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Leverage, Debt Maturity, and Social Capital

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Abstract

We find that both firm leverage and short-term debt ratios are negatively associated with social capital (i.e., the altruistic tendency and mutual trust among people within a community). This relation is more pronounced in cases where information asymmetry problems are more severe and is robust to using alternative measures of key variables, addressing endogeneity issues, employing alternative model specifications, and simultaneously estimating leverage and short-term debt. An analysis on debt structure (bank loans vs. public debt) shows consistent results. Our findings are in line with the idea that social capital lowers the need for corporate borrowing mechanisms as a means to alleviate agency problems for firms.

JEL Classification: G32, G41, Z13

Keywords: Agency costs, capital structure, debt maturity, information asymmetry, social capital

1 Introduction

The capital and debt structures of a firm can affect its value in many ways. One particular channel is through how they alter managerial incentives and impact investment decisions (Jensen and Meckling, 1976). In this regard, finding the optimal levels of leverage and debt maturity involves trading off the benefits and costs associated with them. For instance, using more leverage and shortening debt maturity can both alleviate problems that arise from management entrenchment (Harris and Raviv, 1990; Jensen, 1986), but at the same time introduce shareholder-creditor conflicts and liquidity risk, respectively, in addition to financial distress (e.g., Johnson, 2003; Myers, 1977).[1] Thus, an economic variable that bears the function of substituting the benefits of leverage and short-term debt, thereby lowering the associated potential costs and allowing the reallocation of resources, can be valuable to the firm. In this paper, we hypothesize that social capital fits such a role.

Following Guiso et al. (2004), we define social capital as the degree of altruistic tendency and the level of mutual trust among people within a community. Plainly speaking, high social capital regions comprise of individuals that are more trustworthy, more cooperative, and less self-centered (see, for instance, Hasan et al., 2017b; Jha and Chen, 2015; Jha and Cox, 2015). We propose that managers in these areas are less likely to misbehave or take actions that may harm investors. This can be due to their society reflecting who they are, shaping who they become, or forcing them to be more concerned about reputation losses before taking value-destroying actions (Mead, 1934, p. 178). Through each of these channels, the managers are more likely to be perceived by investors as trustworthy.

If higher social capital alleviates concerns that investors have toward managers as we propose, it would then lead to a lower severity of agency problems at the firm level. Managers in high social capital regions, for example, would less likely take actions that benefit themselves at the expense of investors even when they are entrenched and/or have low ownership stakes (e.g., Jensen, 1986). They would also be more careful when taking actions that may turn out to be over-confident and value-destroying (Heaton, 2002; Malmendier and Tate, 2005; Roll, 1986).[2]

[1] For additional empirical evidence of firms trading off governance with potential costs arising from shareholder-creditor conflicts, see Chava et al. (2009), Cremers et al. (2007), and Klock et al. (2005).

[2] For the incentives behind value-destroying acquisitions and empire building, see also Harford and Li (2007), Loughran and Vijh (1997), and Moeller et al. (2004). Note that value-destroying investments can happen even when

With agency problems mitigated through the presence of social capital, the need to alleviate them through corporate borrowing mechanisms becomes lower.

Prior literature is rich in showing the benefits and costs of using leverage and shortening debt maturity on agency problems: Leverage provides incentives for managers to work more efficiently in many ways. To name a few, leverage (i) commits the firm to loan payments and thereby reduces excess cash flows that can be used on wasteful investments, (ii) introduces management oversight through creditor monitoring (Harris and Raviv, 1990; Rajan and Winton, 1995), and (iii) encourages managerial work commitment and reduces entrenchment through the associated increased risk of financial distress (Brander and Lewis, 1986; Hennessy and Livdan, 2009; Perotti and Spier, 1993).[3] However, using leverage also increases financial distress risk and exacerbates conflicts between creditors and shareholders. Similarly, the use of short-term debt lessens the opportunities for managers to profit themselves at the expense of other stakeholders, as shorter maturity forces the firm to repeatedly return to the creditors for renegotiation and in turn imposes more discipline on the borrower (Harris and Raviv, 1990; Stulz, 1990). Further, refinancing and therefore repricing debt prior to the expiration of investment options reduce debt overhang problems (Barclay and Smith, 1995; Guedes and Opler, 1996). However, due to exactly the same reasons, short-term borrowing exposes the firm to the risks of credit refusal and the possible need to cut down operations or to sell assets at distress prices (i.e., there is a trade-off between costs arising from under-investments and costs of liquidity Johnson, 2003).

In sum, using more leverage and shortening debt maturity may solve certain problems, but they also give rise to new ones. Under the presumption that firms adjust to their optimal level of capital structure and debt maturity (Flannery and Rangan, 2006; Hovakimian et al., 2001; Leary and Roberts, 2005), we expect that firms in high social capital areas have lower leverage levels and longer debt maturities than otherwise. To formally test our hypothesis, we examine the relation between firm borrowing and social capital. Using empirical proxies for social capital at both the county and state levels (Rupasingha et al., 2006; Putnam, 2000, respectively), we find evidence

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managers are serving their investors' interests due to over-confidence.

[3] One other potential benefit of debt financing is that it allows the existing equity holders of the firm to retain ownership concentration, which prevents the dilution of profit shares and encourages monitoring (Jensen and Meckling, 1976). This effect, however, is only evident in firms with sufficiently high ownership concentration. See, for instance, Morck et al. (1988).

that supports our prediction: Controlling for other firm level determinants of borrowing and for geographical characteristics, firm leverage and short-term debt are negatively associated with social capital.

Our results can be consistently extended to provide implications regarding the information asymmetry in capital markets. Although the pricing of equity is more sensitive to managers' private information than other forms of external financing, we argue that the role of leverage and short maturity as ways to avoid the lemons problem is less significant for firms in high social capital areas (see Akerlof, 1970; Leland and Pyle, 1977). If high social capital serves as a good proxy of trustworthy managerial actions as we hypothesize, investors would then demand a lower premium on equity than otherwise, allowing firms to deviate more from the pecking order (Myers, 1984; Myers and Majluf, 1984).[4] On the demand side of funds, our interpretation of social capital also implies that the need to use leverage as a signaling device is less essential for firms in high social capital regions (i.e., the signaling theory of debt; Ross, 1977). Based on the same reason, the usefulness of short-term debt as a signal of high-quality borrowing can also be eroded by social capital (see Diamond, 1991). To alleviate the concern that our results may be biased by omitted variables that drive both corporate borrowing and social capital, we employ a two-stage estimation that uses the historical degree of racial segmentation in a given state as an instrument for social capital (Alesina and La Ferrara, 2000; Hasan et al., 2017a). Our results remain qualitatively similar when using the instrumental variables approach.

Further, in order to test whether social capital affects corporate financing decisions through a reduction in agency costs, we conduct subsample analyses. Agency problems arise when involved parties in a contract have different payoff structures and asymmetric information, such that investors are not certain that the manager is acting in their best interest. If the negative relation between leverage/short-term debt and social capital that we show is indeed due to our interpretation of the results, then we should observe a stronger effect for firms with larger information asymmetry problems. In order to examine this, we categorize firms in our sample as either of high or of low information asymmetry based on several empirical proxies including discretionary accruals (Dechow and Dichev, 2002; Dechow et al., 1995), accounting readability

[4] The pricing of debt is highly dependent on interest rates. Further, debt contracts are associated with lower expected monitoring costs due to less concerns regarding moral hazard problems. For the increasing importance of integrity in financial economics, see also Erhard and Jensen (2015) and Jensen (2017).

(Lehavy et al., 2011; Li, 2008), institutional ownership (Boone and White, 2015; Hartzell and Starks, 2003), stock liquidity (Amihud, 2002; Easley et al., 1996; Venkatesh and Chiang, 1986; Welker, 1995), and percent-cost of trading (Fong et al., 2017). In all cases with high information asymmetry, both leverage and short-term debt continue to be strongly and negatively associated with social capital. Notably, in line with our inferences, the estimated magnitudes of this association for the high asymmetry group are much stronger than those reported in the baseline models for nearly all subsample estimations. For the low information asymmetry subsamples, the magnitudes of the estimated coefficients for social capital are much smaller and are sometimes statistically insignificant. Taken the two subsamples together, we find in nearly all specifications that the negative association between corporate borrowing and social capital is statistically stronger for the high information asymmetry subsample relative to the low asymmetry subsample.

An analysis on debt structure (bank loans vs. public debt) also shows consistent results. Specifically, we examine whether the allocation between private and public debt placements by firms varies in social capital. Compared to "arm's-length" investors, banks play a stronger and more effective monitoring role in lending relationships through their superior access to borrowing firms' information (Denis and Mihov, 2003; Diamond, 1984; Fama, 1985; Leland and Pyle, 1977). Therefore, firms with higher levels of information asymmetry tend to borrow privately, while firms with lower levels do so publicly. Tying this to our main argument, we predict that firms in high social capital regions use less bank debt and more public debt in their debt structure. We find what we expect.

Finally, we validate the robustness of our results by employing several alternative model specifications: First, due to the highly persistent nature of both firm level capital structure and social capital, we control for the beginning leverage level of firms in the respective estimations to ensure that our results are not driven by the long-term levels of the two variables (Lemmon et al., 2008). Second, we ensure the cross-sectional robustness of our results by using a Fama-MacBeth estimation, modeling each cross-section separately while correcting for serial correlation using Newey-West errors (Fama and MacBeth, 1973; Newey and West, 1987). Third, we employ different clusterings of standard errors (e.g., by firm/industry and year instead of by the respective regions; Petersen, 2009). Lastly, we address the possibility of a nonlinear relation between corporate borrowing and social capital. In all alternative specifications, our results remain qualitatively unchanged. We also use additional, more specific measures for social capital, such as

Putnam's (2000) trust and honesty indices and voter turnout, and continue to find similar results. Our results also hold when simultaneously estimating leverage and short-term debt.

Collectively, our results indicate that social capital can substitute for the agency benefits of using leverage and shortening debt maturity, thus providing firms with more flexibility in financing and therefore lowering the costs that are otherwise associated with taking those actions. For instance, prior research has shown that firms would often need to raise more equity capital to sustain growth (Berens and Cuny, 1995). If social capital leads to a lower level of optimal leverage through alleviating agency costs in the first place, the firm would be able to fuel such growth. Another example would be that long-term credit is generally more attractive for firms, as short-term credit is associated with liquidity risk (Berglöf and von Thadden, 1994; Johnson, 2003).[5] If social capital reduces the need for the disciplining mechanism of short-term debt, once again, the firm will have the opportunity to capitalize on the flexibility in financing.

Our study joins the growing literature that examines the substitution effects between different forms of governance. Ferreira et al. (2011), for instance, find that stock price informativeness and board monitoring are mutual substitutes. Guo et al. (2015) find evidence supporting the notion that firms treat internal and external governance as substitutes. Gillan et al. (2011) show that firms with more independent boards are associated with a larger number of charter provisions. Relatedly, Cremers et al. (2008) present evidence that product market competition is a substitute for the market for corporate control. Our empirical results complement this literature by showing that the social environments may substitute for the use of debt as an alternative disciplinary mechanism. More broadly, we add to the line of research that relates the level of trust in a society to its economic development and financial activities (Guiso et al., 2004, 2008b; Gupta et al., 2018; Hasan et al., 2017a; La Porta et al., 1997) and also contribute to the understanding of firm level capital and debt structure choices (e.g., Brockman et al., 2010; Datta et al., 2005; Díaz-Díaz et al., 2016; Huang et al., 2016; Leary and Roberts, 2010).

This paper proceeds as follows: We describe our data and sample in Section 2, present our main findings in Section 3, provide extended analyses and conduct robustness checks in Section 4, and conclude in Section 5.

[5] See Biais and Malécot (1996) for cross-country evidence on the relation between short-term debt and creditor protection.

