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Stock liquidity and societal trust☆

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ABSTRACT

Stock liquidity is a sign of market efficiency and a crucial factor of a well-functioning market. Using US data, we present empirical evidence that a company's stock liquidity is positively associated with regional societal trust. Further analyses indicate that this relationship becomes stronger when companies are more opaque and weakly governed. Regional societal trust as an informal monitoring mechanism is captured with county-level social capital that has two aspects of ethical norms and solid social networks. These aspects bring about trust, reciprocity, honesty, transparency, and organizational citizenship that is ultimately reflected in higher firms' stock liquidity. We also identify a potential channel through which we can explain the positive association between a company's stock liquidity and regional societal trust Particularly, we report that companies located in high societal trust areas provide more accurate management earnings guidance. Ultimately, we find that companies situated in high societal trust areas have lower cost of equity capital as they have better access to equity market financing through stock liquidity.

1. Introduction

In this study, we investigate whether firms headquartered in high societal trust regions have higher stock liquidity. Financing by and investing in capital market is regarded as a specifically trust-intensive conduct because of segregation of ownership and control. We argue that societal trust proxied by the informal institutional factor of social capital curbs self-centered behaviors and decreases the information asymmetry between managers and equity holders as management teams of companies located in high societal trust zones provide credible, material, and value relevant information (making firms' information environment more favorable) and shareholders invested in these companies have higher trust to the credibility of information provided by those managers, which in turn positively influence firms' stock liquidity.

As a definition of trust, Luhmann and Gambetta (1988) explain "the subjective probability an individual assigns to an action performed by a counterparty that is beneficial or at least not harmful". Previous studies indicate that societal trust has a considerable role in economic and social exchanges and expedites economic development and social effectiveness (La Porta et al., 1997). In a theoretical paper, Carlin et al. (2009) show that trust has a significant function on interactions among insiders and outsiders in the presence of agency problems and incomplete contracts. Nanda and Wysocki (2013) show that investors tend to attribute higher reliability to financial information presented by companies located in high societal trust regions, which in turn increases managers' incentives to present high-quality earnings. Pevzner et al. (2015) explain that regional societal trust impacts the efficacy of communication from insiders to outsiders via earnings announcements. Their findings suggest that shareholders are more responsive to corporate earnings announcements in high societal trust areas.

Social capital can be utilized as the representative of societal trust (Jin et al., 2020). We use the comprehensive definition of Woolcock (2001) to explain social capital in our paper, and it is described as "social norms and networks that promote collective action and cooperation among members of community". Cooperative norms in high social capital areas make individuals more obliged to behave ethically and morally and induce mutual trust and altruistic behavior (Hartlieb et al., 2020; Hoi et al., 2019). In areas with powerful collective norms, individuals enjoy a set of familiar values that curb people and organizations from behaving unethically and this behavior is regarded in opposition with the prescribed beliefs and collective interests (Hartlieb et al., 2020; Hoi et al., 2019). Strong social networks in these areas can surge the speed of information flow and credibility of information (reflected in lower moral hazard) in imperfect markets through information sharing and interactions among

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individuals (Lin, 2017). In addition, these dense networks can depress unethical actions through raising social sanctions (causing effective enforcement of ethical norms). Particularly, strong social networks intensify the cost of infringing ethical norms through making the discovery of norm-deviant actions easy and motivate members to implement social embargoes (Hasan et al., 2017a,b). As a societal monitoring mechanism, social capital promotes mutual trust (reflected in higher regional societal trust) by decreasing managers' self-interested behaviors and increasing the cost of misbehavior (reflected in lower perceived moral hazard and contracting costs) (Jin et al., 2020).

Research shows that companies headquartered in high societal trust regions have lower corporate cash reserves (Habib and Hasan, 2017), smaller corporate tax avoidance (Hasan et al., 2017a,b), lower bank loan spread (Hasan et al., 2017a,b), lower likelihood to pledge collateral (Papadimitri et al., 2020), less reliant on trade credit financing (Hasan and Habib, 2019a,b), and have lower idiosyncratic risk and market-wide risk (Hasan and Habib, 2019a,b). This paper adds to the previous ones by investigating whether and how societal trust influences stock liquidity.

Stock liquidity indicates the speed and facility that shareholders could trade on the stock with no severe volatility in the price (Huberman, 2001). Stock liquidity can have significant influences on transaction costs, predicted returns, and capital market stableness (Cheng et al., 2021), and it also directly associated with the investors' trading actions impounding information into prices (Kurov, 2008). Previous studies indicate that the rise in stock liquidity decreases required rates of ROE due to comparatively smaller cost of trading (Shang, 2020; Acharya and Pedersen, 2005). Prior research also reports that costs of issuing equity are much smaller among companies that enjoy higher stock liquidity (Butler et al., 2005; Shang, 2020). There is extensive literature suggesting that stock market liquidity is an integral element that specifies ease of access to the capital market (e.g., Jones and Tuzel, 2013; Bernstein, 2015). Such access can have important effects on several investment activities like inventory, acquisitions, and innovation (Shang, 2020). Because of the significance of stock liquidity as a crucial factor of an efficient and well-operated market (Atawnah et al., 2018), it is crucial to understand what factors mitigate or intensify firms' stock liquidity.

Our reasoning that stock liquidity is higher for firms headquartered in high societal trust regions rests on two central arguments. Stock liquidity is influenced by the information situation related to the firms, and more opaque environments make stock less liquid (Xu and Liu, 2018). Consistent with social identity proposition, the corporate culture of a corporation leans to be in line with the culture of its local environment (Jha and Chen, 2015; Turner and Oakes, 1986), and the latter one influences the managerial decisions. We argue that ethical norms[1] and social networks in high societal trust regions restrain unethical corporate manners and managers' self-serving behaviors and increase the penalties for misconducts. Thus, high regional societal trust can function as a societal monitoring instrument that reduces the information asymmetry between insiders (managers and controlling shareholders) and outsiders (investors and liquidity providers) that eventually increases stock liquidity for companies headquartered in these areas.

Strong social networks in these areas can expedite information collection and acquisition and reduce information and transaction costs for investors (Jha, 2019; Dai, 2018). Furthermore, there is a higher probability that liquidity providers trust managers who are trusted by those around them (Gupta et al., 2018). Thus, information disclosed by management teams of companies located in these areas is considered more reliable if the managers are viewed to be more trustworthy (i.e., more managerial trustworthiness). In addition, if reputational punishments for misconduct are larger in regions with more powerful ethical norms, then managers of companies located in these areas are less probable to behave in a self-centered manner that damage shareholders' interests (Gupta et al., 2018). Thus, we expect investors face lower agency problems, which is reflected in higher stock liquidity for companies located in high societal trust regions.

Focusing on 64,968 company-year observations over the period of 1997–2014, our study examines whether firms located in high societal trust regions have higher stock liquidity. Our findings indicate that societal trust increases stock liquidity. Findings still hold after several robustness tests like substitute measures of societal trust and stock liquidity, implementation of Instrumental-Variable regressions, use of propensity score matching and diff-in-diff approaches, and alleviation of omitted variable bias. Further investigation shows that the influence of societal trust is reasonably consistent over time, and still hold during period of financial crisis when the importance of stock liquidity is higher. In an additional analysis, we investigate the separate and distinct influences of norms and networks on firms' stock liquidity, and find that both norms and networks exert impacts on stock liquidity.

