

# Do rating agencies consider the social capital of the firm in their ratings?

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## Abstract

**Purpose** – We examine whether the social capital of the area where a firm's headquarters is located affects that firm's credit rating. Given that credit rating agencies only infrequently visit a firm's headquarters, it is pertinent to investigate whether this soft information is considered.

**Design/methodology/approach** – In order to test whether social capital affects firms' credit ratings, we estimate the following model using an ordinary least squares regression:  $\text{Rating}_{it} = \beta_0 + \beta_1 \text{Social Capital}_{it} + \sum \text{Controls}_{it} + \text{Industry fixed Effects}_i + \text{State-year fixed effects}_{it} + \varepsilon_{it}$ . We follow recent accounting and finance research and measure societal-level social capital at the county level (Jha & Chen, 2015; Cheng *et al.*, 2017; Hasan *et al.*, 2017a, b; Jha, 2017; Hossain *et al.*, 2023). We use four inputs to calculate social capital: (1) voter turnout in presidential elections, (2) the census response rate, (3) the number of social and civic associations and (4) the number of nongovernmental organizations in each county.

**Findings** – We provide evidence that social capital has a causal effect on credit ratings. Interesting is that this effect is not merely localized to firms near credit rating agencies. We also find that the effect of social capital on credit ratings is concentrated among firms with moderate levels of default risk. For firms with extremely low or extremely high default risk, social capital appears irrelevant to credit ratings, suggesting that social capital plays a larger role in more ambiguous contexts or when greater judgment is required. We demonstrate that the effect of social capital on credit ratings disappears when the rating agency has extensive experience in a particular region. This result is consistent with rating agencies stereotyping certain regions of the USA and using that information to inform their ratings when they have less experience in the region. Finally, we find that while social capital is associated with credit ratings, it has no association with future defaults.

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**Research limitations/implications** – Though we cautiously followed prior studies and were confident in our data construction process, it is possible that we are measuring social capital with error.

**Practical implications** – Our findings suggest that credit rating agencies could benefit from reevaluating how they incorporate non-financial information, such as social capital, into their assessment processes, potentially leading to more nuanced and equitable credit ratings. Additionally, firms could use these insights to bolster their engagement with local communities and stakeholders, thereby enhancing their creditworthiness and attractiveness to investors as part of a broader corporate strategy. The findings also underline the need for regulatory frameworks that foster transparency and the inclusion of social factors in credit evaluations, which could lead to more comprehensive and fair financial reporting and rating systems.

**Social implications** – Recognizing that social capital can influence economic outcomes like credit ratings may encourage both communities and firms to invest more in building and maintaining social networks, trust and civic engagement. By demonstrating how social capital impacts credit ratings, our research highlights the potential to address inequalities faced by regions with lower social capital, guiding targeted social and economic development initiatives. Moreover, understanding that regional social capital can influence credit ratings might affect public perception and trust in the impartiality and accuracy of these ratings, which is essential for maintaining market stability and integrity.

**Originality/value** – Our research provides fresh insights into how social capital, an intangible asset, influences credit ratings – a topic not extensively explored in existing literature. This sheds light on the dynamics between social structures and financial outcomes. Methodologically, our use of the 9/11 attacks as an exogenous shock to measure changes in social capital introduces a novel approach to study similar phenomena. Additionally, our findings contrast with prior studies such as Jha and Chen (2015) and Hossain *et al.* (2023), by delving deeper into how proximity and familiarity impact financial assessments differently, enriching academic discourse and refining existing theories on the role of local knowledge in financial decisions.

**Keywords** Credit ratings, Social capital, Soft information

**Paper type** Research paper

## 1. Introduction

The importance of credit ratings for public firms has been well documented (Hand, Holthausen, & Leftwich, 1992; Goh & Ederington, 1993; Blume, Lim, & MacKinlay, 1998; Graham & Harvey, 2001; Kisgen, 2006, 2007; Kisgen & Strahan, 2010) [1]. In this paper, we investigate whether a firm's social capital, a piece of soft information, has an impact on its credit rating [2]. We are motivated by recent research which finds that social capital at the societal level has a significant impact on corporations. Specifically, this research finds that firms located in high social capital regions pay lower audit fees (Jha & Chen, 2015), have lower loan spreads and a lower cost of borrowing (Cheng, Wang, Zhang, & Zhao, 2017; Hasan, Hoi, Wu, & Zhang, 2017b), and engage in less aggressive tax avoidance (Hasan, Hoi, Wu, & Zhang, 2017a). Owing to the importance of social capital on firm performance, this paper investigates whether credit agents incorporate information implied by the societal-level social capital of the region a firm is headquartered in when determining credit ratings for firms.

Our study is inspired by the recent emerging literature on “social finance and economics”. In particular, Cheng *et al.* (2017) and Hasan *et al.* (2017b) find that bank loan costs are lower for firms located in counties with higher social capital. They argue that good social norms and dense social networks reduce information asymmetry between banks and firms. Specifically, the internalized norms motivate the borrower to work harder and ensure sufficiently profitable operating outcomes to make on-time payments to the lender. Also, the dense networks increase reputation costs and can help spread altruism and trust among the players, reducing the *ex ante* expected default risk. In theory, lower information risk and default risk should be associated with higher credit ratings *if* credit agencies behave in the same way as banks. In addition, there is another way—through stereotyping—where the social capital of the region in which a firm is headquartered affects credit ratings. To the extent that the rating agencies may under or overreact to firms' social capital, this will be reflected in credit ratings. Supporting this view, Hossain, Hossain, Jha, and Mougoué (2023) find that firms headquartered in high social capital regions in the U.S. receive higher credit ratings, primarily because credit analysts perceive these firms as more credible. This relationship is particularly strong in situations of financial distress, greater agency problems, and higher information asymmetry, where credibility is more critical.

Despite the intuitive appeal of these arguments, it is not clear whether social capital will be associated with credit ratings. We elaborate on the reasons below. First, unlike the local banks, which are typically close to the firm headquarters, the geographic distance between the credit rating agencies and the firms they rate can be quite far. This means that their interactions with the people working at the firm are minimal. Hence, from the credit agency's perspective, it is not clear that the information risk is lower for firms located in high social capital regions. In other words, a dense social network may not provide the credit rating agency with any additional information about the firm's creditworthiness. Moreover, unlike a local bank, the credit rating agency may not be viewed as a member of the local community. Consequently, there may not necessarily be a severe reputation penalty for misrepresenting financial information to the credit rating agency [3]. While Hossain *et al.* (2023) identified a positive association between social capital and credit ratings, they left open the question of whether this is driven by firms' past relationships or by positive spillovers from the behavior of other firms in high social capital regions. In addition, it is possible that any positive association between social capital and credit ratings is absorbed by loan spreads. This should not be surprising as local banks are expected to have an informational advantage over non-local credit rating agencies (e.g. Butler, 2008; Agarwal & Hauswald, 2010). As social capital is negatively related to loan costs (i.e. loan spreads) as documented in previous studies (Cheng *et al.*, 2017; Hasan *et al.*, 2017b), it is likely that credit rating agencies can simply observe the loan spreads as assessed by banks (Chandera & Setia-Atmaja, 2020; Jackson, 2018) without needing to consider the regional social capital. If this is true, after controlling for loan spreads, social capital should be unrelated to credit ratings. Given these tensions, ultimately, whether and to what extent credit ratings are affected by social capital is an empirical question.

We measure social capital for each U.S. county using a composite index consisting of the number of religious and civic organizations, the number of nongovernmental organizations, voter turnout, and census response rate (Rupasingha & Goetz, 2008; Jha & Chen, 2015; Cheng *et al.*, 2017; Hasan *et al.* 2017a, b; Jha, 2017). We constructed a sample of 16,253 firm-year observations during the period 1991 to 2012, representing 1,825 distinct firms and 361 U.S. counties. We find that the level of social capital in the county where a firm is headquartered in is positively related to the firm's credit rating. This relationship holds when controlling for a host of financial health variables, corporate governance, and several variables which control for other characteristics of the firm's county, including population, education, religiosity, average income, income growth, and the unemployment rate. We also find that this relationship remains economically and statistically significant after controlling for the firm's loan spread, implying that social capital provides additional information for credit agencies beyond the implied effect of social capital on the loan spread considered by banks. Moreover, the positive relationship between social capital and credit ratings is robust to controlling for firm reputation, corporate social responsibility, managerial ability, and financial reporting quality, suggesting that social capital is used in credit rating decisions and is not simply correlated with firm characteristics.

One concern with the results is that a significant percentage of firms are headquartered in New York City, NY, which is home to the major rating agencies. This could undermine our argument that the rating agencies do not visit the firms frequently, which dampens the effect of social capital. We therefore re-estimate our main model after removing all firms headquartered in New York and its adjacent states. We continue to find that social capital is positively related to credit ratings.

To provide causal evidence on the role of social capital in the credit rating process, we examine an exogenous shock to social capital — the terrorist attacks of September 11, 2001. Prior research shows that the counties most affected by terrorist attacks experienced an increase in social capital (Putnam, 2002; Sander & Putnam, 2010). The attacks resulted in greater trust in the government and the police, as well as increased interest in politics. We view the unexpected disaster as a natural experiment which can help identify causality.

The state of New York and the state of Virginia experienced the most dramatic increase in social capital following the attack, while other states' social capital saw only modest increases (on average). Using a difference-in-difference design, we show that, following the 9/11 terrorist attacks, firms headquartered in the affected counties experienced a significant increase in credit ratings.

We next explore why social capital is positively associated with credit ratings. We posit two competing hypotheses. First, the informational hypothesis argues that social capital is related to credit ratings because it contains information helpful in predicting future defaults. In contrast, the stereotyping hypothesis argues that social capital is positively associated with credit ratings because the rating agencies hold stereotypes of different regions of the country. Research in sociology indicates that people do stereotype others based on geographic region (Rogers & Wood, 2010; Rentfrow *et al.*, 2013).

We perform two additional analyses to empirically differentiate between the informational and stereotyping hypotheses. First, we examine whether the rating agencies' prior county-level experience affects the relationship between social capital and credit ratings. If social capital provides information about future default risk, we would expect to find that the effect of social capital on credit ratings is increasing in the experience the rating agency has with the firms' local area. Our tests reveal that if the rating agency has significant experience giving ratings to firms in the same county, social capital does not appear to affect the rating agency's judgment. In other words, the effect of social capital on credit ratings is concentrated in situations in which the rating agency has less experience in the firm's county. This result is inconsistent with social capital providing information about firms' future default risk. Instead, it is more consistent with stereotyping. Second, we examine the relationship between social capital and future defaults. Given that credit rating agencies appear to incorporate social capital information into their ratings, it is interesting to examine whether social capital is actually predictive of future defaults. We fail to find evidence that social capital helps predict future defaults. This finding is again inconsistent with social capital playing an informational role. Taken together, the stereotyping hypothesis best explains our results.

In an additional test, we partition the sample into quintiles based on firms' estimated default risk and re-estimate our credit rating model for each quintile [4]. We find that the positive association between social capital and credit ratings is concentrated in the middle quintiles. In other words, for firms with extremely low or extremely high default risk, social capital does not appear to affect credit ratings. This result is consistent with the notion that soft information is less necessary, or not needed, when hard information provides a clear indication of the credit rating.

We contribute to the literature in several ways. First, we highlight the impact of soft information on credit ratings. While there is evidence that banks use soft information in making loans (e.g. Cole, Goldberg, & White, 2004; Berger, Miller, Petersen, Rajan, & Stein, 2005; Agarwal & Hauswald, 2010), much less evidence exists on the use of soft information by rating agencies. Hossain *et al.* (2023) make significant strides in this area by identifying the positive association between social capital and credit ratings, attributing it primarily to the perceived credibility of firms in high social capital regions. However, their study leaves open the question of whether this credibility is driven by firms' past relationships or positive spillovers from other firms in the region. Our study advances this line of research by exploring stereotyping as an alternative explanation for the relationship between social capital and credit ratings. This approach challenges the assumption that higher credit ratings in these regions are always justified by firm-specific attributes and demonstrates that the effects of social capital on rating agencies are highly context-dependent.

While studies have shown that bankers consider social capital when establishing loans (Cheng *et al.*, 2017; Hasan *et al.*, 2017b), these findings cannot be directly applied to rating

agencies due to the lack of a dense social network between geographically distant credit agencies and the firms they rate. Additionally, while [Hossain et al. \(2023\)](#) find stronger effects of social capital in firms with poorer performance, such as those with high information asymmetry or low corporate governance, our findings differ. We observe stronger effects for firms with moderate, rather than extreme, default risk, and we also examine how rating agencies' experience moderates this relationship. Moreover, we perform additional tests controlling for loan spreads, further refining our analysis. It is also noteworthy that our study covers a broader timeline, spanning from 1991 to 2012, compared to the 2001–2015 period in [Hossain et al. \(2023\)](#), providing a more extensive temporal context for understanding these dynamics.

Second, we examine whether soft information, particularly the kind that may involve stereotypical thinking, can affect sophisticated decision-makers, such as credit agencies, in performing their tasks ([Owusu & Zalata, 2023](#)). Previous research has documented that the informativeness of credit ratings can be influenced by perceived trustworthiness ([Hossain et al., 2023](#)), competition ([Flynn & Ghent, 2018](#)), business cycles ([Gredil, Kapadia, & Lee, 2022](#)), and conflicts of interest ([Cornaggia, Cornaggia, & Xia, 2016](#)). Our findings suggest that stereotypical thinking could contribute to credit rating inflation. This insight is crucial for evaluating the effectiveness of credit rating agencies.