2 Data and Research Design

In this section, we describe our sample and the construction of key variables that are used in this study. We also provide details on the empirical filters that we apply, as well as on the covariates used in the estimations of both leverage and debt maturity. Detailed variable definitions are included in the Appendix.

2.1 Sample Construction

To construct our sample, we identify firms covered by the intersection of Compustat and CRSP from 1985 to 2015.[6] We require the firm to have positive sales and total assets to be included in the sample and restrict our sample to industrial firms with SIC codes from 2000 to 5999. We exclude observations that do not have sufficient information to calculate the control variables described below. Additionally, following the convention in the debt maturity structure literature, we omit observations with short-term debt to total debt ratios that are less than 0% or greater than 100% (see, for instance, Brockman et al., 2010; Datta et al., 2005; Johnson, 2003). Our final samples consist of 56,840 firm-year observations with 7,811 unique firms for the leverage estimations and 57,417 firm-year observations with 7,844 unique firms for the short-term debt estimations.[7]

2.2 Leverage and Debt Maturity

In order to test the empirical relation between leverage and social capital, we employ two dependent variables: book leverage, defined as total debt divided by book value of total assets (Frank and Goyal, 2009), and market leverage, defined as total debt divided by market value of total assets (Faulkender and Wang, 2006; Michaely and Vincent, 2012). Following prior literature, we include an extensive set of control variables in the regressions of financial leverage, namely firm size, firm size squared, asset tangibility, profitability, dividend payout, capital expenditure, market-to-book, R&D, missing R&D dummy, credit rating dummy, and a regulated industry dummy variable. In order to control for geographic characteristics that may affect our dependent

[6] The sample period starts in 1985 because it is the first year credit rating data became available.

[7] Our choices of covariates and fixed effects in the leverage and debt maturity estimations are largely based on prior literature. Using the same set of control variables for leverage and short-term debt, however, does not qualitatively change our results.

variables, in all regressions we include a set of control variables that capture geographic characteristics, namely income per capita, population density, population growth, and religiosity in the county where the firm is headquartered.

Similar to previous studies (Barclay and Smith, 1995; Brockman et al., 2010; Datta et al., 2005; Johnson, 2003), we use the fraction of debt due within three years (ST Debt 3YR; ST3) and five years (ST Debt 5YR; ST5) as our proxies for the use of short-term debt. ST3 (ST5) is calculated as the ratio of debt in current liabilities plus debt maturing in two and three years (two through five years) to total debt. We include the following control variables that are commonly used in the debt structure literature: firm size, firm size squared, leverage, market-to-book, abnormal earnings, asset maturity, asset volatility, R&D, missing R&D dummy, regulation industry dummy, credit rating dummy, and term structure of interest rate. Similar to financial leverage estimations, all regressions include a set of county level geographic control variables.

2.3 Social Capital

While social capital is an intangible construct and previous literature defines social capital in slightly different manners, the core of social capital is the norms and the networks that facilitate collective action and foster cooperation and trust within a community (Fukuyama, 1997; Guiso et al., 2004; Woolcock, 2001). In the context of this study, we follow Guiso et al. (2004) and regard social capital as the level of mutual trust among people in a society, which is consistent with the broad definition of social capital in the literature.[8] We employ two alternative measures of social capital in this paper.

The first measure is a county level social capital measure compiled by Rupasingha et al. (2006, RGF hereafter), where the authors conduct a principal component analysis to construct a social capital index for each county based on the number of social and civic associations, the voter turnout in the presidential election, the census response rate, and the number of non-government

[8] Given that social capital captures a wide range of societal characteristics in a given region, it is not surprising that the social science literature has a somewhat fluid definition of social capital. For instance, Fukuyama (1997) notes that social capital reflects the existence of a certain set of informal values or norms shared among members of a group that permits cooperation among them. Woolcock (2001) refers to social capital as the norms and networks that facilitate collective action. Guiso et al. (2008a) define social capital as a set of beliefs and values that facilitate cooperation among the members of a community.

organizations at the county level. The data are available from the Northeast Regional Center for Rural Development in the College of Agricultural Sciences at Pennsylvania State University.[9] This county level social capital index is available for the years 1990, 1997, 2005, and 2009. For the years where the data is missing, we assume that the social capital value in a given county remains the same until new data becomes available.

The second social capital measure we adopt is the state-level Putnam (2000) index. This index is a comprehensive measure of social capital in a state constructed based on fourteen different social capital indicators through survey responses (i.e., club meetings attended, community projects worked on, times entertained at home, times volunteered, time spent visiting friends, agreeing that most people are honest, serving on committees for local organizations, servicing as officer of clubs or organizations, attending meetings on town or school affairs, organizations per capita, mean number of group memberships, agreeing that most people can be trusted, civic and social organizations per 1,000 population, and voter turnout). The data can be obtained from Putnam's (2000) official website.[10] While the Putnam index is cross-sectional in nature without allowing time variations, it captures elements in the society that may not be directly covered by the county-level social capital measure such as how trustworthy people are perceived in a particular region. As a result, we use the Putnam index as an alternative proxy for social capital to verify our results. Given that the RGF index and Putnam index are positively but imperfectly correlated with each other (see Table II), we consider them valid alternative social capital measures to test our hypotheses.

[Insert Table I about here.]

Table I shows the descriptive statistics of the variables used in the study.[11] All continuous

[9] The RGF measure of county level social capital is obtained from the Northeast Regional Center for Rural Development in the College of Agricultural Sciences at Pennsylvania State University (http://aese.psu.edu/nercrd/community/social-capital-resources/social-capital-landing-pageaese.psu.edu/nercrd/community/social-capital-resources/social-capital-landing-page).

[10] Putnam's (2000) measures of the different attributes of social capital are obtained from the official website of his seminal work on social capital, "Bowling Alone: The Collapse and Revival of American Community (http://bowlingalone.com/bowlingalone.com)."

[11] Due to space concerns, we report in Table I only the sample with 56,840 observations used in our leverage estimations. Our short-term debt estimations contain 57,417 observations and exhibit very close descriptive statistics to those reported.

variables are winsorized at the 1st and 99th percentile to alleviate the impact of outliers. The variables are generally in line with prior studies. The mean (median) levels of book leverage and market leverage are 0.2817 (0.2628) and 0.2135 (0.1828), respectively. The proportion of debt that matures within the next three-year period (ST3) is 0.5004 (0.4380) at the mean (median); the proportion of debt that matures within the next five-year period (ST5) is 0.6745 (0.7420) at the mean (median). The RGF and Putnam indices are -0.3355 (-0.3447) and -0.1493 (-0.1860) at the mean (median), respectively. The mean and median firm sizes in our sample are $2.35 and $0.25 billion, suggesting the presence of some very large values and thus justifying the use of natural logs of this variable. Further, both leverage and short-term debt vary widely across firms, as shown by the inter-decile/quartile differences. The mean (median) market-to-book of 1.7396 (1.3449) is also roughly in line with those found in prior literature.

[Insert Table II about here.]

Table II presents the Pearson correlation matrix of key variables used in this study (i.e., leverage, short-term debt, and social capital). Consistent with our predictions, univariate results show negative correlations between (i) the RGF index and both leverage ratios (-0.0146 and -0.0098), (ii) the RGF index and both short-term debt ratios (-0.0283 and -0.0440), and (iii) the Putnam index and both leverage ratios (-0.0714 and -0.0759), all statistically significant at conventional levels.[12] The correlations between the Putnam index and the short-term debt measures, ST3 and ST5, are 0.0184 and 0.0032, respectively. The latter is insignificant and the former is statistically positive; both appear to be inconsistent with our predictions at first glance. However, this justifies the examination of our hypothesis in a multivariate setting that enables the removal of confounding effects by omitted firm characteristics on both social capital and corporate borrowing. Especially since short-term borrowing introduces liquidity risk, short-term leverage is expected to be negatively associated with total leverage (see, e.g., Johnson, 2003). This is confirmed in the untabulated full correlation matrix (correlations range between the -0.1773 to -0.2628 range; full matrix available upon request) and again in our later short-term leverage regressions (in Table IV).

When we re-examine the correlation between social capital and short-term debt using a short-term debt measure with firm assets as the denominator, we find significantly negative relations. The correlations between the RGF (Putnam) index and the three- and five-year

[12] The full correlation matrix of all variables used in this study is available upon request.

short-term debt become -0.0128 and -0.0283 (-0.0384 and -0.0592), respectively.

2.4 Empirical Design

We present our empirical analyses in the next two sections. First, we conduct baseline ordinary least squares (OLS) estimations using our social capital measures, namely the RGF and Putnam indices, to predict financial leverage and debt maturity, while controlling for a battery of firm and county level variables that may influence corporate financing decisions.

Realizing the endogenous nature of our main explanatory variable, social capital, we next attempt to address the endogeneity concerns using instrumental variables in a 2SLS setting. Additionally, in order to examine the validity of our argument that social capital helps alleviate agency conflicts between managers and shareholders, which in turn alters firms' decisions to use debt and short-term debt, we analyze the heterogeneous effect of social capital on corporate financing decisions in subsamples based on the severity of agency problems faced by the firm.

To further ensure robustness, we employ additional measures for social capital and also use several alternative model specifications that address the potential empirical issues that we discuss later.

3 Main Analyses

In this section, we investigate the empirical relation between financing decisions (i.e., capital and debt structures) and social capital in a multivariate setting. Following our earlier arguments, using leverage and shortening debt maturity generate agency benefits. For instance, financial leverage entails regular cash outflows, which makes excess cash flows less available to the manager and thereby reducing agency cost. Further, when a large portion of a firm's debt is short-term, the firm needs to frequently revisit the debt market to refinance; the regular re-evaluation process of the firm's financial condition by lenders makes it difficult for the manager to pursue private objectives that deviate from the best interest of the capital providers of the firm.[13]

[13] More recent evidence also suggests that short-term debt can effectively exert restrictions on managerial discretions. For example, Dang et al. (2017) argue that short-term debt can play a monitoring role over managers and constrain bad news hoarding behavior. The authors report a negative relation between the firm's use of short-term debt and stock price crash risk. Fu and Tang (2016) show that firms with more short-term debt are less likely to engage in acquisitions, and when they do, they tend to make smaller deals, take more time to complete the deal, and are less likely to use cash.

However, also as discussed, leverage and short-term debt are not without costs. Given that individuals living in high social capital areas may be more compassionate, more altruistic, and hold higher moral standards, a manager from the area, for example, may be less likely to engage in selfish behavior such as extracting value from the firm at the cost of other stakeholders. Such internal moral and ethical norm may make it less necessary to discipline managers located in high social capital areas, reducing the use of debt and short-term debt for firms headquartered in such regions.[14] Based on the discussion above, we expect an inverse relation between social capital and the use of debt and short-term debt.

3.1 Leverage

The following specification is our baseline estimation for financial leverage:

$$\mathrm{LEV}_t = \beta_{\mathrm{SC}}\mathrm{SC}_t + \mathbf{X}_t' B_{\mathbf{X}} + \epsilon_t, \tag{1}$$

where LEV is the vector of firm leverage and SC is the vector of social capital. $\mathbf{X}$ is the matrix of all control variables and ϵ is the error vector; β and B are the estimated coefficients for social capital and the controls matrix, respectively. All models are reported using robust standard errors clustered by either county or state, depending on the nature of the key independent variable (i.e., social capital).

Table III reports the baseline estimation results of Equation (1). Models 1a and 1b show the estimations of book leverage when employing the county level social capital index of Rupasingha et al. (2006) and the state level social capital index of Putnam (2000), respectively. Models 2a and 2b show the estimations of market leverage following the same format. Below each coefficient estimate, t-statistics are reported in parentheses.

[Insert Table III about here.]

All regressions contain a set of control variables that may affect financial leverage.

