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Does Corporate Social Responsibility (CSR) Improve Credit Ratings? Evidence from Geographic Identification

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We show that a firm's CSR policy is significantly influenced by the CSR policies of firms in the same three-digit zip code, an effect possibly due to investor clienteles, local competition, and/or social interactions. We then exploit the variation in CSR across the zip codes to estimate the effect of CSR on credit ratings under the assumption that zip code assignments are exogenous. We find that more socially responsible firms enjoy more favorable credit ratings. In particular, an increase in CSR by one standard deviation improves the firm's credit rating by as much as 4.5%.

We find that a firm's corporate social responsibility (CSR) policy is significantly influenced by the CSR policies of firms in the same three-digit zip code, an effect possibly due to investor clientele, local competition, and/or social interactions. We then exploit the variation in CSR across the zip codes to estimate the effect of CSR on credit ratings under the assumption that zip code assignments are exogenous. We find that more socially responsible firms enjoy more favorable credit ratings. In particular, an increase in CSR by one standard deviation improves the firm's credit rating by as much as 4.5%.

Although a tremendous volume of research has been conducted regarding the issue of corporate social responsibility (CSR), its effects on corporations are still not completely understood. One difficulty is identifying exogenous shocks to CSR policies. Due to market segmentation, investor clientele, social interactions, and/or local competition, we hypothesize that firms located in close proximity to one another will have similar CSR policies. Exploiting the variation in CSR policies across geographic locations, we then estimate the effect of CSR on credit ratings since ratings significantly influence the cost of debt for the firm. Firms with favorable credit ratings have better access to capital markets and can borrow at a much lower cost. Additionally, strong credit ratings also inspire investor confidence.

Our proximity measure is based on zip codes. The US Postal Service (USPS) allocates zip codes based on efficiency in mail delivery. Zip code changes are also rare and usually reflect changes in macroeconomic factors such as demographics and urban development. Thus, zip code assignments are unlikely related to corporate policies or outcomes and can be considered exogenous.

The idea of corporate isomorphism and peer pressure is hardly new. Corporations that invest in CSR have strong incentives to publicize their CSR activities and make them as visible as they

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can asocial spending is "akin to advertising" (Dorfman and Steiner, 1954; Milgrom and Roberts, 1986; Navarro, 1988; Webb and Farmer, 1996; Sen and Bhattacharya, 2001). Therefore, CSR activities are highly observable. We argue that the observable nature of CSR makes it likely that firms are influenced by their geographic peers when formulating their own CSR policy. Our results strongly confirm this argument. In particular, the empirical evidence indicates that the degree of CSR of a given firm is significantly influenced by the average degree of CSR of the geographically proximate firms. We find that firms situated in the same three-digit zip code exhibit similar CSR policies. The influence of the surrounding firms on CSR remains significant even after controlling for a number of firm characteristics, such as firm size, leverage, profitability, research and development (R&D) spending, capital expenditures, and advertising, as well as possible variations over time and across industries.

We explore the impact of CSR on credit ratings using an identification strategy based on the geographic similarity in CSR policies. Part of the firm's CSR can be attributed to its neighbors. Therefore, it comes from outside the firm and can be considered exogenous. It is this variation in CSR across geographical locations that we exploit in our empirical strategy. Using the average CSR level of the surrounding firms as an instrumental variable, we estimate a two-stage least squares (2SLS) analysis and demonstrate that a higher degree of CSR leads to better credit ratings. Therefore, CSR is recognized and viewed positively by credit rating agencies. To ascertain the impact of the endogeneity bias, we compare the ordinary least square (OLS) and the 2SLS estimates and find that the difference between the two estimates is quite large. In particular, without properly accounting for endogeneity, the effect of CSR on credit ratings would be underestimated by approximately 45%.

We are also aware of a possible endogeneity bias that can be attributed to unobservable firm characteristics. Certain firm attributes not included in the model may influence both CSR and credit ratings, possibly leading to a spurious correlation between CSR and credit ratings. To ensure that our results are not confounded by the omitted variable bias, we execute a two-stage fixed effects analysis, which controls for both possible reverse causality and for the omitted variable bias. We obtain consistent results. The impact of CSR on credit ratings is not only statistically significant, but is also economically meaningful. In particular, an increase in CSR by one standard deviation improves the firm's credit rating by as much as 4.5%.[1]

The literature on the effect of CSR on corporate outcomes is divided. While the more recent evidence appears to demonstrate the beneficial effects of CSR (Orlitzky, Schmidt, and Rynes, 2003; Saiia, Carroll, and Buchholtz, 2003; Godfrey, 2005; Brammer and Millington, 2008; Benson and Davidson, 2010), a large number of other studies find either negative or insignificant results (Aupperle, Carroll, and Hatfield, 1985; McGuire, Sundgren, and Schneeweis, 1988; Wright and Ferris, 1997; Teoh, Welch, and Wazzan, 1999). The literature concerning credit ratings has documented a large number of firm characteristics that influence credit ratings. For example, default risk is found to be inversely related to credit ratings (Lamy and Thompson, 1988; Ziebart and Reiter, 1992), whereas firm size is positively related to credit ratings (Horrigan, 1966, Kaplan and Urwitz, 1979; Boardman and McEnally, 1981; Bhoraj and Sengupta, 2003). Closely related are recent studies that demonstrate that better corporate governance is associated with better

[1] The instrumental variable (IV) approach is especially appropriate in this context as the IV estimation addresses the attenuation bias resulting from mismeasured explanatory variables, which, unless properly addressed, would bias coefficient estimates toward zero. Since it is difficult to precisely measure CSR, there could be measurement errors. The IV approach helps mitigates the bias attributable to these possible measurement errors (Miguel, Satyanath, and Sergenti, 2004).

credit ratings (Ashbaugh-Skaife, Collins, and LaFond, 2006; Liu and Jiraporn, 2010). The role of nonfinancial attributes, however, such as CSR, has rarely been investigated in the literature.

The results of our study contribute to the literature in several ways. First, our study is the first to demonstrate that geography plays an important role in shaping a firm's CSR policy. Additionally, standard economic theory does not recognize the role of peer effects, social interactions, and investor clientele. We argue that these factors are crucial and induce similarity in the CSR policies of geographically close firms. Finally, by investigating the effect of CSR on credit ratings, this paper, for the first time, points to a potential new channel as to how CSR might impact the cost of debt.

The remainder of this article is organized as follows. Section I reviews the prior literature and develops the hypotheses. Section II discusses the sample formation and describes the data. Section III presents the results regarding geography and CSR. Section IV estimates the impact of CSR on credit ratings using geographic identification, while Section V offers our concluding remarks.

I. Prior Research and Hypothesis Development

A. Corporate Social Responsibility (CSR)

Companies are usually considered socially responsible when they voluntarily take actions that benefit not only their shareholders, but also broader groups of stakeholders as well as society at large. Examples of CSR activities include philanthropy, environmental compliance and improvements, community participation and enhancements, product safety, and promotion of human rights. For instance, Tyson Foods donates large amounts of chicken to local food banks as part of its hunger relief program. Haagen-Dazs promotes an environmental initiative to preserve honeybees, which are disappearing at an alarming rate. The company supports research that explores ways in which honeybees can be better protected in the environment. A growing number of firms refuse to use parts manufactured in countries where human rights violations are rampant. As awareness on CSR strengthens over the years, more and more companies engage in more diverse CSR activities.

In the literature, a large number of recent studies explore the issue of CSR. For instance, Jiao (2010) reports that more socially responsible companies exhibit higher firm value, as measured by Tobin's q. Benson and Davidson (2010) examine the relation between firm value, stakeholder relations, and executive compensation. They find that stakeholder management is positively related to firm value. However, firms do not compensate managers for having good relationships with stakeholders. Atkas, Bodt, and Cousin (2011) determine that acquisitions where the target firm is more socially responsible elicit more favorable stock market reactions, suggesting that investors value CSR. Finally, Deng, Kang, and Low (2013) report higher acquisition announcement returns when the acquirer is more socially responsible. Their evidence supports the stakeholder value maximization view. Firm that integrate various stakeholders' interests in their business operations make better investments resulting in higher shareholder wealth and corporate value.