Further investigations indicate that the association between societal trust and stock liquidity becomes stronger when companies are more opaque and weakly governed. We also present empirical evidence that a potential channel/mechanism through which societal trust can increase stock liquidity is voluntary information disclosure. Our results imply that companies situated in high societal trust counties supply more accurate management earnings guidance. Ultimately, we find that companies located in high societal trust areas have lower cost of equity capital as they have better access to equity market financing through stock liquidity.

Regarding the paper's contribution, first, by combining two different research streams of societal trust[2] (and social capital) and stock liquidity, this study contributes to both literature of sociological and corporate finance research as it provides empirical evidence regarding the positive influence of societal trust as an external informal institutional factor on firms' stock liquidity (a crucial driver of a well-functioning market). Using Putnam index[3] (Putnam, 2001), Gupta et al. (2018) report that cost of capital is negatively associated with regional societal trust. Cost of capital and stock liquidity have different definitions[4] (Lin et al., 2009; Amihud et al., 2015; Butler et al., 2005) and we complement/extend (Gupta et al., 2018) study as we identify an important channel (i.e., stock liquidity) through which societal

[1] Social and cooperative norms in these regions prompt ethical behavior (Hartlieb et al., 2020).

[2] Please refer to Guiso et al. (2004) and Duarte et al. (2012).

[3] Our regional societal trust proxy is much more comprehensive than Gupta et al. (2018) proxy. Gupta et al. (2018) use survey data from a single year to proxy for trust, while our data shows much more cross-sectional variation, as it is collected at different points in time that includes much more numerous aspects.

[4] Cost of equity refers to the returns demanded by shareholders, while stock liquidity refers to the speed and facility that shareholders could trade on the stock with no severe volatility in the price (Lin et al., 2009; Amihud et al., 2015; Butler et al., 2005). From computational perspective, these two constructs are calculated differently (Lin et al., 2009; Amihud et al., 2015; Butler et al., 2005). In a seminal study, Butler et al. (2005) argue that liquidity risk is one of the priced risks and show that stock liquidity can be a driver of a company's cost of equity capital and Gupta et al. (2018) report that cost of capital is negatively associated with regional societal trust. If we consider these studies, our study complements/extends Gupta et al. (2018) study as we identify an important channel (i.e., stock liquidity) through which societal trust reduces cost of capital.

trust reduces cost of capital. There is another study that is related to our work. Blau (2017) reports that as home-country levels of trust increase, the level of market liquidity in American Depositary Receipts (ADRs) is dramatically improved. Our paper is different from this paper in two ways. Using an international dataset and focusing only on ADRs domiciled outside the US (3560 ADR-year observations), Blau (2017) measures trust using Corruption Perception Index for each of the ADR home countries in their sample that is a totally different construct and concept from our regional societal trust proxy (i.e., county-level social capital). Particularly, Blau (2017) uses survey data from a single year to proxy for trust, while our data comes from US public firms (headquartered inside the US) and shows much more cross-sectional variation, as it is collected at different points in time that includes numerous aspects. Blau (2017) also does not provide any empirical evidence regarding the moderating/mediating factors (or cross-sectional analyses) in the association between their social trust proxy and market liquidity in ADRs. In another study, Faff et al. (2021) report that "stocks rebound more quickly after the trading halt for high-social capital firms than for other firms in terms of quality of the stock trading environment and promptness with which stock liquidity improved". Our paper is different from this paper in some ways. To capture social capital, they use corporate social responsibility (CSR) performance that is a different construct and concept from our regional societal trust measure. Please see Habib and Hasan (2017) that provides full explanations regarding the differences[5] between social capital and CSR. In addition, they use firms with intraday stock transaction data surrounding the March 2020 market-wide circuit breaker (MWCB) events and market microstructure data that is different from our longitudinal approach. Their dependent variable is the speed of stock liquidity restoration that is different from each of our stock liquidity proxies. Faff et al. (2021) also does not provide any empirical evidence regarding the moderating/mediating factors (or cross-sectional analyses) in the association between their social capital proxy and speed of stock liquidity restoration variable. In an overall view, our findings are consistent with their findings as both studies highlight the monitoring function of societal trust as an external informal institutional factor.

Second, we provide evidence about the moderating functions of corporate governance and firm-level opaqueness on the association between societal trust and stock liquidity. More importantly, we identify a potential channel of management earnings guidance accuracy through which societal trust increases stock liquidity. Given the beneficial function of societal trust in enhancing stock liquidity, our findings can be interesting for regulators, and policymakers who underscore and enhance regional societal trust. Our findings can advise policymakers to consider informal monitoring mechanisms (e.g., societal trust) when making decisions. While different kinds of risk are reported both theoretically and empirically to adversely impact the liquidity of financial markets (Jones and Tuzel, 2013; Bernstein, 2015; Atawnah et al., 2018), findings from our paper shows that the impact of these risks on liquidity may be partially explained by differing levels of regional societal trust. Previous studies suggests that stock liquidity can have a pivotal function in economic growth (Jones and Tuzel, 2013; Bernstein, 2015; Atawnah et al., 2018). Prior research also suggests that regional societal trust is related to higher economic growth (Gao et al., 2019; Jha, 2019; Li et al., 2018). Therefore, our findings imply that regional societal trust may have an important effect on economic growth through the potential channel of enhancing financial markets liquidity.

[5] The magnitude of the correlation between regional societal trust and CSR is small (0.02) in our setting, which indicates that regional societal trust and CSR catch different regional and company-level characteristics.

The other sections of this article are made up as follows. Second part explains the background and presents the study's hypothesis. The third part explains research design. Primary empirical findings are outlined in part four. The fifth part presents additional analyses, and, eventually, part 6 provides final discussion.

2. Background

2.1. Societal trust

As a definition of trust, Luhmann and Gambetta (1988) explain "the subjective probability an individual assigns to an action performed by a counterparty that is beneficial or at least not harmful". Societal trust represents "the values and beliefs that are instilled by parents and other members in a community and transmitted from generation to generation" (Guiso et al., 2006). Hence, societal trust is generalized trust in other people in the society, in contrast to the personalized trust held towards a well-identified person or a particular firm (Guiso et al., 2006).

Social capital as a socio-economic element is a by-product of social associations, and it is regarded advantageous for individuals of a society (Putnam, 2001; Guiso et al., 2004; Woolcock, 2001). Even though there are several definitions presented in literature regarding the subject of social capital, we utilize a comprehensive one that is defined by (Woolcock, 2001), and it refers to "social norms and networks that promote collective action and cooperation among members of community". Adopting this definition is in line with prior research (Gao et al., 2019; Jha, 2019; Li et al., 2018; Papadimitri et al., 2020). The norms promoted in these regions motivate their members to act and decide in a decent way that is in line with these norms (Li et al., 2018). As informal monitoring mechanisms, strong social networks caused by high social capital regions can improve the speed of information flow and credibility of information (reflected in lower moral hazard) in imperfect markets through information sharing and interactions among individuals (Lin, 2017). In addition, these dense networks can depress unethical actions through raising social sanctions (causing effective enforcement of ethical norms). Particularly, strong social networks can intensify the cost of infringing ethical norms through making the discovery of norm-deviant actions easy and motivate members to implement social sanctions (Hasan et al., 2017a,b).

Social capital can be utilized as the representative for societal trust as prior research presents several reasons that support this representation (Jin et al., 2020; Hasan et al., 2017a,b). For instance, Jha (2019) emphasizes on the function of social capital in fostering bilateral trust and altruistic propensity, which is reflected in more transparent financial reports. In an experimental setting, Migheli (2012) reports that we can evaluate trust through the level of social capital. In the context of people-to-people (P2P) lending, Greiner and Wang (2009) utilize social capital as a representative for trustworthiness. Their findings suggest that it decreases information asymmetry and transaction costs and improves reputation and creditworthiness among P2P lending groups. Utilizing social capital as a representative of societal trust, Jin et al. (2020) report that high regional societal trust increases the core deposits and they argue that banks headquartered in these areas have higher access to retail deposits. In summary, as a societal monitoring mechanism, social capital promotes mutual trust through decreasing managers' self-interested behaviors and increasing the cost of misbehavior (reflected in lower perceived moral hazard and contracting costs).