[14] An alternative possibility is that people in high social capital areas may act in a more ethical fashion because the societal punishment on behavior deviating from the acceptable norms is harsh. In this case, even though the manager may be self-interested, she may feel obliged to avoid self-serving behavior, which would also lead to a reduction in agency costs, and hence less need for debt market discipline. As the motivation of people being honest and trustworthy falls out of the scope of this research, we do not attempt to address the question whether people are self-motivated or coerced to be more or less trustworthy; instead, we take the level of social capital and trust in a region as a given and focus on whether and how the level of trust among individuals in the society affects firms' financing decisions.

Additionally, in order to capture geographic characteristics other than social capital that may potentially impact corporate financing decisions, we include several county level control variables such as local population (the natural log of population in a county; source: U.S. Bureau of Economic Analysis / BEA), income per capita (the natural log of income per capita in a county; source: BEA), population density (population per square mile of land area in a county; source: Census Bureau), population growth (population growth in a county; source: BEA), and religiosity (number of adherents divided by the population in a county; source: The Association of Religion Data Archives / ARDA). Year and industry fixed effects are also included in all regressions.

The results in Table III show that the coefficient estimates on both the RGF index (county level social capital measure) and the Putnam index (state-level social capital measure) are negative and statistically significant at the 1% level. The estimated coefficients for the RGF and Putnam indices are -0.0064 and -0.0143 for the book leverage estimation and -0.0064 and -0.0108 for the market leverage estimation. All are statistically significant at conventional levels. Intuitively, based on the descriptive statistics reported in Table I, a one-standard-deviation increase in the RGF (Putnam) index is associated with a drop in book leverage of 60 (75) basis points. Similarly, the drop in market leverage given a one-standard-deviation increase in the RGF (Putnam) index is 60 (57) basis points. With a mean (median) in book leverage of 0.2817 (0.2628) and a mean (median) in market leverage of 0.2135 (0.1828) for our sample, these relations are economically significant. Thus, our results suggest that firms headquartered in high social capital regions are associated with less use of leverage. As shown, we obtain qualitatively similar results whether we use book leverage or market leverage as the measure of capital structure, indicating that our findings are not subject to the choice of measure for leverage ratios.

Following earlier discussions, our finding is consistent with our main hypothesis that firms located in high social capital regions, due to the mutual trust among people and hence less need to use debt to monitor the manager, use less debt in their capital structure.

3.2 Short-Term Debt

We estimate the effect of social capital on corporate debt maturity decisions in a similar fashion. Specifically, we employ the following specification to estimate the empirical relation between the use of short-term debt and social capital:

$$\mathrm{STD}_t = \beta_{\mathrm{SC}}\mathrm{SC}_t + \mathbf{X}_t' B_{\mathbf{X}} + \epsilon_t, \tag{2}$$

where STD is the vector of firm-level short-term debt and SC is the vector of social capital. Following previous studies, we use the fraction of debt maturing in three years (ST3) and the fraction of debt maturing in five years (ST5) as the key measures for debt maturity. Similar to the leverage estimations, $\mathbf{X}$ is the matrix of all control variables for short-term debt and ε is the error vector; β and B are the estimated coefficients for social capital and the controls matrix, respectively. All models include year and industry (based on the two-digit SIC code) fixed effects and are reported using robust standard errors clustered by either county or state, depending on the nature of the key independent variable. Models 1a and 1b show the estimations of short-term debt that matures in less than three years when employing the county level social capital index of Rupasingha et al. (2006) and the state level social capital index of Putnam (2000), respectively (ST3). Models 2a and 2b show the estimations of short-term debt that matures in less than five years (ST5). Below each coefficient estimate, t-statistics are reported in parentheses.

[Insert Table IV about here.]

The empirical results of this test are presented in Table IV. We find that, controlling for firm and county level characteristics that may potentially affect debt maturity decisions as well as year and industry fixed effect, the use of short-term debt is significantly and negatively related to our social capital proxies. The estimated coefficient for the RGF and Putnam indices are -0.0089 and -0.0090 for short-term debt that matures within the next three-year period (ST Debt 3YR; ST3); the estimated coefficient for the RGF and Putnam indices are -0.0091 and -0.0127 for short-term debt that matures within the next five-year period (ST Debt 5YR; ST5). Once again, most estimated coefficients for social capital are statistically significant at the 1% level, with the only exception being Model 1b for estimating ST3 using the Putnam index. To put the results into perspective using the sample descriptions reported in Table I, a one-standard-deviation increase in the RGF (Putnam) index is associated with a drop of 84 (47) basis points in the portion of total debt that matures in the next three years. Likewise, a one-standard-deviation increase in the RGF (Putnam) index is associated with a drop of 86 (67) basis points in the portion of total debt that matures in the following five years. Since the mean (median) level of the portion of total debt that matures in the next three years is 0.5004 (0.4380) for the firms in our sample, these relations are economically significant. The same holds for the mean (median) level of the portion of total debt that matures in the next five years, which is 0.6745 (0.7420). Further, as the use of book leverage or market leverage in the leverage estimations, we obtain qualitatively similar results whether we

use three years or five years as the cutoff in determining short-term debt.

This finding, along with the results reported earlier for the leverage estimations in Table III, support the notion that firms surrounded by more trusting environments have less need to discipline the manager with debt and frequent debt renewal, and therefore such firms use less financial leverage in their capital structure and less short-term debt in their debt structure.

The coefficient estimates on the control variables in both Table III and Table IV are generally intuitive and consistent with those found in previous studies. Similar to, for example, Frank and Goyal (2009) and Lemmon et al. (2008), we find that larger firms use higher levels of debt, as larger firms are likely to have lower default risks and enjoy better reputations. Growth opportunities, measured by Market-to-Book, CapEx, and R&D Expenditures, are negatively associated with the use of financial leverage due to the agency cost of debt. As tangible assets can be used as collateral and are easier for creditors to value, firms with more PP&E tend to have higher financial leverage (Hall, 2012). Profitability, proxied using return on assets, is negatively correlated with the use of debt, which is consistent with the pecking order argument that firms prefer internal financing to external debt financing. In addition, since dividend payers are less likely to be financially constrained and therefore are less dependent on borrowing, dividend payout is negatively associated with debt ratios. With regard to the control variables in the debt maturity regressions, firms that are larger and have credit ratings are likely to use more long-term debt, as lenders prefer borrowers with high credit quality (Diamond, 1991; Johnson, 2003). The coefficient estimate on squared firm size is significant and positive, indicating that the relation between firm size and debt maturity may not be monotonic (Diamond, 1991; Stohs and Mauer, 1996). Because highly levered firms may be more vulnerable to refinancing risk, financial leverage is negatively related to the short-term debt measures. Firms with high R&D tend to be highly uncertain and risky. As a result, these firms may find it difficult to obtain long-term debt and therefore have more short-term debt.

4 Extensions and Robustness Checks

In the previous section, we show from our baseline estimations that both firm leverage and short-term debt ratios are negatively associated with social capital. We argue that, with less severe agency conflicts in high social capital regions, the need to alleviate such conflicts through corporate borrowing mechanisms (e.g., using more debt and/or shortening debt maturity) becomes

lower. We now turn to extended analyses to further provide empirical support for our inference.

4.1 Instrumental Variable Approach

Thus far our OLS regression results are largely consistent with our hypothesis that higher levels of social capital alleviates agency conflicts between the manager and shareholders, allowing firms to reduce the amount of debt in their capital structure and the usage of short-term debt in their debt structure. While we include a battery of firm level and county level control variables in our regressions to account for factors that may affect corporate financing decisions, our results may still be biased by some omitted variables that drive both social capital and financial leverage/debt maturity. In this section, we address such endogeneity concerns by employing a two stage least squares (2SLS) approach, where we first estimate the key independent variables of interest (social capital measures) using an instrumental variable (IV), and then insert the predicted social capital measures from the first stage into the second stage to estimate firms' capital structure and debt structure choices.

The instrument that we use to predict our social capital measures in the first stage is the historical degree of racial segmentation. Specifically, we use one minus the Herfindahl index of black and non-black population in a given state in 1960 as the proxy for racial segmentation. A higher value of this variable, which we refer to as Race, indicates a higher level of racial heterogeneity. Alesina and La Ferrara (2000) show that participation in social activities is significantly lower in racially fragmented societies. Therefore, we expect Race to be negatively related to our social capital measures. Importantly, the racial diversity of a region in 1960 reflects historical racial segregation and is unlikely to affect the current financing decisions of firms through channels other than social capital.[15] Based on the discussion above, we estimate the

[15] In untabulated results, we also consider two additional instruments: (i) the natural log of the distance from the firm's headquarters to the Canadian border and (ii) whether a state belonged to the Confederate States of America that existed between 1861 and 1865. The former is motivated by Putnam's (2001) suggestion that a good proxy for the level of social capital in a state is its distance to the Canadian border, in that social capital decreases in this distance. For the latter, the Confederate States of America consisted of eleven states that, following the election of Abraham Lincoln as the U.S. president in 1860, were convinced that their slavery-based way of life was threatened and seceded from the Union. As pointed out by Putnam (2001), the slavery system was institutionally designed to destroy social capital because social connections among people would threaten the structure of power. Therefore, there should be a negative association between the social capital measures and the depth of slavery among different states in the 19th

endogenous social capital variable using the instrumental variable in the first stage. The estimation is formally expressed as

$$\mathrm{SC}_t = \mathbf{Z}_t' \Lambda + \mathbf{X}_t' \Theta + u_t, \tag{3}$$

where SC is the predicted value of one of our two main social capital measures, the RGF index and the Putnam index. $\mathbf{Z}$ and $\mathbf{X}$ are the matrices of the IV and all other control variables, respectively, Λ and Θ are the corresponding vectors of estimated coefficients, and u is the vector of first-stage errors. As described, $\mathbf{Z}$ represents the IV discussed above: racial heterogeneity in 1960. $\mathbf{X}$ is the same matrix of control variables included in Equations (1) or (2), depending on the dependent variable of the second-stage estimation.[16] Year and industry fixed effects are included in all regressions.

The predicted values of social capital measures (i.e., the RGF and Putnam indices) are then inserted into the second stage regression to estimate corporate financing decisions. The second-stage regressions is formally expressed as:

$$\mathrm{Debt}_t = \beta_{\mathrm{SC}} \mathrm{SC}_t + \mathbf{X}_t' B_{\mathbf{X}} + \epsilon_t, \tag{4}$$

where Debt can be the vector of leverage or short-term debt, depending on the specification, and SC is the vector of predicted values of social capital from the first-stage estimation. $\mathbf{X}$ is the matrix of all control variables and ϵ is the error vector; β and B are the estimated coefficients for social capital and the controls matrix, respectively.

The 2SLS results are reported in Table V. All models include year and industry (based on the two-digit SIC code) fixed effects and are reported using robust standard errors clustered by either county or state, depending on the nature of the key independent variable. In Panel A, Models 1a and 1b show the estimations of book leverage when employing the county level social capital index of Rupasingha et al. (2006) and the state level social capital index of Putnam (2000), respectively. Models 2a and 2b show the estimations of market leverage following the same

century. Although including these as additional instruments do not qualitatively alter our second stage results, they cannot be statistically justified due to their insignificant and inconsistent first stage estimated coefficients.

[16] Since we use two different sets of control variables for leverage and debt maturity estimations in Equation (1) and Equation (2), respectively, $\mathbf{X}$ is the same set of controls included in Equation (1) when financial leverage is the dependent variable in the second-stage regression, and the same control variables in Equation (2) when debt maturity is the dependent variable in the second-stage regression.

format. In Panel B, Models 3a and 3b show the estimations of short-term debt that matures in less than three years when employing the state level social capital index and the county level social capital index, respectively (STD 3YR). Models 4a and 4b show the estimations of short-term debt that matures in less than five years (STD 5YR). Below each coefficient estimate, t-statistics are reported in parentheses.

[Insert Table V about here.]

