on employee welfare improves the credit ratings for the companies. We complement

the findings of Verwijmeren and Derwall (2010), who document that US firms with strong employee relations have higher credit ratings and lower chances of bankruptcy.

In sum, the empirical evidence suggests that improvement in total credit ratings is a potential mechanism, which explains why financial distress risk reduces as firms spend more funds on the welfare of their employees.

## 8. Conclusion

This paper examines the relationship between the CSR spending and financial distress risk. We use a panel dataset of 14,713 firm-year observations from 1,353 unique Indian firms and sample period from 2000 to 2022. We find a negative and statistically significant relationship between CSR expenditure and financial distress risk. The negative relationship between CSR spending and financial distress risk holds for different proxies of financial distress risk. The negative relation between CSR spending and financial distress risk is stronger for old and mature firms than young firms The firm's engagement in CSR influences the financial distress risk through its positive effect on reducing the cost of debt, improving credit ratings, and enhancing access to funds by reducing the financial constraints faced by a firm. Reducing financial constraints and cost of debt is a channel through which spending towards the social-and-community-related activities reduce the financial distress risk. On the other hand, employee-welfare related activities benefit the firm by reducing the financial constraints accompanied by improvement in credit ratings, and thereby reducing the financial distress risk.

This study helps the policymakers to design policies on mandatory CSR by the corporates, which reduces the financial distress risk. It will be useful for the policymakers to make stringent provisions for the firms on spending towards the community and employees for a financially stable firm. It will also be beneficial for the managers for designing CSR policies in order to reduce the financial distress risk, avoid bankruptcy, and ensure financial stability of

corporates. The employees can choose to work in those firms which spend towards their welfare and are ready to work in lower salaries for such firms at adverse scenarios. Investors can invest in portfolios consisting of firms that engage in CSR activities so as to restrain from risky stocks which can give negative returns due to the financial distress of firms. Finally, our study will give insights to the bankers in their lending decisions so that they can judge the quality of their lending and avoid their assets turning into non-performing assets.

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## Table 1: Sample Distribution by Industry and Year

This table presents sample distribution by industry and year. *CSREXP* is the sum of social-and-community, environment-related and employee-welfare related expenses made by a company scaled by the total assets. *Z-Score* is calculated by following Altman (1968). Column (1) reports the number of observations. Columns (2) and (3) report mean *Z-Score* and median *Z-Score*, and Columns (4) and (5) report mean *CSREXP* and median *CSREXP*. *Z-Score* is winsorized at the 1st and 99th percentile, and value of *CSREXP* is in percentage. The sample period is from 2000 to 2022.

| | (1) | (2) | (3) | (4) | (5) |
|---|---|---|---|---|---|
| | | *Z-Score* | | *CSREXP* | |
| | N | Mean | Median | Mean (In %) | Median (In %) |
| Panel A: This panel presents the distribution of the sample by industry. | | | | | |
| Accommodation and Food service activities | 11 | 0.688 | 0.728 | 1.578 | 1.781 |
| Administrative and support service activities | 65 | 0.643 | 0.458 | 0.887 | 0.614 |
| Agriculture, Forestry and Fishing | 13 | 0.947 | 1.035 | 0.822 | 0.959 |
| Arts, entertainment and recreation | 21 | 0.197 | 0.221 | 0.284 | 0.337 |
| Construction | 1,371 | 0.532 | 0.454 | 0.221 | 0.133 |
| Financial and insurance activities | 66 | 0.103 | 0.022 | 0.196 | 0.122 |
| Information and communication | 1,136 | 0.553 | 0.481 | 0.611 | 0.299 |
| Manufacturing | 10,399 | 1.034 | 0.941 | 0.528 | 0.370 |
| Mining and quarrying | 136 | 0.587 | 0.502 | 0.379 | 0.327 |
| Other service activities | 5 | 1.062 | 1.073 | 1.096 | 1.109 |
| Professional, scientific and technical | 121 | 0.401 | 0.301 | 0.474 | 0.219 |
| Transportation and storage | 334 | 0.831 | 0.600 | 0.459 | 0.228 |
| Wholesale and retail trade | 1,111 | 1.122 | 0.931 | 0.347 | 0.190 |
| Panel B: This panel presents the distribution of the sample by year. | | | | | |
| 2000 | 352 | 0.954 | 0.864 | 0.689 | 0.455 |
| 2001 | 333 | 0.969 | 0.883 | 0.713 | 0.539 |
| 2002 | 324 | 0.987 | 0.915 | 0.687 | 0.527 |
| 2003 | 302 | 0.988 | 0.901 | 0.651 | 0.513 |
| 2004 | 329 | 1.068 | 0.946 | 0.599 | 0.423 |
| 2005 | 376 | 1.097 | 0.991 | 0.545 | 0.378 |
| 2006 | 426 | 1.050 | 0.907 | 0.488 | 0.308 |
| 2007 | 527 | 1.044 | 0.911 | 0.477 | 0.313 |
| 2008 | 611 | 0.965 | 0.870 | 0.464 | 0.289 |
| 2009 | 613 | 0.945 | 0.831 | 0.442 | 0.267 |
| 2010 | 668 | 0.907 | 0.805 | 0.423 | 0.250 |
| 2011 | 733 | 0.951 | 0.841 | 0.420 | 0.239 |
| 2012 | 784 | 0.981 | 0.882 | 0.437 | 0.231 |
| 2013 | 759 | 0.955 | 0.858 | 0.433 | 0.251 |
| 2014 | 758 | 0.970 | 0.867 | 0.436 | 0.250 |
| 2015 | 780 | 0.964 | 0.862 | 0.475 | 0.295 |
| 2016 | 825 | 0.920 | 0.863 | 0.494 | 0.323 |
| 2017 | 875 | 0.892 | 0.815 | 0.499 | 0.324 |
| 2018 | 863 | 0.874 | 0.797 | 0.489 | 0.329 |
| 2019 | 846 | 0.906 | 0.831 | 0.498 | 0.341 |
| 2020 | 868 | 0.856 | 0.774 | 0.524 | 0.365 |
| 2021 | 904 | 0.777 | 0.708 | 0.446 | 0.327 |
| 2022 | 933 | 0.916 | 0.833 | 0.459 | 0.333 |