Finally, we respond to the call for research in social finance. [Hirshleifer \(2015\)](#) suggests that there is a need to move from behavioral finance to social finance (and social economics). Specifically, he advocates for researchers to investigate how social norms and moral attitudes influence financial behaviors and decisions. In this context, we extend the understanding of the economics of societal-level social capital by focusing on the “social economics” dimension of credit evaluation. Our study provides insights into the micro-foundations of the benefits of societal-level social capital in promoting economic development through obtaining more favorable debt ratings.

## 2. Background and hypothesis development

### 2.1 Credit ratings

Credit ratings have been issued for corporate borrowers for over a century. Rating agencies serve to reduce the duplication of information gathering and processing efforts by those interested in debt securities ([Wakeman, 1984](#)). Credit ratings are widely used to value bonds ([Hand et al., 1992](#); [Goh & Ederington, 1993](#); [Blume et al., 1998](#)), in debt contracts ([Beaver, Shakespeare, & Soliman, 2006](#)), and in capital structure decisions ([Kisgen, 2006, 2009](#)). A credit rating upgrade or downgrade can also have a significant effect on the level of institutional ownership, as many mutual funds, pension funds, and insurance companies face limitations in holding non-investment-grade debt securities ([Cantor & Packer, 1994](#); [White, 2010](#)). Given these consequences, it is not surprising that firms use accounting discretion to achieve desired credit ratings ([Alissa, Bonsall, Koharki, & Penn, 2013](#)).

While the rating agencies begin their process by using quantitative financial information, they also claim to incorporate qualitative information into their ratings ([S&P 2008](#)), including internal controls, corporate governance, the firm's industry structure, management quality, and managerial bondholder friendliness ([Kraft, 2015](#)). Early research finds that firms with better financial health and lower default risk generally have higher credit ratings ([Kaplan & Urwitz, 1979](#); [Boardman & McEnally, 1981](#); [Lamy & Thompson, 1988](#); [Ziebart & Reiter, 1992](#)). Subsequent studies find that corporate governance is also positively related to credit ratings ([Sengupta, 1998](#); [Ashbaugh-Skaife, Collins, & LaFond, 2006](#)). In particular, [Ashbaugh-Skaife et al. \(2006\)](#) argue that strong corporate governance increases a firm's expected future cash flows by reducing opportunistic managerial behavior and minimizing agency conflicts between shareholders and bondholders. [Cheng and Subramanyam \(2008\)](#)

argue that analyst coverage lowers a firm's default risk as analysts serve to decrease the variance of expected future cash flows by providing information to investors and also decrease the variance of those future cash flows via analysts' monitoring role. The authors find that firms with greater analyst coverage have higher credit ratings [5]. Kuang and Qin (2013) use a similar argument and find that CEO risk-taking incentives are negatively related to credit ratings. Finally, Bonsall, Holzman, and Miller (2017) argue and show that managerial ability is associated with higher credit ratings via its association with lower variability in earnings and stock returns.

While the literature has moved from examining quantitative to qualitative factors, it is important to note that a common thread to motivate all these studies is that these factors affect credit ratings by affecting the expected future cash flows or the variability of those cash flows. So far, little is known about whether and how credit rating agencies incorporate other factors, which may have *no relation* to future cash flows, into their ratings [6].

### 2.2 Soft information and distance

Soft information refers to qualitative information that is difficult to communicate to others, particularly in writing (Polanyi, 1958; Petersen & Rajan, 1994, 2002). Although there is little evidence that any particular piece of soft information is used in corporate decisions or transactions, the literature often assumes that the geographic distance between two parties reflects the amount of access to soft information one has. There is considerable evidence to support this assumption. For example, Hossain *et al.* (2023) find that firms headquartered in high social capital regions in the US tend to receive higher credit ratings, likely because credit analysts view these firms as more credible due to the social norms around their headquarters. Similarly, Coval and Moskowitz (2001) show that local mutual fund managers earn abnormally high returns when they invest in local stocks. Malloy (2005) finds that local financial analysts have greater forecast accuracy. Butler (2008) finds that local investment banks have a competitive advantage over nonlocal banks, and this effect is strongest for high credit risk bonds and bonds not rated by the rating agencies. This suggests that soft information is more important for firms with high information asymmetry. There is also evidence that local commercial banks make more extensive use of soft information (Cole *et al.*, 2004) and are better able to use that information in their loan decisions (Berger *et al.*, 2005). Agarwal and Hauswald (2010) find that banks' delinquency rates on loans to firms are increasing with the distance between the bank and the firm. Taken together, the literature has presented a wealth of evidence that locality facilitates the collection of some type of soft information. However, we are left wondering what exactly that information is.

### 2.3 Social capital

Social capital can be defined as the level of mutual trust in a society (Guiso, Sapienza, & Zingales, 2004b). In a high social capital region, people are more likely to honor their obligations, have a higher degree of mutual trust, are more altruistic, and have a community-centric attitude (Portes, 1998; Guiso, Sapienza, & Zingales, 2004a). There are two facets of high social capital regions which shape the behavior of its citizens: (1) cooperative norms and (2) dense social networks (Woolcock, 1998). Cooperative norms provide society with a set of common beliefs and an evaluation system for citizens to judge the behavior of others. Cooperative norms arise from iterated prisoner's dilemma games and historical traditions (Fukuyama, 1997). Over generations, people internalize these norms and feel obligated to follow them (Portes, 1998). Strong, dense social networks also shape people's behavior in two ways. First, dense networks are conducive to facilitate better monitoring of others' behavior (Coleman, 1988), which results in stronger penalties for violating the societal norms

(Coleman, 1990; Spagnolo, 1999). Second, over time, dense networks strengthen norms (Fukuyama, 1997; Portes, 1998; Putnam, 2001).

Empirical research has shown that the level of social capital in a region is positively associated with financial development (Guiso *et al.*, 2004b) and economic growth (Helliwell & Putnam, 1995). Social capital has also been shown to be negatively related to property crimes (Buonanno, Montolio, & Vanin, 2009) and political corruption (La Porta, Lopez-De-Silanes, Shleifer, & Vishny, 1997).

More recent research in finance and accounting examines the effect of a region's social capital on corporate decision-making and on a corporation's transactions with other parties. Firms headquartered in high social capital regions pay lower audit fees (Jha & Chen, 2015) and have lower borrowing costs (Cheng *et al.*, 2017; Hasan *et al.*, 2017b). These findings are consistent with social capital reducing transaction costs (Jha, 2017). Social capital has also been linked to a reduced likelihood of committing fraud (Jha, 2017) and less aggressive tax avoidance (Hasan *et al.*, 2017a). Recently, Hossain *et al.* (2023) found that firms in high social capital regions receive higher credit ratings, as analysts perceive these firms to be more credible, reflecting the trust embedded in their headquarters' social environment.

#### 2.4 Hypothesis development

*Ex ante*, the effect of the level of social capital in the county where a firm is headquartered on the firm's credit rating is unclear. On the one hand, there is considerable evidence that shows that other parties with which the firm interacts do consider social capital in their interactions with the firm. In general, the findings from this literature indicate that other parties are willing to lower their transaction costs when dealing with a firm located in a high social capital region (Jha & Chen, 2015; Cheng *et al.*, 2017; Hasan *et al.*, 2017b). From this perspective, we predict a positive relationship between societal-level social capital and credit ratings.

However, there are at least two reasons we would expect a null relationship between societal-level social capital and credit ratings. First, an important point to note is that one of the key components of a high social capital region is its dense social network. The effectiveness of dense social networks in policing those who violate norms is much weaker if the violators are not part of the same networks. For example, Jha and Chen (2015) find that auditors charge lower fees to firms in high social capital regions. Importantly, they find that this effect is approximately three times larger when the auditor is located in the same region as the firm. Second, unlike local banks (Hasan *et al.*, 2017b) and auditors (Jha & Chen, 2015), credit rating agencies do not visit the firms they rate very frequently (Frost, 2007). Given the discussion, our hypothesis is stated in null form:

*H.* There is no association between societal level social capital and credit ratings.

### 3. Research design

#### 3.1 Main model

In order to test whether social capital affects firms' credit ratings, we estimate the following model using an OLS regression [7]:

$$\begin{aligned} Rating_{it} = & \beta_0 + \beta_1 Social\ Capital_{it} + \sum Controls_{it} + Industry\ fixed\ Effects_i \\ & + State - year\ fixed\ effects_{it} + \varepsilon_{it} \end{aligned} \tag{1}$$

The dependent variable is *RATING*, which is derived from Standard & Poor's ratings. We use Standard & Poor's long-term domestic issuer credit rating, which represents Standard & Poor's current opinion on an issuer's overall capacity to meet its financial obligations

(Standard & Poor's, 2002; Kuang & Qin, 2013). Higher ratings are assigned higher values. For example, AAA ratings are assigned a value of 22, while the lowest rating, D, is assigned a value of 1.

### 3.2 Measure of social capital

The variable of interest is *Social Capital*. We follow recent accounting and finance research and measure societal-level social capital at the county level (Jha & Chen, 2015; Cheng *et al.*, 2017; Hasan *et al.* 2017a, b; Jha, 2017). This county-year specific variable is based on the assumption that social capital manifests itself through individuals' participation in associational activities (Guiso *et al.*, 2004b). We use four inputs to calculate social capital: (1) voter turnout in presidential elections, (2) the census response rate, (3) the number of social and civic associations, and (4) the number of nongovernmental organizations in each county. All four of these inputs were obtained from the Northeast Regional Center for Rural Development (NERCRD) [8].

While our measures of social capital include four components, it is important to note that these are proxies for the broader concept of social capital. Analysts may not directly use these specific measures but instead rely on indirect indicators and publicly available information to infer the social capital of a region. For instance, crime rates, local economic conditions, and media portrayals of community engagement are commonly accessible data points that can provide insights into the social fabric of a community. Our approach is consistent with prior studies (Jha & Chen, 2015; Cheng *et al.*, 2017; Hasan *et al.* 2017a, b; Jha, 2017).

*Voter turnout and Census response rate* are intended to capture social norms. Voter turnout in presidential elections is measured as the number of votes cast divided by the population of those 18 years or older. The Census response rate is the response rate to the Census Bureau's decennial census. Because there is no legal incentive to vote or fill out the Census form, citizens voluntarily participate because they feel obligated to do so, which is indicative of an internalized norm. Therefore, the higher the percentage of citizens engaging in these activities, the stronger are the social norms in the county.

The *number of social and civic associations* and the *number of nongovernmental organizations* (NGOs) are two primitive inputs which are intended to capture the density of social networks. The number of social and civic associations is calculated by summing the total number of religious organizations, civic and social associations, business associations, political organizations, professional organizations, labor organizations, bowling centers, public golf courses, sports clubs, physical fitness facilities, manager and promoter membership sports and recreation clubs (no data for 2005 or 2009), and membership organizations not elsewhere classified (no data for 2005 or 2009), divided by 12 (divided by 10 for 2005 or 2009) and scaled by the county population. The number of nongovernmental organizations is taken by adding up the number of NGOs, excluding those with an international focus, divided by the population. Citizens' participation in associational activities and voluntary groups is an indication of strong social networks. As such, higher values of these two inputs correspond to higher social capital.

The four input variables are measured each year for which survey data are available: 1990, 1997, 2005, 2009, and 2014. *Social Capital* is then calculated as the first principal component of these four inputs. We follow prior literature (e.g. Jha & Chen, 2015; Cheng *et al.*, 2017) and linearly interpolate the data to fill in the years in between [9]. Refer to Appendix for more details.

Finally, we match firms' state and county information using the historical zip codes. As Compustat only retains the most recent zip code of a firm's headquarter, we use the headquarter information contained in 10-K filings to determine a firm's historical zip codes. Specifically, we extract the zip codes from firms' 10-K filings using the web-scraping techniques. Because firms' headquarters are in close proximity to their core business

activities (Pirinsky & Wang, 2006), we use the level of social capital in the county in which the firm is headquartered as our measure of social capital.

3.3 Control variables

The model controls for several known determinants of credit ratings, including firm size (*SIZE*), the percentage of the firm’s assets which are property, plant, or equipment (*PPE*), financial leverage (*LEV*), interest coverage ratio (*INTCOV*), whether the firm has subordinated debt (*SUBORD*), profitability (*ROA*), loss incidence (*LOSS*), the book-to-market ratio (*BM*), and the standard deviation of the firm’s stock returns (*STDRET*). We control for corporate governance and monitoring via the percentage of shares held by institutions (*INSTOWN*) and the number of outstanding earnings forecasts (*NUMEST*) following prior research (e.g. Cheng & Subramanyam, 2008; Bonsall *et al.*, 2017). The model also includes accruals quality (*AQ*) because Ashbaugh-Skaife *et al.* (2006) found that firms with higher accruals quality have higher credit ratings.

The model also controls for other geographic variables that may be related to credit ratings. In particular, we control for county population (*POP*), the percentage of residents with a college education in a given county (*EDUC*), the percentage of residents who are religious adherents in a given county (*RELIGION*), and the average per capita income adjusted by the consumer price index in a given county (*INCOME*). We also include the county-level unemployment rate (*UNEMP*) to control for local economic conditions. Additionally, the model includes the growth rate of per capita income for each county (*INC\_GROWTH*).