All of the control variables in our baseline leverage and debt maturity estimations are included in the two-stage regressions in Panels A and B of Table V, respectively, but are not shown for the purpose of brevity. The second-stage regression results in Panel A indicate that, upon addressing the endogeneity concerns, financial leverage is negatively associated with the level of social capital, and the coefficient estimates on the predicted RGF index and the predicted Putnam index are significant at the 1% level. This finding confirms our OLS results reported earlier in Table III: Firms headquartered in areas with high levels of trust use less debt in their capital structure. In Panel B, we continue to find a strong and inverse relation between the use of short-term debt and the level of social capital, consistent with the OLS results reported in Table IV. Overall, the 2SLS results confirm our baseline OLS estimation results and support our main hypothesis that firms located in high social capital regions use lower financial leverage and less short-term debt.

In both panels, we also report the coefficient estimates of the instrumental variables from the first stage models on the right. The coefficient estimate for racial heterogeneity, as expected, is negatively significant in both first stage estimations of the RGF and Putnam indices. These findings are consistent with the predictions made by previous studies such as Alesina and La Ferrara (2000). We also report the adjusted R-squared and robust F-statistic for each first-stage model. The F-statistics further justify our use of racial diversity as an instrument for social capital according to conventional standards (Stock et al., 2002).

4.2 Subsamples

Next, we examine how the association between corporate borrowing and social capital can vary in the degree of information asymmetry. Information asymmetry exacerbates agency problems. With larger discrepancies in information sets between managers and shareholders, the likelihood that such conflicts between them worsen becomes larger. If the inverse association between

leverage/short-term debt and social capital is indeed due to the effect of social capital substituting the agency benefits of using more leverage and shortening debt maturity as we infer, then we should observe stronger effects in cases where information asymmetry problems are more severe. That is, if social capital indeed helps alleviate agency costs, it should matter most when opportunities for managers to pursue self-serving behavior are more available. In order to test this, we examine the heterogeneous effect of social capital on financial leverage and debt maturity in subsamples of firms that face more or less agency conflicts. We define five sets of subsamples, each based on an empirical proxy for information asymmetry used in prior literature: The first proxy is discretionary accruals, as firms with a larger degree of accrual-based earnings management have been shown to have larger information asymmetry (Dechow and Dichev, 2002; Dechow et al., 1995); the second proxy is accounting readability, as harder-to-read/follow financial statements indicate poorer information efficiency (Lehavy et al., 2011; Li, 2008);[17] the third proxy is institutional ownership, since the large holdings of institutions motivate their information production and monitoring (Shleifer and Vishny, 1986; Smith, 1996);[18] the fourth is stock liquidity, due to the higher efficiency of pricing more liquid securities (Amihud, 2002; Easley et al., 1996; Welker, 1995);[19] the fifth is percent-cost of trading for the same reason (i.e., higher costs lowers the incentive to transact, as stock market liquidity enhances informed trading which helps reveal the fundamental value of the firm; Fong et al., 2017; Holmström and Tirole, 1993).[20] Following our main hypothesis, we expect the effect of social capital to be more

[17] Our empirical proxy for accounting readability is the fog index of Li (2008). A higher value of the fog index indicates lower readability. We thank Feng Li for generously making the annual report readability data available on his website (http://webuser.bus.umich.edu/feng/webuser.bus.umich.edu/feng).

[18] The institutional ownership of a firm is calculated as the portion of its equity, ranging inclusively between 0% and 100%, that is held by institutional investors. Institutional holdings information is reported in the 13F filings of investors (obtained from Thomson Reuters).

[19] We use Amihud's (2002) illiquidity ratio, calculated as the mean square root of the absolute value of daily stock return over daily trading volume over the fiscal year. When using the bid-ask spread as an alternative market liquidity measure, we are able to obtain similar results (dealers set larger spreads to compensate for the potential costs of transacting with informed traders during times of high information asymmetry; Venkatesh and Chiang, 1986).

[20] Here, we use Fong et al.'s (2017) cost of trading, which is defined as

$$\mathrm{FHT}_{i,t} = 2\sigma N^{-1}\left(\frac{1+z}{2}\right),$$

pronounced in the subsamples of firms that bear higher agency costs.

We categorize firm-years in our sample as either of high or of low information asymmetry for each of these proxies. Depending on the definition of the proxy, a larger value can be either of higher or lower severity of agency problems. For instance, a firm that uses more discretionary accruals than the median is of high information asymmetry, so on and so forth. Following the definitions, we create indicator variables for both high or low information asymmetry and interact social capital with those indicators to reestimate corporate borrowing:

$$\text{Debt}_t = \beta_0 + \sum_{\mathbf{d}\in\{d_{\text{High}},d_{\text{Low}}\}} \beta^{\mathbf{d}}\mathbf{d}\text{SC}_t + \mathbf{X}_t' B_{\mathbf{X}} + \epsilon_t, \tag{5}$$

where d_{High} and d_{Low} are dummy variables that indicate high and low information asymmetry cases, respectively. The results are reported in Table VI.

[Insert Table VI about here.]

Each panel presents a set of subsample analysis, sorted in the order of description above: Panel A uses discretionary accruals; Panel B uses accounting readability; Panel C uses institutional ownership; Panel D uses Amihud illiquidity; and Panel E uses cost of trading. In each of the panels, Models 1a and 1b show the estimations of book leverage when employing the county level social capital index of Rupasingha et al. (2006) and the state level social capital index of Putnam (2000), respectively; Models 2a and 2b show the estimations of market leverage following the same format; Models 3a and 3b show the estimations of short-term debt that matures in less than three years when employing the county level social capital index and the state level social capital index, respectively (ST3); Models 4a and 4b show the estimations of short-term debt that matures in less than five years (ST5). At the bottom row of each model, we report the p-values calculated from F-tests of differences between the estimated coefficients for the interactions between social capital and the high and low information asymmetry indicators.

We see that in all cases with high information asymmetry, both leverage and short-term debt continue to be strongly and negatively associated with social capital. Importantly, comparing

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where σ is the standard deviation of non-zero returns for firm i over year t, $N^{-1}(\cdot)$ is the inverse function of the cumulative normal distribution, and z is the proportion of zero return days relative to the number of total trading days for firm i over year t. This measure captures two important aspects of transaction costs: return volatility and the proportion of zero returns.

the results reported here to those from the baseline models in Tables III and IV, the estimated coefficients for the high asymmetry group are much larger in magnitude for nearly all estimations. This is in line with our intuition that social capital substitutes the agency benefits of using leverage and shortening debt maturity. From the low information asymmetry subsamples, we also see that the magnitudes of the estimated coefficients for social capital are much smaller and are sometimes statistically insignificant. Looking at the two subsamples collectively, the negative association between corporate borrowing and social capital is statistically stronger for the high information asymmetry subsample relative to the low asymmetry subsample in nearly all specifications, as indicated by the reported p-values.

4.3 Bank Debt vs. Public Debt

To further shed light on the effect of social capital on creditors' perceived agency problems associated with the borrowing firm, we examine whether the structure of debt, i.e., the allocation between bank loans and public debt by firms, varies in social capital. It is well documented that, compared to "arm's-length" investors, banks play a stronger and more effective monitoring role in lending relationships through their superior access to borrowing firms' information (Denis and Mihov, 2003; Diamond, 1984; Fama, 1985; Leland and Pyle, 1977). Therefore, firms with higher levels of information asymmetry tend to borrow privately, while firms with less information asymmetry are more likely to use public debt. Tying this line of research to the main argument in our paper that social capital mitigates agency problems and thus lowers the need for monitoring, we expect the social norms in an area to affect firms' debt choice. Specifically, we predict that firms headquartered in high social capital regions use less bank debt and more public debt in their debt structure.

To empirically test this prediction, we collect debt structure data from S&P Capital IQ following recent studies and classify corporate debt into seven mutually exclusive categories: commercial paper, revolving credit, term loans, senior bonds and notes, subordinated bonds and notes, capital leases, and others (Colla et al., 2013; Lin, 2016). The data are available starting in 2002. We merge the Capital IQ debt structure data with the sample used for the main analyses in our paper and end up with 9,484 firm-year observations for 1,309 unique firms. Observations for which the difference in total debt reported in Capital IQ and Compustat exceeds 10% of total debt are removed.

The objective of this analysis is to examine the impact of social capital on creditors' monitoring intensity in the debt markets. Guided by prior studies, we use the choice between bank debt and public debt to gauge the strength of creditors' monitoring: Firms with a higher proportion of bank (public) debt are subject to more (less) intense creditor monitoring. We define bank debt as the sum of revolving credit and term loans, and public debt as the sum of senior bonds and notes and subordinated bonds and notes. We employ the following specification to estimate the relation between the use of bank (public) debt and social capital:

$$\text{DebtChoice}_t = \beta_{\text{SC}}\text{SC}_t + \mathbf{X}_t' B_{\mathbf{X}} + \epsilon_t, \tag{6}$$

where Debt Choice indicates the fraction of bank debt or public debt relative to total debt. $\mathbf{X}$ is a matrix that includes firm and county level control variables. We adopt the same set of firm level controls as those used in Colla et al. (2013). The county level control variables are the same as those employed in the main analyses. All models include year and industry (based on the two-digit SIC code) fixed effects and are reported using robust standard errors clustered by either county or state, depending on the nature of the key independent variable.

[Insert Table VII about here.]

The empirical results of this analysis are reported in Table VII. The dependent variable in Models 1a and 1b is the ratio of bank debt to total debt, while the dependent variable in Models 2a and 2b is the ratio of public debt to total debt. As is shown in Models 1a and 1b, the coefficient estimates on both the county level (RGF index) and the state level (Putnam index) social capital indices are significantly negative in predicting bank debt, indicating that firms located in high social capital regions are associated with less use of bank debt. This finding is consistent with our prediction that, because social capital may play a disciplinary role that prevents managers from pursuing private benefits at the cost of investors, there is less need to monitor firms surrounded by higher levels of social capital through bank debt. Turning to Models 2a and 2b, we find that the coefficient estimates on both social capital measures are significantly positive, implying that firms headquartered in high social capital areas have a higher proportion of public debt in their debt structure. As public debt is associated with relatively less intense monitoring, this result lends further support to the notion that firms operating in high social capital environments are less likely to expropriate the wealth of creditors and thus require less monitoring from the debt markets. Taken together, the analysis on the relation between the use of bank (public) debt and social capital strengthens our argument that social capital provides a substitution effect for debt mechanisms in

mitigating agency conflicts.

4.4 Alternative Specifications and Social Capital Measures

We now turn to alternative model specifications to ensure the robustness of our main results. We report these supporting results in Table VIII. In all panels, Models 1a and 1b show the estimations of book leverage when employing the county level social capital index of Rupasingha et al. (2006) and the state level social capital index of Putnam (2000), respectively; Models 2a and 2b show the estimations of market leverage following the same format; Models 3a and 3b show the estimations of short-term debt that matures in less than three years when employing the county level social capital index and the state level social capital index, respectively (ST3); Models 4a and 4b show the estimations of short-term debt that matures in less than five years (ST5).

[Insert Table VIII about here.]

In Panel A, we include the beginning level of leverage as an additional covariate in our leverage and short-term debt estimations. This is motivated by the highly persistent nature of both firm level capital structure and social capital (Lemmon et al., 2008). We address the concern that our results are merely driven by the long-term levels of the two variables. As expected, beginning leverage is significantly related to the contemporaneous levels. In Panel B, we employ a Fama-MacBeth estimation, where each cross-section is estimated separately to ensure cross-sectional robustness, with Newey-West errors that correct for serial correlation (Fama and MacBeth, 1973; Newey and West, 1987). In Panel C, we include two-way clustered errors by industry and year to simultaneously control for cross-sectional and time series dependencies (Cameron et al., 2011; Petersen, 2009). In Panel D, we examine the possibility of a nonlinear relation between corporate borrowing and social capital by adding in a quadratic term of social capital in the leverage and short-term debt models. In untabulated results, we also simultaneously estimate leverage and short-term debt to alleviate the concern that they are jointly determined by the firm (Barclay et al., 2003). In all the above alternative specifications, our results continue to be economically and statistically significant.