## Table 2: Descriptive statistics

This table presents descriptive statistics. *Z-Score* is calculated by following Altman (1968). *O-Score* is measured by following Ohlson (1980). *ZM-Score* is computed by following Zmijewski (1984). *CSREXP* is defined as the summation of social and community expenses, environment, and employee-welfare related expenses made by a company scaled by the total assets. *CSR Amount* is the total amount spent on all CSR activities undertaken by a firm, *Social-and-community*, *Environment*, and *Employee-welfare* are the amount spent on social-and-community, environment, and employee-welfare related CSR spending, respectively. *MB* is the market value of equity divided by the book value of equity, *STKRET* is the average of the monthly stock return calculated over a year, *FIRMSIZE* is the natural log of the book value of total assets, *RND* is the research and development expenses scaled by total assets, *DEP* is the total depreciation scaled by the total assets, *LEV* is long term borrowings scaled by total assets, *CASH* is cash and cash equivalent defined as a ratio of the total assets, *LOSS* is an indicator variable that is equal to one if a firm suffers from a loss in a given financial year and zero otherwise, and *QUICK* is the quick assets scaled by current liabilities. All continuous variables are winsorized at the 1st and 99th percentile. The sample period is from 2000 to 2022.

Panel A: This panel reports summary statistics for all variables.

| | (1) Mean | (2) Median | (3) 25th percentile | (4) 75th percentile | (5) Std Dev |
|---|---|---|---|---|---|
| *Z-Score* | 0.936 | 0.845 | 0.523 | 1.223 | 0.620 |
| *O-Score* | -3.558 | -3.673 | -4.759 | -2.613 | 1.724 |
| *ZM-Score* | -3.091 | -3.213 | -4.115 | -2.340 | 1.432 |
| *CSREXP (in %)* | 0.510 | 0.337 | 0.142 | 0.680 | 0.560 |
| *CSR Amount* (INR million) | 177.246 | 26.500 | 7.500 | 84.700 | 856.074 |
| *Social-and-community* (INR million) | 34.833 | 0.000 | 0.000 | 4.600 | 287.270 |
| *Environment* (INR million) | 3.300 | 0.000 | 0.000 | 0.000 | 53.204 |
| *Employee-welfare* (INR million) | 139.113 | 21.800 | 6.100 | 68.300 | 652.412 |
| *MB* | 80.105 | 16.542 | 4.511 | 56.696 | 259.147 |
| *STKRET* | 1.001 | 1.001 | 0.999 | 1.003 | 0.003 |
| *FIRMSIZE* | 9.183 | 9.007 | 8.073 | 10.132 | 1.560 |
| *RND* | 0.004 | 0.000 | 0.000 | 0.002 | 0.021 |
| *DEP* | 0.030 | 0.026 | 0.015 | 0.039 | 0.021 |
| *LEV* | 0.294 | 0.263 | 0.113 | 0.410 | 0.290 |
| *CASH* | 0.019 | 0.001 | 0.000 | 0.007 | 0.056 |
| *LOSS* | 0.172 | 0.000 | 0.000 | 0.000 | 0.377 |
| *QUICK* | 1.018 | 0.692 | 0.437 | 1.092 | 1.786 |

Panel B: This panel reports Pearson (Spearman) correlation coefficients in the above (below) the diagonal. Significant coefficients (at the 5 % level) are indicated by *.

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) | (13) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *Z-Score (1)* | | -0.103* | -0.207* | 0.445* | 0.144* | 0.088* | -0.202* | 0.203* | 0.265* | -0.104* | 0.093* | -0.291* | 0.020* |
| *O-Score (2)* | -0.114* | | 0.902* | -0.212* | -0.591* | -0.000 | -0.329* | -0.203* | 0.204* | 0.873* | -0.246* | 0.433* | -0.522* |
| *ZM-Score (3)* | -0.196* | 0.913* | | -0.311* | -0.468* | -0.034* | 0.016 | -0.189* | 0.127* | 0.962* | -0.235* | 0.425* | -0.530* |
| *CSR_EXP (4)* | 0.354* | -0.200* | -0.291* | | 0.268* | 0.058* | -0.140* | 0.403* | 0.309* | -0.265* | 0.135* | -0.181* | 0.111* |
| *MB (5)* | 0.045* | -0.275* | -0.203* | 0.110* | | -0.084* | 0.439* | 0.308* | -0.075* | -0.393* | 0.162* | -0.374* | 0.242* |
| *STKRET (6)* | 0.058* | -0.004 | -0.034* | 0.052* | -0.025* | | -0.087* | 0.039* | 0.071* | -0.022* | 0.011 | -0.043* | 0.012 |
| *FIRMSIZE (7)* | -0.154* | -0.317* | 0.013 | -0.150* | 0.252* | -0.084* | | 0.119* | -0.123* | 0.028* | 0.007 | -0.024* | -0.116* |
| *RND (8)* | -0.002 | -0.023* | -0.037* | 0.120* | 0.053* | 0.014 | -0.004 | | 0.126* | -0.150* | 0.050* | -0.126* | 0.056* |
| *DEP (9)* | 0.142* | 0.199* | 0.137* | 0.235* | -0.006 | 0.056* | -0.108* | 0.016 | | 0.168* | -0.025* | 0.040* | -0.139* |
| *LEV (10)* | -0.117* | 0.882* | 0.962* | -0.244* | -0.178* | -0.023* | 0.020* | -0.065* | 0.155* | | -0.234* | 0.306* | -0.523* |
| *CASH (11)* | -0.036* | -0.287* | -0.244* | 0.082* | 0.163* | -0.007 | 0.083* | 0.010 | -0.055* | -0.246* | | -0.120* | 0.233* |
| *LOSS (12)* | -0.243* | 0.498* | 0.497* | -0.199* | -0.111* | -0.032* | -0.018* | 0.013 | 0.080* | 0.376* | -0.078* | | -0.257* |
| *QUICK (13)* | -0.095* | -0.232* | -0.206* | -0.035* | 0.038* | 0.007 | -0.080* | -0.003 | -0.062* | -0.222* | 0.329* | -0.073* | |

Panel C: The total sample is divided into two subsamples based on CSR percentages of below (low-CSR) and above (high-CSR) sample median CSR. This panel reports the mean and median values of variables for the two subsamples and results from the test of difference-in-means and difference-in-medians. Statistical significance at the 1%, 5%, and 10% level is indicated by ***, **, and *, respectively.