2.2. The association between societal trust and stock liquidity

Received information determines the behaviors of investors in the stock market, and investors who have lower relevant information face higher transaction costs and losses compared with those who obtain more relevant information (Grewal et al., 2020). Corporate insiders are considered as agents who possess more relevant information about the corporation than outsiders. Such a situation escalates information asymmetry (between insiders and outsiders) and its outcomes (i.e., moral hazard and adverse selection) (Xu and Liu, 2018). Existence of information asymmetry violates the strong form of market efficiency as insiders have valuable information, which is not necessarily reflected in the stock price changes and decreases stock liquidity (Ahmed and Ali, 2017). Firms' stock liquidity, as an important component of a well-functioning and efficient operation of equity markets, is influenced by the information environment related to the firms, and more opaque environments make stocks less liquid (Xu and Liu, 2018). Previous studies also find that information environment and a company's decisions can be impacted by the social effect of the region where the company is located (Jha, 2019; Li et al., 2018; Papadimitri et al., 2020). Along this line, Hartlieb et al. (2020) suggest "corporate and managerial decisions do not emerge in a societal vacuum, but that they are influenced by the social environment". Hilary and Hui (2009) also explain that "individuals' social actions have a powerful impact on their professional manner". In addition, corporations prefer to employ a considerable portion of their workers and managers from the area where they are headquartered (Jha, 2019; Gao et al., 2019). Prior research also shows that employees are employed by corporations that share alike values (Gao et al., 2019). Thus, consistent with social identity theory,[6] corporate culture of a corporation leans to be in line with the culture of its local environment (Jha and Chen, 2015; Turner and Oakes, 1986), and the latter one influences the managerial decisions. In this study, we contend that ethical norms and strong networks in high societal trust areas restrain unethical corporate manners and managers' self-centered behaviors and increase the penalties for misconduct. Thus, societal trust can function as a societal monitoring instrument that decreases the information asymmetry between insiders and outsiders, thus reflected in higher stock liquidity for companies located in high societal trust regions.

Amihud and Mendelson (2000) describe three drivers of stock liquidity: (a) increasing the stock liquidity providers base by attracting retail investors through actions such as stock split by firms; (b) crucial role of financial intermediaries such as financial analysts to disseminate a firm's information to the public (especially to unsophisticated retail investors); (c) providing an increased material and value relevant information to investors by firms. Regarding the second driver, Dai (2018) shows that companies situated in high societal trust areas have more analyst coverage and lower financial analysts' earnings forecast dispersion that can mitigate the information asymmetry between retail and institutional investors and improve stock liquidity (Roulstone, 2003). Thus, we can predict that societal trust can increase stock liquidity. Regarding the third driver, disclosure of high-quality information can improve firms' transparency (causing firms' richer information environment) and mitigate the information asymmetry and principal–agent problems. Along this line, we have evidence that companies located in high societal trust areas enjoy a less obscure tone in their 10-K filings (Kanagaretnam et al., 2020) and Jha (2019) finds that the quality and readability of financial reports is positively associated with societal trust. He also reports that the probability of having fraud, financial misstatements, and disclosing misleading information are negatively associated with societal trust since their managers respect trust, altruism, and honor their obligations (Jha, 2019). Such transparency and richness in the improved information environment of companies headquartered in high societal trust areas can increase their stock liquidity.

Regarding to the norms, Sunstein (1996) explains "social attitudes of approval and disapproval, specifying what ought to be done and what ought not to be done". Environment can use monitoring tools such as "open criticism" and "withdrawal of social support" to penalize infringements of norms (Horne, 2009). On the other hand, people who observe cooperative norms and act in an ethical manner may acquire "higher levels of social recognition and respect" (Stavrova et al., 2013). Unethical behaviors (e.g., self-interested actions and opportunistic behaviors, and hiding or misreporting material and value relevant information to investors) that impair the transparency of a firm's information environment infringe acceptable social norms. Thus, the managers of companies headquartered in high societal trust regions will unlikely breach a social norm due to embargoes and disapproval that could follow.

We also have evidence in literature implying that strong social networks in high societal trust areas expedite information collection and acquisition and reduce informational friction[7] costs, information, and transaction costs for investors (Jha, 2019; Dai, 2018). Furthermore, liquidity providers are more possibly to trust managers who are trusted by those around them (e.g., high societal trust regions) (Gupta et al., 2018). Thus, information disclosed by management teams of companies located in these areas is considered more reliable if the managers are viewed to be more trustworthy (i.e., more managerial trustworthiness). In addition, if reputational punishments for misconduct are larger in regions with more powerful ethical norms, then managers of companies located in these areas unlikely behave in a self-centered manner that reduces shareholder value (Gupta et al., 2018). Hence, we predict investors face lower moral hazard and adverse selection problems, which is reflected in higher stock liquidity for companies located in these areas.

In summary, our reasoning is consistent with this idea that financing by and investing in capital market is regarded as a specifically trust-intensive conduct because of segregation of ownership and control. Investors' trust in managers is related to managerial incentives and oversight quality. Societal trust can increase investors' trust through curbing managers' self-interested actions and opportunistic behaviors, increasing reputational cost of violating ethical norms, and serving as a societal monitoring mechanism of managerial behavior. We believe that such an incremental trust mitigates principal–agent problems, which is finally reflected in higher stock liquidity for companies headquartered in high societal trust regions.[8] Accordingly, we pose our hypothesis below:

[6] This theory suggests that a part of a person's self-concept depends on the discernment of the person's social group, and it supports this proposition that the culture of a corporation is correspondent with its regional culture (Turner and Oakes, 1986).

[7] Brockman et al. (2009) explain that "informational friction refers to the losses of trading against informed traders. If an investor frequently trades on private information, this investor will deteriorate stock liquidity by raising the informational friction costs".

[8] The matter that societal trust increases stock liquidity does not essentially suggest that all companies act ethically in high societal trust regions. Reported findings, therefore, indicate that, on balance, the advantages related to high societal trust areas exceed those in other areas. Jha (2019) also utilizes a similar explanation. He finds that social capital decreases financial misstatements, but he does not leave out the possibility that numerous companies in high social capital counties have financial misstatements. Prior studies that investigate the influence of societal trust on different financial consequences such as corporate cash reserves, accounting quality, and corporate social responsibility ratings is also shaped in a comparative, not in an absolute, sense (Hasan and Habib, 2017).

H1: Stock liquidity is greater for companies headquartered in high societal trust regions.

3. Research design

3.1. Data

To probe the relationship between societal trust (proxied by county-level social capital) and stock liquidity, we focus on all US publicly traded firm-year observations with the needed information from the CRSP, Compustat, and Northeast Regional Center for Rural Development (NERCRD) database from 1997 to 2014.[9] Our sample starts from 1997 due to data availability of social capital.[10] We follow prior research (Habib and Hasan, 2017; Gao et al., 2019; Jha, 2019) and drop company-year observations from Standard Industrial Classification codes of 6000–6999 and 4900–4999. We also omit firms headquartered outside the US. After merging NERCDR, CRSP, and Compustat; our ultimate sample incorporates 64,968 company-year observations with the required data on variables utilized in our multivariate analyses. We also winsorize the continuous variables at the top and bottom one percent to attenuate the unsuitable impacts of outliers.