Lastly, throughout the paper, we use both the county level social capital index of Rupasingha et al. (2006) and the state level social capital index of Putnam (2000) in all estimations. While these measures are widely accepted in the literature, we further ensure that our results are not merely due to our choice of social capital variables by using three additional, more

specific measures of social capital. These include Putnam's (2000) honesty and trust indices, as well as voter turnout.

The honesty and trust indices are individual components that are part of the Putnam social capital index that we employ as one of the main social capital measures in this study.[21] Specifically, the honesty index is an index based on responses to the survey question "Agree that 'Most people are honest'," and the trust index is based on responses to the survey question "Agree that 'Most people can be trusted'." Higher values of either index indicate higher levels of social capital in a given state. To the extent that the perceived level of agency conflicts between the manager and various stakeholders relies heavily on the amount of trust placed in the management, we argue that the honesty and trust indices more directly measure the "trustworthy" component in social capital compared to the aggregated index and therefore serve as valid alternative proxies to test the robustness of our empirical results.

Previous studies suggest that higher voter turnout is associated with greater civic participation by individuals in a community and should indicate higher levels of social capital in the region (Alesina and La Ferrara, 2000; Guiso et al., 2004). Following this logic, we use the state-level voter turnout rates in U.S. elections as an alternative measure of social capital. The data are available from the United States Elections Project.[22] The voter turnout rate is measured as the ratio of the number of people who voted for the highest office in an election year to the total voting-eligible population in a state. Intuitively, states with higher voter turnout rates are considered to enjoy a higher level of social capital. Unlike the time-invariant Putnam measures, the voter turnout data is available every other year and as a result helps mitigate potential concerns regarding the time-invariant nature of our state-level Putnam measures.[23]

[Insert Table IX about here.]

We report the results in Table IX. Panel A reports results for the leverage estimations

[21] As with the state-level social capital index, Putnam's (2000) honesty and trust indices can be obtained from the official website of his seminal work on social capital, "Bowling Alone: The Collapse and Revival of American Community (http://bowlingalone.com/bowlingalone.com)."

[22] We thank Michael McDonald for generously sharing data on voter turnout and information regarding the United States electoral system through the United States Elections Project (http://www.electproject.org/www.electproject.org).

[23] For the years where voter turnout data is not available, we use the voter turnout rate in a state from the previous year.

(Model 1 estimates book leverage and Model 2 estimates market leverage); Panel B reports the debt maturity estimations (Model 3 estimates short-term debt that matures within the next three years and Model 4 estimates short-term debt that matures within the next five years). Models 1a through 4a employ the honesty index as the empirical proxy for social capital; Models 1b through 4b use the trust index; and Models 1c through 4c use voter turnout. As shown, replacing the county- and state-level overall social capital measures of Rupasingha et al. and Putnam in our main presentation with these alternatives do not change our results qualitatively.

4.5 Other Concerns

4.5.1 More Geographical Issues

Since our measures of social capital are geographically-based, we have controlled for firm location characteristics throughout our analysis. As described in Section 3, these include population, income, population density, and religiosity. Two additional pieces of empirical evidence warrant further discussion, however.

First, John et al. (2011) show that firms located in metropolitan (rural) areas make less (more) dividend payout. Their interpretation is that agency problems are more of a concern for investors of firms located in rural areas. Therefore, remotely located firms use more dividend payout to mitigate agency costs. The same idea can cause problems to our inference in this study since leverage also serves as devices for reducing free-cash-flow and signaling. What if our results are simply driven by geographical locations, in such a way that metropolitan areas just happen to have higher social capital in general? To alleviate this concern, we create an indicator variable that identifies whether a county belongs to the top ten metropolitan regions in the U.S., following the definition of John et al., and use it as an additional covariate in our estimations.

Second, we explore whether our results can be altered by including consideration for the Delaware General Corporation Law (i.e., corporate-friendliness). Based on official information provided by the Delaware Division of Corporations, over 50% of publicly traded firms in the U.S. and 60% of the Fortune 500 are incorporated in the state. Consistent with this observation, 4,556 of the 7,811 unique firms in our leverage estimation have a history of incorporating during our sample period. These numbers are 4,576 of 7,844 unique firms for our debt maturity estimations. Similar to our argument above, if most firms with low leverage and short debt maturity happen to incorporate in Delaware, our result may simply be a by-product of, for instance, tax benefits. To

address this concern, we create another dummy variable that indicates whether a firm is incorporated in Delaware and as another control.

In untabulated results, we find that, whether we control for (i) metropolitan area, (ii) Delaware incorporation, or (iii) both simultaneously, our results remain qualitatively similar.

4.5.2 Financing Constraints

What if firms in high social capital areas are simply less financially constrained? If firms in these areas happen to have better access to marketable securities due to reasons other than what we propose (i.e., less agency problems), then our results may merely be mechanical. To alleviate this concern, we use two measures to capture financing constraints on top of the dividend payout and credit rating controls that we already employ. The first is the Kaplan-Zingales index (Kaplan and Zingales, 1997) and the second is the Whited-Wu index (Whited and Wu, 2006).[24] Our results continue to hold even after further controlling for either measure.

4.5.3 Cost of Debt

To further ensure the economic validity of our inference, we examine the relation between corporate debt pricing and social capital for our sample. Since our main argument is that social capital works as a substitute mechanism for the benefits of leverage and short-term debt in reducing agency costs, we should expect to see that a negative (or at least non-positive) relation between firms' cost of debt and social capital, as in prior studies, also holds for our sample (e.g., Hasan et al., 2017a).

Our corporate debt data, obtained from Bloomberg and TRACE (Trade Reporting and Compliance Engine), are at the issue-level of publicly traded debt securities and contain over-the-counter market activity information on secondary market transactions and quotes starting

[24] The Kaplan-Zingales index is defined as $-1.002 \times \text{cash flow} + 0.283 \times \text{Q} + 3.139 \times \text{leverage} - 39.368 \times \text{dividends} - 1.315 \times \text{cash holdings}$, where cash flow is `(ib+dp)/ppent`, Q is `(at+prcc_f` × `csho-ceq-txdb)/at`, leverage is `(dltt+dlc)/(dltt+dlc+seq)`, dividends are `(dvc+dvp)/ppent`, and cash holdings are `(che/ppent)`, `ppent` is lagged in all ratios (Kaplan and Zingales, 1997); the Whited-Wu index is calculated as $-0.091 \times \text{cashflow} - 0.062 \times \text{dividenddummy} + 0.021 \times \text{long} - \text{termdebt} - 0.044 \times \text{size} + 0.102 \times \text{industrysalesgrowth}$, where cash flow is `(ib+dp)/at`, long-term debt is `(dltt/at)`, and size is calculated as the natural log of assets (Whited and Wu, 2006). `Verbatim` fonts denote Compustat item names.

quarterly from 1995. Following prior studies on the U.S. corporate debt market, we retain nonconvertible, fixed-coupon bonds that are denominated in U.S. Dollars and issued by U.S. firms, as well as require non-negative prices and maturity dates to be no later than quote/transaction dates (e.g., Bhojraj and Sengupta, 2003; Huang and Petkevich, 2016).

For each corporate bond issue, we dynamically infer the yield from its price and remaining cash flows on the observation date. We then calculate spreads by benchmarking the bond yield against the yield on the Treasury security with a term to maturity that is closest to the remaining life of the bond. Since the bond issues data are quarterly, in order to merge the spreads to our firm-year sample, we use the mean of the spreads of all issues by a firm during the four quarters of each calendar year as the spread for that firm-year.[25]

In our firm-level, annual estimations of lead bond spreads using the county level social capital index of Rupasingha et al. (2006) and the state level social capital index of Putnam (2000), we find that the estimated coefficient for social capital is negatively significant at conventional levels. These results are robust to using different benchmarks in calculating the spreads (the alternative benchmarks that we use include simply the three-month T-Bill yield and the yield on the Treasury security with the closest maturity at issuance) and to capturing spreads differently for the annual observations (e.g., using the last available issues for the firm during the year instead of taking the mean in order to align bond information closer to firm level characteristics). When estimating issue-level, quarterly spread estimations using the same social capital indices, we find qualitatively similar results. Employing two-way clustered errors by firm (issue) and year (quarter) to simultaneously control for cross-sectional and time-series dependencies does not alter our results (Petersen, 2009). We therefore find what we expect: Social capital is negatively associated with cost of debt for our sample. Given that these results are consistent with and somewhat replicate findings in earlier studies, we do not tabulate them.

[25] Based on earlier studies of debt pricing, we control in our lead spread estimations for various bond-level (term left to maturity, current clean price, return over the past quarter, and issue size), firm-level (tangibility, *z*-score, debt-to-equity ratio, profitability, firm size, market-to-book ratio, stock beta, and stock return over the past quarter), and macro-level variables (credit spread and term spread) that have been shown to affect debt pricing (Bhojraj and Sengupta, 2003; Graham et al., 2008). Following our main analyses, we use robust errors clustered by either county or state, depending on the nature of the social capital measure.

5 Conclusion

This study empirically examines whether local social capital influences firms' use of debt financing. Prior studies provide ample evidence that individuals living in high social capital regions are perceived to be less selfish and more trustworthy. To the extent that the use of debt, and the use of short-term debt in particular, can serve as an effective monitoring device to discipline the manager, we argue that firms located in high social capital areas may use less debt and short-term debt as a disciplinary mechanism because local social norms may prevent managers from pursuing private benefits at the cost of others (e.g., investors), which reduces agency costs and in turn lowers the need for monitoring. The empirical results reported in this paper support our prediction: we find that firms headquartered in high social capital areas are indeed associated with lower leverage and less short-term debt. This finding is robust to a variety of robustness checks. In addition, we show that the effect of social capital on firms' debt financing decisions is more pronounced in a subsample of firms in which the information asymmetry problem tends to be more severe. This evidence suggests that social capital and trust play an even more important role in reducing agency cost when opportunities to extract value from investors are more available to managers. An analysis on debt structure (bank loans vs. public debt) shows consistent results. Collectively, the empirical results lend support to our main hypothesis that local altruistic culture and social norms discourage the self-serving behavior of involved parties within a firm, thus alleviating agency problems and leading to less use of corporate borrowing mechanisms as a means of mitigation. That is, social capital may substitute for the benefits of debt market discipline.

Our research opens up several avenues for future investigations. Especially, under the presumption that firms are able to reallocate resources optimally, our findings are consistent with Zak and Knack (2001), who examine the role of trust in a general equilibrium model and show that the level of trust is closely associated with investment and growth rate.[26] This alone leaves one to wonder: What are the costs of adopting high social capital for the society? For some firms, is it more costly to incorporate in these areas, making it optimal for them to reside in lower social capital areas? What are the consequences of not holding up to the standards in a high social capital

[26] At the individual level, there is also evidence showing that households living in high social capital areas are more likely to use checks and to participate in the stock market (Guiso et al., 2004, 2008b).

area? For instance, are the penalties resulting from a serious financial restatement more severe in a high social capital region compared to otherwise? Recent literature suggests that firms in high social capital areas not only enjoy lower costs of debt (Hasan et al., 2017a), but also lower costs of equity (Gupta et al., 2018). Given the impact of social capital on debtholders and shareholders, what are the implications of social capital on other related parties, such as supply chain partners and employees? We conclude here and leave these questions open.

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Appendix: Variable Definitions

Below are the detailed descriptions of the variables used in this study. Panel A shows the key variables, Panel B shows the firm level covariates, Panel C shows the regional and macroeconomic controls, and Panel D shows the instrumental variables and alternative empirical measures for our key explanatory variables. `Verbatim` fonts denote Compustat variable names and calculations.