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) = (2) – (5) | (8) = (3)- (6) |
|---|---|---|---|---|---|---|---|---|
| | Low CSR Firms (Below Sample Median) | | | High CSR Firms (Above Sample Median) | | | Difference-in-Means | Difference-in-Medians |
| *Z-Score* | 7362 | 0.751 | 0.650 | 7351 | 1.122 | 1.027 | -0.371*** | -0.377*** |
| *O-Score* | 6703 | -3.225 | -3.385 | 6785 | -3.894 | -3.995 | 0.669*** | 0.610*** |
| *ZM-Score* | 7282 | -2.722 | -2.901 | 7222 | -3.468 | -3.567 | 0.746*** | 0.666*** |
| *CSR_EXP* | 7362 | -6.917 | -6.632 | 7351 | -4.964 | -5.031 | -1.953*** | -1.601*** |
| *MB* | 7362 | 45.623 | 10.145 | 7351 | 115.278 | 26.558 | -69.655*** | -16.413*** |
| *STKRET* | 7362 | 1.001 | 1.001 | 7351 | 1.001 | 1.001 | 0.000*** | 0.000*** |
| *FIRMSIZE* | 7362 | 9.278 | 9.144 | 7351 | 9.096 | 8.914 | 0.182*** | 0.229*** |
| *RND* | 7362 | 0.001 | 0.000 | 7351 | 0.006 | 0.001 | -0.005*** | -0.001*** |
| *DEP* | 7362 | 0.026 | 0.022 | 7351 | 0.033 | 0.030 | -0.007*** | -0.008*** |
| *LEV* | 7362 | 0.349 | 0.313 | 7351 | 0.238 | 0.212 | 0.111*** | 0.101*** |
| *CASH* | 7362 | 0.015 | 0.001 | 7351 | 0.024 | 0.001 | -0.009*** | 0.000*** |
| *LOSS* | 7362 | 0.227 | 0.000 | 7351 | 0.116 | 0.000 | 0.111*** | 0.000*** |
| *QUICK* | 7362 | 1.047 | 0.659 | 7351 | 0.987 | 0.725 | 0.060*** | -0.066*** |

## Table 3: Baseline regression results and robustness tests

This table presents the main analysis and the robustness tests, where the dependent variable is the financial distress risk which is measured by *Z-Score* wherein *Z-Score* is calculated by following Altman (1968). The independent variable is the *lnCSR*, which is the natural log of *CSREXP*, which is calculated as the total amount spent on CSR activities undertaken by a firm, scaled by total assets. *MB* is the market value of equity divided by the book value of equity, *STKRET* is the average of the monthly stock return calculated over a year, *FIRMSIZE* is the natural log of the book value of total assets, *RND* is the research and development expenses scaled by total assets, *DEP* is the total depreciation scaled by the total assets, *LEV* is long term borrowings scaled by total assets, *CASH* is cash and cash equivalent defined as a ratio of the total assets, *LOSS* is an indicator variable that is equal to one if a firm suffers from a loss in a given financial year and zero otherwise, and *QUICK* is the quick assets scaled by current liabilities. All continuous variables are winsorized at the 1st and 99th percentile. The sample period is from 2000 to 2022. Statistical significance at the 1%, 5%, and 10% level is indicated by ***, **, and *, respectively. *t*-Statistics (in parentheses) are calculated based on heteroscedasticity-robust standard errors clustered by firm and year.

| | (1) Baseline Regression | (2) Controlling for industry-by-year FE | (3) Controlling for $CSR^2$ | (4) Fama-MacBeth regression | (5) Newey-west errors | (6) Manufacturing firms | (7) Non-manufacturing firms |
|---|---|---|---|---|---|---|---|
| *lnCSR* | 0.128 | 0.130 | | 0.126 | 0.128 | 0.134 | 0.124 |
| | (11.476)*** | (11.465)*** | | (32.329)*** | (26.966)*** | (8.284)*** | (8.692)*** |
| *CSREXP* | | | 0.455 | | | | |
| | | | (7.924)*** | | | | |
| $CSREXP^2$ | | | -0.073 | | | | |
| | | | (-3.432)*** | | | | |
| *MB* | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| | (1.831)* | (1.844)* | (1.776)* | (5.398)*** | (4.195)*** | (1.318) | (2.680)** |
| *STKRET* | 7.302 | 7.202 | 7.741 | 7.857 | 7.302 | 8.746 | 4.172 |
| | (2.606)** | (2.456)** | (2.739)** | (2.021)* | (3.671)*** | (2.806)** | (0.942) |
| *FIRMSIZE* | -0.041 | -0.041 | -0.041 | -0.044 | -0.041 | -0.043 | -0.034 |
| | (-2.975)*** | (-3.005)*** | (-3.008)*** | (-13.373)*** | (-10.428)*** | (-2.265)** | (-2.178)** |
| *RND* | -1.076 | -1.110 | -1.233 | -2.805 | -1.076 | -4.339 | -0.397 |
| | (-1.484) | (-1.525) | (-1.694) | (-4.774)*** | (-2.858)*** | (-3.601)*** | (-1.171) |
| *DEP* | 2.089 | 2.094 | 2.261 | 2.517 | 2.089 | 3.096 | 0.798 |
| | (3.695)*** | (3.578)*** | (4.106)*** | (11.131)*** | (7.632)*** | (4.019)*** | (1.030) |
| *LEV* | -0.067 | -0.069 | -0.071 | -0.184 | -0.067 | -0.124 | 0.010 |
| | (-0.801) | (-0.786) | (-0.881) | (-4.449)*** | (-1.124) | (-1.040) | (0.201) |
| *CASH* | -0.376 | -0.335 | -0.290 | 1.429 | -0.376 | -0.237 | -0.725 |
| | (-2.704)** | (-2.324)** | (-2.078)** | (2.643)** | (-4.704)*** | (-1.209) | (-3.914)*** |
| *LOSS* | -0.279 | -0.279 | -0.304 | -0.257 | -0.279 | -0.292 | -0.250 |
| | (-10.014)*** | (-9.155)*** | (-10.016)*** | (-14.570)*** | (-17.782)*** | (-7.605)*** | (-8.425)*** |
| *QUICK* | -0.020 | -0.022 | -0.024 | -0.043 | -0.020 | -0.029 | -0.009 |
| | (-3.628)*** | (-3.322)*** | (-3.500)*** | (-6.638)*** | (-5.615)*** | (-2.360)** | (-1.837)* |
| *Constant* | -5.676 | -5.815 | -7.184 | -6.070 | -5.676 | -6.638 | -2.516 |
| | (-2.019)* | (-1.970)* | (-2.529)** | (-1.549) | (-2.849)*** | (-2.132)** | (-0.566) |
| *N* | 14,713 | 14,713 | 14,713 | 14,713 | 14,713 | 10,360 | 4,353 |
| *Adj-$R^2$* | 0.267 | 0.264 | 0.266 | 0.294 | - | 0.192 | 0.289 |
| *Industry FE* | YES | - | YES | YES | YES | YES | YES |
| *Year FE* | YES | - | YES | YES | YES | YES | YES |
| *Industry-Year FE* | - | YES | - | - | - | - | - |