In addition, we control for industry fixed effects using 2-digit SIC codes, as credit ratings may vary by industry. We also include state-year fixed effects to control for unobservable geographic characteristics, which may also vary over time [10]. We present a complete list of variable definitions in Appendix.

4. Sample selection and descriptive statistics

4.1 Sample selection

Our county-level social capital index was constructed using the procedures outlined in Section 3.2 [11]. We merge this data with Compustat/CRSP merged data using the dynamic headquarters zip codes we constructed from EDGAR. Our data end in 2012, as this is the last year when the county-level control variables are available. We then merge this initial dataset with the Compustat S&P Ratings database.

After removing firm-year observations with missing data on county and state characteristics, Standard & Poor’s long-term domestic issuer credit rating at the fiscal-year end, or with missing financial and industry data, the final sample includes 16,253 firm-year observations, covering fiscal years between 1991 and 2012. Table 1 shows the sample

Table 1.  
Sample selection

|                                                                                                                       | Number of firm-year observations |
|-----------------------------------------------------------------------------------------------------------------------|----------------------------------|
| Compustat/CRSP firms with available NERCRD data to construct a social capital index over the period from 1991 to 2012 | 123,404                          |
| Observations with missing county and state characteristics                                                            | (54)                             |
| Observations with missing standard and poor’s long-term domestic issuer credit rating                                 | (98,799)                         |
| Observations with missing firm-level controls and industry information                                                | (8,298)                          |
| Main sample                                                                                                           | 16,253                           |
| Source(s): Table by authors                                                                                           |                                  |

selection procedure. All continuous variables are winsorized at the 1st and 99th percentiles to mitigate the effect of outliers.

#### 4.2 Descriptive statistics

**Table 2** – Panel A presents descriptive statistics for all variables used in our analysis. The median value of *RATING* is 13, which corresponds to a “BBB–” rated bond, right at the cutoff of investment grade. *Social Capital* has a mean of  $-0.454$  and median of  $-0.357$ , indicating a slightly left-skewed distribution. 18.9% of observations in the sample have subordinated debt, the average debt-to-assets ratio is 34.5%, and 18.2% of observations are loss years. The median unemployment rate in our sample is 5.3%, and the median percentage of residents who are religious is 54.3%. **Table 2** – Panel B reports the five counties with the lowest rank of median social capital and the five counties with the highest rank. Queens, NY has the lowest median value of social capital during our sample period ( $-2.656$ ), while Polk, IA has the highest value (3.029). We also report the number and the median of credit ratings of our sample firms in each county across years 1991–2012.

**Table 2** – Panel C reports Pearson and Spearman correlation coefficients for all of the variables used in our analyses. We discuss the Pearson correlations, as the Spearman correlations are quite similar. The variables most highly correlated with credit ratings are *SIZE* (0.50), *LOSS* ( $-0.59$ ), *STDRET* ( $-0.59$ ), *NUMEST* (0.45), *ROA* (0.45), and *LEV* ( $-0.44$ ). Interestingly, social capital exhibits a fairly strong positive correlation with *RATING* (0.15). *Social Capital* does not exhibit high correlations with any of the other independent variables, with the exception of the county population ( $-0.48$ ) [12].

## 5. Main empirical results

### 5.1 Main results

Our main results are presented in **Table 3** – Panel A. Column (1) is the basic model. The coefficient of *Social Capital* is 0.249, and it is significant at the 1% level ( $t$ -stat. = 2.67), indicating a positive relationship between societal-level social capital and credit ratings. The next three specifications control for factors that may be correlated with both social capital and credit ratings. Column (2) augments the basic model by controlling for company reputation. *Reputation* equals 1 if the firm is listed on Forbes’s annual Most Admired list that year, 0 otherwise. Column (3) controls for the firm’s corporate social responsibility score (*CSR*). Column (4) controls for the ability of the manager of the firm using the Demerjian, Lev, and McVay’s (2012) measure of managerial ability (*MAScore*). Using all three specifications, we continue to find a significantly positive coefficient for *Social Capital*, suggesting that social capital is distinct from company reputation, CSR, and managerial ability [13]. Finally, column (5) includes only observations in the survey years (i.e. 1997, 2005, and 2009). Although the sample is considerably smaller using only these observations, we continue to find evidence that social capital is positively associated with credit ratings.

**Table 3** – Panel B uses an alternative way to assign social capital to firms. In our main analysis, we measure a firm’s social capital as the level of social capital in the county where the firm is headquartered. However, many firms have extensive operations in multiple jurisdictions. We therefore define *Social Capital*<sup>Simple Average-Division</sup> as the simple average of the social capital across all of the firm’s geographic divisions. We also use a second alternative measure of social capital, *Social Capital*<sup>Weighted Average-Division</sup>, which equals the weighted-average of social capital across the firm’s geographic divisions, where each division is weighted by its size. We then re-estimate our main credit rating model (Eq. (1)) using these alternative measures of social capital. **Table 3** – Panel B reports the results of this analysis. Using either a simple or a weighted average of social capital across the firms’

**Table 2.**  
Descriptive statistics

| Panel A – Distribution of variables |        |        |        |        |        |           |
|-------------------------------------|--------|--------|--------|--------|--------|-----------|
| Variable                            | N      | Mean   | P25    | Median | P75    | Std. dev. |
| <i>RATING</i>                       | 16,253 | 12.990 | 10.000 | 13.000 | 16.000 | 3.560     |
| <i>Social Capital</i>               | 16,253 | −0.454 | −1.139 | −0.357 | 0.112  | 0.903     |
| <i>AQ</i>                           | 16,253 | −0.039 | −0.048 | −0.029 | −0.017 | 0.036     |
| <i>INTCOV</i>                       | 16,253 | 10.681 | 3.122  | 5.518  | 10.566 | 20.459    |
| <i>SIZE</i>                         | 16,253 | 7.965  | 6.983  | 7.865  | 8.900  | 1.396     |
| <i>PPE</i>                          | 16,253 | 0.381  | 0.170  | 0.335  | 0.586  | 0.247     |
| <i>LEV</i>                          | 16,253 | 0.345  | 0.221  | 0.323  | 0.434  | 0.186     |
| <i>SUBORD</i>                       | 16,253 | 0.189  | 0.000  | 0.000  | 0.000  | 0.391     |
| <i>INSTOWN</i>                      | 16,253 | 0.641  | 0.496  | 0.670  | 0.808  | 0.228     |
| <i>NUMEST</i>                       | 16,253 | 27.763 | 12.000 | 24.000 | 40.000 | 20.465    |
| <i>ROA</i>                          | 16,253 | 0.030  | 0.011  | 0.037  | 0.067  | 0.078     |
| <i>LOSS</i>                         | 16,253 | 0.182  | 0.000  | 0.000  | 0.250  | 0.269     |
| <i>BM</i>                           | 16,253 | 0.521  | 0.279  | 0.467  | 0.698  | 0.545     |
| <i>STDRET</i>                       | 16,253 | 0.026  | 0.016  | 0.022  | 0.031  | 0.014     |
| <i>POP</i>                          | 16,253 | 13.646 | 13.101 | 13.684 | 14.275 | 1.114     |
| <i>EDUC</i>                         | 16,253 | 0.315  | 0.251  | 0.290  | 0.386  | 0.098     |
| <i>RELIGION</i>                     | 16,253 | 0.539  | 0.461  | 0.543  | 0.604  | 0.108     |
| <i>INCOME</i>                       | 16,253 | 9.912  | 9.714  | 9.865  | 10.066 | 0.288     |
| <i>INC_GROWTH</i>                   | 16,253 | 0.038  | 0.022  | 0.040  | 0.059  | 0.037     |
| <i>UNEMP</i>                        | 16,253 | 5.684  | 4.200  | 5.300  | 6.900  | 2.100     |
| <i>Default Risk</i>                 | 15,078 | 0.101  | 0.000  | 0.000  | 0.020  | 0.243     |
| <i>Reputation</i>                   | 15,527 | 0.218  | 0.000  | 0.000  | 0.000  | 0.413     |
| <i>CSR</i>                          | 10,625 | −0.218 | −2.000 | −0.333 | 1.000  | 3.123     |
| <i>MASCORE</i>                      | 13,967 | 0.000  | −0.089 | −0.033 | 0.051  | 0.142     |
| <i>Minus DDresid</i>                | 15,028 | 0.001  | −0.023 | −0.001 | 0.020  | 0.050     |
| <i>Readability</i>                  | 13,887 | 25.887 | 23.298 | 25.814 | 28.428 | 3.949     |

(continued)

| Panel B – Counties with low and high social capital |                     |              |                       |               |
|-----------------------------------------------------|---------------------|--------------|-----------------------|---------------|
| Counties                                            | Social capital rank | # Of ratings | Median social capital | Median rating |
| <i>Queens, NY</i>                                   | 1 (lowest)          | 18           | –2.656                | B–            |
| <i>Kings, NY</i>                                    | 2                   | 9            | –2.496                | A             |
| <i>El Paso, TX</i>                                  | 3                   | 17           | –2.466                | BBB           |
| <i>Cumberland, NC</i>                               | 4                   | 1            | –2.200                | AA–           |
| <i>Hudson, NJ</i>                                   | 5                   | 8            | –2.120                | BB+           |
| <i>Washington, VT</i>                               | 357                 | 2            | 2.005                 | B+            |
| <i>Burleigh, ND</i>                                 | 358                 | 22           | 2.174                 | A/A–          |
| <i>Washington D.C.</i>                              | 359                 | 114          | 2.726                 | A+            |
| <i>Beadle, SD</i>                                   | 360                 | 7            | 2.823                 | A+            |
| <i>Polk, IA</i>                                     | 361 (highest)       | 15           | 3.029                 | BB+           |

**Note(s):** Panel A presents descriptive statistics for the main variables used in the analyses. Refer to [Appendix](#) for variable definitions. Panel B presents the five counties in our sample with the lowest rank of median social capital and the five counties with the highest rank. We calculate the median social capital using all counties with available Compustat/CRSP firms. We also report the number and the median of credit ratings of our sample firms in each county across years 1991–2012