B. Geography and Corporate Policy

A distinct area of the literature examines the impact of geography on firm policy. For example, Kedia and Rajgopal (2009) find that a firm is more likely to grant stock options to rank and file employees if other firms in the same area do so. The authors argue that location matters because of local labor market conditions and social interaction with neighboring firms. John, Knyazeva,

and Knyazeva (2011) report that remotely located firms facing free cash flow problems are more likely to use dividends to alleviate agency conflict. Further evidence concerning the effect of geography can be found in the following studies. Acquirers prefer local targets and gain more from local acquisitions (Kang and Kim, 2008; Kedia, Panchapagesan, and Uysal, 2008). Local dividend clientele influence dividend policy (Becker, Ivkovic, and Weisbenner, 2011). Location also affects chief executive officer (CEO) power and board composition (Francis et al., 2007; Knyazeva, Knyazeva, and Masulis, 2010). Firms located in a more metropolitan area use more equity financing and better quality underwriters (Loughran and Schultz, 2006). Geographic location also influences corporate governance and financing policies (John and Kadyrzhanova, 2008; Gao, Ng, and Wang, 2011).

C. Geographic Proximity and Corporate Social Responsibility

A crucial hypothesis of this study is that the degree of corporate social responsibility (CSR) of a firm is influenced by that of the geographically proximate firms. Several arguments can be made in support this hypothesis. The first argument is based on geographic segmentation and investor clientele. A large number of prior studies document that professional money managers and individual investors exhibit preferences for geographically proximate investments (Coval and Moskowitz, 1999; Grinblatt and Keloharju, 2001; Zhu, 2002; Ivkovic and Weisbenner, 2005; Massa and Simonov, 2006). Local investors in different geographical locations likely exhibit different preferences for CSR. For instance, in an area where environmental problems are more severe, local investors may expect local firms (in which they are stockholders) to be more environmentally conscious.[2] Thus, firms that are situated geographically close to each other are affected by the same local factors and preferences and should exhibit similarities in their CSR policies.

In addition, local competition is expected to be a critical factor. CSR is usually viewed positively by investors. How investors view a firm's CSR policy may depend, in part, on the CSR policies of neighboring firms. Investors may have a negative view of a firm if its CSR policy is much weaker than those of the surrounding firms. For this reason, when formulating its CSR policy, a firm must take into consideration the CSR policies of surrounding firms. Local competition to attract investors forces the CSR policies of geographically proximate firms to be similar. Moreover, social interaction and peer effects can be particularly important for corporate decision makers. Managers who work in the same geographic area usually have opportunities to network and build valuable relationships with their peers, exchanging ideas and learning from one another's experience (Pirinsky and Wang, 2010). The social interactions and peer effects of the executives in the same geographic area have the potential to make the CSR policies of neighboring firms more similar.

D. Corporate Social Responsibility and Credit Ratings

Credit ratings provide information about default likelihood and the financial health of firms, thereby reducing a duplication of effort in the financial markets. They enable investors to readily assess broad risk properties of a large number of firms using a single and well known scale. Additionally, credit ratings play a crucial role in regulation and private contracting, as a tool

[2] Consistent with this notion, Pirinsky and Wang (2010) argue that the local preference of investors naturally creates a clientele of investors from the same region, which could have an influence on major corporate policies. For example, a company that is headquartered in Boston would have a disproportionately large number of (local) institutional investors that could affect its corporate financial policies.

for measuring and mitigating risk. We hypothesize that if CSR activities are beneficial to the firm, such a positive effect should be viewed favorably by credit rating agencies. As a result, the benefit of CSR should be reflected in the firm's credit rating. Credit rating agencies are sophisticated financial intermediaries with strong financial expertise. They also have access to better information than the average investor. Therefore, if CSR has a beneficial effect, credit rating agencies are more likely to discover it than public investors in general.[3]

Prior literature suggests that CSR engagement can help firms build positive moral capital that insulates them from adverse events in the future. Thus, firms with more CSR engagement are exposed to a lower degree of risk (Godfrey, 2005; Gardberg and Fombrun, 2006; Godfrey, Merrill, and Hansen, 2009). Debtholders and credit rating agencies care primarily about the default risk. This risk mitigation view suggests that CSR activities improve credit ratings. However, the agency view argues that CSR investments represent a misallocation of resources. Managers tend to overinvest in CSR to enhance their own private benefits, rather than to maximize shareholder wealth (Friedman and Friedman, 1962; Bernea and Rubin, 2010). This view perceives CSR investments as an agency problem that reduces firm value, thereby hurting both debtholders and shareholders. Because the risk mitigation view and the agency view offer conflicting predictions, the effect of CSR on credit ratings remains an empirical question.

II. Sample Construction and Data Description

A. Sample Formation

Our CSR sample is from Kinder, Lydenberg, and Domini's (KLD's) database. The KLD database is the most widely recognized and reliable database in the CSR literature referenced by over 40 peer reviewed articles. We obtain data on corporate headquarters location and other financial and accounting characteristics from Compustat. We classify firm geographic location by the three-digit zip code. A three-digit zip code is included if it has at least five corporate headquarters.[4] Geographic and economic data, such as land area, population, and household income, are from the Census Bureau report. Our final sample is comprised of a total of 2,516 firm-year observations from 1995 to 2007. Please note that we include only those firms with complete data on all of the variables. As a robustness check, we also use an alternative sample where we assume that R&D and advertising expenditures are zero when the data are missing. We report the number of observations remaining after each screening criterion in Table A1.

B. Corporate Social Responsibility (CSR) Score

One challenge for research in CSR is the measurement of CSR. Prior research uses a number of alternative CSR measures. However, KLD is the most recognized and accepted in the literature.[5]

[3] Credit ratings agencies are more likely to discover the value of CSR for a number of reasons. First, credit rating agencies have more resources dedicated to the analysis of corporate performance. In addition, credit rating agencies enjoy economies of scale, where the expertise developed for one group of firms can be used for another group. Moreover, credit rating agencies accumulate their expertise over time and, as such, are more likely to discern potentially value-creating activities such as CSR.

[4] Our sample includes 133 unique three-digit zip codes with at least five corporate headquarters. There are a total of 323 unique three-digit zip codes with at least one corporate headquarters in the United States (according to the data from Compustat). Thus, our sample represents 41.20% of all of the three-digit zip codes with at least one corporate headquarters. We also check the robustness of our results using two-digit zip codes and obtain similar results.

[5] Although there are other alternative measures of CSR, KLD is the most widely accepted. Other CSR measures can be found in Carroll (1991), Hansen and Wernerfelt (1989), and Waddock and Graves (1997).

KLD includes strength ratings and concern ratings for 13 dimensions: (1) community, (2) diversity, (3) corporate governance, (4) employee relations, (5) environment, (6) human rights, (7) product, (8) alcohol, (9) gambling, (10) firearms, (11) military, (12) tobacco, and (13) nuclear power. KLD assigns strengths and concerns in the first seven dimensions, while the final six dimensions are just exclusionary screens and firms can only register concerns in those categories. For instance, a company can receive credit for a strong environment policy at the same time a concern is registered for its environmental record. We do not include the exclusionary screen as part of the total CSR score. The total of the strengths minus the concerns is the composite CSR score (Goss and Roberts, 2011).

C. Firm Location

The modern firm has fuzzy boundaries as its operations and management could encompass numerous countries around the globe. The academic literature usually defines a firm's location as the location of its corporate headquarters. Corporate headquarters are usually close to corporate core business activities. More importantly, corporate headquarters are the place where corporate decision makers reside and are the center of information exchange between the firm and its suppliers, service providers, and investors (Davis and Henderson, 2008; Pirinsky and Wang, 2010).