## Table 4: Endogeneity Tests: Fixed Effects Regression

Column (1) presents results from the fixed-effect regression model. In Column (1), the dependent variable is the natural log of idiosyncratic volatility (*IVOL*) lead by one year for all the cases, wherein is the financial distress risk which is measured by *Z-Score* wherein *Z-Score* is calculated by following Altman (1968). The independent variable is the *lnCSR*, which is the natural log of *CSREXP*, calculated as the total amount spent on CSR activities undertaken by a firm, scaled by total assets. *MB* is the market value of equity divided by the book value of equity, *STKRET* is the average of the monthly stock return calculated over a year, *FIRMSIZE* is the natural log of the book value of total assets, *RND* is the research and development expenses scaled by total assets, *DEP* is the total depreciation scaled by the total assets, *LEV* is long term borrowings scaled by total assets, *CASH* is cash and cash equivalent defined as a ratio of the total assets, *LOSS* is an indicator variable that is equal to one if a firm suffers from a loss in a given financial year and zero otherwise, and *QUICK* is the quick assets scaled by current liabilities. All continuous variables are winsorized at the 1st and 99th percentile. The sample period is from 2000 to 2022. Statistical significance at the 1%, 5%, and 10% level is indicated by ***, **, and *, respectively. *t*-Statistics (in parentheses) are calculated based on heteroscedasticity-robust standard errors clustered by firm.

| | (1)<br>Fixed-Effects Regression |
|---|---|
| *lnCSR* | 0.132 |
| | (13.686)*** |
| *MB* | 0.000 |
| | (0.058) |
| *STKRET* | 1.820 |
| | (1.362) |
| *FIRMSIZE* | -0.129 |
| | (-9.368)*** |
| *RND* | 0.128 |
| | (0.487) |
| *DEP* | 2.188 |
| | (5.322)*** |
| *LEV* | -0.077 |
| | (-0.900) |
| *CASH* | -0.456 |
| | (-4.895)*** |
| *LOSS* | -0.187 |
| | (-11.392)*** |
| *QUICK* | -0.010 |
| | (-3.653)*** |
| *Constant* | 0.833 |
| | (0.610) |
| *N* | 14,713 |
| $R^2$ | 0.148 |
| *Industry FE* | YES |
| *Year FE* | YES |

## Table 5: Endogeneity Tests: Two-Stage-Least Squares Model

Column (1) and Column (2) present results from the 2SLS Estimation Model. Column (1) reports the first-stage regression results in which the dependent variable is the *lnCSR*, the natural log of *CSREXP*, calculated as the total amount spent on CSR activities undertaken by a firm, scaled by total assets, and $IV_1$ is a one-year lagged corporate social responsibility expenses expressed as a percentage of the total assets differentials. $IV_2$ is the initial corporate social responsibility expenses scaled by the total assets when a company enters the sample. Column (2) reports the results from the second stage of the two-stage least-squares estimation model. In Column (2), the dependent variable is *Z-Score*, wherein it is estimated by following Altman (1968). *MB* is the market value of equity divided by the book value of equity, *STKRET* is the average of the monthly stock return calculated over a year, *FIRMSIZE* is the natural log of the book value of total assets, *RND* is the research and development expenses scaled by total assets, *DEP* is the total depreciation scaled by the total assets, *LEV* is long term borrowings scaled by total assets, CASH is cash and cash equivalent defined as a ratio of the total assets, *LOSS* is an indicator variable that is equal to one if a firm suffers from a loss in a given financial year and zero otherwise, and *QUICK* is the quick assets scaled by current liabilities. All continuous variables are winsorized at the 1st and 99th percentile. The sample period is from 2000 to 2022. Statistical significance at the 1%, 5%, and 10% level is indicated by ***, **, and *, respectively. *t*-Statistics (in parentheses) are calculated based on heteroscedasticity-robust standard errors clustered by firm and year.