Panel A: Key Variables	
Book Leverage	The ratio of total debt (`dlc + dltt`) to the book value of total assets (`at`)
Mkt Leverage	Market Leverage; the ratio of total debt (`dlc + dltt`) to the market value of assets (`at + csho * prcc_f - ceq`)
ST Debt 3YR	The ratio of debt in current liabilities (`dlc`) plus debt maturing in two and three years (`dd2 + dd3`) to total debt (`dlc + dltt`)
ST Debt 5YR	The ratio of debt in current liabilities (`dlc`) plus debt maturing in two, three, four, and five years (`dd2 + dd3 + dd4 + dd5`) to total debt (`dlc + dltt`)
RGF Index	Rupasingha et al.'s (2006) county level social capital index
Putnam Index	Putnam's (2000) state level social capital index
Panel B: Firm Level Controls	
Firm Size	The natural logarithm of book value of total assets (`at`).
Tangibility	The ratio of net property, plant, and equipment (`ppent`) to the book value of total assets (`at`)
Profitability	The ratio of operating income before depreciation (`oibdp`) to the book value of total assets (`at`).
Payout	Ratio of common dividends to operating income before depreciation (`dvc/oibdp`)
Cap Ex	Capital expenditure: Ratio of capital expenditure to assets (`capx/at`)
Market-to-Book	Market-to-book assets; the ratio of the market value of assets (`at + csho * prcc_f - ceq`) to the book value of total assets (`at`)

R&D	The ratio of research and development expense (xrd) to total assets (at); R&D is assigned a value of zero if xrd is missing
Missing R&D	Dummy variable that equals to one if R&D expenses (xrd) are missing in Compustat and zero otherwise
Credit Rating	Dummy variable equal to one if the firm has an S&P long-term credit rating (splticrm) and zero otherwise
Regulated Industry	Dummy variable equal to one if the firm's SIC code is between 4900 and 4939
Abnormal Earnings	The ratio of the difference between the income before extraordinary items, adjusted for common equivalents (ibadj) in year t and $t-1$, to the market value of equity (prcc_f * cshpri)
Asset Maturity	Property, plant, and equipment over depreciation (ppegt/dp) times the proportion of property, plant, and equipment in total assets (ppegt/at), plus the ratio of current assets to the cost of goods sold (act/cogs) times the proportion of current assets in total assets (act/at)
Asset Volatility	The standard deviation of the stock return (during the fiscal year) times the market value of equity (csho * prcc_f), divided by the market value of assets (csho * prcc_f + at - ceq)
Earnings Volatility	Standard deviation of the ratio of earnings before extraordinary items (ib) to total assets (at) in the previous three years
Panel C: Regional and Macroeconomic Controls	
Term Structure	The difference between the yield on 10-year government bonds and the yield on 6-month government bonds
Population	Natural log of population in a county (Source: BEA)
Income Per Capita	Natural log of income per capita in a county (Source: BEA)
Population Density	Population per square mile of land area in a county (Source: Census Bureau)
Population Growth	Population growth in a county (Source: BEA)
Religiosity	Number of adherents divided by the population in a county (Source:

	ARDA)
Panel D: IVs and Alternative Empirical Measures for Key Variables	
Race	Historical degree of racial segmentation; 1 – Herfindahl of black and non-black population in a given state
Honesty	Putnam's (2000) honesty index
Trust	Putnam's (2000) trust index
Voter Turnout	The ratio of the number of people who voted for the highest office in an election year to the total voting-eligible population in a state

Table I: **Descriptive Statistics**

This table shows the descriptive statistics of the variables used in the study for the leverage estimations. Definition and construction details for each variable can be found in the Appendix.

N = 56840			Pct.				
Variable	Mean	Std Dev	10%	25%	Median	75%	90%
Book Leverage	0.2817	0.1981	0.0371	0.1290	0.2628	0.3932	0.5352
Mkt Leverage	0.2135	0.1670	0.0178	0.0742	0.1828	0.3196	0.4532
ST Debt 3YR	0.5004	0.3484	0.0512	0.1932	0.4380	0.8645	1.0000
ST Debt 5YR	0.6745	0.3167	0.2023	0.4135	0.7420	0.9997	1.0000
RGF Index	-0.3355	0.9421	-1.5676	-1.0751	-0.3447	0.3401	0.7941
Putnam Index	-0.1493	0.5263	-0.7906	-0.4031	-0.1860	0.0559	0.5650
Assets ($Bil.)	2.3530	6.5206	0.0147	0.0518	0.2510	1.3418	5.3323
Tangibility	0.3235	0.2228	0.0704	0.1466	0.2724	0.4609	0.6790
Profitability	0.0816	0.1756	-0.0671	0.0621	0.1161	0.1656	0.2182
Payout	0.0693	0.1245	0.0000	0.0000	0.0000	0.1063	0.2197
Cap Ex	0.0609	0.0552	0.0121	0.0240	0.0453	0.0787	0.1268
Market-to-Book	1.7396	1.2133	0.9053	1.0762	1.3449	1.9112	2.9457
R&D	0.0352	0.0771	0.0000	0.0000	0.0000	0.0340	0.1073
Missing R&D	0.4156	0.4928	0.0000	0.0000	0.0000	1.0000	1.0000
Credit Rating	0.3205	0.4667	0.0000	0.0000	0.0000	1.0000	1.0000
Regulated Industry	0.0643	0.2454	0.0000	0.0000	0.0000	0.0000	0.0000
Abnormal Earnings	-0.0269	0.3068	-0.1744	-0.0338	0.0052	0.0283	0.1054
Asset Maturity	10.4084	10.1286	1.8067	3.6183	7.0552	13.2561	24.1485
Asset Volatility	0.0196	0.0147	0.0059	0.0094	0.0153	0.0254	0.0394
Term Structure	1.5503	0.9829	0.0922	0.7273	1.5992	2.4290	2.8149
Population	13.5117	1.1610	11.9382	12.9390	13.6308	14.2123	14.8579
Income Per	10.3439	0.4392	9.7940	10.0154	10.3187	10.6486	10.9061

Capita							
Pop Density (000's)	4.0549	12.0851	0.2169	0.5771	1.3645	2.2051	4.6214
Population Growth	0.0108	0.0134	-0.0027	0.0027	0.0087	0.0166	0.0260
Religiosity	0.5121	0.1394	0.3349	0.4034	0.5152	0.6075	0.6973

Table II: **Correlations**

This table presents the Pearson correlation matrix of key variables used in this study. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively. The definition and construction details for each variable can be found in the Appendix.

	Blev	Mlev	ST3	ST5	RGF	Putnam
Book Leverage	1.0000					
Mkt Leverage	0.8450***	1.0000				
ST Debt 3YR	-0.2628***	-0.2019***	1.0000			
ST Debt 5YR	-0.2237***	-0.1773***	0.7705***	1.0000		
RGF Index	-0.0146***	-0.0098**	-0.0283***	-0.0440***	1.0000	
Putnam Index	-0.0714***	-0.0759***	0.0184***	0.0032	0.4950***	1.0000

Table III: **Leverage Estimations**

This table presents results from OLS estimations of book and market leverage using social capital as the key determinant. The models take the following functional form:

$$\text{LEV}_t = \beta_{\text{SC}}\text{SC}_t + \mathbf{X}_t' B_{\mathbf{X}} + \epsilon_t,$$

where LEV is the vector of firm leverage and SC is the vector of social capital. $\mathbf{X}$ is the matrix of all control variables and ϵ is the error vector; β and B are the estimated coefficients for social capital and the controls matrix, respectively. All models include year and industry (based on the two-digit SIC code) fixed effects and are reported using robust standard errors clustered by either county or state, depending on the nature of the key independent variable. Models 1a and 1b show the estimations of book leverage when employing the county level social capital index of Rupasingha et al. (2006) and the state level social capital index of Putnam (2000), respectively. Models 2a and 2b show the estimations of market leverage following the same format. Below each coefficient estimate, t-statistics are reported in parentheses. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively. All variable definitions are included in the Appendix.

	Book Leverage		Market Leverage	
	Model 1a	Model 1b	Model 2a	Model 2b
RGF Index	-0.0064**		-0.0064***	
	(-2.23)		(-2.90)	
Putnam Index		-0.0143***		-0.0108***
		(-6.02)		(-5.45)
Firm Size	0.0255***	0.0251***	0.0220***	0.0216***
	(6.26)	(6.08)	(7.30)	(7.13)
Squared Size	-0.0027***	-0.0027***	-0.0023***	-0.0023***
	(-7.54)	(-7.28)	(-8.72)	(-8.40)
Tangibility	0.1888***	0.1890***	0.1700***	0.1699***
	(13.56)	(10.72)	(15.05)	(13.63)
Profitability	-0.2003***	-0.1994***	-0.1708***	-0.1704***
	(-14.45)	(-11.82)	(-14.99)	(-7.45)
Payout	-0.1628***	-0.1634***	-0.1746***	-0.1755***

	(-9.09)	(-6.92)	(-14.31)	(-10.28)
Cap Ex	-0.4168***	-0.4139***	-0.4650***	-0.4628***
	(-15.40)	(-16.78)	(-22.67)	(-21.84)
Market-to-Book	-0.0030*	-0.0030	-0.0429***	-0.0428***
	(-1.77)	(-1.51)	(-23.54)	(-13.30)
R&D	-0.3189***	-0.3167***	-0.2779***	-0.2763***
	(-8.96)	(-10.02)	(-13.24)	(-10.97)
Missing R&D	0.0376***	0.0368***	0.0344***	0.0339***
	(7.50)	(6.55)	(8.12)	(6.18)
Credit Rating	0.1161***	0.1160***	0.0761***	0.0759***
	(19.51)	(13.57)	(17.53)	(11.80)
Regulated Industry	-0.0049	-0.0043	0.0266**	0.0268**
	(-0.31)	(-0.31)	(2.02)	(2.33)
Population	-0.0059***	-0.0041***	-0.0059***	-0.0039***
	(-3.08)	(-2.85)	(-3.80)	(-3.70)
Income Per Capita	0.0391***	0.0345***	0.0261***	0.0205*
	(3.06)	(2.80)	(2.68)	(2.00)
Population Density	-0.0000	-0.0000*	-0.0000	-0.0000
	(-1.35)	(-1.80)	(-0.41)	(-1.00)
Population Growth	-0.0973	-0.0871	-0.1478	-0.1090
	(-0.62)	(-0.48)	(-1.21)	(-0.73)
Religiosity	-0.0111	-0.0158	-0.0088	-0.0131
	(-0.60)	(-0.79)	(-0.62)	(-0.91)
Intercept	-0.0893	-0.0645	0.0575	0.0885
	(-0.80)	(-0.58)	(0.67)	(0.97)
Adjusted R-squared	0.2068	0.2076	0.3611	0.3614
Observations	56840	56840	56840	56840

Table IV: **Short-Term Debt Estimations**

This table presents results from OLS estimations of short-term debt using social capital as the key determinant. The models take the following functional form:

$$\mathrm{STD}_t = \beta_{\mathrm{SC}}\mathrm{SC}_t + \mathbf{X}_t' B_{\mathbf{X}} + \epsilon_t,$$

where STD is the vector of firm-level short-term debt and SC is the vector of social capital. $\mathbf{X}$ is the matrix of all control variables and ϵ is the error vector; β and B are the estimated coefficients for social capital and the controls matrix, respectively. All models include year and industry (based on the two-digit SIC code) fixed effects and are reported using robust standard errors clustered by either county or state, depending on the nature of the key independent variable. Models 1a and 1b show the estimations of short-term debt that matures in less than three years when employing the county level social capital index of Rupasingha et al. (2006) and the state level social capital index of Putnam (2000), respectively (STD 3YR). Models 2a and 2b show the estimations of short-term debt that matures in less than five years (STD 5YR). Below each coefficient estimate, t-statistics are reported in parentheses. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively. All variable definitions are included in the Appendix.