In this study, we follow the literature and define a firm's location by the location of its headquarters. We identify the zip code of the headquarters location and classify firms as "geographically proximate" if they are located in the same three-digit zip code. This method of geographic identification has several advantages. First, zip codes are easily identifiable and have clear boundaries, facilitating geographic identification. Additionally, the zip code is determined by the US Postal Service to maximize efficient mail delivery. Thus, it is unlikely related to corporate financial characteristics. Moreover, zip code changes are rare. The US Postal Service does not modify zip codes based on corporate performance.[6] For these reasons, a geographic location based on a zip code is likely exogenous.

D. Credit Ratings

We follow Klock, Mansi, and Maxwell (2005) and compute credit ratings using a conversion process in which AAA-rated bonds are assigned a value of 22 and D-rated bonds are assigned a value of 1. For example, a firm with an A+ rating from S&P would receive a score of 18. We focus on the S&P credit ratings because Litov (2005) and Ashbaugh-Skaife et al. (2006) find that the S&P ratings reflect the overall creditworthiness of the firm. Table I provides our credit rating conversion.

E. Summary Statistics

Table II displays the descriptive statistics. A few observations are worth noting. The average credit rating is 13.43, corresponding to BBB−. On average, the sample firms are profitable as indicated by the average earnings before interest and taxes (EBIT) ratio of 0.09 of total assets. The average leverage, calculated as total debt divided by total assets, is 0.30. R&D expenditures and advertising spending average 0.03 and 0.01, respectively. The fixed assets ratio, computed as

[6] Zip codes are occasionally reassigned based on demographics and mail delivery efficiency. For instance, when a rural area becomes suburban, a new zip code is introduced. It is unlikely that corporate financial policies influence how the U.S. Postal Service reallocates zip codes. In this sense, geographic identification based on zip codes is probably exogenous.

Table I. Credit Rating Conversion

Conversion Number	S&P Ratings
22	AAA
21	AA+
20	AA
19	AA−
18	A+
17	A
16	A−
15	BBB+
14	BBB
13	BBB−
12	BB+
11	BB
10	BB−
9	B+
8	B
7	B−
6	CCC+
5	CCC
4	CCC−
3	CC
2	C
1	D

Table II. Descriptive Statistics

Credit ratings are the S&P credit ratings. Leverage is total debt divided by total assets. R&D intensity is R&D expenditures divided by total assets. Advertising intensity is advertising expenditures divided by total assets. The fixed assets ratio is plant, property, and equipment divided by total assets. Firms in the financial industry (SIC 6000 to 6999) and utility industry (SIC 4900 to 4999) are considered regulated. The S&P 500 dummy is equal to one if the firm is included in the S&P 500 Index and zero otherwise. The CSR score is based on the KLD ratings and represents the total of the strengths minus the concerns.

	Mean	Median	*SD*	25th	75th
Credit Ratings	13.43	13.83	3.53	10.00	16.00
Total assets	13,484	3889	46,122	1872	9701
EBIT/total assets	0.09	0.09	0.10	0.06	0.14
Leverage	0.30	0.27	0.18	0.17	0.41
R&D intensity	0.03	0.01	0.05	0.00	0.04
Advertising intensity	0.01	0.00	0.06	0.00	0.00
Fixed assets ratio	0.09	0.07	0.12	0.00	0.13
Regulated	0.10	–	–	–	–
S&P 500	0.53	–	–	–	–
CSR score	0.22	0.00	2.67	−1.00	1.00

Table III. Most and Least Socially Responsible Areas

Most Socially Responsible			Least Socially Responsible		
3-Digit Zip	**Area**	**Avg. CSR**	**3-Digit Zip**	**Area**	**AVG. CSR**
105	West Chester, New York	2.35	727	Fayetteville, Arkansas	−2.35
061	Hartford, Connecticut	2.27	443	Columbus, Ohio	−2.31
551	St. Paul, Minnesota	1.95	662	Shawnee Mission, Kansas	−2.10
102	New York, New York	1.73	151	Pittsburgh, Pennsylvania	−1.60
941	San Francisco, California	1.54	336	Tampa, Florida	−1.56
971	Portland, Oregon	1.42	841	Salt Lake City, Utah	−1.46
970	Portland, Oregon	1.42	153	Pittsburgh, Pennsylvania	−1.40
462	Indianapolis, Indiana	1.39	220	Northern Area, Virginia	−1.26
943	Palo Alto, California	1.20	274	Greensboro, North Carolina	−1.20
146	Rochester, New York	1.13	731	Oklahoma City, Oklahoma	−1.11

plant, property, and equipment divided by total assets, averages 0.09. About 10% of the sample firms are regulated (i.e., they belong to either the financial or utility industries). Approximately 53% of the sample firms are included in the S&P 500 Index. The average CSR score is 0.22. This slightly positive average CSR score indicates that, on average, there are more CSR strengths than CSR concerns.

F. Most and Least Socially Responsible Areas

Table III reports the 10 most socially responsible areas and the 10 least socially responsible areas. The area where firms have the highest average CSR score is the three-digit zip code 105 in West Chester, New York. The next most socially responsible areas are Hartford, Connecticut, St. Paul, Minnesota, and New York, New York.

The rest of the top 10 most socially responsible areas are predominantly in the West (California and Oregon) and the Midwest (Indiana). Alternatively, the area where firms are given the lowest average CSR score is the three-digit zip code 727 for Fayetteville, Arkansas. The rest of the top 10 least socially responsible areas scatter across the country, covering states in different regions including the East (Pennsylvania and Virginia), the Southeast (Florida and North Carolina), and the Midwest (Kansas and Ohio).

G. Control Variables

Based on the literature, we control for a number of firm characteristics that have been found to influence CSR. We control for firm size by including the log of total assets. Large firms tend to attract more attention and pressure to respond to stakeholders' demands (Burke et al., 1986). Large firms are expected to exhibit more social responsibility. We control for profitability by

including the ratio of EBIT to total assets. Evidently, more profitable firms can afford to be more socially responsible. We also include the ratio of debt to total assets to control for financial leverage. McWilliams and Siegel (2001) argue that R&D expenditures have an impact on CSR. Accordingly, we include the ratio of R&D expenditures to total assets.

Furthermore, we control for advertising intensity by including the ratio of advertising expenditures to total assets. Since CSR promotes the reputation of the firm, it may substitute for advertising. We also control for corporate investments by including the ratio of capital expenditures to total assets. Firms that make heavy investments may have fewer funds left for CSR. Firms included in the S&P 500 enjoy more visibility and may be expected to be more socially responsible. Therefore, we include a dummy variable to indicate whether or not the firm is part of the S&P 500 Index. The awareness of CSR has increased over the years. Thus, we control for variation over time in CSR by including year dummies. Finally, it is critical to account for possible industry effects. We control for industry effects by creating industry dummies corresponding to the first two digits of the standard industrial classification (SIC) code. In certain regressions where it is econometrically inadvisable to include industry dummies, we include industry-average CSR to control for any possible industry effects.

III. Geographic Proximity and Corporate Social Responsibility

A. Geographic Proximity and CSR

Following the method in Bouwman (2011), we determine the impact of geography on CSR by exploring how a particular firm's CSR is influenced by the average CSR score of geographically proximate firms, while controlling for other firm characteristics. The regression results are reported in Table IV. The dependent variable is the CSR score. The *t*-statistics are adjusted for error due to clustering at the firm level. Each zip code in our sample contains at least five firms. We compute the average CSR score of all of the firms in the same zip code, excluding firm *i*. In Model 1, the coefficient is positive and highly significant for the average CSR score of the geographically close firms. We control for industry effects by including the industry average CSR score (base on the two-digit SIC). Year dummies are included as well to account for possible variation over time. Thus, after controlling for other firm-specific factors, as well as for industry and time effects, the result indicates that a particular firm's CSR is highly related to the CSR levels of the surrounding firms.[7] It is important to note that the geographic effect is above and beyond the industry effect documented in prior research. The coefficient of the average CSR score of the neighboring firms is approximately one-fifth the magnitude of the coefficient of the industry average, suggesting that the geographic effect is about 20% as strong as the industry effect.