3.2. Model determination

Consistent with former papers (Ahmed and Ali, 2017; Wang and Wei, 2021; Atawnah et al., 2018; Boubaker et al., 2019; Feng and Yan, 2019), we employ the regression model (Eq. (1)) below to investigate the association between stock liquidity and societal trust:

$$LIQ_{i,t} = \alpha_0 + \alpha_1 SCapital_{i,t-1} + \alpha_2 SIZE_{i,t-1} + \alpha_3 REVT_{i,t-1} + \alpha_4 BMR_{i,t-1} + \alpha_5 Return_{i,t-1} + \alpha_6 PR_{i,t-1} + \alpha_7 Age_{i,t-1} + \alpha_8 TANG_{i,t-1} + \alpha_9 LEV_{i,t-1} + \sum \alpha_n County\ Attributes + \sum \alpha_k Industry\ dummies + \sum \alpha_j Year\ dummies + \epsilon_{i,t} \quad (1)$$

LIQ denotes company-level stock liquidity for company *i* at time *t*. We measure *LIQ* using three proxies of *LIQ1*, *LIQ2*, and *LIQ3*. As Goyenko et al. (2009) explains, Amihud's measure of stock liquidity (Amihud, 2002) is considered an appropriate proxy for stock liquidity.[11] Initially, we measure Amihud's liquidity proxy that is "the absolute amount of stock return scaled by the dollar trading volume on a specific trading day" (Amihud, 2002). We then take the average of the daily Amihud's liquidity proxy within a year to create *LIQ1*. Consistent with Ng et al. (2016), *LIQ2* is calculated based on the "volume-based Amihud's liquidity proxy, which is the absolute amount of stock return scaled by the number of shares traded on a specific trading day". *LIQ2* is "the average of the daily volume-based Amihud's liquidity proxy within a year". Both *LIQ1* and *LIQ2* are multiplied by one million for reporting purposes. Finally, *LIQ3* is "the proportion of the number of days with zero stock returns to the total number of trading days with non-missing stock returns in each year" (Wang and Wei, 2021). We multiply our proxies by minus one for the easier interpretation. Therefore, higher values of *LIQ1*, *LIQ2*, and *LIQ3* imply higher stock liquidity.

To measure social capital (*SCapital*) as the representative of societal trust, we pursue prior research (Jha, 2019; Gao et al., 2019; Habib and Hasan, 2017) and calculate county-level *SCapital* index based on two aspects of norms and networks of social capital. Particularly, utilizing principal component analysis (PCA), *SCapital* is measured based on the first principal component of the "response rate to the surveys done by the US Census Bureau, voter turnout in the US presidential elections" (as two measures for the norm aspect of social capital), "the number of non-government organizations (NGO), and the number of social and civic associations" (as two measures for the networks aspect of social capital). In line with prior studies (Hilary and Hui, 2009; Jha, 2019; Gao et al., 2019; Habib and Hasan, 2017), as *SCapital*[12] data are available in the years 1997, 2005, 2009, and 2014; we linearly interpolate the data to fill in the missing years from 1998–2004, 2006–2008, and 2010–2013. In our setting, α_1 is predicted to be positive and significant in Eq. (1) to support our hypothesis. Please see the Appendix for the definition of independent variables[13] and their related data sources. We include a firm's size (*SIZE*) as larger companies could simultaneously exhibit higher investor interests due to less adverse selection risk. Stock return volatility (*RETV*) is included to capture the higher trading costs and greater potential benefits for informed traders associated with more volatile stocks. We also control for leverage (*LEV*) as more levered companies exercise more transparency to mitigate the higher monitoring cost. We control for firm age (*Age*) and book to market ratio (*BMR*) because young and high growth firms are likely to be associated with higher information asymmetry between managers and investors (reflected in lower stock liquidity). As the payoffs of tangible assets are easy to observe, the firms with more tangible assets (*TANG*) are likely to have higher stock liquidity. We also add natural log of stock price (*PR*) to control for the higher risk and lower liquidity associated with low-priced stocks (Boubaker et al., 2019). As we can see in Eq. (1), we lag[14] *SCapital* and covariates by one period to attenuate the issue associated with synchronous endogeneity (Petersen, 2009). We also comprise year, and industry fixed effects, and we estimate our model with t-statistics[15] (measured by standard errors that are clustered[16] at the county level).

9 Previous studies (e.g., Oyotode-Adebile and Ujah, 2021; Hasan and Habib, 2019a,b) use similar period.

10 NRCRD presents the data for creating the social capital index in 2 various versions. Former one presents data for 1990, 1997, and 2005 and later one presents data for 1997, 2005, 2009, and 2014. There are some discrepancies (e.g., the difference in the quantity of non-government organizations and the quantity of social and civic associations in these two datasets), and the information from 1990 is not in harmony with later periods (Habib and Hasan, 2017). Hence, our panel begins from 1997, when the later dataset was accessible. Our findings still hold when data from 1990 to 1996 are incorporated. To mitigate this issue that our results may be impacted by the index interpolation, we utilize only four years of 1997, 2005, 2009, and 2014, when the *SCapital* data are available. Our results regarding our hypothesis still hold when we use only these four years.

11 An important characteristic of Amihud's (2002) liquidity proxy is its low data requirements, as the ratio could be created out of daily stock price and trading data. Former research indicates that Amihud's (2002) liquidity proxy works well in capturing stock liquidity (Fong et al., 2017). We also consider the recommendation made by Gopalan et al. (2012) regarding the use of square root of Amihud's (2002) liquidity proxy to mitigate skewness concern. Our inference regarding our hypothesis still holds when we utilize the square root of Amihud's (2002) proxy.

12 Rupasingha et al. (2008). US county-level social capital data, 1990–2005. The Northeast Regional center for rural development. University Park, PA: Penn State University (https://aese.psu.edu/nercrd/community/social-capital-resources/default).

13 As you can see in our model in Eq. (1), we incorporate county-level demographic variables to alleviate the concern related to omitted county features.

14 Our findings still hold when we use the contemporaneous values of covariates.

15 t-statistics are robust to both heteroscedasticity and serial correlation (Petersen, 2009).

16 Our primary findings still hold when we cluster standard errors at the company level.

Table 1
Descriptive statistics.

Variable	Number of observations	Mean	SD	Minimum	Maximum
LIQ1	64 968	−0.71	2.76	−16.11	0.00
LIQ2	64 968	−5.93	15.64	−114.79	0.00
LIQ3	64 968	−0.11	0.13	−0.67	0.00
SCapital	64 968	−0.64	0.83	−1.48	0.17
SIZE	64 968	4.64	2.69	1.14	12.98
REVT	64 968	0.48	0.29	0.13	1.56
BMR	64 968	0.68	0.61	0.00	4.31
Return	64 968	0.11	0.39	−0.88	2.04
PR	64 968	2.89	0.83	0.26	5.81
Age	64 968	2.78	0.81	1.51	3.89
TANG	64 968	0.13	0.17	0.00	0.42
LEV	64 968	0.19	0.28	0.00	0.64
PAge	64 968	34.28	2.47	30.02	39.23
Pop	64 968	13.89	1.17	12.58	16.22
PGrowth	64 968	14.01	13.93	3.78	28.96
Density	64 968	4474.49	11 846.37	483.19	17 834.17
Minor	64 968	20.66	10.78	8.14	31.68
Income	64 968	38 542.92	13 532.71	23 792.00	54 289.00
Religion	64 968	0.53	0.12	0.31	0.74

Table 2
Pearson's correlation matrix.

Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
(1) *LIQ1*	1.00							
(2) *LIQ2*	0.79*	1.00						
(3) *LIQ3*	0.47*	0.39*	1.00					
(4) *SCapital*	0.18*	0.16*	0.13*	1.00				
(5) *SIZE*	0.21*	0.22*	0.16*	0.00	1.00			
(6) *RETV*	−0.13*	−0.13*	−0.09*	−0.03*	−0.29*	1.00		
(7) *Return*	0.04*	0.03*	0.06*	0.01	0.11*	−0.03*	1.00	
(8) *PR*	0.07*	0.08*	0.04*	−0.00	0.24*	−0.07*	0.09*	1.00
(9) *BMR*	0.03*	0.04*	0.01	−0.04*	−0.06*	−0.09*	−0.06*	−0.12*
(10) *Age*	0.10*	0.09*	0.06*	0.02	0.04	−0.02	0.00	−0.06*
(11) *TANG*	0.07*	0.08*	0.05*	0.00	0.18*	−0.04	0.01	0.08*
(12) *LEV*	0.11*	0.10*	0.08*	0.01	0.12*	0.03	0.02	0.16*

Variables	(9)	(10)	(11)	(12)
(9) *BMR*	1.00			
(10) *Age*	0.13*	1.00		
(11) *TANG*	0.10*	0.05*	1.00	
(12) *LEV*	0.02	0.01*	0.00	1.00

* Denotes significance at the 5% level.

4. Empirical findings

Table 1 illustrates descriptive statistics for the modeled variables. The distribution of *SCapital* and demographic controls are in line with literature (Hasan and Habib, 2019a,b; Gao et al., 2019; Jha, 2019). Descriptive statistics of remaining controls are also in line with literature (Wang and Wei, 2021). Table 2 shows the correlation matrix and results suggest that there is a positive correlation between *SCapital* with each of *LIQ1*, *LIQ2*, and *LIQ3* that presents preliminary evidence that regional societal trust can be influential in improving the stock liquidity. We also observe that *SIZE*, *PR*, *BMR*, *Age*, *TANG*, and *LEV* are positively correlated with our stock liquidity proxies. These results are consistent with our expectations and literature (Wang and Wei, 2021).

Table 3 indicates the results[17] from running our model in Eq. (1). Models one to three in Table 3 show the findings related to the function of societal trust (proxied by *SCapital*) on increasing the stock liquidity. As we can see in models 1, 2, and 3 of Table 3, the coefficients for *SCapital* (0.058, 0.427, and 0.011) are significant at the 1% level, and support our hypothesis.[18] According to models 1, 2, and 3 of Table 3, one standard deviation rise in *SCapital* is related to a 0.048 increase in *LIQ1*, a 0.354 increase in *LIQ2*, and a 0.009 increase in *LIQ3*, suggesting a 6.72%, 5.91%, and 8.30% increase over the sample's average of *LIQ1, LIQ2*, and *LIQ3* respectively, implying that our results are also economically meaningful. The sign and statistical significance of coefficients for most covariates are in line with literature (Ahmed and Ali, 2017; Wang and Wei, 2021; Atawnah et al., 2018).

5. Additional test

5.1. Substitute proxies for stock liquidity and societal trust

The model in Eq. (1) is re-estimated using three other proxies of *LIQ*. We utilize Amivest liquidity ratio (*LIQ4*), computed as "the

[17] Variance inflation factors for our modeled variables are lower than ten. It means that multicollinearity is not an important matter for our setting.

[18] To mitigate this concern that the large sample size has driven our findings, we constrain our sample to only one observation for each company. To implement this robustness check, we calculate the average of each company observation over the years and utilize the mean amounts for the investigation. Our results still hold when we use this specification. The other potential concern is that the linear interpolation of data possibly produces systematic noise in our panel (Jin et al., 2020; Hartlieb et al., 2020). To mitigate this concern, we perform a robustness check, utilizing the ranking of *SCapital* (*R-SCapital*, which is the standardized rank) instead of the actual values of *SCapital*. Particularly, we create the ranked variable by ranking the level of the *SCapital* index into one hundred segments for each period. Findings (untabulated) regarding the ranked checks are qualitatively parallel to those in Table 3.

Table 3
The influence of societal trust on stock liquidity.

Dependent variable =	*LIQ1* (1)	*LIQ2* (2)	*LIQ3* (3)
SCapital	0.058***	0.427***	0.011***
	(3.37)	(3.01)	(2.79)
SIZE	0.267***	2.612***	0.027***
	(4.93)	(4.13)	(3.59)
REVT	−0.863***	−11.342***	−0.039***
	(−3.31)	(−2.93)	(−3.02)
BMR	0.369***	3.802***	0.001
	(2.84)	(3.79)	(0.79)
Return	0.059***	0.849***	0.007***
	(2.86)	(3.27)	(3.12)
PR	0.159***	0.579***	0.004***
	(3.56)	(2.74)	(3.36)
Age	0.082**	0.398	0.011*
	(2.16)	(1.19)	(1.82)
TANG	0.614***	1.631***	0.177***
	(3.69)	(3.26)	(3.04)
LEV	0.424***	2.091***	0.261***
	(4.72)	(2.94)	(3.16)
PAge	−0.013	−0.121	−0.000
	(−0.81)	(−1.21)	(−0.59)
Pop	0.039	0.154	0.082
	(0.73)	(0.92)	(0.68)
PGrowth	−0.027	−0.000	−0.131
	(−0.49)	(−0.97)	(−1.26)
Density	0.039	0.071	0.000
	(0.76)	(1.22)	(0.88)
Minor	0.026	0.642	0.013**
	(1.16)	(0.79)	(2.07)
Income	0.016*	0.181**	0.047
	(1.83)	(2.27)	(0.84)
Religion	0.053	0.148	0.000
	(0.87)	(0.66)	(1.09)
Industry dummies	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes
Adj R^2	0.197	0.229	0.734
Observations	64968	64968	64968

Notes: This table illustrates the findings related to the impact of societal trust (proxied by social capital) on firms' stock liquidity. Robust *t* amounts have been shown in parentheses.
*, ** and *** imply significance at ten, five, and one percent levels.

average, over all non-zero-return days, of daily trading volume over daily stock return" (Goyenko et al., 2009), "bid–ask spread estimator of Corwin and Schultz (2012) (*LIQ5*) based on daily high and low prices", and "the adverse selection component of the effective bid–ask spread" (*LIQ6*) calculated utilizing the method suggested by Lin et al. (1995) as alternative measures of *LIQ* (Boubaker et al., 2019; Fong et al., 2017). We multiply *LIQ5* and *LIQ6* by minus one for the easier interpretation of our findings. Higher values of *LIQ4, LIQ5*, and *LIQ6* imply higher stock liquidity. As we can see in Table 4 (Panel A), our findings still hold that implies a unique proxy of *LIQ* does not drive our findings.

We also follow prior research (Habib and Hasan, 2017; Li et al., 2018; Hasan et al., 2017a,b) and use two substitute proxies for *SCapital*. This robustness test mitigates our concern related to the possible measurement error regarding the computation of *SCapital* index. In this line, we utilize "state-level per capita registered organ donor[19] multiplied by 1000 (*SCapital2*), and the state-level charitable contributions per return filed (*SCapital3*)" as substitute proxies of societal trust. Our findings in Table 4 (Panel B) are in line with the baseline regression.

[19] Li et al. (2018) contend that "organ donations are a reflection of altruistic norms and can be regarded as a proxy for social capital". We got the data from Organ Procurement and Transplantation Network (OPTN).