| Panel C: Correlation matrix |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
|-----------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Variable                    | (1)   | (2)   | (3)   | (4)   | (5)   | (6)   | (7)   | (8)   | (9)   | (10)  | (11)  | (12)  | (13)  | (14)  | (15)  | (16)  | (17)  | (18)  | (19)  | (20)  |
| <i>RATING (1)</i>           | –     | 0.14  | 0.39  | 0.57  | 0.50  | 0.11  | –0.42 | –0.32 | –0.11 | 0.46  | 0.49  | –0.60 | –0.17 | –0.63 | –0.07 | –0.03 | 0.12  | –0.04 | 0.03  | –0.04 |
| <i>Social Capital (2)</i>   | 0.15  | –     | 0.11  | 0.04  | 0.01  | –0.07 | –0.04 | –0.05 | –0.07 | –0.07 | 0.04  | –0.09 | –0.01 | –0.15 | –0.49 | 0.27  | 0.13  | 0.18  | –0.01 | –0.14 |
| <i>AQ (3)</i>               | 0.36  | 0.09  | –     | 0.11  | 0.23  | 0.28  | –0.04 | –0.11 | –0.11 | 0.10  | 0.15  | –0.44 | 0.10  | –0.44 | –0.11 | –0.08 | 0.03  | –0.11 | –0.01 | 0.02  |
| <i>INTCOV (4)</i>           | 0.26  | –0.02 | 0.02  | –     | 0.28  | –0.13 | –0.71 | –0.29 | 0.24  | 0.41  | 0.75  | –0.49 | –0.29 | –0.34 | 0.00  | 0.12  | 0.02  | 0.11  | 0.04  | 0.00  |
| <i>SIZE (5)</i>             | 0.50  | 0.00  | 0.21  | 0.15  | –     | 0.03  | –0.22 | –0.17 | 0.20  | 0.68  | 0.19  | –0.26 | –0.10 | –0.36 | 0.09  | 0.14  | 0.01  | 0.17  | –0.03 | 0.12  |
| <i>PPE (6)</i>              | 0.08  | –0.09 | 0.22  | –0.13 | 0.02  | –     | 0.19  | –0.05 | –0.26 | 0.07  | –0.09 | –0.04 | 0.12  | –0.15 | –0.09 | –0.26 | 0.00  | –0.26 | 0.02  | –0.03 |
| <i>LEV (7)</i>              | –0.44 | –0.05 | –0.13 | –0.41 | –0.25 | 0.16  | –     | 0.31  | –0.19 | –0.31 | –0.43 | 0.27  | 0.02  | 0.21  | –0.03 | –0.09 | –0.02 | –0.09 | –0.01 | –0.04 |
| <i>SUBORD (8)</i>           | –0.31 | –0.06 | –0.07 | –0.14 | –0.16 | –0.04 | 0.33  | –     | –0.02 | –0.19 | –0.18 | 0.17  | 0.06  | 0.22  | 0.03  | –0.04 | 0.00  | –0.02 | 0.00  | –0.05 |
| <i>INSTOWN (9)</i>          | –0.08 | –0.07 | –0.02 | 0.12  | 0.22  | –0.26 | –0.20 | –0.03 | –     | 0.21  | 0.13  | –0.02 | –0.04 | 0.06  | 0.10  | 0.21  | –0.07 | 0.24  | –0.05 | 0.11  |
| <i>NUMEST (10)</i>          | 0.45  | –0.07 | 0.05  | 0.28  | 0.66  | 0.06  | –0.30 | –0.18 | 0.19  | –     | 0.32  | –0.24 | –0.25 | –0.28 | 0.10  | 0.10  | –0.03 | 0.10  | 0.02  | 0.12  |
| <i>ROA (11)</i>             | 0.45  | 0.03  | 0.29  | 0.33  | 0.21  | –0.03 | –0.35 | –0.12 | 0.11  | 0.25  | –     | –0.54 | –0.36 | –0.36 | –0.01 | 0.05  | 0.02  | 0.04  | 0.09  | –0.03 |
| <i>LOSS (12)</i>            | –0.59 | –0.09 | –0.40 | –0.19 | –0.26 | –0.03 | 0.38  | 0.16  | –0.07 | –0.21 | –0.51 | –     | 0.05  | 0.48  | 0.08  | 0.01  | –0.03 | 0.03  | –0.01 | 0.06  |
| <i>BM (13)</i>              | –0.11 | –0.02 | 0.10  | –0.11 | –0.07 | 0.07  | –0.15 | 0.03  | –0.02 | –0.16 | –0.11 | –0.05 | –     | 0.11  | –0.02 | –0.10 | –0.02 | –0.11 | –0.08 | 0.04  |
| <i>STDRET (14)</i>          | –0.59 | –0.14 | –0.39 | –0.12 | –0.34 | –0.11 | 0.29  | 0.18  | –0.04 | –0.26 | –0.46 | 0.48  | 0.12  | –     | 0.09  | 0.05  | –0.09 | 0.08  | –0.09 | –0.05 |
| <i>POP (15)</i>             | –0.05 | –0.48 | –0.08 | 0.02  | 0.10  | –0.08 | –0.02 | 0.02  | 0.11  | 0.11  | –0.01 | 0.05  | –0.02 | 0.06  | –     | 0.16  | 0.06  | 0.26  | 0.04  | 0.22  |
| <i>EDUC (16)</i>            | –0.02 | 0.29  | –0.09 | 0.10  | 0.15  | –0.25 | –0.08 | –0.04 | 0.20  | 0.12  | 0.01  | 0.02  | –0.05 | 0.04  | 0.19  | –     | 0.09  | 0.88  | 0.03  | –0.09 |
| <i>RELIGION (17)</i>        | 0.12  | 0.18  | 0.05  | –0.04 | 0.00  | 0.00  | –0.01 | 0.00  | –0.08 | –0.03 | 0.01  | –0.02 | –0.02 | –0.07 | 0.04  | 0.07  | –     | 0.19  | 0.06  | 0.01  |
| <i>INCOME (18)</i>          | –0.02 | 0.24  | –0.10 | 0.08  | 0.17  | –0.26 | –0.06 | –0.02 | 0.21  | 0.10  | 0.01  | 0.03  | –0.05 | 0.06  | 0.26  | 0.87  | 0.20  | –     | 0.10  | –0.09 |
| <i>INC_GROWTH (19)</i>      | 0.04  | 0.01  | 0.01  | 0.03  | –0.04 | 0.02  | 0.00  | 0.01  | –0.06 | 0.00  | 0.09  | –0.02 | –0.04 | –0.14 | 0.00  | –0.01 | 0.04  | 0.05  | –     | –0.36 |
| <i>UNEMP (20)</i>           | –0.05 | –0.11 | 0.02  | 0.02  | 0.12  | –0.03 | –0.02 | –0.05 | 0.10  | 0.13  | –0.02 | 0.06  | –0.01 | –0.02 | 0.18  | –0.07 | –0.02 | –0.05 | –0.36 | –     |

**Note(s):** This panel presents a Pearson/Spearman correlation matrix. Pearson (Spearman) correlation coefficients are presented in the lower (upper) triangle. Definitions of all variables are reported in [Appendix](#). Italics indicates significance at the 10 percent level or better

**Source(s):** Table by authors

**Table 3.**  
Does social capital  
influence credit  
ratings?

| Panel A: Baseline test   |                   |                                    |                                    |                                    |                                    |                                    |
|--------------------------|-------------------|------------------------------------|------------------------------------|------------------------------------|------------------------------------|------------------------------------|
| Variable                 | Predicted<br>sign | Dependent variable = <i>RATING</i> |                                    |                                    |                                    |                                    |
|                          |                   | (1)<br>Coef.<br>( <i>t</i> -stat.) | (2)<br>Coef.<br>( <i>t</i> -stat.) | (3)<br>Coef.<br>( <i>t</i> -stat.) | (4)<br>Coef.<br>( <i>t</i> -stat.) | (5)<br>Coef.<br>( <i>t</i> -stat.) |
| <i>Social Capital</i>    | (+)               | 0.249***<br>(2.67)                 | 0.258***<br>(2.83)                 | 0.333***<br>(2.89)                 | 0.260***<br>(2.79)                 | 0.293**<br>(2.39)                  |
| <i>Reputation</i>        | (+)               |                                    | 0.679***<br>(6.69)                 |                                    |                                    |                                    |
| <i>CSR</i>               | (+)               |                                    |                                    | 0.088***<br>(6.22)                 |                                    |                                    |
| <i>MASCORE</i>           | (+)               |                                    |                                    |                                    | 1.293***<br>(4.11)                 |                                    |
| <i>AQ</i>                | (+)               | 4.249***<br>(4.52)                 | 3.933***<br>(4.08)                 | 3.892***<br>(3.60)                 | 4.173***<br>(4.44)                 | 2.663*<br>(1.72)                   |
| <i>INTCOV</i>            | (+)               | 0.010***<br>(3.92)                 | 0.009***<br>(3.66)                 | 0.007***<br>(2.98)                 | 0.010***<br>(3.89)                 | 0.002<br>(0.78)                    |
| <i>SIZE</i>              | (+)               | 0.668***<br>(14.18)                | 0.583***<br>(11.96)                | 0.671***<br>(12.48)                | 0.816***<br>(17.29)                | 0.787***<br>(12.73)                |
| <i>PPE</i>               | (+)               | 0.722***<br>(2.79)                 | 0.794***<br>(3.03)                 | 0.636**<br>(2.13)                  | 0.380<br>(1.39)                    | 1.019***<br>(3.07)                 |
| <i>LEV</i>               | (−)               | −3.014***<br>(−12.21)              | −3.020***<br>(−12.17)              | −3.103***<br>(−10.49)              | −2.520***<br>(−10.20)              | −3.594***<br>(−8.82)               |
| <i>SUBORD</i>            | (−)               | −0.837***<br>(−10.59)              | −0.828***<br>(−10.46)              | −0.803***<br>(−7.99)               | −0.836***<br>(−10.47)              | −0.899***<br>(−7.34)               |
| <i>INSTOWN</i>           | (?)               | −1.481***<br>(−6.37)               | −1.383***<br>(−5.95)               | −1.713***<br>(−6.11)               | −0.820***<br>(−3.57)               | −1.792***<br>(−5.70)               |
| <i>NUMEST</i>            | (+)               | 0.022***<br>(7.88)                 | 0.021***<br>(7.20)                 | 0.015***<br>(4.95)                 | 0.021***<br>(7.42)                 | 0.012***<br>(2.94)                 |
| <i>ROA</i>               | (+)               | 2.151***<br>(5.48)                 | 1.877***<br>(4.74)                 | 2.060***<br>(4.28)                 | 1.817***<br>(4.67)                 | 3.470***<br>(4.07)                 |
| <i>LOSS</i>              | (−)               | −2.752***<br>(−19.08)              | −2.797***<br>(−18.99)              | −2.885***<br>(−17.33)              | −2.533***<br>(−16.53)              | −3.129***<br>(−13.92)              |
| <i>BM</i>                | (−)               | −0.608***<br>(−9.95)               | −0.593***<br>(−9.61)               | −0.735***<br>(−7.62)               | −0.488***<br>(−8.10)               | −1.211***<br>(−7.14)               |
| <i>STDRET</i>            | (−)               | −65.201***<br>(−20.68)             | −64.234***<br>(−20.62)             | −67.239***<br>(−16.47)             | −61.393***<br>(−18.36)             | −49.214***<br>(−10.05)             |
| <i>POP</i>               | (?)               | 0.074<br>(1.21)                    | 0.081<br>(1.33)                    | 0.075<br>(1.07)                    | 0.111*<br>(1.91)                   | 0.114<br>(1.59)                    |
| <i>EDUC</i>              | (?)               | −3.189***<br>(−2.94)               | −3.237***<br>(−2.93)               | −4.264***<br>(−3.72)               | −4.445***<br>(−4.02)               | −2.688*<br>(−1.91)                 |
| <i>RELIGION</i>          | (?)               | 0.291<br>(0.49)                    | 0.238<br>(0.40)                    | −0.100<br>(−0.16)                  | −0.995*<br>(−1.70)                 | −0.017<br>(−0.02)                  |
| <i>INCOME</i>            | (?)               | 0.469<br>(1.19)                    | 0.468<br>(1.16)                    | 0.817*<br>(1.90)                   | 0.706<br>(1.63)                    | 0.278<br>(0.54)                    |
| <i>INC_GROWTH</i>        | (?)               | −2.760***<br>(−2.80)               | −2.648***<br>(−2.65)               | −3.602***<br>(−3.20)               | −3.584***<br>(−3.60)               | −3.254<br>(−1.60)                  |
| <i>UNEMP</i>             | (?)               | −0.052<br>(−1.26)                  | −0.057<br>(−1.37)                  | −0.023<br>(−0.47)                  | −0.063<br>(−1.53)                  | 0.014<br>(0.29)                    |
| <i>Constant</i>          | (?)               | 7.511**<br>(2.13)                  | 7.893**<br>(2.21)                  | 5.718<br>(1.40)                    | 4.830<br>(1.25)                    | 4.677<br>(0.97)                    |
| Industry fixed effects   |                   | Included                           | Included                           | Included                           | Included                           | Included                           |
| State-year fixed effects |                   | Included                           | Included                           | Included                           | Included                           | Included                           |

(continued)

Panel A: Baseline test

| Variable                       | Predicted<br>sign | Dependent variable = <i>RATING</i> |                                    |                                    |                                    |                                    |
|--------------------------------|-------------------|------------------------------------|------------------------------------|------------------------------------|------------------------------------|------------------------------------|
|                                |                   | (1)<br>Coef.<br>( <i>t</i> -stat.) | (2)<br>Coef.<br>( <i>t</i> -stat.) | (3)<br>Coef.<br>( <i>t</i> -stat.) | (4)<br>Coef.<br>( <i>t</i> -stat.) | (5)<br>Coef.<br>( <i>t</i> -stat.) |
| <i>N</i>                       |                   | 16,253                             | 15,527                             | 10,625                             | 13,967                             | 2,277                              |
| Adjusted <i>R</i> <sup>2</sup> |                   | 73.92%                             | 74.26%                             | 75.48%                             | 76.00%                             | 72.98%                             |

**Note(s):** The dependent variable in all regressions is *RATING*. All regressions include 2-digit SIC code industry fixed effects and state-year fixed effects. Variable definitions are presented in [Appendix](#). *t*-statistics are based on standard errors which are clustered by firm. \*, \*\*, and \*\*\* denote statistical significance at the 10, 5, and 1% level, respectively, using a two-tailed test

Panel B: Alternative methods of assigning social capital to firm-years

|                                                            | Dependent variable = <i>RATING</i> |                   |
|------------------------------------------------------------|------------------------------------|-------------------|
|                                                            | (1)                                | (2)               |
| <i>Social Capital</i> <sup>Simple Average-Division</sup>   | 0.183**<br>(2.06)                  |                   |
| <i>Social Capital</i> <sup>Weighted Average-Division</sup> |                                    | 0.203**<br>(2.21) |
| <i>Constant</i>                                            | 7.701**<br>(2.45)                  | 6.719**<br>(2.05) |
| Industry Fixed Effects                                     | Included                           | Included          |
| State-year Fixed Effects                                   | Included                           | Included          |
| Controls                                                   | Included                           | Included          |
| <i>N</i>                                                   | 16,253                             | 16,253            |
| Adjusted <i>R</i> <sup>2</sup>                             | 73.87%                             | 73.89%            |

**Note(s):** The dependent variable is *RATING*. This table presents the effect of social capital on credit ratings, using a firm's all geographic divisions. For each firm, we measure the social capital as the simple average of social capital and the division-size weighted average of social capital across all its geographic divisions. The division-size is calculated as the number of managers in each division. Following [Billet, Chen, Martin, and Wang \(2015\)](#), divisional information is extracted from the Thomson Financial Insider Trading database. We label the two alternative measures of social capital as *Social Capital*<sup>Simple Average-Division</sup> (column 1) and *Social Capital*<sup>Weighted Average-Division</sup> (column 2). The regressions include all firm-level control variables used in [Table 3](#) – Panel A, Column (1), 2-digit SIC code industry fixed effects, and State-Year fixed effects. Each demographic and geographic control variable is measured as its simple-average amount across the firm's geographic divisions in column (1) and the weighted-average amount in column (2). *t*-statistics are based on standard errors which are clustered by firm. \*, \*\*, and \*\*\* denote statistical significance at the 10, 5, and 1 percent levels, respectively, using a two-tailed test

**Source(s):** Table by authors

Table 3.

divisions, we continue to find a positive and significant association between social capital and credit ratings.