Panel A: This panel reports the results from the Diagnostic Tests of the Two-Stage Least Squares Regression

*Post estimation Test of Endogeneity*

$H_0$ = *Variables are exogenous*

*Robust regression F (1, 1190)* = 4.555 (p = 0.033)

*Test of Weak Instruments*

$H_0$ = *Instruments are weak*

*F (2, 1190)* = 190.516 (p = 0.000)

*Test of Over-Identifying Restrictions*

$H_0$ = *Instruments are valid*

*Sargan's* $\chi^2$*(p-value)* = 0.294 (0.566)

*Basmann's* $\chi^2$*(p-value)* = 0.292 (0.567)

| Panel B: Endogeneity Tests | (1) | (2) |
|---|---|---|
| | 2SLS Regression | |
| | First-Stage | Second-Stage |
| *lnCSR* | | 0.158 |
| | | (9.362)*** |
| *MB* | 0.000 | 0.000 |
| | (1.930)* | (1.540) |
| *STKRET* | 4.673 | 8.923 |
| | (0.580) | (4.034)*** |
| *FIRMSIZE* | -0.043 | -0.037 |
| | (-2.620)*** | (-2.560)** |
| *RND* | 4.280 | -2.179 |
| | (1.810)* | (-1.940)* |
| *DEP* | 6.002 | 1.621 |
| | (5.250)*** | (2.958)*** |
| *LEV* | -0.426 | -0.057 |
| | (-3.890)*** | (-0.755) |
| *CASH* | 1.293 | -0.371 |
| | (5.010)*** | (-2.274)** |
| *LOSS* | -0.422 | -0.245 |
| | (-7.800)*** | (-10.124)*** |
| *QUICK* | -0.063 | -0.024 |
| | (-6.150)*** | (-3.153)*** |
| $IV_1$ | 216.473 | |
| | (17.430)*** | |
| $IV_2$ | 57.119 | |
| | (10.440)*** | |
| *Constant* | -11.312 | -7.099 |
| | (-1.400) | (-3.197)*** |
| *N* | 12,607 | 12,607 |
| *Adj-*$R^2$ | 0.496 | 0.272 |
| *Industry FE* | YES | YES |
| *Year FE* | YES | YES |

**Table 6: Difference-in-Difference Analysis (To be added)**

## Table 7: Other proxies of financial distress risk

This table presents the additional analysis, where the dependent variable is the financial distress risk which is measured by different proxies of financial distress risk namely *O-Score*, *ZM-Score*, and revised *Z-Score* wherein *O-Score* is measured by following Ohlson (1980), *ZM-Score* is computed by following Zmijewski (1984) and revised *Z-Score* is calculated by following Altman (2017). The independent variable is the *lnCSR*, calculated as the natural log of *CSREXP*, estimated as the total amount spent on CSR activities undertaken by a firm, scaled by total assets. *MB* is the market value of equity divided by the book value of equity, *STKRET* is the average of the monthly stock return calculated over a year, *FIRMSIZE* is the natural log of the book value of total assets, *RND* is the research and development expenses scaled by total assets, *DEP* is the total depreciation scaled by the total assets, *LEV* is long term borrowings scaled by total assets, *CASH* is cash and cash equivalent defined as a ratio of the total assets, *LOSS* is an indicator variable that is equal to one if a firm suffers from a loss in a given financial year and zero otherwise, and *QUICK* is the quick assets scaled by current liabilities. All continuous variables are winsorized at the 1st and 99th percentile. The sample period is from 2000 to 2022. Statistical significance at the 1%, 5%, and 10% level is indicated by ***, **, and *, respectively. *t*-Statistics (in parentheses) are calculated based on heteroscedasticity-robust standard errors clustered by firm and year.

| | (1) | (2) | (3) |
|---|---|---|---|
| | *O-Score* | *ZM-Score* | *Altman (2017)* |
| *lnCSR* | -0.034 | -0.042 | 0.133 |
| | (-3.898)*** | (-7.278)*** | (2.474)** |
| *MB* | -0.000 | -0.000 | 0.004 |
| | (-2.080)** | (-1.730)* | (2.717)** |
| *STKRET* | -7.525 | -6.017 | -16.935 |
| | (-2.401)** | (-3.008)*** | (-0.990) |
| *FIRMSIZE* | -0.368 | -0.012 | -0.107 |
| | (-71.546)*** | (-3.016)*** | (-1.881)* |
| *RND* | 2.003 | 1.595 | 16.561 |
| | (3.230)*** | (3.188)*** | (4.324)*** |
| *DEP* | 2.505 | 0.216 | -7.018 |
| | (3.688)*** | (0.725) | (-1.976)* |
| *LEV* | 6.152 | 5.907 | -5.572 |
| | (68.560)*** | (149.561)*** | (-7.533)*** |
| *CASH* | -1.050 | -0.401 | 5.745 |
| | (-7.114)*** | (-4.272)*** | (5.617)*** |
| *LOSS* | 0.774 | 0.526 | -1.885 |
| | (18.185)*** | (35.230)*** | (-10.018)*** |
| *QUICK* | -0.065 | 0.003 | 0.214 |
| | (-4.176)*** | (0.929) | (4.361)*** |
| *Constant* | 5.439 | 1.234 | 25.736 |
| | (1.781)* | (0.621) | (1.524) |
| *N* | 13,488 | 14,504 | 14,713 |
| *Adj-$R^2$* | 0.927 | 0.951 | 0.488 |
| *Industry FE* | YES | YES | YES |
| *Year FE* | YES | YES | YES |