5.2. Instrumental-Variable (IV) regressions

As a robustness test of our findings, we use IV regressions to mitigate concern related to the endogeneity of *SCapital* because of omitted variables, which are correlated with *SCapital* and *LIQ*. Supported by former studies (Hasan et al., 2017a,b; Gupta et al., 2018), we utilize *Distance* as an instrument that is estimated based on the "log of the nearest distance between the US–Canadian border and the county where a firm's headquarter is located". Putnam (2001) explains that "the best single predictor of the level of social capital in American states is distance to the Canadian border and being closer to the Canadian border means more social capital". Hence, we predict that *Distance* is negatively associated with *SCapital*. Putnam (2007) also explains that "people living in ethnically diverse settings appear to 'hunker down'—that is, to pull in like a turtle", and shows that ethnic homogeneity improves *SCapital*. We define *Homogeneity* as our second instrument that is measured based on "Herfindahl index calculated across the Census Bureau ethnic categories of Hispanic, non-Hispanic black, non-Hispanic white, and Asian for a county in a specific year" (Hasan et al., 2017a,b). We predict that *Homogeneity* is positively related to *SCapital*. As we can see in Table 5, results of IV approach[20] qualitatively resemble those documented in Table 3, implying that the endogeneity of *SCapital* is unlikely to be an important concern impacting our primary results. To ensure that our IV approach is well-specified, we do three tests. Finding associated with the first stage F-statistic (columns 1 of Table 5) was significant ($p < 0.001$) for *Homogeneity* and *Distance*, implying that our instruments for *SCapital* are strong. Results of Wald statistics ($p < 0.05$) suggest that the endogenous *SCapital* is suitable for our IV approach. Finally, Hansen's *J* test for over-identification was not declined ($p > 0.10$), implying that *Homogeneity* and *Distance* are adequately uncorrelated with the error terms.

5.3. Propensity score matching (PSM) findings and evidence from headquarters relocation

There is an argument that firms with high stock liquidity may self-select and incline to situate in high societal trust regions. Use of PSM (Rosenbaum and Rubin, 1983) can attenuate the issue related to the self-selection bias. To implement PSM, we divide our panel based on the median amount of *SCapital* and match the treated sample (firms having high *SCapital*) with the control sample (firms having low *SCapital*) using propensity scores. In line with prior research (Oyotode-Adebile and Ujah, 2021; Hoi et al., 2019), we utilize a logit model to predict propensity score for each observation, and the dependent variable in this model is a dichotomous variable that has the amount of 1 if *SCapital* is greater than the median, and 0 otherwise., and independent variables[21] in this model are *SIZE*, *REVT*, *BMR*, *PR*, *Return*, *PR*, *Age*, *TANG*, and *LEV*. Using a caliper of 1% and without replacement,[22] we match the treated and control samples. Table 6 (Panel A) demonstrates the comparison between the treated sample and control sample (i.e., balancing test). Table 6 (Panel B) depicts findings for the matched sample. Even though the number of observations declines, findings are in line with our hypothesis.

[20] We also pursue Hasan and Habib (2017) and use "the industry-level mean social capital in each year and the state-level mean social capital in each year" as alternative instruments for *SCapital*. Results of this examination are qualitatively parallel to those in Table 5.

[21] Incorporation of numerous variables decreases the chance of creating distinct pairs.

[22] Our findings continue to hold when we permit for replication and use different calipers of 3% and 5%.

Table 4
Alternative measures of societal trust and stock liquidity.

Panel A: Alternative measures of stock liquidity			
Dependent variable =	*LIQ4* (1)	*LIQ5* (2)	*LIQ6* (3)
SCapital	0.418***	0.062***	0.217***
	(3.17)	(3.79)	(3.58)
SIZE	0.144***	0.514***	0.207***
	(3.28)	(3.30)	(3.17)
REVT	−0.194***	−0.921***	−0.137***
	(−3.89)	(−3.53)	(−3.34)
BMR	0.057	0.707	0.081
	(1.28)	(0.61)	(1.12)
Return	0.312***	0.453**	0.062
	(3.48)	(2.38)	(0.92)
PR	0.109***	0.182***	0.514***
	(2.84)	(2.99)	(3.86)
Age	0.179***	0.281	0.007
	(3.49)	(0.56)	(0.87)
TANG	0.367***	0.527**	1.063***
	(3.34)	(2.28)	(3.39)
LEV	0.221***	0.593***	0.064***
	(4.13)	(3.62)	(2.83)
County-level controls	Included	Included	Included
Industry and Year fixed effects	Yes	Yes	Yes
Adj R^2	0.172	0.107	0.051
Observations	64 968	64 968	64 968

Panel B: Alternative measures of societal trust						
Dependent variable =	*LIQ1* (1)	*LIQ2* (2)	*LIQ3* (3)	*LIQ1* (4)	*LIQ2* (5)	*LIQ3* (6)
SCapital2	0.753***	0.221**	0.117***			
	(3.74)	(2.32)	(4.51)			
SCapital3				0.161***	0.318***	0.022***
				(3.19)	(2.69)	(3.51)
Controls in Eq. (1)	Yes	Yes	Yes	Yes	Yes	Yes
Industry effect	Yes	Yes	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes
State dummies	Yes	Yes	Yes	Yes	Yes	Yes
Adj R^2	0.195	0.224	0.729	0.193	0.226	0.736
Observations	64 968	64 968	64 968	64 968	64 968	64 968

Notes: First panel illustrates the findings associated with the influence of societal trust on alternative measures of firms' stock liquidity. Panel B shows the findings of the influence of alternative measures of societal trust on firms' stock liquidity.
*, ** and *** imply significance at ten, five, and one percent levels.

Table 5
IV regressions results for the influence of societal trust on stock liquidity.

	1st stage DV: *SCapital* (1)	2nd stage DV: *LIQ1* (2)	2nd stage DV: *LIQ2* (3)	2nd stage DV: *LIQ3* (4)
Distance	−0.128***			
	(−5.19)			
Homogeneity	0.216***			
	(4.68)			
Fitted_SCapital		0.074***	0.367***	0.023**
		(2.89)	(2.76)	(2.31)
Controls in Eq. (1)	Yes	Yes	Yes	Yes
Industry and Year fixed effects	Yes	Yes	Yes	Yes
Adj R^2	0.351	0.194	0.227	0.732
Observations	64 968	64 968	64 968	64 968

Notes: This table illustrates the findings related to the use of IV regressions to explore the influence of *SCapital* on firms' stock liquidity. We utilize two instruments. The first instrument, *Distance* is measured based on the "log of the nearest distance between the US–Canadian border and the county where a company's headquarter is located". The second instrument, *Homogeneity* is measured based on the "Herfindahl index that is estimated across the Census Bureau ethnic categories of Hispanic, non-Hispanic black, non-Hispanic white, and Asian for a county in a specific year". Robust *t* amounts have been shown in parentheses.
*, ** and *** imply significance at ten, five, and one percent levels.

To further mitigate the endogeneity concern in our analyses, we execute a diff-in-diff (DiD) investigation of companies that relocate to larger *SCapital* areas, and we want to investigate whether relocation[23] is related to larger stock liquidity. We focus on companies that altered their headquarters and create two new variables (Jha, 2019; Hasan et al., 2017a,b). *Post* has the amount of 1 for company years after company relocates, and 0 otherwise (Jha, 2019; Hasan et al., 2017a,b). *SCapital_Up* has the amount of 1 for company years when a company moves to a county with larger *SCapital*, and 0 otherwise. As we can see in Table 6 (columns 1 and 2; Panel C), the coefficients of interaction term *Post* * *SCapital_Up* are positive and significant, implying that moving to a higher *SCapital* county is related to a higher stock liquidity. These results[24] indicate that investors' and liquidity providers' trust in management systems of firms headquartered

[23] Prior research (e.g., Jha, 2019; Hasan et al., 2017a,b) also uses a similar *DiD* approach in other settings.