To ensure that our result is robust, we execute additional regressions. Financial and utility firms are unique as they are subject to regulation. The geographic effect of CSR may be different for

[7] We use contemporaneous variables in Table IV. To alleviate concerns regarding possible reverse causality, we also run a regression where the average CSR score of the surrounding firms is lagged by one year. The result remains similar. Furthermore, we investigate the impact of geography on CSR using the same method as Gao et al. (2011). In particular, we construct a location dummy variable for each three-digit zip code. We regress the CSR score on all of the control variables, including the industry dummies and the location dummies. Then, we examine whether the location dummies are jointly significant. The *F*-statistics are significant suggesting that geographic location does matter to CSR. The large *F*-statistics allow us to reject the null hypothesis that geographic location bears no effect on CSR. It is important to note that the industry dummies are also included and are jointly significant. Thus, the location effects are above and beyond those explained by industry.

Table IV. The Impact of Geography on Corporate Social Responsibility

Credit ratings are the S&P credit ratings. Leverage is total debt divided by total assets. R&D intensity is R&D expenditures divided by total assets. Advertising intensity is advertising expenditures divided by total assets. The fixed assets ratio is plant, property, and equipment divided by total assets. Firms in the financial industry (SIC 6000 to 6999) and utility industry (SIC 4900 to 4999) are considered regulated. The S&P 500 dummy is equal to one if the firm is included in the S&P 500 Index and zero otherwise. The CSR score is based on the KLD ratings and represents the total of the strengths minus the concerns. The industry dummies are based on the first two digits of the SIC codes. The geographically proximate firms are those located in the same three-digit zip code as firm *i*. Data on land area, population, and household income are from the Census Bureau report.

	Model 1 (*t*-statistic)	**Model 2 (*t*-statistic)**	**Model 3 (*t*-statistic)**
	Full Sample	**Excluding Regulated Firms**	**With Additional Controls**
Constant	−6.65***	−6.88***	−7.62
	(−7.98)	(−7.76)	(−1.03)
Average CSR score of geographically close firms	0.25***	0.29***	0.25**
	(2.43)	(2.59)	(2.37)
Average CSR score of industry peers	1.35***	1.38***	1.34***
	(7.85)	(7.82)	(7.85)
Ln(total assets)	0.67***	0.70***	0.69***
	(7.61)	(7.49)	(7.69)
EBIT/total assets	2.72***	2.56***	2.66***
	(2.82)	(2.64)	(2.72)
Leverage	0.02	−0.13	−0.01
	(0.05)	(−0.24)	(−0.02)
R&D intensity	9.41***	9.76***	9.40***
	(4.68)	(4.61)	(4.60)
Advertising intensity	0.31	1.02	0.41
	(0.49)	(1.59)	(0.63)
Capital expenditures ratio	−0.02	−0.34**	−0.02
	(−0.16)	(−2.09)	(−0.15)
S&P 500	0.06	0.10	0.06
	(0.31)	(0.45)	(0.30)
No. of firms in the same 3-digit ZIP			−0.01
			(−1.19)
Ln(land area)			−0.14
			(−0.82)
Ln(population)			−0.14
			(−0.56)
Ln(household income)			0.49
			(0.67)
Year dummies	Yes	Yes	Yes
Adjusted R^2	26.72%	27.45%	26.98%
N	2,516	2,241	2,516

***Significant at the 0.01 level.
**Significant at the 0.05 level.
*Significant at the 0.10 level.

these firms. In Model 2, we run a regression without including financial and utility firms. The coefficient of the average CSR score stills retains a positive and significant coefficient. Even after excluding regulated firms, the result remains similar. In addition, it is conceivable that location-specific factors may influence CSR. As a result, we include geographic and economic factors that are specific to each zip code. In particular, we include the number of firms in each zip code, population, land area, and average household income as control variables.[8] Model 3 presents the regression results with the additional control variables. Again, the average CSR score still retains a positive and significant coefficient. Even after controlling for a number of location-specific factors, the effect of the CSR of the surrounding firms remains significant.

B. Additional Robustness Checks

We execute additional robustness checks. First, we employ an alternative definition of a geographic area. Instead of the three-digit zip code, we use only the first two digits. All of the results remain consistent. Next, we hypothesize that firms that are included in the S&P 500 Index are large and are expected to be less affected by local influences such as local competition and investor clientele. If our results are indeed driven by the effect of geographic proximity, we expect the effect to be weaker for the S&P 500 firms, which operate nationally as well as internationally. To test this conjecture, we construct a dummy variable equal to one if the firm is part of the S&P 500 Index and zero otherwise. Then, we interact this variable with the average CSR score of the surrounding firms. The coefficient of this interaction term should reveal the relative effects of the average CSR score on S&P 500 vs. non-S&P 500 firms. The coefficient appears to be negative and significant suggesting that the average CSR score of the neighboring firms has a much weaker effect on the CSR of the S&P 500 firms. This is consistent with our expectations and with the notion that our results are driven by geographic proximity.[9]

C. Possible Reverse Causality

Thus far, we assume that the direction of causality runs from the average CSR score of the neighboring firms to the CSR score of a given firm. Reverse causality would imply that the CSR score of a given firm influences the average CSR score of the geographically proximate firms. Reverse causality is unlikely as we require that each zip code contain at least five firms. Thus, the influence of a single firm on the other four firms should not be so large (the average number of firms in a zip code area is 22, the median 14). To further ensure robustness, we increase the minimum number of firms in each zip code to 20 and 30. The results are presented in Table V. The results hold even when the minimum number of firms is raised to 20 and 30. When one zip code contains 30 firms, the influence of one firm on the other 29 firms in the same area should

[8] We obtain the zip-code specific data from the US Census Bureau.

[9] Because Compustat reports only the current address, it is possible that some sample firms relocated their headquarters and, as such, did not have the same addresses throughout the sample period. This problem is not particularly serious as headquarters relocations are quite rare (Alli, Ramirez, and Yung, 1991; Pirinsky and Wang, 2006). We execute additional tests that should alleviate this problem. First, Pirinsky and Wang (2006) find that the vast majority of the headquarter relocations in their sample come from small firms. Large firms rarely relocate their headquarters. Thus, we concentrate on the S&P 500 firms. These firms are large and are highly unlikely to have their headquarters relocated. Consequently, this subsample is considerably less vulnerable to the relocation bias. Using only the S & P 500 firms, we obtain similar results. In addition, we focus on the subsample of firms in the last year of the sample, where we know with certainty that the addresses are current. Evidently, the relocation bias cannot influence this subsample. We obtain similar results. It appears that the relocation bias does not unduly affect our conclusion.

Table V. Regression Results based on Alternative Minimum Requirements

	Model 1 (*t*-statistic)	Model 2 (*t*-statistic)
Sample Restrictions	**At least 20 Firms**	**At least 30 Firms**
Average CSR score of geographically close firms	0.57*** (2.41)	0.84*** (2.56)
Average CSR score of industry peers	1.54*** (4.76)	1.56*** (3.82)
Control variables	Yes	Yes
Year dummies	Yes	Yes
Adjusted R^2	32.93%	36.44%
N	913	533

***Significant at the 0.01 level.
**Significant at the 0.05 level.
*Significant at the 0.10 level.

be negligible. Therefore, the possibility that our results are driven by reverse causality is quite weak.[10]

We also execute additional empirical tests to mitigate the concern for reverse causality. First, we lag the average CSR score of the geographically close firms by one period (i.e., we regress the CSR score of a given firm at time t on the average CSR score of the surrounding firms in year $t - 1$). We continue to obtain consistent results. Moreover, we identify the first year when each firm shows up in the sample. Then, we replace the average CSR score of the neighboring firms in each year by the value in the earliest year. The logic is that the average CSR score in the earliest year could not have resulted from the CSR score in any of the subsequent years, making reverse causality unlikely. The regression result holds when we use the value in the earliest year. These additional tests increase our confidence that an endogeneity bias due to reverse causality is unlikely in our sample.