## Table 8: Firm life cycle stages

This table presents the results of the impact of different stages of the firm life cycle on the relationship between CSR and financial distress risk using OLS results, wherein the dependent variable is *Z-Score* in all the cases, which is estimated by following Altman (1968). The independent variable is the *lnCSR*, calculated as the natural log of CSREXP, estimated as the total amount spent on CSR activities undertaken by a firm, scaled by total assets. The sample is divided into three subsamples based on the life cycle stage of the firm. A firm is in the young (old) stage when it lies in the lower 25% (higher 25%), and in the mature stage when it lies in between the top and bottom 25% of the distribution. *Listing Age* is estimated as the number of years counted from the date of listing on the stock exchange, and *Incorporation Age* is calculated as the number of years counted from the date of incorporation of the firms. *MB* is the market value of equity divided by the book value of equity, *STKRET* is the average of the monthly stock return calculated over a year, *FIRMSIZE* is the natural log of the book value of total assets, *RND* is the research and development expenses scaled by total assets, *DEP* is the total depreciation scaled by the total assets, *LEV* is long term borrowings scaled by total assets, *CASH* is cash and cash equivalent defined as a ratio of the total assets, *LOSS* is an indicator variable that is equal to one if a firm suffers from a loss in a given financial year and zero otherwise, and *QUICK* is the quick assets scaled by current liabilities. All continuous variables are winsorized at the 1st and 99th percentile. The sample period is from 2000 to 2022. Statistical significance at the 1%, 5%, and 10% level is indicated by ***, **, and *, respectively. *t*-Statistics (in parentheses) are calculated based on heteroscedasticity-robust standard errors clustered by firm and year.

| | (1) | (2) | (3) | (4) | (5) | (6) |
|---|---|---|---|---|---|---|
| | Listing Age | | | Incorporation Age | | |
| | Young | Mature | Old | Young | Mature | Old |
| *lnCSR* | 0.118 | 0.133 | 0.134 | 0.108 | 0.115 | 0.198 |
| | (8.592)*** | (7.775)*** | (6.524)*** | (5.877)*** | (8.381)*** | (7.188)*** |
| *MB* | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| | (3.190)*** | (1.522) | (1.116) | (3.305)*** | (2.049)** | (0.292) |
| *STKRET* | 5.255 | 8.111 | 5.340 | 6.435 | 8.875 | 4.137 |
| | (1.356) | (3.021)*** | (1.255) | (1.649)* | (3.557)*** | (0.935) |
| *FIRMSIZE* | -0.050 | -0.031 | -0.063 | -0.049 | -0.064 | 0.015 |
| | (-2.618)*** | (-1.386) | (-4.578)*** | (-3.006)*** | (-4.633)*** | (0.452) |
| *RND* | -0.306 | -6.568 | 1.318 | -0.392 | -5.132 | -2.086 |
| | (-1.647) | (-5.522)*** | (0.512) | (-1.384) | (-4.635)*** | (-0.743) |
| *DEP* | 0.763 | 1.916 | 5.300 | 0.389 | 3.323 | 2.558 |
| | (1.037) | (2.512)** | (3.991)*** | (0.485) | (4.168)*** | (1.855)* |
| *LEV* | -0.072 | -0.059 | -0.234 | -0.014 | -0.226 | 0.099 |
| | (-0.991) | (-0.652) | (-2.142)** | (-0.368) | (-3.433)*** | (0.494) |
| *CASH* | -0.243 | -0.714 | 0.236 | -0.501 | -0.569 | 0.067 |
| | (-1.138) | (-3.199)*** | (0.730) | (-2.052)** | (-2.766)*** | (0.200) |
| *LOSS* | -0.299 | -0.294 | -0.130 | -0.344 | -0.236 | -0.202 |
| | (-10.284)*** | (-8.915)*** | (-3.152)*** | (-10.312)*** | (-9.120)*** | (-3.796)*** |
| *QUICK* | -0.020 | -0.024 | -0.016 | -0.024 | -0.018 | -0.043 |
| | (-2.833)*** | (-2.080)** | (-2.718)*** | (-2.780)*** | (-3.023)*** | (-1.976)** |
| *Constant* | -3.358 | -6.361 | -3.870 | -5.001 | -6.643 | -2.764 |
| | (-0.859) | (-2.319)** | (-0.898) | (-1.271) | (-2.589)*** | (-0.624) |
| *N* | 4,025 | 7,629 | 3,202 | 3,949 | 7,264 | 3,643 |
| *Adj-$R^2$* | 0.282 | 0.251 | 0.342 | 0.277 | 0.302 | 0.249 |
| *Industry Effects* | YES | YES | YES | YES | YES | YES |
| *Year Effects* | YES | YES | YES | YES | YES | YES |

## Table 9: Mandatory CSR period, explain-only firms, mandated amount and components of CSR

This table presents results obtained from the estimation of OLS regression model. The dependent variable is *Z-Score*, wherein it is estimated by following Altman (1968). The main explanatory variable is represented by *X*, which is one of *lnCSR*, *lnSOCIAL*, *lnENVIRON*, or *lnEMP*, where *lnCSR* is the natural log of *CSREXP*, which is the amount spent on CSR activities scaled by total assets, *lnSOCIAL*, *lnENVIRON*, and *lnEMP* are the natural log of the amount spent on social-and-community, environment, and employee-welfare related CSR spending, scaled by total assets, respectively. *POST2014* is one for 2015-2021 and zero for 2000-2014, *EXPLAIN* is one for firms that spend less than the minimum mandated amount on CSR activities, and *MANDATED* is one if firms spend more than the minimum mandated amount on CSR activities. *MB* is the market value of equity divided by the book value of equity, *STKRET* is the average of the monthly stock return calculated over a year, *FIRMSIZE* is the natural log of the book value of total assets, *RND* is the research and development expenses scaled by total assets, *DEP* is the total depreciation scaled by the total assets, *LEV* is long term borrowings scaled by total assets, *CASH* is cash and cash equivalent defined as a ratio of the total assets, *LOSS* is an indicator variable that is equal to one if a firm suffers from a loss in a given financial year and zero otherwise, and *QUICK* is the quick assets scaled by current liabilities. All continuous variables are winsorized at the 1st and 99th percentile. The sample period is from 2000 to 2022. Statistical significance at the 1%, 5%, and 10% level is indicated by ***, **, and *, respectively. *t*-Statistics (in parentheses) are calculated based on heteroscedasticity-robust standard errors clustered by firm and year.