## 5.2 Robustness tests

**5.2.1 Distance to credit rating agencies.** In this section, we test whether the effect of social capital on credit ratings is contingent on the firm being located close to the rating agency. The literature has shown that the effect of social capital can be limited to cases where the other party is located close to the firm (e.g. [Jha & Chen, 2015](#)). Given that the three major credit rating agencies are all based in New York City, we re-estimate [Eq. \(1\)](#) after removing firms headquartered in the State of New York or adjacent states.

[Table 4](#) – Panel A reports the results. We continue to find a positive and statistically significant coefficient of *Social Capital* after removing firms headquartered in the State of

Panel A: Proximity to New York city

| Variable                       | Dependent variable = <i>RATING</i>                                           |                                                                                   |
|--------------------------------|------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|
|                                | (1)<br>Remove firms in NY and adjacent states<br>Coef.<br>( <i>t</i> -stat.) | (2)<br>Control for firms in NY and adjacent states<br>Coef.<br>( <i>t</i> -stat.) |
| <i>Social Capital</i>          | 0.280**<br>(2.57)                                                            | 0.251***<br>(2.69)                                                                |
| <i>Adjacent NY</i>             |                                                                              | 1.400*<br>(1.68)                                                                  |
| <i>Constant</i>                | 7.944*<br>(1.92)                                                             | 7.566**<br>(2.15)                                                                 |
| Industry Fixed Effects         | Included                                                                     | Included                                                                          |
| State-year Fixed Effects       | Included                                                                     | Included                                                                          |
| Controls                       | Included                                                                     | Included                                                                          |
| <i>N</i>                       | 12,243                                                                       | 16,253                                                                            |
| Adjusted <i>R</i> <sup>2</sup> | 74.22%                                                                       | 73.92%                                                                            |

**Note(s):** The dependent variable in all regressions is *RATING*. Column (1) uses only firms headquartered outside of New York and states not adjacent to New York. Column (2) includes an indicator variable *Adjacent NY*, which equals 1 if the firm is located in the State of New York or a state adjacent to New York (i.e. New Jersey, Pennsylvania, Vermont, Massachusetts, and Connecticut). All regressions include all control variables used in Table 3 – Panel A, Column (1), 2-digit SIC code industry fixed effects, and State-Year fixed effects. *t*-statistics are based on standard errors which are clustered by firm. \*, \*\*, and \*\*\* denote statistical significance at the 10, 5, and 1% levels, respectively, using a two-tailed test

Panel B: Controlling for loan spreads

| Variable                                       | Predicted sign | Dependent variable = <i>RATING</i> |                                    |
|------------------------------------------------|----------------|------------------------------------|------------------------------------|
|                                                |                | (1)<br>Coef.<br>( <i>t</i> -stat.) | (2)<br>Coef.<br>( <i>t</i> -stat.) |
| <i>Social Capital</i>                          | (+)            | 0.242***<br>(3.44)                 |                                    |
| <i>Social Capital</i> <sup>Adjusted</sup>      | (+)            |                                    | 0.207***<br>(2.89)                 |
| <i>Social Capital</i> <sup>State Average</sup> | (+)            |                                    | 0.306***<br>(2.88)                 |
| <i>Log(Spread)</i>                             | (−)            | −1.560***<br>(−27.66)              | −1.558***<br>(−27.68)              |
| <i>AQ</i>                                      | (+)            | 0.557<br>(0.56)                    | 0.526<br>(0.53)                    |
| <i>INTCOV</i>                                  | (+)            | 0.011***<br>(3.44)                 | 0.011***<br>(3.45)                 |
| <i>SIZE</i>                                    | (+)            | 0.434***<br>(9.88)                 | 0.435***<br>(9.91)                 |
| <i>PPE</i>                                     | (+)            | 0.042<br>(0.20)                    | 0.036<br>(0.18)                    |
| <i>LEV</i>                                     | (−)            | −1.321***<br>(−5.84)               | −1.305***<br>(−5.76)               |
| <i>SUBORD</i>                                  | (−)            | −0.406***<br>(−5.98)               | −0.407***<br>(−5.99)               |
| <i>INSTOWN</i>                                 | (?)            | −0.886***<br>(−5.17)               | −0.878***<br>(−5.10)               |

**Table 4.**  
Sensitivity analyses

(continued)

Panel B: Controlling for loan spreads

| Variable                       | Predicted sign | Dependent variable = <i>RATING</i> |                                    |
|--------------------------------|----------------|------------------------------------|------------------------------------|
|                                |                | (1)<br>Coef.<br>( <i>t</i> -stat.) | (2)<br>Coef.<br>( <i>t</i> -stat.) |
| <i>NUMEST</i>                  | (+)            | 0.012***<br>(5.55)                 | 0.012***<br>(5.54)                 |
| <i>ROA</i>                     | (+)            | 2.289***<br>(4.85)                 | 2.309***<br>(4.90)                 |
| <i>LOSS</i>                    | (−)            | −1.577***<br>(−12.07)              | −1.577***<br>(−12.08)              |
| <i>BM</i>                      | (−)            | −0.302***<br>(−4.24)               | −0.300***<br>(−4.22)               |
| <i>STDRET</i>                  | (−)            | −47.642***<br>(−13.33)             | −47.673***<br>(−13.35)             |
| <i>POP</i>                     | (?)            | 0.051<br>(1.19)                    | 0.048<br>(1.13)                    |
| <i>EDUC</i>                    | (?)            | −2.661***<br>(−3.01)               | −2.655***<br>(−3.01)               |
| <i>RELIGION</i>                | (?)            | 0.045<br>(0.10)                    | −0.030<br>(−0.06)                  |
| <i>INCOME</i>                  | (?)            | 0.464<br>(1.33)                    | 0.481<br>(1.39)                    |
| <i>INC_GROWTH</i>              | (?)            | −3.685***<br>(−3.46)               | −3.715***<br>(−3.50)               |
| <i>UNEMP</i>                   | (?)            | −0.019<br>(−0.50)                  | −0.021<br>(−0.57)                  |
| <i>Constant</i>                | (?)            | 14.614***<br>(4.57)                | 14.592***<br>(4.57)                |
| Industry Fixed Effects         |                | Included                           | Included                           |
| State-Year Fixed Effects       |                | Included                           | Included                           |
| Loan Controls Included         |                | Included                           | Included                           |
| <i>N</i>                       |                | 10,667                             | 10,667                             |
| Adjusted <i>R</i> <sup>2</sup> |                | 84.00%                             | 84.01%                             |

**Note(s):** The dependent variable in all regressions is *RATING*. This table presents the effect of social capital on credit ratings, after controlling for loan spreads. *Social Capital<sup>State Average</sup>* is the average social capital of all counties in the firm's state. *Social Capital<sup>Adjusted</sup>* is the firm's county-level social capital minus *Social Capital<sup>State Average</sup>*. Definitions of other variables are presented in [Appendix](#). The regressions include 2-digit SIC code industry fixed effects, the State-Year fixed effects, and loan control variables as defined in [Appendix](#) (i.e. including *Log(Spread)*, *Previous Relation*, *Subordinate*, *Performance Pricing*, *Loan Maturity*, *Loan Amount*, *Log(# of Facilities)*, *Log(# of Lenders)*), indicator variables for loan purpose, loan type, and bank type). *t*-statistics are based on standard errors which are clustered by firm. \*, \*\*, and \*\*\* denote statistical significance at the 10, 5, and 1% levels, respectively, using a two-tailed test

Panel C: Controlling for earnings quality

| Variable              | Dependent variable = <i>RATING</i> |                                    |                                    |                                    |                                    |                                    |                                    |
|-----------------------|------------------------------------|------------------------------------|------------------------------------|------------------------------------|------------------------------------|------------------------------------|------------------------------------|
|                       | (1)<br>Coef.<br>( <i>t</i> -stat.) | (2)<br>Coef.<br>( <i>t</i> -stat.) | (3)<br>Coef.<br>( <i>t</i> -stat.) | (4)<br>Coef.<br>( <i>t</i> -stat.) | (5)<br>Coef.<br>( <i>t</i> -stat.) | (6)<br>Coef.<br>( <i>t</i> -stat.) | (7)<br>Coef.<br>( <i>t</i> -stat.) |
| <i>Social Capital</i> | 0.249***<br>(2.67)                 | 0.249***<br>(2.67)                 | 0.249***<br>(2.67)                 | 0.249***<br>(2.67)                 | 0.250***<br>(2.68)                 | 0.267***<br>(2.81)                 | 0.307***<br>(3.03)                 |
| <i>AAER</i>           | −0.280<br>(−1.50)                  |                                    |                                    |                                    |                                    |                                    |                                    |

(continued)

Table 4.

| Panel C: Controlling for earnings quality |                                    |                                    |                                    |                                    |                                    |                                    |                                    |
|-------------------------------------------|------------------------------------|------------------------------------|------------------------------------|------------------------------------|------------------------------------|------------------------------------|------------------------------------|
| Dependent variable = <i>RATING</i>        |                                    |                                    |                                    |                                    |                                    |                                    |                                    |
| Variable                                  | (1)<br>Coef.<br>( <i>t</i> -stat.) | (2)<br>Coef.<br>( <i>t</i> -stat.) | (3)<br>Coef.<br>( <i>t</i> -stat.) | (4)<br>Coef.<br>( <i>t</i> -stat.) | (5)<br>Coef.<br>( <i>t</i> -stat.) | (6)<br>Coef.<br>( <i>t</i> -stat.) | (7)<br>Coef.<br>( <i>t</i> -stat.) |
| <i>Restatement</i>                        |                                    | 0.025<br>(0.36)                    |                                    |                                    |                                    |                                    |                                    |
| <i>Backdating</i> <sup>CEO</sup>          |                                    |                                    | 0.001<br>(0.01)                    |                                    |                                    |                                    |                                    |
| <i>Backdating</i> <sup>Director</sup>     |                                    |                                    |                                    | −0.052<br>(−0.46)                  |                                    |                                    |                                    |
| <i>Backdating</i> <sup>WSJ</sup>          |                                    |                                    |                                    |                                    | −0.547<br>(−1.62)                  |                                    |                                    |
| <i>Minus DDresid</i>                      |                                    |                                    |                                    |                                    |                                    | 1.793***<br>(3.04)                 |                                    |
| <i>Readability</i>                        |                                    |                                    |                                    |                                    |                                    |                                    | 0.027***<br>(2.89)                 |
| <i>AQ</i>                                 | 4.248***<br>(4.53)                 | 4.251***<br>(4.52)                 | 4.249***<br>(4.52)                 | 4.251***<br>(4.52)                 | 4.199***<br>(4.45)                 |                                    |                                    |
| <i>Constant</i>                           | 7.489**<br>(2.13)                  | 7.510**<br>(2.13)                  | 7.511**<br>(2.13)                  | 7.514**<br>(2.13)                  | 7.521**<br>(2.13)                  | 6.627*<br>(1.80)                   | 7.297**<br>(1.99)                  |
| Industry Fixed Effects                    | Included                           | Included                           | Included                           | Included                           | Included                           | Included                           | Included                           |
| State-Year Fixed Effects                  | Included                           | Included                           | Included                           | Included                           | Included                           | Included                           | Included                           |
| Other Controls                            | Included                           | Included                           | Included                           | Included                           | Included                           | Included                           | Included                           |
| <i>N</i>                                  | 16,253                             | 16,253                             | 16,253                             | 16,253                             | 16,253                             | 15,028                             | 13,887                             |
| Adjusted <i>R</i> <sup>2</sup>            | 73.92%                             | 73.92%                             | 73.92%                             | 73.92%                             | 73.93%                             | 73.62%                             | 74.15%                             |

**Note(s):** This panel presents the results after controlling for earnings quality. The dependent variable in all regressions is *RATING*. All regressions include 2-digit SIC code industry fixed effects and State-Year fixed effects. All regressions in columns (1)–(5) include all control variables used in Table 3 – Panel A, Column (1). Regressions in columns (6) and (7) replace *AQ* with *Minus DDresid* and *Readability*, respectively. Regressions in columns (6) and (7) also include all other control variables used in Table 3 – Panel A, Column (1). Variable definitions are presented in Appendix. *t*-statistics are based on standard errors which are clustered by firm. \*, \*\*, and \*\*\* denote statistical significance at the 10, 5, and 1 percent levels, respectively, using a two-tailed test

Table 4.

Source(s): Table by authors

New York and states adjacent to New York in column (1). Column (2) includes all observations but also includes an indicator variable *Adjacent NY*, which equals 1 if the firm is located in the State of New York or a state adjacent to New York. We continue to find a positive and significant relationship between social capital and credit ratings. These results suggest that the findings are not driven by local firms.

**5.2.2 Controlling for loan spreads.** In this section, we test whether the positive association between societal-level social capital and credit ratings is absorbed by loan spreads. We therefore re-estimate an augmented version of Eq. (1), which includes a control for the natural logarithm of loan spreads (*Log(Spread)*). We also include several loan controls, including indicator variables for whether the loan is subordinate, whether the lender has previous experience with the borrower, whether the loan has performance pricing, whether the bank is an investment bank, a foreign bank, the loan amount and maturity, as well as the package-level control variables (the number of loan facilities in the package and the number of loan lenders), and the loan purpose and loan type fixed effects as defined in Appendix. The sample includes 10,667 loan facilities denominated in U.S. dollars [14].