	ST Debt 3YR		ST Debt 5YR	
	Model 1a	Model 1b	Model 2a	Model 2b
RGF Index	-0.0089***		-0.0091***	
	(-3.07)		(-3.05)	
Putnam Index		-0.0090**		-0.0127***
		(-2.36)		(-2.92)
Firm Size	-0.1353***	-0.1356***	-0.0798***	-0.0802***
	(-30.66)	(-27.57)	(-21.72)	(-18.45)
Squared Size	0.0077***	0.0077***	0.0041***	0.0041***
	(20.82)	(19.23)	(12.58)	(11.36)
Market-to-Book	0.0023	0.0022	0.0009	0.0010
	(1.09)	(1.29)	(0.52)	(0.62)

R&D	0.2260***	0.2275***	0.0698**	0.0713***
	(6.87)	(8.90)	(2.36)	(2.85)
Missing R&D	0.0166***	0.0166***	0.0190***	0.0186***
	(2.78)	(3.27)	(3.37)	(3.58)
Credit Rating	-0.1396***	-0.1399***	-0.1751***	-0.1753***
	(-21.92)	(-16.09)	(-27.54)	(-20.72)
Regulated Industry	0.0342	0.0336	0.0092	0.0090
	(1.57)	(1.40)	(0.35)	(0.31)
Leverage	-0.3414***	-0.3412***	-0.2127***	-0.2131***
	(-19.07)	(-13.77)	(-14.53)	(-11.94)
Abnormal Earnings	-0.0505***	-0.0505***	-0.0296***	-0.0297***
	(-12.06)	(-10.59)	(-9.33)	(-6.44)
Asset Maturity	-0.0026***	-0.0026***	-0.0034***	-0.0034***
	(-9.08)	(-7.85)	(-11.16)	(-9.30)
Asset Volatility	-0.2707	-0.2560	-0.1869	-0.1764
	(-1.52)	(-1.46)	(-1.07)	(-1.02)
Term Structure	0.0019	0.0020	0.0042	0.0043
	(0.36)	(0.35)	(0.87)	(0.86)
Population	0.0043	0.0075**	-0.0001	0.0028
	(1.62)	(2.67)	(-0.06)	(1.64)
Income Per Capita	-0.0088	-0.0183*	-0.0008	-0.0095
	(-0.70)	(-1.73)	(-0.08)	(-1.03)
Population Density	0.0000***	0.0000**	0.0000	-0.0000
	(3.82)	(2.48)	(0.69)	(-0.15)
Population Growth	-0.2813	-0.1812	-0.2578	-0.1839
	(-1.36)	(-0.88)	(-1.35)	(-0.88)
Religiosity	-0.0108	-0.0160	-0.0008	-0.0066
	(-0.57)	(-0.81)	(-0.05)	(-0.37)
Intercept	1.0541***	1.1068***	1.0002***	1.0483***

	(9.49)	(11.17)	(10.33)	(11.44)
Adjusted R-squared	0.3463	0.3462	0.3247	0.3247
Observations	57417	57417	57417	57417

Table V: **Instrumental Variable Approach**

This table presents results from two-stage estimations of leverage (Panel A) and short-term debt (Panel B). Racial heterogeneity in 1960 (Alesina and La Ferrara, 2000; Hasan et al., 2017a) is used as an instrument for social capital in all first-stage models. The second-stage models take the following form:

$$\text{Debt}_t = \beta_{\text{SC}} \text{SC}_t + \mathbf{X}_t' B_{\mathbf{X}} + \epsilon_t,$$

where Debt can be the vector of leverage or short-term debt, depending on the specification, and SC is the vector of predicted values of social capital from the first-stage estimation. $\mathbf{X}$ is the matrix of all control variables and ϵ is the error vector; β and B are the estimated coefficients for social capital and the controls matrix, respectively. All models include year and industry (based on the two-digit SIC code) fixed effects and are reported using robust standard errors clustered by either county or state, depending on the nature of the key independent variable. In Panel A, Models 1a and 1b show the estimations of book leverage when employing the county level social capital index of Rupasingha et al. (2006) and the state level social capital index of Putnam (2000), respectively. Models 2a and 2b show the estimations of market leverage following the same format. In Panel B, Models 3a and 3b show the estimations of short-term debt that matures in less than three years when employing the state level social capital index and the county level social capital index, respectively (ST3). Models 4a and 4b show the estimations of short-term debt that matures in less than five years (ST5). In both panels, coefficient estimates of the instruments and robust F-statistics from the first stage model are reported on the right. Below each coefficient estimate, t-statistics are reported in parentheses. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively. All variable definitions are included in the Appendix.

Panel A: Leverage								
	Book Leverage		Market Leverage			1st Stage Estimation		
	Model 1a	Model 1b	Model 2a	Model 2b		Race	Adj. R2	F-stat
RGF Index	-0.0229***		-0.0175***			-2.6373***	0.5488	30.3565
	(-3.24)		(-3.01)			(-5.51)		
Putnam		-0.0145***		-0.0111***		-4.1645***	0.6789	70.3233

Index								
		(-4.19)		(-3.86)		(-8.39)		
All Lev Ctrls	YES	YES	YES	YES				
Adjusted R-squared	0.2035	0.2076	0.3591	0.3614				
Observations	56840	56840	56840	56840				
Panel B: Short-Term Debt								
	ST Debt 3YR		ST Debt 5YR			1st Stage Estimation		
	Model 3a	Model 3b	Model 4a	Model 4b		Race	Adj. R2	F-stat
RGF Index	-0.0170*		-0.0214**			-2.6427***	0.5500	30.3872
	(-1.72)		(-2.33)			(-5.51)		
Putnam Index		-0.0108***		-0.0136***		-4.1643***	0.6782	69.5859
		(-2.79)		(-2.66)		(-8.34)		
All STD Ctrls	YES	YES	YES	YES				
Adjusted R-squared	0.3461	0.3462	0.3240	0.3247				
Observations	57417	57417	57417	57417				

Table VI: **Subsamples**

This table presents results of subsample analyses using the estimations of leverage and short-term debt using social capital. The subsamples are determined based on the degree of information asymmetry between the firm and its capital providers. The empirical proxies used to capture information asymmetry are discretionary accruals (Dechow et al., 1995; Dechow and Dichev, 2002), accounting readability (Li, 2008), institutional ownership (Boone and White, 2015; Hartzell and Starks, 2003), illiquidity (Amihud, 2002), and percent-cost of trading (Fong et al., 2017) in Panels A, B, C, D, and E, respectively. Model 1 estimates book leverage; Model 2 estimates market leverage; Model 3 estimates short-term debt that matures in less than three years; Model 4 estimates short-term debt that matures in less than five years. Models 1a-4a employ the county level social capital index of Rupasingha et al. (2006); Models 1b-4b employ the state level social capital index of Putnam (2000). All models include year and industry (based on the two-digit SIC code) fixed effects and are reported using robust standard errors clustered by either county or state, depending on the nature of the key independent variable. Below each coefficient estimate, *t*-statistics are reported in parentheses. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively. All variable definitions are included in the Appendix. At the bottom row of each model, the *p*-values calculated from *F*-tests of differences in estimated coefficients (between high and low information asymmetry) are reported.

	Book Leverage		Market Leverage		ST Debt 3YR		ST Debt 5YR	
	Model 1a	Model 1b	Model 2a	Model 2b	Model 3a	Model 3b	Model 4a	Model 4b
Panel A: Discretionary Accruals								
RGF Index × High Info Asymm	-0.0082***		-0.0099***		-0.0149***		-0.0110***	
	(-5.85)		(-7.43)		(-6.21)		(-5.01)	
RGF Index	-0.0063**		-0.0071**		-0.0069**		-0.0074**	

× Low Info Asymm	*		*		*		*	
	(-4.33)		(-5.20)		(-2.81)		(-3.30)	
Putnam Index × High Info Asymm		-0.0188***		-0.0158***		-0.0215***		-0.0229***
		(-8.73)		(-7.76)		(-5.85)		(-6.82)
Putnam Index × Low Info Asymm		-0.0084***		-0.0110***		0.0028		-0.0013
		(-3.87)		(-5.38)		(0.76)		(-0.38)
All Lev/STD Ctrls	YES	YES	YES	YES	YES	YES	YES	YES
Adjusted R-squared	0.2080	0.2089	0.3785	0.3791	0.3320	0.3319	0.2822	0.2825
Observations	47028	47028	47028	47028	47515	47515	47515	47515
Different (p-val)?	0.2174	0.0003	0.0671	0.0811	0.0037	0.0000	0.1568	0.0000
Panel B: Accounting Readability								
RGF Index × High Info Asymm	-0.0133***		-0.0123***		-0.0117***		-0.0103***	
	(-5.62)		(-5.17)		(-3.02)		(-2.85)	

RGF Index × Low Info Asymm	-0.0066***		-0.0037		-0.0043		0.0000	
	(-2.81)		(-1.58)		(-1.11)		(0.00)	
Putnam Index × High Info Asymm		-0.0223***		-0.0210***		-0.0118**		-0.0143***
		(-6.48)		(-6.06)		(-2.08)		(-2.70)
Putnam Index × Low Info Asymm		-0.0162***		-0.0140***		0.0122**		0.0063
		(-4.81)		(-4.14)		(2.19)		(1.21)
All Lev/STD Ctrls	YES	YES	YES	YES	YES	YES	YES	YES
Adjusted R-squared	0.2588	0.2599	0.4114	0.4120	0.3481	0.3482	0.3088	0.3088
Observations	20264	20264	20264	20264	20437	20437	20437	20437
Different (p-val)?	0.0074	0.1827	0.0007	0.1328	0.0692	0.0015	0.0070	0.0036
Panel C: Institutional Ownership								
RGF Index × High Info Asymm	-0.0097***		-0.0127***		-0.0205***		-0.0121***	

	(-7.48)		(-9.65)		(-9.89)		(-6.32)	
RGF Index × Low Info Asymm	-0.0033***		0.0006		0.0053***		-0.0054***	
	(-2.32)		(0.44)		(2.36)		(-2.61)	
Putnam Index × High Info Asymm		-0.0255***		-0.0277***		-0.0288***		-0.0212***
		(-12.74)		(-13.66)		(-8.99)		(-7.13)
Putnam Index × Low Info Asymm		-0.0042***		0.0024		0.0124***		-0.0039
		(-2.01)		(1.16)		(3.71)		(-1.27)
All Lev/STD Ctrls	YES	YES	YES	YES	YES	YES	YES	YES
Adjusted R-squared	0.2105	0.2120	0.3946	0.3955	0.3445	0.3441	0.3237	0.3238
Observations	55434	55434	55434	55434	55999	55999	55999	55999
Different (p-val)?	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0036	0.0000
Panel D: Illiquidity								
RGF Index × High Info Asymm	-0.0069***		-0.0109***		-0.0198***		-0.0118***	

	(-5.28)		(-8.32)		(-9.63)		(-6.17)	
RGF Index × Low Info Asymm	-0.0058***		-0.0016		0.0041*		-0.0058***	
	(-4.22)		(-1.12)		(1.87)		(-2.89)	
Putnam Index × High Info Asymm		-0.0237***		-0.0313***		-0.0281***		-0.0225***
		(-11.85)		(-15.47)		(-8.82)		(-7.64)
Putnam Index × Low Info Asymm		-0.0042**		0.0070***		0.0115***		-0.0022
		(-2.05)		(3.38)		(3.50)		(-0.74)
All Lev/STD Ctrls	YES	YES	YES	YES	YES	YES	YES	YES
Adjusted R-squared	0.2070	0.2085	0.3921	0.3941	0.3474	0.3471	0.3247	0.3250
Observations	56837	56837	56837	56837	57414	57414	57414	57414
Different (p-val)?	0.4964	0.0000	0.0000	0.0000	0.0000	0.0000	0.0095	0.0000
Panel E: Trading Cost								
RGF Index × High Info	-0.0093***		-0.0126***		-0.0171***		-0.0107***	