| | (1) | (2) | (3) | (4) | (5) | (6) |
|---|---|---|---|---|---|---|
| | | *Sample consists of mandatory CSR period only* | | | | |
| | *X = lnCSR*<br>*Y = Z-Score* | *X = lnCSR*<br>*Y = Z-Score* | *X = lnCSR*<br>*Y = Z-Score* | *X = lnSOCIAL*<br>*Y = Z-Score* | *X = lnENVIRON*<br>*Y = Z-Score* | *X = lnEMP*<br>*Y = Z-Score* |
| *X* | 0.138 | 0.136 | 0.129 | 0.048 | 0.006 | 0.122 |
| | (10.368)*** | (11.106)*** | (10.447)*** | (2.892)*** | (0.320) | (10.460)*** |
| *X × POST2014* | -0.023 | | | | | |
| | (-1.806)* | | | | | |
| *POST2014* | -0.035 | | | | | |
| | (-0.478) | | | | | |
| *X × EXPLAIN* | | -0.046 | | | | |
| | | (-2.196)* | | | | |
| *EXPLAIN* | | -0.173 | | | | |
| | | (-1.509) | | | | |
| *X × MANDATED* | | | 0.021 | | | |
| | | | (0.946) | | | |
| *MANDATED* | | | 0.124 | | | |
| | | | (1.026) | | | |
| *MB* | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| | (1.904)* | (1.937)* | (2.098)* | (1.651) | (0.790) | (1.918)* |
| *STKRET* | 7.053 | 11.216 | 7.440 | 24.207 | 9.735 | 6.777 |
| | (2.508)** | (3.576)*** | (2.577)** | (3.849)*** | (0.753) | (2.409)** |
| *FIRMSIZE* | -0.041 | -0.047 | -0.054 | -0.051 | -0.081 | -0.040 |
| | (-3.040)*** | (-4.365)*** | (-4.888)*** | (-3.009)*** | (-2.206)** | (-2.895)*** |
| *RND* | -1.069 | -0.823 | -0.444 | -4.080 | -7.145 | -1.039 |
| | (-1.473) | (-1.245) | (-1.096) | (-3.448)*** | (-3.134)*** | (-1.458) |
| *DEP* | 2.105 | 2.125 | 2.398 | 3.392 | 0.494 | 2.124 |
| | (3.739)*** | (3.142)** | (3.532)*** | (3.659)*** | (0.147) | (3.744)*** |
| *LEV* | -0.068 | 0.103 | 0.114 | -0.165 | -0.361 | -0.080 |
| | (-0.805) | (1.035) | (1.070) | (-1.114) | (-1.298) | (-0.980) |
| *CASH* | -0.367 | -0.445 | -0.435 | -0.343 | 0.573 | -0.297 |
| | (-2.639)** | (-3.176)** | (-2.990)** | (-2.001)* | (1.212) | (-2.155)** |
| *LOSS* | -0.285 | -0.300 | -0.321 | -0.234 | -0.282 | -0.299 |
| | (-9.856)*** | (-8.896)*** | (-9.370)*** | (-5.810)*** | (-2.160)** | (-9.505)*** |
| *QUICK* | -0.020 | -0.014 | -0.013 | -0.035 | -0.095 | -0.019 |
| | (-3.655)*** | (-2.306)* | (-2.358)* | (-3.530)*** | (-1.354) | (-3.535)*** |
| *Constant* | -5.359 | -9.348 | -5.597 | -22.657 | -8.068 | -5.226 |
| | (-1.898)* | (-3.000)** | (-1.949)* | (-3.569)*** | (-0.619) | (-1.851)* |
| *N* | 14,713 | 6,877 | 5,033 | 5,070 | 633 | 14,643 |
| *Adj-$R^2$* | 0.267 | 0.310 | 0.344 | 0.222 | 0.168 | 0.266 |
| *Industry FE* | YES | YES | YES | YES | YES | YES |
| *Year FE* | YES | YES | YES | YES | YES | YES |

## Table 10: Financial constraints

This table presents the impact of financial constraints on the relationship between CSR and financial distress risk using OLS results, wherein the dependent variable is *Z-Score* in all the cases, which is estimated by following Altman (1968). The main explanatory variable is represented by *X*, which is one of *lnSOCIAL*, *lnENVIRON*, or *lnEMP*, where *lnSOCIAL*, *lnENVIRON*, and *lnEMP* are the natural log of the amount spent on social-and-community, environment, and employee-welfare related CSR spending, scaled by total assets, respectively. The financial constraints are proxied by using the index developed by Kaplan and Zingales (1997). *MB* is the market value of equity divided by the book value of equity, *STKRET* is the average of the monthly stock return calculated over a year, *FIRMSIZE* is the natural log of the book value of total assets, *RND* is the research and development expenses scaled by total assets, *DEP* is the total depreciation scaled by the total assets, *LEV* is long term borrowings scaled by total assets, *CASH* is cash and cash equivalent defined as a ratio of the total assets, *LOSS* is an indicator variable that is equal to one if a firm suffers from a loss in a given financial year and zero otherwise, and *QUICK* is the quick assets scaled by current liabilities. All continuous variables are winsorized at the 1st and 99th percentile. The sample period is from 2000 to 2022. Statistical significance at the 1%, 5%, and 10% level is indicated by ***, **, and *, respectively. *t*-Statistics (in parentheses) are calculated based on heteroscedasticity-robust standard errors clustered by firm and year.