D. Fixed Effects Regression Analysis, Regression Based on Changes, and the Possible Urban Effect

To gain further insight, we execute a fixed effects regression analysis. One critical advantage of the fixed effects analysis is that it only captures the variation over time. As such, it controls for the possible effects of unobservable firm characteristics that remain constant over time, thereby minimizing the omitted variable bias. Table VI reports the results of the fixed effects regressions. In Model 1, the average CSR score of the geographically close firms has a positive and significant coefficient. The result suggests that when the neighboring firms become more socially responsible, firm i also increases its own CSR. In Model 3, we average the CSR score over time for each firm. Thus, the regression in Model 3 captures only the cross-sectional variation. The coefficient of the average CSR score is positive and significant. When we only look at the

[10] Another possible argument for reverse causality is that firms may choose a geographic location based on CSR. In other words, firms with high CSR choose to be located closer to other firms with high CSR. This is highly unlikely. Headquarter relocations are rare. It is implausible that firms change location in response to CSR. Furthermore, CSR has received much more attention recently. Thus, CSR has increased significantly over the years. Yet, firms still rarely change their headquarter locations. If reverse causality were valid, we would observe many more corporate relocations as CSR levels change over the years.

Table VI. Within versus Between Variation in Corporate Social Responsibility and Random-effects Regressions

	With-in (Fixed Effects)	Between (Group Means)	Random-Effects
	Model 1 (*t*-statistic)	Model 2 (*t*-statistic)	Model 3 (*t*-statistic)
Average CSR score of geographically close firms	0.51*** (7.34)	0.88*** (7.63)	0.87*** (13.71)
Average CSR score of industry Peers	0.08 (1.07)	0.93*** (6.50)	0.80*** (9.90)
Control variables	Yes	Yes	Yes
Year dummies	Yes	No	Yes
Adjusted R^2	78.68%	28.46%	34.39%
N	2,516	2,516	2.516

***Significant at the 0.01 level.
**Significant at the 0.05 level.
*Significant at the 0.10 level.

cross-sectional variation, we still obtain consistent results. Finally, in Model 3, we conduct a random-effects regression analysis. Once again, the results confirm our prior conclusions.

In addition, we perform a regression analysis based on changes in the variables. We regress changes in the CSR score of a given firm on the changes in the average CSR score of neighboring firms. An analysis based on changes in the variables is less vulnerable to the endogeneity bias. The results are displayed in Model 1 of Table VII. The coefficient of the changes in the average CSR score is positive and significant, confirming our prior results. When the surrounding firms improve their CSR over time, a given firm raises their CSR as well. This is consistent with the evidence from the fixed effects analysis, which captures the variation in CSR over time. Furthermore, it is conceivable that our results are driven by the urban effect. Firms located in a metropolitan area may be more visible and under more pressure to be socially responsible than firms in a rural area. We test this notion by creating a dummy variable equal to one if the firm is located in one of the largest cities in the United States and zero otherwise.[11] The regression results are reported in Model 2 of Table VII. The coefficient of the urban dummy is not significant. Apparently, the location effect documented in our study is not based on the difference between urban and rural areas.[12]

IV. Effect of Corporate Social Responsibility on Credit Ratings

The literature suggests two points of view regarding the impact of CSR on credit ratings. The risk mitigation view argues for a positive association between CSR activities and credit ratings, while the overinvestment hypothesis predicts a negative relationship. Below, we discuss these two hypotheses.

[11] We obtain the population data from the US Census Bureau. According to the 2010 Census, the 10 largest cities are New York, Los Angeles, Chicago, Houston, Philadelphia, Phoenix, San Antonio, San Diego, Dallas, and San Jose.

[12] We thank an anonymous referee for this suggestion.

Table VII. Regression Based on Changes in the Variables and Regression for Possible Urban Effect

Regression Based on Changes	Model 1 (*t*-statistic)	Testing the Urban Effect	Model 2 (*t*-statistic)
Constant	−0.32***	Constant	−7.42***
	(−11.01)		(−6.67)
		Urban Area (1 if Urban)	−0.17
			(−0.56)
Δ Average CSR score of geographically close firms	0.16**	Average CSR score of geographically close firms	0.18*
	(2.22)		(1.76)
Δ Ln(total assets)	−0.17	Ln (total assets)	0.73***
	(−0.99)		(7.09)
Δ EBIT/total assets	−1.09***	EBIT/total assets	2.59***
	(−2.83)		(2.58)
Δ Leverage	0.35	Leverage	−0.51
	(0.83)		(−0.96)
Δ R&D Intensity	−0.30	R&D intensity	11.90***
	(−0.21)		(5.02)
Δ Advertising intensity	3.41*	Advertising intensity	0.84
	(1.71)		(1.46)
Δ Capital expenditures ratio	−0.23***	Capital expenditures ratio	−0.15
	(−3.22)		(−1.55)
S&P 500	−0.91	S&P 500	−0.07
	(0.07)		(−0.34)
Industry dummies	Yes	Industry dummies	Yes
Adjusted R^2	2.70%	Adjusted R^2	30.65%
N	1,978	N	2,516

***Significant at the 0.01 level.
**Significant at the 0.05 level.
*Significant at the 0.10 level.

A. The Risk Mitigation View

One crucial argument in favor of CSR is the notion that CSR engagement reduces risk (McGuire et al., 1988; Starks, 2009). In particular, CSR activities generate a form of goodwill or moral capital for the firm that functions as "insurance-like" protection when negative events occur (Godfrey, 2005; Gardberg and Fombrun, 2006; Godfrey et al., 2009). The positive moral capital alleviates the negative assessments and resulting sanctions by stakeholders following firms' misconduct, making firms less vulnerable to negative events (Godfrey, 2005; Peloza, 2006; Zhang, Zhu, Yue, and Zhu, 2010; Ye and Zhang, 2011). Moreover, CSR engagement fosters relationships with the government and the community, thereby mitigating the risk of litigation and government sanctions that would otherwise threaten firm profitability in the future (McGuire et al, 1988; Peloza, 2006; Sharfman and Fernando, 2008; Dhaliwal, Eheitzman, and Li, 2009; Ye and Zhang, 2011). A number of prior studies provide empirical evidence in favor of the risk mitigation view (Boutin-Dufresne and Savaria, 2004; Lee and Faff, 2009; Godfrey et al., 2009; El Ghoul et al., 2011; Goss and Roberts, 2011). The risk mitigation view is particularly germane to our study. Credit rating agencies and debtholders concentrate considerably more on downside risk when reviewing a firm because their payoff on the upside is limited. Consequently, the risk mitigation hypothesis suggests that more socially responsible firms are assigned more favorable credit ratings.

B. The Overinvestment View

Based on agency theory, this perspective argues that CSR investments constitute costly diversions of firm resources. CSR engagement represents an agency conflict between managers and shareholders. Managers over invest in CSR and gain private benefits at the expense of shareholders. Bernea and Rubin (2010) contend that overinvestments in CSR occur because the credit for CSR initiatives accrues principally to the manager, while the cost is borne by the shareholders. Friedman and Fridman (1962) argue that firms should not be involved in philanthropy as shareholders can better engage in philanthropic activities on their own. Porter and Kramer (2006) also make a similar argument that philanthropy should be left in the hands of individual shareholders. Thus, CSR initiatives represent an inefficient deployment of corporate resources that do not create value for shareholders. To the extent that CSR activities constitute an agency cost or a wasteful diversion of resources, firm value is expected to decline, making both shareholders and debtholders worse off. The overinvestment view suggests that recognizing the agency conflict engendered by CSR activities, credit rating agencies assign lower credit ratings to firms with higher CSR.

C. Empirical Results

A crucial challenge in the empirical literature in CSR is the endogeneity bias, which prevents researchers from drawing casual inferences. Firms with better CSR may enjoy better firm performance. At the same time, better performing firms can afford to invest more in CSR. Thus, it is unclear whether the direction of causality runs from CSR to firm performance or vice versa. One possible solution to the endogeneity problem is the instrumental variable (IV) technique. The idea is to identify a variable that is highly correlated with CSR, yet does not influence firm performance except through CSR. It is difficult to find such a variable as financial variables tend to be correlated. Geographic location has been used as an instrumental variable in many prior studies as it is fixed and more likely to be exogenous.