**Table 4** – Panel B reports the results. As expected, the coefficient on *Log(Spread)* is very significantly related to credit ratings (coef. =  $-1.560$ ; *t*-stat. =  $-27.66$  in column 1). Importantly, the coefficient on *Social Capital* remains positive and significant (coef. =  $0.242$ ; *t*-stat. =  $3.44$ ), suggesting that the effect of social capital on credit ratings is not absorbed by loan spreads. In column (2), we introduce two additional variables. *Social Capital*<sup>State Average</sup> is the average social capital of all counties in the firm's state. *Social Capital*<sup>Adjusted</sup> is the firm's county-level social capital minus *Social Capital*<sup>State Average</sup>. Interestingly, we find that the coefficients for both of these variables are positive and statistically significant. In fact, the coefficient on the state average social capital measure is  $0.306$ , compared to only  $0.207$  on *Social Capital*<sup>Adjusted</sup>. The fact that the state-level social capital measure has a stronger effect than the county-level social capital measure is an interesting issue, which leads us to [Section 6.1](#).

**5.2.3 Controlling for earnings quality.** Our main results suggest that social capital is positively associated with firms' credit ratings. While this is consistent with the credit rating agencies judging firms' creditworthiness based on their regional headquarters, it is also possible that firms located in high social capital areas simply manage earnings less and are less likely to engage in suspicious corporate practices ([Jha, 2017](#)). If this is true, our findings could be driven by a correlated omitted variable, namely, earnings management. While we attempt to control for earnings management via *AQ*, it is possible that this variable does not capture all forms of earnings management. To alleviate these concerns, we estimate several specifications of our model after including various proxies for earnings quality and proxies for egregious financial reporting behavior, including fraud, options backdating, and restatements. The results are presented in **Table 4** – Panel C.

**Table 4** – Panel C reports the results of including various proxies for earnings management and corporate misconduct. When controlling for Accounting and Auditing Enforcement Releases, accounting restatements, CEO options backdating, director options backdating, and options backdating reported by the Wall Street Journal, an alternative measure of earnings quality from [Dechow and Dichev \(2002\)](#), and annual report readability via the FOG index, we continue to find a positive and statistically significant relationship between social capital and credit ratings. Overall, the evidence in **Table 4** – Panel C suggests that it is unlikely that our main results are driven by earnings quality differences between high and low social capital firms.

**5.2.4 Evidence from the September 11 terrorist attacks.** One potential limitation of our study is the inherent stability of social capital, which complicates efforts to establish causality. To address this issue, we identify an exogenous shock—specifically, the terrorist attacks of September 11, 2001—that potentially influenced social capital, and we examine whether this shock led to higher credit ratings. These attacks are a suitable exogenous shocks for several reasons.

First, the local governments in Arlington, VA, and New York, NY, implemented various initiatives post-attack, contributing to the building of social capital. Second, the September 11, 2001 terrorist attacks had profound social and psychological impacts on the affected regions, particularly in New York and Virginia. Prior research has utilized the 9/11 attacks to examine changes in social capital and their subsequent effects on various economic and social outcomes. For example, studies have shown that areas directly affected by the attacks experienced a resurgence in community engagement and trust, as documented by [Putnam \(2002\)](#) and [Sander and Putnam \(2010\)](#). These researchers found a notable increase in civic engagement, community solidarity, and trust in government and public institutions following the attacks. This surge in social capital could lead to heightened communal activities, increased voter turnout, and greater participation in civic and social organizations. This evidence supports the argument that the 9/11 attacks caused a significant and measurable increase in social capital, making it a valid proxy for such changes in our study.

As a result, the States of New York and Virginia experienced sharp increases in social capital following the attacks, while other states saw only modest rises, on average. This

variance allows for a difference-in-differences approach to test whether firms located in counties affected by the 9/11 attacks experienced a sharper increase in credit ratings compared with firms in unaffected counties. We use the following model:

$$\begin{aligned} Rating_{it} = & \gamma_0 + \gamma_1 Post\,9/11_{it} + \gamma_2 9/11\,Affected\,Counties_{it} \\ & + \gamma_3 9/11\,Affected\,Counties_{it} \times Post\,9/11_{it} + \sum Controls_{it} \\ & + Industry\,fixed\,Effects_i + State - year\,fixed\,effects_{it} + \varepsilon_{it} \end{aligned} \tag{2}$$

*Post 9/11* equals 1 if the credit rating is issued in years after September 11, 2001, 0 otherwise. *9/11 Affected Counties* equals 1 if the firm is headquartered in a county affected by the 9/11 terrorist attacks, 0 otherwise. Eq. (2) is estimated on credit ratings issued two years before and two years after the 9/11 terrorist attacks (i.e. years 1999, 2000, 2002, and 2003). If the terrorist attacks led to an increase in social capital for firms headquartered in the disaster areas, we would observe a sharper increase in credit ratings for these firms following the attacks. We therefore expect to observe  $\gamma_3 > 0$ .

Table 5 reports the results. Column (1) considers all counties in the State of New York and the State of Virginia to be affected counties. Column (2) considers counties within 100 miles of

| Variable                                  | Dependent variable = <i>RATING</i> |                                                    |
|-------------------------------------------|------------------------------------|----------------------------------------------------|
|                                           | NY and VA counties                 | Counties that are close to the Pentagon or the WTC |
|                                           | (1)                                | (2)                                                |
|                                           | Coef.                              | Coef.                                              |
|                                           | ( <i>t</i> -stat.)                 | ( <i>t</i> -stat.)                                 |
| <i>Post 9/11</i>                          | −2.869***<br>(−3.72)               | −2.836***<br>(−3.65)                               |
| <i>9/11 Affected Counties</i>             | −2.374***<br>(−2.61)               | 0.176<br>(0.50)                                    |
| <i>9/11 Affected Counties × Post 9/11</i> | 3.522***<br>(3.80)                 | 0.564**<br>(2.03)                                  |
| <i>Constant</i>                           | 2.164<br>(0.44)                    | 3.859<br>(0.74)                                    |
| Industry Fixed Effects                    | Included                           | Included                                           |
| State-year Fixed Effects                  | Included                           | Included                                           |
| Controls                                  | Included                           | Included                                           |
| <i>N</i>                                  | 3,104                              | 3,104                                              |
| Adjusted <i>R</i> <sup>2</sup>            | 75.71 %                            | 75.75 %                                            |

**Note(s):** The dependent variable in all regressions is *RATING*. These regressions are estimated using only observations two years before and two years after the September 11, 2001 terrorist attacks (in fiscal years 1999, 2000, 2002, and 2003). *Post 9/11* is an indicator variable that equal to one if the firm's credit rating is issued within two years following the September 11, 2001 terrorist attacks (i.e. in fiscal years 2002 and 2003), and zero otherwise. *9/11 Affected Counties* is an indicator variable that equal to one if the firm's headquarters is in a 9/11 affected county, and zero otherwise. 9/11 affected counties are defined as all counties in NY and VA in column (1) and as counties that are within 100 miles of the Pentagon (Arlington, VA) or the World Trade Center (Manhattan, New York City, NY) in column (2). All regressions include 2-digit SIC code industry fixed effects and State-Year fixed effects. All regressions also include all control variables used in Table 3 – Panel A, Column (1). Refer to Appendix for all other variable definitions. *t*-statistics are based on standard errors which are clustered by firm. \*, \*\*, and \*\*\* denote statistical significance at the 10, 5, and 1 percent levels, respectively, using a two-tailed test

**Source(s):** Table by authors

**Table 5.**  
Exogenous shock to  
social capital

the Pentagon or the World Trade Center to be affected counties. Using either definition, we observe a significantly positive coefficient on the interaction term *9/11 Affected Counties*  $\times$  *Post 9/11*, indicating that firms located in affected counties experience a significant increase in their credit rating following the terrorist attacks. The results are consistent with social capital having a causal effect on firms' credit ratings [15].

## 6. Additional analysis

### 6.1 Stereotyping vs informational hypotheses

The purpose of this section is to further explore why social capital affects credit ratings. We propose two competing hypotheses. The first is the informational hypothesis, which argues that social capital is positively associated with credit ratings because it contains information about the firm's likelihood of defaulting in the future. This argument, however, is inconsistent with the evidence in column (2) of Table 4 – Panel B, which shows that the state-level social capital has a stronger effect on credit ratings than the county-level social capital. Therefore, we posit a stereotyping hypothesis in which rating agencies use stereotypes of the regions in which firms are located to assist them in forming their ratings. This argument has support in the social science literature, which finds that individuals form stereotypes of others based on geographic region (Rogers & Wood, 2010; Rentfrow *et al.*, 2013).

To provide evidence for these competing hypotheses, we first examine whether the credit rating agency's experience rating firms in the same county affects the relationship between social capital and credit ratings. Given that rating agencies visit the firms they rate only infrequently (Frost, 2007), it remains a puzzle as to how societal-level social capital, a piece of soft information, is incorporated into their ratings. It is possible that the social capital of a region affects credit ratings only when the rating agencies have had considerable experience rating firms in the region. This would support the information hypothesis. To test this conjecture, we split our sample into two groups based on the rating agency's county-level experience. Specifically, we split the sample based on whether the rating agency's experience rating firms in the county is greater than the median county-level experience for the year [16].

Table 6 reports the results. Column (1) includes an indicator variable, *CountyExp*, to proxy for ratings issued by rating agencies with county-level experience greater than the median for the year. To calculate the *CountyExp*, we first identify the first fiscal year-end date when firms in a county received a credit rating, using all Compustat/CRSP firms with available ratings. Next, we calculate the rating length in months as the difference between each fiscal year-end date and the first fiscal year-end date when the county has a rating. The median county-level experience is the median rating length of all counties in each fiscal year. For each firm-year observation, *CountyExp* equals one if the rating length (in months) for the firm's county is greater than the median county-level experience, and zero otherwise.

Interestingly, higher county-level experience was associated with lower credit ratings (Coef. =  $-0.166$ ; *t*-stat. =  $-1.97$ ). More relevant to our study is that we also find a positive and significant coefficient on *Social Capital*. When we split the sample into columns (2) and (3), we find an interesting pattern. The coefficient of *Social Capital* is insignificant when using the high county experience subsample. However, it is positive and significant when using the low county experience subsample in column (3) (Coef. =  $0.272$ ; *t*-stat. =  $2.56$ ). It appears that social capital affects credit ratings only when the rating agency has relatively low experience in the firm's county. While this finding is surprising, it is consistent with stereotyping by geographic region (Rogers & Wood, 2010; Rentfrow *et al.*, 2013). The fact that the rating agencies do not consider social capital when they have sufficient experience in the county suggests that their stereotypes may not be accurate and therefore are not helpful in forming their ratings.

| Variable                       | Dependent variable = <i>RATING</i>             |                                                                                             |                                                                                            |
|--------------------------------|------------------------------------------------|---------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------|
|                                | (1) Full sample<br>Coef.<br>( <i>t</i> -stat.) | (2) High county experience<br>(county > county-level median)<br>Coef.<br>( <i>t</i> -stat.) | (3) Low county experience<br>(county ≤ county-level median)<br>Coef.<br>( <i>t</i> -stat.) |
| <i>Social Capital</i>          | 0.256***<br>(2.74)                             | 0.152<br>(1.18)                                                                             | 0.272**<br>(2.56)                                                                          |
| <i>CountyExp</i>               | −0.166**<br>(−1.97)                            |                                                                                             |                                                                                            |
| <i>Constant</i>                | 7.570**<br>(2.15)                              | 0.633<br>(0.12)                                                                             | 8.430**<br>(2.12)                                                                          |
| Industry FE                    | Included                                       | Included                                                                                    | Included                                                                                   |
| State-year FE                  | Included                                       | Included                                                                                    | Included                                                                                   |
| Controls                       | Included                                       | Included                                                                                    | Included                                                                                   |
| <i>N</i>                       | 16,253                                         | 5,549                                                                                       | 10,704                                                                                     |
| Adjusted <i>R</i> <sup>2</sup> | 73.94%                                         | 73.89%                                                                                      | 74.24%                                                                                     |

**Note(s):** The dependent variable in all regressions is *RATING*. Column (1) uses all observations. Column (2) uses observations with county experience greater than the median county-level experience for the year. Column (3) uses observations with county experience less than or equal to the median county-level experience for the year. All regressions include 2-digit SIC code industry fixed effects and State-Year fixed effects. All regressions also include all control variables used in Table 3 – Panel A, Column (1). *CountyExp* is an indicator variable that equals one if the rating length for the firm’s county is greater than the median county-level experience, and zero otherwise. Refer to Appendix for other variable definitions. *t*-statistics are based on standard errors which are clustered by firm. \*, \*\*, and \*\*\* denote statistical significance at the 10, 5, and 1 percent levels, respectively, using a two-tailed test

**Source(s):** Table by authors

**Table 6.**  
County experience and  
the effect of social  
capital on credit  
ratings

As a second test to provide evidence on the informational vs stereotyping hypotheses, we examine the effect of social capital on future defaults. In other words, we want to know if the rating agencies are correct to consider social capital in their ratings. Using an approach similar to Jaggi and Tang (2017), we investigate whether social capital improves rating accuracy. We do so by estimating a multivariate model in which the dependent variable, *DEF*, equals 1 if the firm either (1) files a liquidation-related bankruptcy, (2) delists due to default, or (3) receives a “D” rating within three years following the current year, 0 otherwise. Providing evidence that social capital is associated with a reduced likelihood of future defaults would support the informational hypothesis.