| | (1)<br>*X = lnSOCIAL*<br>*Y = Z-Score* | (2)<br>*X = lnENVIRON*<br>*Y = Z-Score* | (3)<br>*X = lnEMP*<br>*Y = Z-Score* |
|---|---|---|---|
| *X* | 0.053 | 0.003 | 0.103 |
| | (2.803)** | (0.112) | (5.790)*** |
| *X×KZ* | 0.000 | 0.000 | 0.000 |
| | (2.385)** | (0.868) | (3.327)*** |
| *KZ* | 0.018 | 0.152 | 0.022 |
| | (1.501) | (1.093) | (1.846)* |
| *MB* | -0.005 | -0.042 | -0.006 |
| | (-1.331) | (-1.078) | (-1.671) |
| *STKRET* | 29.725 | 19.932 | 21.745 |
| | (5.363)*** | (1.002) | (5.102)*** |
| *FIRMSIZE* | -0.056 | -0.075 | -0.056 |
| | (-2.636)** | (-1.252) | (-3.280)*** |
| *RND* | -4.923 | -4.951 | -5.713 |
| | (-4.037)*** | (-2.473)** | (-4.817)*** |
| *DEP* | 4.051 | 3.019 | 2.258 |
| | (3.351)*** | (0.687) | (2.830)** |
| *LEV* | -0.286 | 0.272 | -0.284 |
| | (-1.538) | (0.488) | (-2.510)** |
| *CASH* | -0.526 | 0.142 | -0.515 |
| | (-2.254)** | (0.244) | (-2.580)** |
| *LOSS* | -0.196 | -0.045 | -0.210 |
| | (-5.472)*** | (-0.219) | (-6.117)*** |
| *QUICK* | -0.038 | 0.046 | -0.025 |
| | (-3.291)*** | (0.705) | (-2.842)** |
| *Constant* | -27.564 | -18.418 | -19.796 |
| | (-4.904)*** | (-0.926) | (-4.652)*** |
| *N* | 3,196 | 293 | 5,436 |
| *Adj-$R^2$* | 0.224 | 0.165 | 0.261 |
| *Industry Effects* | YES | YES | YES |
| *Year Effects* | YES | YES | YES |

## Table 11: Cost of debt and credit ratings

This table presents the impact of financial constraints on the relationship between CSR and financial distress risk using OLS results, wherein the dependent variable is the cost of debt (*KD*) in Columns (1)-(3) and credit ratings (*CRTNG*) in Columns (4)-(6). The main explanatory variable is represented by *X*, which is one of *lnSOCIAL*, *lnENVIRON*, or *lnEMP*, where *lnSOCIAL*, *lnENVIRON*, and *lnEMP* are the natural log of the amount spent on social-and-community, environment, and employee-welfare related CSR spending, scaled by total assets, respectively. *FIRMSIZE* is the natural log of the book value of total assets, *LEV* is long term borrowings scaled by total assets, *EBIT/TA* is the ratio of earnings before interest and taxes scaled by total assets, *RND* is the research and development expenses scaled by total assets, *ADV* is the advertisement expenses scaled by total assets, *CAPEX* is the capital expenditure incurred divided by total assets, *DIV* is the dividend paid by the company scaled by total assets, *TANG* is the ratio of plant, property, and equipment divided by total assets, *MB* is the market value of equity divided by the book value of equity, *CF* is cash flow from operating activities scaled by total assets, *SD_CF* is the standard deviation of *CF*, using data for the trailing three years. All continuous variables are winsorized at the 1st and 99th percentile. The sample period is from 2000 to 2022. Statistical significance at the 1%, 5%, and 10% level is indicated by ***, **, and *, respectively. *t*-Statistics (in parentheses) are calculated based on heteroscedasticity-robust standard errors clustered by firm and year.

| | (1) | (2) | (3) | (4) | (5) | (6) |
|---|---|---|---|---|---|---|
| | *X = lnSOCIAL* | *lnENVIRON* | *lnEMP* | *X = lnSOCIAL* | *lnENVIRON* | *lnEMP* |
| | *Y = KD* | *Y = KD* | *Y = KD* | *Y = CRTNG* | *Y = CRTNG* | *Y = CRTNG* |
| *X* | -1.330 | -1.363 | 0.323 | 0.722 | 2.060 | 3.182 |
| | (-3.116)*** | (-1.532) | (1.431) | (0.504) | (0.830) | (2.767)** |
| *FIRMSIZE* | 0.207 | 1.112 | -0.234 | 19.060 | 13.302 | 16.710 |
| | (0.480) | (0.661) | (-0.826) | (9.842)*** | (5.291)*** | (9.303)*** |
| *LEV* | -34.992 | -26.009 | -10.196 | 58.203 | 45.502 | 22.688 |
| | (-7.991)*** | (-1.747)* | (-3.888)*** | (6.137)*** | (2.058)* | (2.556)** |
| *EBIT/TA* | | | | -15.359 | -41.049 | -5.313 |
| | | | | (-1.093) | (-1.220) | (-0.441) |
| *RND* | | | | -183.376 | -466.232 | -121.119 |
| | | | | (-1.578) | (-2.552)** | (-1.327) |
| *ADV* | | | | -6.565 | 710.682 | 5.190 |
| | | | | (-0.167) | (1.015) | (0.174) |
| *CAPEX* | | | | 38.837 | 51.921 | 31.007 |
| | | | | (1.435) | (0.690) | (2.048)* |
| *DIV* | | | | -72.111 | 78.695 | -59.986 |
| | | | | (-1.484) | (0.315) | (-1.554) |
| *TANG* | -6.004 | -10.294 | -7.941 | 14.419 | -14.643 | 6.880 |
| | (-2.029)* | (-1.170) | (-3.430)*** | (1.133) | (-0.858) | (0.705) |
| *MB* | -0.001 | -0.011 | -0.001 | | | |
| | (-0.569) | (-0.885) | (-0.567) | | | |
| *CF* | 12.126 | 0.272 | 20.190 | | | |
| | (2.841)** | (0.018) | (3.938)*** | | | |
| *SD_CF* | -4.943 | -19.110 | -4.559 | | | |
| | (-0.586) | (-1.098) | (-0.705) | | | |
| *Constant* | 0.778 | 135.297 | 25.205 | -186.266 | -52.386 | -124.633 |
| | (0.186) | (3.918)*** | (9.020)*** | (-9.162)*** | (-2.105)** | (-8.617)*** |
| *N* | 3,905 | 433 | 9,876 | 3,451 | 381 | 7,454 |
| *Adj-$R^2$* | 0.070 | 0.142 | 0.050 | 0.221 | 0.327 | 0.216 |
| *Industry Effects* | YES | YES | YES | YES | YES | YES |
| *Year Effects* | YES | YES | YES | YES | YES | YES |