Previously, we have demonstrated robust evidence that the degree of CSR of a given firm in a particular area is influenced by the CSR of geographically proximate firms. We exploit the variation in CSR across the geographic locations and estimate the impact of CSR on credit ratings. In particular, we employ as our instrumental variable the average CSR score of the surrounding firms in the same three-digit zip code. This variable should be a legitimate instrument for two reasons. First, this variable is clearly related to the CSR score of a given firm, as demonstrated earlier. As such, it meets the relevance requirement for an instrumental variable. In addition, it plausibly meets the exclusion requirement; that is, it is not correlated with credit ratings. The US Postal Service allocates zip codes exclusively based on efficiency in postal delivery, not corporate financial policies or outcomes. Thus, the variation in CSR across zip codes is likely exogenous.

The two-stage least squares (2SLS) results are presented in Table VIII. Model 1 is the first stage regression, where we estimate the CSR score using the average CSR score of the surrounding firms. We include all of the control variables, as well as the year and industry dummies. As expected, the average CSR score of the geographically close firms carries a positive and significant coefficient.[13] Model 2 is the second stage regression, where we take the instrumented value of

[13] To ensure the strength of our instrumental variable, we compute the Anderson canonical correlation LM statistic for under-identification, as well as the Craig-Donald Wald F-statistic for weak identification. These two statistics examine whether the relationship between the instrumental variable and the instruments is sufficiently strong to justify inference from the results. We find that the two statistics are highly significant. Thus, our instrumental variable does not suffer from the weak instrument problem.

Table VIII. Two-Stage Least Squares (2SLS) Analysis of the Effect of CSR on Credit Ratings

Credit ratings are the S&P credit ratings. Leverage is total debt divided by total assets. R&D intensity is R&D expenditures divided by total assets. Advertising intensity is advertising expenditures divided by total assets. The fixed assets ratio is plant, property, and equipment divided by total assets. Firms in the financial industry (SIC 6000 to 6999) and utility industry (SIC 4900 to 4999) are considered regulated. The S&P 500 dummy is equal to one if the firm is included in the S&P 500 Index and zero otherwise. The CSR score is based on the KLD ratings and represents the total of the strengths minus the concerns. The industry dummies are based on the first two digits of the SIC codes. The geographically proximate firms are those located in the same three-digit zip code as firm *i*.

	Model 1 (*t*-statistic)	**Model 2 (*t*-statistic)**	**Model 3 (*t*-statistic)**	**Model 4 (*t*-statistic)**
	First Stage	**Second Stage**	**First Stage**	**Second Stage**
	CSR Score	**Credit Rating**	**CSR Score**	**Credit Rating**
Constant	−6.70***	6.31***	−7.20***	6.27***
	(−6.23)	(5.85)	(−6.76)	(5.88)
Average CSR score of geographically close firms	1.07***	–	1.03***	–
	(17.55)		(17.09)	
Average CSR score of industry Peers (2-digit SIC)	–		0.95***	
			(7.51)	–
CSR score (instrumented)	–	0.23***	–	0.22***
		(4.28)		(4.55)
Ln(total assets)	0.66***	1.27***	0.70***	1.27***
	(16.95)	(23.98)	(17.39)	(25.11)
EBIT/total assets	2.13***	8.97***	1.99***	8.99***
	(4.19)	(18.14)	(3.94)	(18.30)
Leverage	−0.23	−4.54***	−0.22	−4.54***
	(−0.77)	(−16.60)	(−0.77)	(−16.64)
R&D intensity	9.54***	−4.12***	9.61***	−4.06***
	(8.08)	(−3.24)	(8.23)	(−3.25)
Advertising intensity	0.61	0.09	0.57	−0.09
	(0.83)	(−0.13)	(0.79)	(−0.13)
Capital expenditures ratio	−0.21*	0.35***	−0.19*	0.35***
	(−1.94)	(3.42)	(−1.79)	(3.41)
S&P 500	−0.06	−0.07	−0.06	−0.07
	(−0.67)	(−0.83)	(−0.59)	(−0.83)
Dividend/total assets	2.11*	8.63***	1.93*	8.64***
	(1.84)	(7.99)	(1.70)	(8.02)
Fixed assets/total assets	−0.31	2.86***	−0.19	2.86***
	(−0.66)	(6.58)	(−0.42)	(6.58)
Regulated	0.69	0.55	1.54	−1.91
	(0.48)	(−0.41)	(0.87)	(−1.14)
Year dummies	Yes	Yes	Yes	Yes
Industry dummies	Yes	Yes	Yes	Yes
Adjusted R^2	38.27%	68.28%	39.66%	68.33%
Shea's (1997) partial R^2	11.00%	–	13.20%	–
F-statistics	305.32***	75.63***	185.78***	75.78***
Sargan's (1958) Statistic	–	–	–	0.07
N	2,516	2,516	2,516	2,516

***Significant at the 0.01 level.
**Significant at the 0.05 level.
*Significant at the 0.10 level.

the CSR score from the first stage and include it as an independent variable in the second-stage regression. The coefficient of the instrumented CSR score is positive and highly significant. Thus, the evidence suggests that CSR improves credit ratings significantly.[14] In terms of economic significance, the coefficient of the CSR score in the second-stage regression is 0.228. Therefore, an improvement in CSR by one standard deviation raises the firm's credit rating by about 4.5%.[15]

We execute further tests to ensure robustness. The prior 2SLS analysis is exactly identified (i.e., there is one endogenous variable and one instrumental variable). When a model is exactly identified, it is not possible to calculate Sargan's (1958) statistics to determine whether the instrument is valid. As a consequence, we add one more instrument to make the model overidentified, enabling us to execute a test of overidentifying restrictions and compute Sargan's (1958) statistics. Several prior studies employ an industry average as an instrument. The logic is that credit ratings may be related to firm-level CSR. However, it is less likely related to industry-level CSR. Given that there are many firms in an industry, changes in CSR at the industry level are more likely exogenous (the average number of firms in an industry is 21, the median 14). Therefore, we use industry average CSR as an additional instrument. The result of the first stage regression is found in Model 3, where we use as our instruments the average CSR score of neighboring firms and the industry-average CSR score. Both instruments have significant explanatory power as indicated by their positive and highly significant coefficients. Then, in Model 4, which is the second stage regression, we regress credit ratings on the CSR score instrumented from the first stage. The coefficient of the instrumented CSR score is positive and highly significant. Again, the evidence reveals that firms that engage in more CSR activities enjoy better credit ratings. It is important to note that we can now conduct a test of overidentifying restrictions. Sargan's (1958) statistics in Model 4 is 0.067, which is statistically insignificant. Because Sargan's (1958) statistics is not significant, our instrumental variables appear to be valid.[16]

Thus far, we have used the 2SLS estimation to correct for endogeneity. To estimate the magnitude of the endogeneity bias, we run an OLS regression with the same set of control variables and the CSR score that is not instrumented. The result can be found in Table IX, Model 1. The coefficient of the CSR score is positive and significant. Even without correcting for endogeneity, the result indicates that CSR has a favorable effect on credit ratings. Of course, this estimate is subject to the endogeneity bias and is not reliable. It is worth noting, though, that the coefficient of CSR from the OLS regression is 0.126, while the coefficient of CSR from the 2SLS regression (Model 2 of Table VII) is 0.228. Without a proper correction for endogeneity, the effect of CSR on credit rating would be underestimated by about 45%, [(0.228 − 0.126)/0.228]. The significant difference between the two estimates reveals that the effect of the endogeneity bias is not negligible.

To further corroborate the result, we employ an alternative instrumental variable. Instead of using the average CSR score of the surrounding firms in the same year, we now use the average CSR score of neighboring firms from the earliest year in the sample. This instrumental variable is even more unlikely related to credit ratings. Not only does it come from outside the firm (average

[14] We also use the average CSR score of the surrounding firms in the same two-digit, instead of three-digit, zip code and obtain consistent results.