Table 7 reports the results of estimating a logistic regression that attempts to predict future defaults. Many of the same variables associated with credit ratings correlate with the likelihood of future defaults, including *SIZE*, *PPE*, *LEV*, *NUMEST*, *ROA*, *LOSS*, *BM*, and *STDRET*. Importantly, however, *Social Capital* appears to have no significant relationship with future defaults (Coef. = 0.151; Z-stat. = 0.53 in column 1). The results are similar when augmenting the basic model with loan spread and related loan-level controls in column (2) [17].

### 6.2 Decision ambiguity and the use of social capital by credit rating agencies

While social capital appears to be a piece of information used by credit rating agencies in forming their ratings, it is unclear under what circumstances they are more likely to use this piece of soft information. We expect that rating agencies will be more likely to use social capital information in forming their ratings when their decision is more ambiguous. We capture decision ambiguity by separating firms into quintiles based on their default risk. We

| Variable                     | Dependent variable = <i>DEF</i> |                           |
|------------------------------|---------------------------------|---------------------------|
|                              | (1)<br>Coef.<br>(z-stat.)       | (2)<br>Coef.<br>(z-stat.) |
| <i>Social Capital</i>        | 0.151<br>(0.53)                 | -0.058<br>(-0.13)         |
| <i>Log(Spread)</i>           |                                 | 0.921***<br>(3.93)        |
| <i>AQ</i>                    | 0.452<br>(0.17)                 | -3.988<br>(-0.95)         |
| <i>INTCOV</i>                | -0.008<br>(-0.23)               | -0.262***<br>(-3.94)      |
| <i>SIZE</i>                  | 0.458***<br>(4.00)              | 0.841***<br>(4.19)        |
| <i>PPE</i>                   | 1.419**<br>(2.25)               | 3.377***<br>(3.04)        |
| <i>LEV</i>                   | 1.759***<br>(2.69)              | 0.100<br>(0.08)           |
| <i>SUBORD</i>                | 0.082<br>(0.36)                 | -0.559<br>(-1.61)         |
| <i>INSTOWN</i>               | -0.197<br>(-0.36)               | -1.781<br>(-1.36)         |
| <i>NUMEST</i>                | -0.041***<br>(-4.01)            | -0.031*<br>(-1.75)        |
| <i>ROA</i>                   | -6.366***<br>(-5.70)            | -5.980***<br>(-3.63)      |
| <i>LOSS</i>                  | 1.337***<br>(3.01)              | 0.269<br>(0.36)           |
| <i>BM</i>                    | 0.509***<br>(4.37)              | 0.529**<br>(2.36)         |
| <i>STDRET</i>                | 51.692***<br>(5.89)             | 38.776**<br>(2.29)        |
| <i>POP</i>                   | -0.059<br>(-0.37)               | -0.291<br>(-1.61)         |
| <i>EDUC</i>                  | 3.388<br>(1.09)                 | 4.446<br>(0.46)           |
| <i>RELIGION</i>              | 1.022<br>(0.80)                 | -1.101<br>(-0.26)         |
| <i>INCOME</i>                | -1.140<br>(-1.11)               | -2.392<br>(-0.62)         |
| <i>INC_GROWTH</i>            | 2.689<br>(0.64)                 | 13.465**<br>(2.06)        |
| <i>UNEMP</i>                 | -0.028<br>(-0.22)               | -0.159<br>(-0.62)         |
| <i>Constant</i>              | -19.291**<br>(-2.11)            | 4.291<br>(0.16)           |
| Industry Fixed Effects       | Included                        | Included                  |
| State-year Fixed Effects     | Included                        | Included                  |
| Loan Controls Included       | No                              | Included                  |
| <i>N</i>                     | 16,253                          | 10,667                    |
| Pseudo <i>R</i> <sup>2</sup> | 49.43%                          | 63.80%                    |

**Note(s):** The dependent variable is *DEF*. *DEF* is an indicator variable that equal to one if the firm files a liquidation-related bankruptcy, delists due to default (CRSP delisting code = 400–499, 572, or 574), or receives a D rating within three years after the current year, and zero otherwise. The regressions include all control variables used in Table 3 – Panel A, Column (1), 2-digit SIC code industry fixed effects, and State-Year fixed effects. Column (2) also includes several control variables for loan characteristics, including *Log(Spread)*, *Previous Relation*, *Performance Pricing*, *Loan Maturity*, *Loan Amount*, *Log(# of Facilities)*, *Log(# of Lenders)*, indicator variables for loan purpose, loan type, and bank type. Refer to Appendix for all other variable definitions. Z-statistics are based on standard errors which are clustered by firm. \*, \*\*, and \*\*\* denote statistical significance at the 10, 5, and 1 percent levels, respectively, using a two-tailed test

**Source(s):** Table by authors

**Table 7.**  
Social capital and  
credit rating accuracy

predict that credit rating agencies will be less likely to use social capital in their rating decisions for firms that are either very high or very low in default risk. Social capital is expected to play a larger role in firms with medium default risk.

Table 8 reports the results of estimating Eq. (1) on firms separated into quintiles by default risk. We also control for default risk in the model. Social capital appears to have the lowest effect on credit ratings for firms in the bottom quintile of default risk (Coef. = 0.081; *t*-stat. = 0.58). The effect of social capital on credit ratings is also quite low for firms in the highest quintile of default risk (Coef. = 0.182; *t*-stat. = 1.37). Social capital is only significantly positively associated with credit ratings for firms in the middle three quintiles of default risk.

7. Conclusion

In this paper, we examine the effect of the societal level of social capital in the region where a firm is headquartered on credit rating agencies' judgments. We find that firms headquartered in areas with higher social capital tend to receive higher credit ratings. This finding is true even after controlling for variables such as firms' financial health, profitability, loan spread, managerial ability, misreporting, company reputation, and corporate social responsibility. Using the September 11, 2001 terrorist attacks as an exogenous shock to social capital in New York and Virginia, we provide evidence that social capital has a causal effect on credit ratings. Interestingly, this effect is not merely localized to firms near credit rating agencies.

We also find that the effect of social capital on credit ratings is concentrated among firms with moderate levels of default risk. For firms with extremely low or extremely high default risk, social capital appears irrelevant to credit ratings, suggesting that social capital plays a larger role in more ambiguous contexts or when more judgment is required. We demonstrate

| Variable                       | Dependent variable = <i>RATING</i>   |                             |                             |                             |                                       |
|--------------------------------|--------------------------------------|-----------------------------|-----------------------------|-----------------------------|---------------------------------------|
|                                | (1) Quintile 1<br>(Low default risk) | (2) Quintile 2              | (3) Quintile 3              | (4) Quintile 4              | (5) Quintile 5<br>(High default risk) |
|                                | Coef.<br>( <i>t</i> -stat.)          | Coef.<br>( <i>t</i> -stat.) | Coef.<br>( <i>t</i> -stat.) | Coef.<br>( <i>t</i> -stat.) | Coef.<br>( <i>t</i> -stat.)           |
| <i>Social Capital</i>          | 0.081<br>(0.58)                      | 0.258*<br>(1.87)            | 0.364***<br>(2.67)          | 0.494***<br>(3.78)          | 0.182<br>(1.37)                       |
| <i>Default Risk</i>            | 19.501<br>(0.21)                     | 1.729<br>(0.55)             | 1.527<br>(1.12)             | 0.353<br>(0.51)             | 0.162<br>(1.02)                       |
| <i>Constant</i>                | 2.422<br>(0.45)                      | 7.048<br>(1.37)             | 11.490**<br>(1.99)          | 12.210**<br>(2.35)          | 4.635<br>(0.97)                       |
| Industry FE                    | Included                             | Included                    | Included                    | Included                    | Included                              |
| State-year FE                  | Included                             | Included                    | Included                    | Included                    | Included                              |
| Controls                       | Included                             | Included                    | Included                    | Included                    | Included                              |
| <i>N</i>                       | 3,005                                | 3,024                       | 3,015                       | 3,024                       | 3,010                                 |
| Adjusted <i>R</i> <sup>2</sup> | 72.40%                               | 67.02%                      | 67.20%                      | 67.73%                      | 62.82%                                |

**Note(s):** The dependent variable in all regressions is *RATING*. Observations are separated into quintiles of *Default Risk*. Each regression uses only observations from one quintile. Column (1) uses observations in the lowest quintile of default risk, while column (5) uses observations in the highest quintile. All regressions include 2-digit SIC code industry fixed effects and State-Year fixed effects. All regressions also include all control variables used in Table 3 – Panel A, Column (1). Refer to Appendix for variable definitions. *t*-statistics are based on standard errors which are clustered by firm. \*, \*\*, and \*\*\* denote statistical significance at the 10, 5, and 1 percent levels, respectively, using a two-tailed test

**Source(s):** Table by authors

**Table 8.**  
Does decision  
ambiguity exacerbate  
the effect of social  
capital on credit  
ratings?

that the effect of social capital on credit ratings disappears when the rating agency has extensive experience in a particular region. This result is consistent with rating agencies stereotyping certain regions of the U.S. and using that information to inform their ratings when they have less experience in the region.

Finally, we find that while social capital is associated with credit ratings, it has no association with future defaults. Therefore, while rating agencies appear to incorporate this information into their ratings, it is unclear why they do so.

This study is subject to a few limitations. First, while we follow prior literature in measuring social capital (e.g. [Jha & Chen, 2015](#); [Cheng et al., 2017](#); [Hasan et al., 2017a, b](#); [Jha, 2017](#)), it is possible that we are measuring social capital with error [18]. Second, our measure of social capital is only available in select years. We fill in missing data for these years using linear interpolation following prior literature. In addition, we have replicated our main result using years in which the social capital data are available. However, this remains a limitation of this study. Our findings enhance the literature on credit ratings by demonstrating that social capital—a specific type of soft information, exerts a meaningful influence on the decisions of credit rating agencies. Future research can explore the additional types of soft information utilized in credit rating decisions.

Our study, along with [Jha and Chen \(2015\)](#), explores the influence of social capital under different conditions—each pivotal to the nature of the respective financial assessments. Whereas audit fees are influenced by geographic proximity due to the need for direct communication and verification of physical assets, credit ratings focus on a more comprehensive analysis of a firm's past, present, and future financial health, where accumulated experience rather than proximity plays a crucial role. Specifically, our study reveals that the effect of social capital on credit ratings is moderated by the rating agencies' accumulated local experience, while [Jha and Chen \(2015\)](#) show that auditor proximity facilitates access to the dense networks in high social-capital counties. Collectively, the findings of these two studies underscore that the impact of social capital is not uniform but varies significantly depending on the nature of the business and the specific requirements of the financial assessment.

Furthermore, our study builds upon and extends the findings of [Hossain et al. \(2023\)](#) by delving into the nuanced ways social capital influences credit ratings. We introduce the concept of stereotyping, provide causal evidence through the natural experiment of 9/11, and emphasize the role of agency experience while controlling for loan spreads. These contributions offer a more comprehensive understanding of the relationship between social capital and credit ratings, enhancing the existing literature and providing valuable insights for the practical assessment of creditworthiness.

Another important implication of our findings is the potential mispricing of bonds due to the influence of social capital on credit ratings. While we find that social capital is associated with higher credit ratings, it is not associated with lower default risk. This discrepancy suggests that credit rating agencies may overestimate the stabilizing effects of social capital on firms, leading to a mispricing of bonds. This phenomenon holds significant ramifications for behavior finance. The mispricing of assets in capital markets is a well-documented issue, attributed to factors such as liquidity demand, information asymmetry, and behavioral biases ([Bartram, Grinblatt, & Nozawa, 2024](#); [Bhojraj & Swaminathan, 2009](#); [Lewis, Longstaff, & Petrasek, 2021](#)). However, the specific role of soft information, like social capital, in asset mispricing remains underexplored. Future research could investigate how such soft information impacts credit rating decisions and contributes to mispricing in financial markets. Understanding this potential mispricing is crucial for both investors and policymakers. Overestimating the benefits of social capital could lead to suboptimal investment decisions and diminished market efficiency. Therefore, it is essential to consider policy recommendations to mitigate such biases, ensuring that credit ratings more accurately reflect the true underlying default risk.