[24] We use firm headquarters addresses as described in a company's 10-K filings to determine social-capital-changing relocation events. A social-capital changing relocation event happens when a company reports headquarters addresses in two different counties in its 10-K filings in two successive years. We identify 168 firms with a unique social-capital-increasing relocation and 156 firms with a unique social-capital-decreasing relocation. The ultimate sample includes 2126 firm-year observations for our sample period. Of these, 1124 observations are from the pre-relocation window and 1002 observations are from the post-relocation window. We also check that whether firms with

Table 6
Findings related to propensity score matching.

Panel A: Mean difference T-test between matched sample and treated sample			
Variables	Treatment group	Control group	*P*-value
SIZE	4.614	4.615	0.961
REVT	0.467	0.468	0.576
BMR	0.668	0.667	0.813
Return	0.099	0.100	0.279
PR	2.882	2.883	0.364
Age	2.763	2.778	0.026
TANG	0.136	0.135	0.478
LEV	0.197	0.197	0.743

Panel B: Findings for the matched sample			
Dependent variable =	*LIQ1* (1)	*LIQ2* (2)	*LIQ3* (3)
SCapital	0.067*** (3.14)	0.387** (2.83)	0.013** (2.32)
Controls in Eq. (1)	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes
Adj R^2	0.194	0.221	0.727
Observations	9746	9746	9746

Panel C: Evidence from relocation			
Dependent variable =	*LIQ1* (1)	*LIQ2* (2)	*LIQ3* (3)
SCapital_Up	−0.017 (−0.63)	−0.041 (−0.83)	0.025 (0.91)
Post	−0.006 (−0.72)	−0.101 (−1.15)	−0.034 (−0.69)
*Post * SCapital_Up*	0.016** (2.01)	0.032** (2.29)	0.009 (1.38)
Controls in Eq. (1)	Yes	Yes	Yes
Industry dummies	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes
Adj R^2	0.188	0.216	0.709
Observations	2126	2126	2126

Notes: We use a caliper of 1% and without replacement for matching the treated and control samples. First panel depicts the comparison between the treated sample and control sample (i.e., balancing test). Panel B shows results for the matched sample. Last panel reports findings regarding diff-in-diff (DiD) analysis. *, ** and *** imply statistical significance at the ten, five, and one percent levels.

in high societal trust regions is a determinant of firms' stock liquidity.

5.4. Alleviation of omitted variable bias

To further attenuate potential concerns originating from correlated omitted variables, our main model is re-run, including more control variables (Kale and Loon, 2011; Atawnah et al., 2018). We incorporate advertising expenses (*AdE*) measured by advertising expenses scaled by total assets and R&D expenditure (*RD*) estimated by R&D expenditures scaled by total assets. *AdE* and *RD* are difficult to estimate and can increase asymmetric information problems between managers and investors. In addition, they can control for excessive managerial risk-taking, which can decrease stock liquidity. Trading volume (*TradeV*) calculated by the mean daily dollar trading volume scaled by one million (less trading by investors can reduce liquidity by increasing inventory holding cost and spreads); return on assets (*ROA*) calculated by earnings before interests scaled by total assets (to control for financial performance); corporate social responsibility performance[25] (*CSR*) measured by the aggregation approach of Cheung (2016) are also added. *CSR* is a different concept from *SCapital* and it refers to "actions that appear to further some social good, beyond the interests of the firm and that which is required by law" (McWilliams and Siegel, 2001). However, *SCapital* is "a set of informal values, norms, and networks that fosters collaboration and expedites collective action in an area" (Fukuyama, 1997) (different from CSR, *SCapital* is an influence from outside the firm). Thus, based on a conceptual structure viewpoint, *SCapital* is not similar to *CSR*. The magnitude of the correlation between *SCapital* and *CSR* is small (0.02), which indicates that *SCapital* and *CSR* catch different regional and company-level characteristics. Our results suggest that *SCapital* has an incremental impact beyond *CSR*. Please see Habib and Hasan (2017) that provides full explanations regarding the differences between social capital and corporate social responsibility. It is also noteworthy to mention that *SCapital* is different from *Religion* (proxied by proportion of religious adherents in the county in our setting Hilary and Hui, 2009). Former research explains that *Religion* is embedded within the broader concept of *SCapital* (Oyotode-Adebile and Ujah, 2021). Hence, we can infer that *Religion* is considered one of the numerous sources of *SCapital*. Please see Jha (2019) that provides full explanations regarding the differences between social capital and religiosity. Although data necessity for extra covariates decreases our sample size, findings (untabulated) imply that our understanding of our hypothesis continues to hold when we incorporate these additional covariates to Eq. (1). Ultimately, we utilize firm fixed effects instead of industry fixed effects in our model in Eq. (1) to capture unknown time-invariant firm-level features. Findings (untabulated) imply that our understanding of our hypothesis keeps on holding by testing this specification.

5.5. Societal trust and financial crisis

Financial crisis is considered a turbulent period with a high level of uncertainty for many companies (Oyotode-Adebile and Ujah, 2021; Kanagaretnam et al., 2020). In this context, we investigate whether the association between societal trust and stock liquidity is different during financial crisis period. We split our sample into the three subsamples (i.e., 1997–2006; 2007–2008; 2009–2014) to explore the association between *SCapital* and stock liquidity in the recessionary periods and non-recessionary periods. Table 7 shows the findings of our sub-sample analyses. Findings (Panel B) indicate that the positive association between stock liquidity and societal trust continues to hold during financial crisis. These results imply that the influence of societal trust is reasonably consistent over time, and still hold during period of financial crisis when the importance of stock liquidity is higher. In other words, our findings indicate that societal trust has a persistent influence on stock liquidity, and it is not forgotten during bad times.

5.6. Separate influence of norms and networks on stock liquidity

Our findings in the former parts indicate that *SCapital* increases stock liquidity. Nonetheless, there is a potential that norms and networks exert distinct impacts on stock liquidity. Following former research (e.g., Habib and Hasan, 2017; Oyotode-Adebile and Ujah, 2021), we define *SNetwork* as the first principal component from PCA based on "the number of non-government organizations and the number of social and civic associations"

social-capital-increasing relocations and social-capital-decreasing relocations are comparable in firm attributes and *LIQ* prior to relocations. Results of *t-tests* (untabualted) suggest that there are no significant differences between the two sets of firms in any of the dimensions (firm variables used in Eq. (1)), suggesting that our sampled firms are comparable. One criticism to our *DiD* approach is that corporate headquarters relocation decisions could be endogenous. As such, one should interpret the results from our relocation analysis with caution. While they do not demonstrate causality, they do provide evidence to support the positive association between societal trust and stock liquidity in an alternative empirical setting, which is consistent with our hypothesis.

[25] *CSR* data comes from MSCI/KLD.

Table 7
Financial crisis examination.