[15] To determine the economic significance, we multiply the standard deviation of the CSR score by the coefficient (2.672 × 0.228 = 0.609). Thus, an increase in CSR by one standard deviation improves the firm's credit rating by 0.609 or about 4.5% of the average credit rating (0.609/13.42 = 0.045).

[16] Gao et al. (2011) report that leverage of firms located in close proximity exhibits similarity. This finding may be relevant to our study as leverage and financial risk are taken into account by credit rating agencies. To explore this issue, we run a regression similar to those in Table VII, but include, as an additional control variable, the average leverage of firms located in the same three-digit zip code. The result remains consistent.

Table IX. Two-Stage Least Squares (2SLS) Analysis of the Effect of CSR on Credit Ratings

Credit ratings are the S&P credit ratings. Leverage is total debt divided by total assets. R&D intensity is R&D expenditures divided by total assets. Advertising intensity is advertising expenditures divided by total assets. The fixed assets ratio is plant, property, and equipment divided by total assets. Firms in the financial industry (SIC 6000 to 6999) and utility industry (SIC 4900 to 4999) are considered regulated. The S&P 500 dummy is equal to one if the firm is included in the S&P 500 Index and zero otherwise. The CSR score is based on the KLD ratings and represents the total of the strengths minus the concerns. The industry dummies are based on the first two digits of the SIC codes. The geographically proximate firms are those located in the same 3-digit zip code as firm *i*.

	Model 1	Model 2	Model 3	Model 4	Model 5
	OLS	First Stage (Earliest year as instrument)	Second Stage	First Stage (Fixed Effects)	Second Stage (Fixed Effects)
	Credit Rating	CSR Score	Credit Rating	CSR Score	Credit Rating
Constant	−3.57***	−4.74***	2.76***	–	–
	(−3.35)	(−6.90)	(1.24)		
CSR score	0.13***	–	–	–	–
	(3.41)				
CSR score (instrumented)	–	–	1.38***	–	0.31***
			(3.28)		(5.51)
					–
Average CSR score of geographically close firms		–	–	0.73***	
				(11.10)	
Average CSR score of geographically close firms (earliest year)		0.20***	–	–	–
		(3.59)			
Ln(total assets)	1.18***	0.61***	0.38	0.03	0.76***
	(13.83)	(15.12)	(1.38)	(0.28)	(11.14)
EBIT/total assets	9.64***	3.46***	4.75***	−0.30	1.44***
	(5.21)	(6.19)	(2.75)	(−0.51)	(3.91)
Leverage	−3.93***	−0.20	−3.68***	0.32	−1.53***
	(−6.91)	(−0.67)	(−7.83)	(0.78)	(−6.06)
R&D intensity	0.08	14.06***	−18.64***	1.93	1.78
	(0.03)	(12.28)	(−2.90)	(0.96)	(1.43)
Advertising intensity	0.08	0.35	−0.49	5.14**	−1.21
	(0.88)	(0.44)	(−0.40)	(2.43)	(−0.90)
Capital expenditures ratio	0.08	−0.10	0.18	−0.27	0.25
	(0.13)	(−0.97)	(1.14)	(−1.08)	(1.58)
S&P 500	−0.05	0.06	−0.12	−0.44*	0.38***
	(−0.27)	(0.56)	(−0.73)	(−2.84)	(3.82)
Fixed assets/Total assets	2.37***	−0.18	2.47***	−5.31***	1.88
	(3.12)	(−0.43)	(3.88)	(−4.42)	(2.29)
Regulated	1.98***	0.12	1.15***	–	–
	(6.90)	(0.61)	(5.15)		
Industry-average	0.56***	−0.04	0.59***	−0.24***	0.36***
Credit rating	(9.72)	(−1.21)	(10.94)	(−7.28)	(18.10)
Year dummies	Yes	Yes	Yes	Yes	Yes
Adjusted R^2/pseudo R^2	66.04%	17.88%	–	4.59%	53.61%
Shea's Partial R^2	–	0.51%	–	–	–
F-statistics	58.51***	12.87%	63.86***	15.96***	24.36***
N	2,516	2,516	2,516	2,516	2,516

***Significant at the 0.01 level.
**Significant at the 0.05 level.
*Significant at the 0.10 level.

CSR of other firms in the same zip code), it also comes from another time period (the earliest year instead of year *i* for each firm). Therefore, it is far removed from the credit rating of firm *i* along both dimensions (both in terms of time as well as in terms of space). As such, this instrument is probably exogenous. In Table IX, Model 2, we regress the CSR score on the average CSR in the earliest year and the control variables. Not surprisingly, the coefficient of the average CSR score in the earliest year is positive and significant. In Model 3, we regress credit ratings on the CSR score instrumented from the first stage. The coefficient of the instrumented CSR score is significantly positive, again corroborating the conclusion that higher CSR leads to higher credit ratings.

The above tests are meant to alleviate concerns about reverse causality. Yet, there is another type of endogeneity that could produce a spurious relationship. It is possible that both firm value and CSR are related to certain unobservable firm characteristics that are omitted in the model. We address this potential problem by running a two-stage fixed effects analysis. Like the regular two-stage model, this approach helps alleviate endogeneity due to reverse causality. In addition, this method also controls for unobservable firm attributes that remain constant through time, thus mitigating the omitted variable bias. In Model 4, we run a fixed effects regression of the CSR score on the average CSR score of the surrounding firms. The coefficient of the average CSR score is positive and significant. In Model 5, we regress credit ratings on the CSR score instrumented from the first stage. The coefficient of the instrumented CSR score is positive and significant. So, even after controlling for both possible reverse causality and unobservable firm attributes, we continue to find that more socially responsible firms enjoy better credit ratings.

D. Further Analysis for the Risk Mitigation View

The risk mitigation view argues that firms engage in CSR activities to build up moral capital thereby mitigating the adverse effects of negative events. There are two implications of the risk mitigation view. First, if CSR activities are associated with lower risk, then the effect of CSR on credit ratings should be positive. Our results support this notion indicating that more socially responsible firms enjoy more favorable credit ratings. In addition, if CSR reduces risk, then the effect should be attributed more to CSR concerns, rather than CSR strengths. To examine this second implication, we execute additional analysis as follows. We separate the CSR score into strengths and concerns, instead of combining them into one aggregate CSR score. Then, we perform a regression analysis for the strengths and the concerns separately. The regression results are found in Table X. The evidence corroborates our hypothesis. In particular, the strengths carry an insignificant coefficient, while the concerns exhibit a significantly negative coefficient. The effects of the strengths and the concerns are indeed asymmetric. This is consistent with the notion that companies invest in CSR primarily to reduce their risk exposure. The risk mitigation view is corroborated.

E. Additional Robustness Tests

We execute several additional robustness checks including using an expanded sample, changing the minimum number of firms in each zip code, using the exclusionary screens, and distinguishing between investment grade and noninvestment grade credit ratings. Due to space limitations, we present and discuss the results of these additional tests in the appendix.

Table X. The Effects of CSR Strengths and Concerns on Credit Ratings

Total CSR Strengths equal the total number of CSR strength reported by KLD. Total CSR Concerns are the total number of CSR concerns reported by KLD. The control variables are the same as those included in Table IX.

	Model 1	Model 2
	Credit Rating	Credit Rating
Constant	5.25***	4.75***
	(1.04)	(8.59)
Total CSR strengths	0.03	
	(1.24)	
Total CSR concerns		−0.11***
		(−3.98)
Control variables	Yes	Yes
Year dummies	Yes	Yes
Industry dummies	Yes	Yes
Adjusted R^2	66.95%	67.19%
N	2,516	2,516

***Significant at the 0.01 level.
**Significant at the 0.05 level.
*Significant at the 0.10 level.

VI. Concluding Remarks

Due to market segmentation, investor clientele, local competition, and social interactions, a firm is likely to take into account the levels of CSR of surrounding firms when formulating its own CSR policy. We find robust empirical evidence in support of this hypothesis. In particular, firms located in the same three-digit zip code exhibit similar CSR policies. The effect survives even after controlling for a number of factors such as firm size, profitability, leverage, advertising, R&D spending, and capital expenditures, as well as industry and time. After establishing that a firm' CSR is influenced by the CSR levels of surrounding firms in the same zip code, we then exploit the variation in CSR across zip codes to estimate the impact of CSR on credit ratings. Our two-stage least square results demonstrate that a higher degree of CSR leads to more favorable credit ratings. Our empirical strategy, which is less vulnerable to endogeneity, leads us to conclude that more socially responsible firms do indeed enjoy better credit ratings.