## Notes

1. We provide a brief review of this literature in [Section 2](#).
2. Social capital has been the subject of much research in political science ([Putnam, 1993](#)), sociology ([Coleman, 1988](#)), and economics ([Fukuyama, 1995](#); [Woolcock, 1998](#)) and it can be defined as the extent of mutual trust in a society ([Jha & Chen, 2015](#)). High social capital areas are characterized as having strong cooperative norms and dense social networks ([Putnam, 1993](#)). Cooperative norms are nonreligious social norms that limit opportunistic self-interested behavior in transactions, such as altruism, honoring obligations, and mutual trust ([Knack & Keefer, 1997](#); [Coleman, 1988](#); [Guiso, Sapienza, & Zingales, 2010](#)). Dense social networks also act as a deterrent to opportunistic behavior by increasing the amount of information available about other parties and by creating a strong reputational penalty for dishonest behavior ([Coleman, 1988](#); [Spagnolo, 1999](#)).
3. [Alissa et al. \(2013\)](#) find that firms use accounting discretion to influence their credit ratings.
4. We define default risk as the fiscal year-end expected default probability derived from the KMV-Merton (1974) model and [Bharath and Shumway \(2008\)](#).
5. While analysts provide more information to the market, there is also evidence that better accounting information is associated with higher credit ratings ([Ashbaugh-Skaife et al., 2006](#); [Chan, Hsu, & Lee, 2013](#)).
6. [Jaggi and Tang \(2017\)](#) find that credit ratings are less accurate when the rating agency is located further away from the firm. This suggests that credit ratings do incorporate soft information into their ratings. However, their study is silent on what type of soft information the rating agencies are using.
7. In untabulated analyses, we employ ordered logit regressions. The results yield qualitatively similar inferences.
8. A more detailed discussion of the data collection procedures used by Northeast Regional Center for Rural Development is located at: <http://aese.psu.edu/nercrd/community/social-capital-resources/social-capital-variables-for-1990-1997-and-2005> and <http://aese.psu.edu/nercrd/community/social-capital-resources/social-capital-variables-for-1997-2005-and-2009>.
9. Linear interpolation is a method of curve fitting using polynomials, and is a common practice in prior studies (e.g. [Hilary & Hui, 2009](#); [Kumar, Page, & Splat, 2011](#); [Jha & Chen, 2015](#); [Cheng et al., 2017](#); [Jha, 2017](#)).
10. State-year fixed effects are more flexible than simply including both state and year fixed effects because they allow the state fixed effects to vary by year. In other words, by using state-year fixed effects, we allow for the possibility that the effect of being in a given state on credit ratings changes over time.
11. We thank Ning Zhang for sharing the social capital measures, demographic and geographic variables, the company reputation, CSR, and earnings quality measures with us.
12. However, in our main regression in [Table 3](#) – Panel A, Column (1), the variance inflation factor on *Social Capital* is 4.9, which is less than 10, alleviating concerns of multi-collinearity ([Wooldridge, 2002](#)).
13. We appreciate the reviewer's insightful suggestion regarding the clustering of standard errors. As a robustness check, we also estimated our models with standard errors clustered at the county/state level. The results are consistent with those obtained when clustering at the firm level, supporting the robustness of our findings. These additional results are available upon request.
14. We match DealScan and Compustat datasets using the linking file provided by Professor Michael Roberts at the Wharton School of the University of Pennsylvania.
15. We conducted additional univariate tests, detailed in untabulated files, to further investigate whether the September 11 Terrorist Attacks could serve as an exogenous shock driving changes in a county's social capital. Our results indicate that, while the mean *Social Capital* in affected counties shows some increase from 1997 to 2005, this change is statistically significant only for counties

within 100 miles of the Pentagon or World Trade Center. In contrast, the increase in mean *Social Capital* of unaffected counties (based on both classification methods to define affected and unaffected counties) is insignificant and smaller than that of 9/11 affected counties. Additionally, we examined whether there was a significant difference in credit ratings between firms in affected and unaffected counties before the attacks. The untabulated univariate tests' results show that the credit ratings are not significantly different between firms in NY and VA counties and other counties in the pre-9/11 period. However, firms in counties that are within 100 miles of the Pentagon or World Trade Center have significantly higher ratings than firms in other counties in the pre-9/11 period. Our results are available upon request. Table 5 shows that after controlling for the standalone indicator variable 9/11 Affected Counties, the coefficients on the interaction term *9/11 Affected Counties*  $\times$  *Post 9/11* are significantly positive, indicating that firms located in affected counties experience a significant increase in credit ratings after the 9/11 event. These outcomes underscore the 9/11 attacks as a pertinent factor in influencing both social capital dynamics and firm credit ratings in affected counties.

16. This results in two subsamples of unequal size for a few reasons. First, we split the sample based on the median county-level experience each fiscal year. It is important to split based on county-level experience because social capital is measured at the county level. It is also important to split separately each year. Splitting based on experience, without considering the year, would result in all observations with high levels of experience falling in the later years of our sample. Second, we use all Compustat/CRSP firms with available ratings to determine the rating length of each county and use all counties with available rating length to determine medians.
17. In column (2) of Table 7, the control variable *Subordinate* for loan characteristics is dropped because it predicts failure perfectly.
18. In untabulated analyses, we attempt to alleviate this concern by using organ donation as an alternative measure of social capital, measured as the number of all organ donations scaled by the total population (measured in 10,000 people) in each state in each year (*Source: Organ Procurement and Transplantation Network of the U.S. Department of Health and Human Services.*). After including all control variables used in Table 3 – Panel A, Column (1), the industry and year fixed effects, the basic model yields qualitatively similar inferences. However, it remains a limitation of the study.

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(The Appendix follows overleaf)

Appendix

| Variables                                                                                               | Definition                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|---------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <i>Dependent variable (Source(s): Compustat)</i>                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <i>RATING</i>                                                                                           | Standard & Poor's long-term domestic issuer credit rating (SPLTCRM). Firms with AAA ratings are assigned a value of 22, those with AA + ratings are assigned a value of 21, and so on, down to firms with D ratings, which are assigned a value of 1.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <i>Variable of interest</i>                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <i>Social Capital</i>                                                                                   | This variable is the measure of societal-level social capital at the county level. The variable is constructed as the first principal component of four inputs: <i>Assn</i> , <i>Nccs</i> , <i>Pvote</i> , and <i>Respn</i> . <i>Assn</i> is the sum of the religious organizations, civic and social associations, business associations, political organizations, professional organizations, labor organizations, bowling centers, physical fitness facilities, public golf courses, sport clubs, managers and promoters membership sports and recreation clubs (no data for 2005 or 2009), and membership organizations not elsewhere classified (no data for 2005 or 2009), then divided the number by 12 (10 for 2005 or 2009) and scaled by the population of the county (measured per 10,000 people). <i>Nccs</i> is the total number of nongovernment organizations, excluding those with an international focus, scaled by the population (measured per 10,000 people). <i>Pvote</i> is the number of votes casted scaled by the population above 18 years old (measured per 10,000 people). <i>Respn</i> is the census response rate. As the NERCD surveys are only available for the years 1990, 1997, 2005, 2009, and 2014, we linearly interpolate and fill the social capital data for years between two adjacent surveys. Due to data availability of other county-level variables, the social capital is measured for years 1990–2012. <i>Source(s): NERCRD</i> |
| <i>Demographic and geographic controls</i>                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <i>POP</i>                                                                                              | The natural logarithm of population each year for each county. <i>Source(s): Bureau of Economic Analysis (BEA)</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <i>EDUC</i>                                                                                             | The percentage of college graduates each year for each county. The education data are available only in 1990, 2000, 2010, 2011, and 2012. We linearly interpolate the data to fill in the years between each survey. <i>Source(s): BEA</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <i>RELIGION</i>                                                                                         | The percentage of religious adherents each year for each county. The religiosity data at the county-level are available only in 1990, 2000, 2010, and 2012. We linearly interpolate the data to fill in the years between each survey. <i>Source(s): Association of Religion Data Archive (ARDA)</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <i>INCOME</i>                                                                                           | The natural logarithm of the per capita income each year for each county. <i>Source(s): BEA</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <i>INC_GROWTH</i>                                                                                       | The growth rate of per capita income each year for each county. <i>Source(s): BEA</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <i>UNEMP</i>                                                                                            | The unemployment rate is expressed as a percentage rate for each county. <i>Source(s): Bureau of Labor Statistics</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <i>Firm-level control variables (Source(s): Compustat, ISS, I/B/E/S, SEC's Edgar system, KLD, AAER)</i> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <i>SIZE</i>                                                                                             | The natural logarithm of total assets                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <i>PPE</i>                                                                                              | Net property, plant, and equipment divided by total assets                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <i>LEV</i>                                                                                              | The sum of long-term debt plus debt in current liabilities, divided by total assets                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <i>SUBORD</i>                                                                                           | An indicator variable that takes a value of one if the firm has subordinated debt in the current fiscal year, and zero otherwise                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <i>INSTOWN</i>                                                                                          | The average percentage of shares held by institutional investors during the current fiscal year                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <i>NUMEST</i>                                                                                           | The number of current-year earnings forecasts outstanding before the firm's fiscal year-end. <i>Source(s): I/B/E/S</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <i>ROA</i>                                                                                              | Earnings before extraordinary items divided by the total assets                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <i>LOSS</i>                                                                                             | An indicator variable that takes a value of one if the firm reports negative earnings before extraordinary items, and zero otherwise                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |

Table A1.  
Variable definitions

(continued)

| Variables                                                          | Definition                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|--------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <i>INTCOV</i>                                                      | Operating income before depreciation and interest expense divided by interest expense                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <i>BM</i>                                                          | The book-to-market ratio                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <i>STDRET</i>                                                      | The standard deviation of daily stock returns in the current fiscal year                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <i>AQ</i>                                                          | Accruals Quality. This variable is calculated as a negative one times the standard deviation of a firm's residuals from the modified <a href="#">Dechow and Dichev (2002)</a> model over the five-year rolling window. We estimate the following regression for each year and each industry: $\Delta WC_i = \beta_0 + \beta_1 CFO_{i-1} + \beta_2 CFO_i + \beta_3 CFO_{i+1} + \beta_4 (\Delta Rev_{i,t} - \Delta AR_{i,t}) + \beta_5 PPE_{i,t} + \varepsilon$ , where <i>CFO</i> is firms' cash flows from operations, <i>Rev</i> is sales, <i>AR</i> the account receivable and <i>PPE</i> is net PP&E, all scaled by lagged total assets |
| <i>Minus DDresid</i>                                               | This variable is calculated as a negative one times the residual from the modified <a href="#">Dechow and Dichev (2002)</a> model                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <i>Readability</i>                                                 | This variable captures 10-K readability and is calculated as $206.835 - 1.015 * (\#words / \#sentences) - 84.6 * (\#syllables / \#words)$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <i>Reputation</i>                                                  | An indicator variable that takes a value of one if the company name is on the <i>Most Admired list</i> issued by Fortune each year, and zero otherwise                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <i>CSR</i>                                                         | This variable is calculated as total strengths minus total concerns in KLD's seven social rating categories: community, diversity, employee relations, environment, product, governance and human rights                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <i>MASCORE</i>                                                     | The managerial ability score created by <a href="#">Demerjian, Lev, and McVay (2012)</a>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <i>AAER</i>                                                        | An indicator variable that takes a value of one if the company is alleged of accounting and/or auditing misconduct by the SEC, and zero otherwise                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <i>Restatement</i>                                                 | An indicator variable that takes a value of one if the company restates its earnings, and zero otherwise                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <i>Backdating</i> <sup>CEO</sup>                                   | An indicator variable that takes a value of one if at least one backdated option grant to the CEO during the year was given on a day which had the lowest price of the month, and zero otherwise                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <i>Backdating</i> <sup>Director</sup>                              | An indicator variable that takes a value of one if at least one backdated option grant to the director during the year was given on a day which had the lowest price of the month, and zero otherwise                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <i>Backdating</i> <sup>WSJ</sup>                                   | An indicator variable that takes a value of one if the year is associated with an identified backdating activity by the Wall Street Journal, and zero otherwise                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <i>Default risk</i>                                                | The fiscal year-end expected default probability is derived from the KMV-Merton (1974) model and <a href="#">Bharath and Shumway (2008)</a>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <i>Loan facility-level control variables (Source(s): DealScan)</i> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <i>Log(Spread)</i>                                                 | The natural logarithm of loan spreads for loans issued within the fiscal year. Loan spreads are all-in-drawn spreads expressed in basis points. The all-in-drawn spread is the sum of upfront fees, spread over LIBOR, utilization fee, and annual fee specified in a facility at the inception of the facility                                                                                                                                                                                                                                                                                                                            |
| <i>Previous relation</i>                                           | An indicator that takes a value of one if at least one of the loan's lead lenders had been a lead lender of the borrower's previous loans in the past five years preceding the loan's issuance date, and zero otherwise                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <i>Subordinate</i>                                                 | An indicator variable that takes a value of one for subordinate debt and zero otherwise                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <i>Performance pricing</i>                                         | An indicator variable that takes a value of one if the loan facility uses performance pricing and zero otherwise                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <i>Loan maturity</i>                                               | The natural logarithm of loan maturity (in months)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <i>Loan amount/TA</i>                                              | Offering amount of the loan facility, divided by total assets                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <i>Loan package-level control variables (Source(s): DealScan)</i>  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <i>Log(# of facilities)</i>                                        | The natural logarithm of the number of loan facilities in the package                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <i>Log(# of lenders)</i>                                           | The natural logarithm of the number of loan lenders                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |

(continued)

Table A1.

Table A1.

| Variables                                                                        | Definition                                                                                                                                                                                 |
|----------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <i>Loan purpose, loan type and bank type fixed effects (Source(s): DealScan)</i> |                                                                                                                                                                                            |
| <i>Loan purpose</i>                                                              | Five indicator variables for the primary purposes of loans are acquisitions, backup line, refinancing, working capital/corporate purposes, and other, respectively                         |
| <i>Loan type</i>                                                                 | Four indicator variables for term loan, the loan type of revolver greater than one year, the loan type of revolver less than one year, and the loan type of 364-day facility, respectively |
| <i>Bank type</i>                                                                 | Two indicator variables for investment bank (if at least one lead lender is an investment bank) and foreign bank (if at least one lead lender is a foreign bank), respectively             |
| <b>Source(s):</b> Appendix by authors                                            |                                                                                                                                                                                            |

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