Asymm								
	(-7.27)		(-9.74)		(-8.42)		(-5.70)	
RGF Index × Low Info Asymm	-0.0024*		0.0015		0.0021		-0.0068***	
	(-1.71)		(1.02)		(0.94)		(-3.27)	
Putnam Index × High Info Asymm		-0.0274***		-0.0324***		-0.0255***		-0.0191***
		(-13.63)		(-15.94)		(-8.00)		(-6.46)
Putnam Index × Low Info Asymm		-0.0004		0.0082***		0.0086***		-0.0059*
		(-0.18)		(3.93)		(2.61)		(-1.95)
All Lev/STD Ctrls	YES	YES	YES	YES	YES	YES	YES	YES
Adjusted R-squared	0.2074	0.2092	0.3926	0.3944	0.3470	0.3469	0.3247	0.3249
Observations	56808	56808	56808	56808	57385	57385	57385	57385
Different (p-val)?	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0949	0.0014

Table VII: **Debt Choice Estimations**

This table presents results from estimating firm debt choices (bank loans vs. public debt) using social capital. Bank debt is defined as the sum of revolving credit and term loans; public debt is defined as the sum of senior bonds and notes and subordinated bonds and notes. The estimations follow the specification:

$$\text{DebtChoice}_t = \beta_{\text{SC}}\text{SC}_t + \mathbf{X}_t' B_{\mathbf{X}} + \epsilon_t,$$

where Debt Choice indicates the fraction of bank debt or public debt relative to total debt. $\mathbf{X}$ is a matrix that includes firm and county level control variables and ϵ is the error vector; β and B are the estimated coefficients for social capital and the controls matrix, respectively. All models include year and industry (based on the two-digit SIC code) fixed effects and are reported using robust standard errors clustered by either county or state, depending on the nature of the key independent variable. Models 1a and 1b estimate the ratio of bank debt to total debt on social capital using the county-level measure of Rupasingha et al. (2006) and the state-level measure of Putnam (2000), respectively; Models 2a and 2b estimates the ratio of public debt to total debt following the same format. Below each coefficient estimate, t-statistics are reported in parentheses. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively. All variable definitions are included in the Appendix.

	Bank Debt Pct.		Bond Pct.	
	Model 1a	Model 1b	Model 2a	Model 2b
RGF Index	-0.0348***		0.0389***	
	(-6.20)		(7.01)	
Putnam Index		-0.0245***		0.0325***
		(-3.59)		(4.80)
Firm Size	-0.069***	-0.0697***	0.0562***	0.0571***
	(-25.55)	(-25.75)	(21.07)	(21.35)
Tangibility	-0.1316***	-0.1267***	0.1233***	0.1179***
	(-5.29)	(-5.09)	(5.02)	(4.79)
Profitability	0.1493***	0.1546***	-0.0801**	-0.0865**
	(4.03)	(4.17)	(-2.19)	(-2.36)

Payout	-0.1676***	-0.1723***	0.1264***	0.1313***
	(-5.69)	(-5.84)	(4.34)	(4.51)
Market-to-Book	-0.0189***	-0.0192***	0.0028	0.0030
	(-5.06)	(-5.14)	(0.75)	(0.82)
R&D	-0.5229***	-0.5105***	0.3399***	0.3259***
	(-6.60)	(-6.44)	(4.35)	(4.16)
Rated	-0.1630***	-0.1633***	0.1914***	0.1917***
	(-16.20)	(-16.21)	(19.25)	(19.26)
Leverage	0.0952***	0.0904***	0.1705***	0.1769***
	(4.50)	(4.26)	(8.17)	(8.44)
Earnings Volatility	-0.1277**	-0.1269**	-0.0376	-0.0372
	(-2.47)	(-2.45)	(-0.73)	(-0.73)
Population	-0.0187***	-0.0055*	0.0230***	0.0088***
	(-4.57)	(-1.66)	(5.71)	(2.67)
Income Per Capita	0.0149	-0.0034	-0.0077	0.0122
	(0.89)	(-0.21)	(-0.47)	(0.75)
Population Density	-0.0000	-0.0000	-0.0000*	-0.0000***
	(-0.61)	(-1.33)	(1.68)	(2.57)
Population Growth	-0.0779	0.1368	0.1408	-0.0818
	(-0.28)	(0.50)	(0.51)	(-0.30)
Religiosity	0.0031	-0.0245	-0.0211	0.0082
	(0.10)	(-0.78)	(-0.67)	(0.26)
Intercept	0.9979***	1.0477***	-0.2317	-0.2846*
	(6.08)	(6.38)	(-1.43)	(-1.76)
Adjusted R-squared	0.3038	0.3019	0.3242	0.3223
Observations	9484	9484	9484	9484

Table VIII: **Alternative Specifications**

This table presents results from alternative model specifications. Panel A extends the baseline models from Section 3 (Tables III and IV) by controlling for the first available leverage ratios of firms (Lemmon et al., 2008); Panel B shows Fama-MacBeth estimations with Newey-West errors (Fama and MacBeth, 1973; Newey and West, 1987); Panel C uses two-way clusters by industry and year (Petersen, 2009); Panel D includes quadratic terms of social capital. Model 1 estimates book leverage; Model 2 estimates market leverage; Model 3 estimates short-term debt that matures in less than three years; Model 4 estimates short-term debt that matures in less than five years. Models 1a-4a employ the county level social capital index of Rupasingha et al. (2006); Models 1b-4b employ the state level social capital index of Putnam (2000). All models, aside from the Fama-MacBeth estimates, include year and industry (based on the two-digit SIC code) fixed effects. The Fama-MacBeth estimations include industry fixed effects. All models are reported using robust standard errors. Below each coefficient estimate, *t* -statistics are reported in parentheses. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively. All variable definitions are included in the Appendix.

	Book Leverage		Market Leverage		ST Debt 3YR		ST Debt 5YR	
	Model 1a	Model 1b	Model 2a	Model 2b	Model 3a	Model 3b	Model 4a	Model 4b
Panel A: Controlling for Beginning Leverage Levels								
RGF Index	-0.0063**		-0.0070***		-0.0089***		-0.0091***	
	(-2.29)		(-3.50)		(-3.07)		(-3.05)	
Putnam Index		-0.0132***		-0.0094***		-0.0089**		-0.0126***
		(-5.64)		(-4.74)		(-2.35)		(-2.89)
Beginning Leverage	0.1332***	0.1329***	0.2422***	0.2412***	0.0050	0.0048	0.0162*	0.0160
	(16.03)	(15.19)	(20.48)	(16.78)	(0.55)	(0.48)	(1.89)	(1.66)
All	YES	YES	YES	YES	YES	YES	YES	YES

Lev/STD Ctrls								
Adjusted R-squared	0.2374	0.2380	0.4017	0.4017	0.3463	0.3462	0.3248	0.3249
Observations	56840	56840	56840	56840	57417	57417	57417	57417
Panel B: Fama-MacBeth Estimations								
RGF Index	-0.0043***		-0.0051***		-0.0096***		-0.0121***	
	(-3.07)		(-4.46)		(-5.19)		(-4.49)	
Putnam Index		-0.0127***		-0.0092***		-0.0065*		-0.0118***
		(-8.69)		(-6.80)		(-1.96)		(-5.45)
All Lev/STD Ctrls	YES	YES	YES	YES	YES	YES	YES	YES
Average R-squared	0.2345	0.2352	0.3724	0.3727	0.3411	0.3411	0.3242	0.3239
Observations	56840	56840	56840	56840	57417	57417	57417	57417
Panel C: Two-Way Clustered Errors by Industry and Year								
RGF Index	-0.0064*		-0.0064***		-0.0089***		-0.0091***	
	(-1.84)		(-2.58)		(-3.24)		(-3.83)	
Putnam Index		-0.0143***		-0.0108***		-0.0090*		-0.0127***
		(-3.65)		(-3.55)		(-1.94)		(-3.11)
All Lev/STD	YES	YES	YES	YES	YES	YES	YES	YES

Ctrls								
Adjusted R-squared	0.2068	0.2076	0.3611	0.3614	0.3463	0.3462	0.3247	0.3247
Observations	56840	56840	56840	56840	57417	57417	57417	57417
Panel D: Nonlinearity								
RGF Index	-0.0073***		-0.0072***		-0.0086***		-0.0084***	
	(-2.72)		(-3.44)		(-2.93)		(-2.77)	
Squared RGF SC	-0.0034**		-0.0029**		0.0013		0.0024	
	(-2.32)		(-2.42)		(0.64)		(1.55)	
Putnam Index		-0.0139***		-0.0106***		-0.0091**		-0.0126***
		(-5.76)		(-4.82)		(-2.55)		(-2.90)
Squared Putnam SC		-0.0026		-0.0013		0.0012		-0.0006
		(-0.92)		(-0.58)		(0.25)		(-0.16)
All Lev/STD Ctrls	YES	YES	YES	YES	YES	YES	YES	YES
Adjusted R-squared	0.2071	0.2076	0.3614	0.3614	0.3463	0.3462	0.3247	0.3247
Observations	56840	56840	56840	56840	57417	57417	57417	57417

Table IX: **Alternative Social Capital Measures**

This table presents results from OLS estimations of book and market leverage using alternative measures of social capital. The models take the following functional form:

$$\text{Debt}_t = \beta_{\text{SC}}\text{SC}_t + \mathbf{X}_t' B_{\mathbf{X}} + \epsilon_t,$$

where Debt can be the vector of leverage or short-term debt, depending on the specification, and SC is the vector of social capital values. $\mathbf{X}$ is the matrix of all control variables and ϵ is the error vector; β and B are the estimated coefficients for social capital and the controls matrix, respectively. All models include year and industry (based on the two-digit SIC code) fixed effects and are reported using robust standard errors clustered by state, due to the nature of the key independent variable. In Panel A, Models 1a, 1b, and 1c show the estimations of book leverage when the honesty and trust indices of Putnam (2000) and voter turnout the proxy for social capital, respectively. Models 2a, 2b, and 2c show the estimations of market leverage following the same format. In Panel B, Models 3a, 3b, and 3c show the estimations of short-term debt that matures in less than three years when employing the three proxies. Models 4a, 4b, and 4c show the estimations of short-term debt that matures in less than five years (STD 5YR). Below each coefficient estimate, t-statistics are reported in parentheses. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively. All variable definitions are included in the Appendix.

Panel A: Leverage						
	Book Leverage			Market Leverage		
	Model 1a	Model 1b	Model 1c	Model 2a	Model 2b	Model 2c
Putnam Honesty	-0.0614***			-0.0512***		
	(-3.22)			(-3.86)		
Putnam Trust		-0.0703***			-0.0484**	
		(-2.78)			(-2.41)	
Voter Turnout			-0.1209***			-0.0904***
			(-5.46)			(-5.10)
All Lev Ctrls	YES	YES	YES	YES	YES	YES

Adjusted R-squared	0.2071	0.2084	0.2075	0.3612	0.3616	0.3614
Observations	56840	55607	56840	56840	55607	56840
Panel B: Short-Term Debt						
	ST Debt 3YR			ST Debt 5YR		
	Model 3a	Model 3b	Model 3c	Model 4a	Model 4b	Model 4c
Putnam Honesty	-0.0674***			-0.0812***		
	(-3.18)			(-3.10)		
Putnam Trust		-0.0692**			-0.0981**	
		(-2.49)			(-2.56)	
Voter Turnout			-0.0724***			-0.1130***
			(-2.79)			(-2.96)
All STD Ctrls	YES	YES	YES	YES	YES	YES
Adjusted R-squared	0.3463	0.3430	0.3462	0.3248	0.3202	0.3247
Observations	57417	56165	57417	57417	56165	57417

Highlights:

- We examine the relation between social capital and corporate borrowing (leverage and debt maturity).
- Both firm leverage and short-term debt ratios are negatively associated with social capital.
- These relations are more pronounced in cases where information asymmetry problems are more severe.
- The use of bank loans (public debt) is negatively (positively) associated with social capital.
- Our results are consistent with the idea that social capital lowers the need for corporate borrowing mechanisms as a means to alleviate agency problems for firms.