Appendix

Additional Robustness Tests

A. Expanded Sample

We execute further robustness checks. First, in our sample selection process, we lost a substantial number of firms due to missing data regarding R&D and advertising expenditures. It is well known in the literature in empirical finance that these two variables are missing for a large number of firms in Compustat. One common solution to this problem is to assume that R&D and advertising expenditures are zero when the data are missing. This assumption has been used in many prior studies that significantly deal with these two variables. When we apply this assumption to our

Table A1. Sample Construction and Screening Criteria

No.	Screening Criterion	Remaining Observations
1.	KLD data, credit ratings, and firm characteristics available on Compustat (except for R&D and Advertising expenditures)	7,085
2.	There are at least five corporate headquarters in each zip code	4,726
3.	R&D and Advertising expenditures available on Compustat	2,516

study, the sample size increases from 2,516 to 4,726. The results based on the expanded sample are shown in Table A2. Model 1 is the first-stage regression where the CSR score is the dependent variable. The average CSR score of the neighboring firms exhibits a positive and significant coefficient, confirming the results based on the smaller original sample. Model 2 is the second-stage model. The dependent variable is credit ratings. The CSR score instrumented from the first stage shows a significantly positive coefficient. Thus, the results based on the expanded sample reinforce the conclusion that firms with higher CSR enjoy better credit ratings.

Please note that we do not use the expanded sample as our primary sample as the assumption of zero R&D and advertising expenditures when the data are missing is made simply to address the sample size problem in empirical research and, as such, is not based on an economic rationale. Just because a firm does not report its R&D and advertising expenditures does not necessarily mean that it does not spend anything on R&D and advertising. As a result, we do not believe that the results based on this assumption are as reliable as those from our original example (which, although smaller, contains actual data on R&D and advertising). In any event, the results are remarkably consistent, regardless of which sample is used.

B. Minimum Number of Firms in Each Zip Code

Our requirement that each zip code has at least five headquarters may seem a bit arbitrary. We impose this minimum requirement to avoid any mechanical relationship when the number of firms in each zip code is too low. For robustness, we change the minimum requirement to three and seven firms. The alternative tests produce consistent results. The minimum number of firms in each zip code does not materially affect the conclusion.

C. Exclusionary Screens

Please recall that there are six other CSR categories that KLD uses only as exclusionary screens. These CSR components are not included in the calculation of the CSR score. These categories are alcohol, firearms, gambling, military, nuclear power, and tobacco. For these CSR categories, KLD reports only the concerns and not the strengths, while for the other seven categories included in the CSR score, both the strengths and the concerns are reported. Thus, it is quite evident that the six exclusionary screens are not meant to be interpreted the same way as the other seven categories. For the sake of completeness, we construct an index based on these six exclusionary screens by summing the concerns in these six categories. Then, we run a regression with this index as an independent variable. The coefficient of the total exclusionary concerns is not significant. It does not appear that credit ratings agencies take these exclusionary CSR categories into account when assigning credit ratings. The result confirms our assumption that these six exclusionary screens should not be interpreted the same way as the other seven CSR categories.

Table A2. The Effect of CSR on Credit Ratings Using an Alternative CSR Index

Credit ratings are the S&P credit ratings. Leverage is total debt divided by total assets. R&D intensity is R&D expenditures divided by total assets. Advertising intensity is advertising expenditures divided by total assets. The fixed assets ratio is plant, property, and equipment divided by total assets. Firms in the financial industry (SIC 6000 to 6999) and utility industry (SIC 4900 to 4999) are considered regulated. The S&P 500 dummy is equal to one if the firm is included in the S&P 500 Index and zero otherwise. The CSR score is based on the KLD ratings and represents the total of the strengths minus the concerns. The industry dummies are based on the first two digits of the SIC codes. The geographically proximate firms are those located in the same three-digit zip code as firm *i*.

	Model 1	**Model 2**
	First Stage	**Second Stage**
	CSR Score	**Credit Rating**
Constant	−3.93***	4.87***
	(−4.40)	(6.04)
CSR score (instrumented)	–	0.22***
		(5.87)
Average CSR score of geographically close firms	1.12***	–
	(23.86)	
Ln(total assets)	0.41***	1.09***
	(14.34)	(35.07)
EBIT/total assets	3.37***	9.14***
	(7.58)	(21.90)
Leverage	−0.58	−4.78***
	(−2.78)	(−25.66)
R&D intensity	12.49***	−4.79***
	(10.28)	(−3.94)
Advertising intensity	7.56***	−1.54
	(5.63)	(−1.23)
Capital expenditures ratio	1.46	−2.29***
	(1.47)	(−2.59)
S&P 500	0.23	1.02***
	(1.09)	(5.49)
Fixed assets/total assets	0.82***	1.16***
	(2.84)	(4.55)
Regulated	−0.01	0.01
	(−0.01)	(0.01)
Year dummies	Yes	Yes
Industry dummies	Yes	Yes
Adjusted R^2	31.96%	64.12%
Shea's partial R^2	10.93%	–
F-statistics	25.34***	95.70***
N	4,726	4,726

***Significant at the 0.01 level.
**Significant at the 0.05 level.
*Significant at the 0.10 level.

Table A3. The Effects of CSR Components on Credit Ratings

Model	1	2	3	4	5	6	7
CSR Components	Corporate Governance	Community	Diversity	Employee Relations	Environment	Human Rights	Products
Constant	4.73***	5.31***	5.19***	4.87***	5.09***	4.83***	4.84***
	(4.62)	(5.14)	(5.01)	(4.79)	(4.94)	(4.73)	(4.73)
Corporate governance	0.11*						
	(1.65)						
Community		0.20***					
		(3.07)					
Diversity			0.08**				
			(2.05)				
Employee relations				0.21***			
				(4.55)			
Environment					0.11***		
					(2.06)		
Human rights						−0.30***	
						(−2.15)	
Products							0.00
							(0.02)
Control variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted R^2	67.08	67.17%	67.10%	67.32%	67.10%	67.10%	67.94%
N	2,516	2,516	2,516	2,516	2,516	2,516	2,516

***Significant at the 0.01 level.
**Significant at the 0.05 level.
*Significant at the 0.10 level.

D. CSR Components

The CSR score is constructed based on seven CSR categories: (1) corporate governance, (2) community, (3) diversity, (4) employee relations, (5) environment, (6) human rights, and (7) products. The evidence thus far suggests that the overall CSR score is positively associated with credit ratings. To gain further insight, we conduct a robustness check where we explore the impact of each individual CSR category on credit ratings. The regression results are provided in Table A3. To avoid collinearity, we include only one CSR component at a time. The results reveal that, out of the seven components, five of them are positively related to credit ratings. As a result, it is apparent that the positive impact of CSR on credit ratings is not concentrated merely in one or two CSR categories. Rather, it is based on a broad set of CSR categories. Since the focus of our study is on the overall impact of CSR, our investigation of the CSR categories is of exploratory nature. Nevertheless, we encourage future research to examine this issue more carefully.

E. Investment-Grade versus Noninvestment-Grade

Additionally, certain financial institutions are only allowed to hold investment-grade securities. Thus, the difference between investment-grade and noninvestment-grade ratings is much more

crucial than the difference between any two ratings. To further explore this issue, we construct a dummy variable equal to one if the credit rating is at least BBB− and zero otherwise. A rating above BBB− is usually considered investment-grade. Then, we execute a two-stage probit model predicting the likelihood of having an investment-grade rating. In the second-stage regression, we use the CSR score instrumented from the first stage. The coefficient of the CSR score is positive and significant. The results suggest that higher CSR significantly improves the probability of being classified as investment-grade.

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