Panel A: 1997–2006				Panel B: 2007–2008		
DV=	*LIQ1* (1)	*LIQ2* (2)	*LIQ3* (3)	*LIQ1* (4)	*LIQ2* (5)	*LIQ3* (6)
SCapital	0.049*** (3.21)	0.407*** (3.43)	0.009*** (2.69)	0.052*** (2.98)	0.458** (2.34)	0.014** (2.01)
All variables in Eq. (1)	Yes	Yes	Yes	Yes	Yes	Yes
Ind. FE.	Yes	Yes	Yes	Yes	Yes	Yes
Year FE.	Yes	Yes	Yes	Yes	Yes	Yes
Adj R^2	0.194	0.227	0.731	0.199	0.224	0.730
Observations	33 341	33 341	33 341	12 048	12 048	12 048
Panel C: 2009–2014						
DV=	*LIQ1* (1)	*LIQ2* (2)	*LIQ3* (3)			
SCapital	0.062*** (3.64)	0.438*** (3.29)	0.012*** (2.86)			
All variables in Eq. (1)	Yes	Yes	Yes			
Ind. FE.	Yes	Yes	Yes			
Year FE.	Yes	Yes	Yes			
Adj R^2	0.198	0.225	0.733			
Observations	19 579	19 579	19 579			

Notes: This table depicts the findings related to societal trust and financial crisis analysis. Robust *t* amounts have been shown in parentheses.
*, ** and *** imply significance at the ten, five, and one percent levels.

Table 8
The association of civic norms and social networks with stock liquidity.

Dependent variable =	*LIQ1* (1)	*LIQ2* (2)	*LIQ3* (3)	*LIQ1* (4)	*LIQ2* (5)	*LIQ3* (6)
SNetwork	0.037** (2.21)	0.305*** (2.78)	0.004** (2.07)			
SNorm				0.079*** (3.69)	0.484*** (3.37)	0.029*** (3.98)
SIZE	0.259*** (4.72)	2.601*** (4.03)	0.024*** (3.54)	0.257*** (4.63)	2.542*** (3.96)	0.023*** (3.48)
REVT	−0.854*** (−3.29)	−11.271** (−2.26)	−0.037*** (−2.91)	−0.853*** (−3.21)	−11.129** (−2.37)	−0.036*** (−2.94)
BMR	0.362*** (2.76)	3.800*** (3.73)	0.000 (0.73)	0.366*** (2.82)	3.788*** (3.79)	0.001 (0.93)
Return	0.056*** (2.78)	0.848*** (3.23)	0.005*** (3.10)	0.057*** (2.83)	0.848*** (3.29)	0.005*** (3.07)
PR	0.161*** (3.49)	0.578*** (2.72)	0.006*** (3.32)	0.160*** (3.58)	0.578*** (2.77)	0.004*** (3.29)
Age	0.081** (2.13)	0.390 (1.09)	0.011* (1.83)	0.081** (2.18)	0.390 (1.16)	0.011* (1.82)
TANG	0.612*** (3.66)	1.631*** (3.24)	0.177*** (3.11)	0.612*** (3.59)	1.631*** (3.21)	0.177*** (3.07)
LEV	0.424*** (4.69)	2.091*** (2.92)	0.261*** (3.17)	0.424*** (4.74)	2.091*** (2.95)	0.262*** (3.14)
County-level controls	Yes	Yes	Yes	Yes	Yes	Yes
Industry and Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Adj R^2	0.196	0.228	0.732	0.196	0.228	0.732
Observations	64 968	64 968	64 968	64 968	64 968	64 968

Notes: This table illustrates the findings associated with the separate influence of norms and networks on stock liquidity. Robust *t* amounts have been shown in parentheses.
*, ** and *** imply significance at the ten, five, and one percent levels. Appendix provides explanations about variables.

to capture the county-level density of social networks. *SNorm* is also defined as the first principal component from PCA based on the "response rate to US Census Bureau and voter turnout in the US presidential elections" to catch the county-level strength of norms. Results[26] reported in Table 8 show that both *SNetwork* and *SNorm* increase stock liquidity. Collectively, our results imply that both norms and networks exert impacts on stock liquidity.

5.7. Moderating functions of firm-level opaqueness and corporate governance

We argue that societal trust decreases information asymmetry between insiders and outsiders that is finally reflected in higher stock liquidity. Based on this argument, we can expect that societal trust can have a superior informational influence on companies that are more opaque. In other words, we predict that societal trust is less important and has an inferior informational

[26] Implementation of F-test indicates that the influence of *SNorm* on *LIQ* is stronger than that on *SNetwork*.

Table 9
Functions of corporate governance and firm's opaqueness in the association between societal trust with stock liquidity.

Dependent variable: *LIQ1*			
	(1)	(2)	(3)
SCapital	0.048***	0.053***	0.050***
	(2.88)	(3.02)	(3.18)
OPA	−0.140***	−0.108**	
	(−3.12)	(−2.29)	
*OPA * SCapital*		0.074***	
		(2.72)	
GOV	0.042**		0.033**
	(2.23)		(2.07)
*GOV * SCapital*			−0.019***
			(−2.86)
All variables in Eq. (1)	Yes	Yes	Yes
Industry dummies	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes
Adj R^2	0.206	0.196	0.203
Observations	51 788	55 432	51 788

Notes: This table illustrates findings related to the moderating roles of firm's opaqueness (*OPA*) and corporate governance (*GOV*) on the association between societal trust with stock liquidity. Robust *t* amounts have been shown in parentheses.
*, ** and *** imply significance at the ten, five, and one percent levels. Appendix provides explanations about variables.

influence on companies that have a more crystal clear information atmosphere. To capture a firm-level opaqueness,[27] we define *OPA*[28] measured as the standard deviation of the financial analysts' earnings per share forecasts, scaled by the stock price at the start of the period (Li and Zhao, 2008). Higher amounts of *OPA* imply higher firm-level opaqueness. We add *OPA* and (*OPA * SCapital*) to our model in Eq. (1). Findings in Table 9 (Column 2) depict that the coefficient of interaction term (i.e., *OPA * SCapital*) is positive and significant and supports our prediction. Our results suggest that the relationship between *SCapital* and *LIQ1* is stronger for firms with higher *OPA*.

We also investigate the function of corporate governance (*GOV*) on the association between societal trust and stock liquidity. If societal trust provides benefit for investors (reflected in higher stock liquidity), its benefit should be higher for weekly governed companies, as these companies are more afflicted with self-interested and opportunistic behaviors, and they have more agency costs and problems (Hasan and Habib, 2020). Societal trust as a powerful oversight tool can play a more highlighted role in increasing the investors' trust through curbing managers' self-interested actions and opportunistic behaviors in weekly governed companies. In other words, we argue that the function of societal trust as an oversight tool is more pronounced when other controlling tools such as *GOV* are not strong. We utilize the percentage of common shares kept by institutional investors (*PINST*) to capture *GOV*[29] (Cheng et al., 2019; Chung and Zhang, 2011; Jha, 2019). Higher values of *GOV* imply higher governance quality. We add *GOV* and (*GOV * SCapital*) to our model in Eq. (1). Findings in Table 9 (Column 3) show that the coefficient of *GOV* is positive (0.033 $p < 0.05$) and significant, which suggest that *GOV* as a formal institutional factor and monitoring mechanism can be influential in increasing stock liquidity. The coefficient of interaction term (i.e., *GOV * SCapital*) is negative and significant (−0.019 $p < 0.01$), implying a substitution impact[30] for *GOV* in the relationship between societal trust and stock liquidity.[31] Hence, our results imply that societal trust as an informal institutional factor functions as a substitute for the formal institutional factor of *GOV*. In other words, the effect of societal trust is stronger when other monitoring mechanisms are week.[32] These findings suggest that equity holders should put in place more influential corporate governance tools in low societal trust areas to hold back opportunistic managerial actions. Our results regarding the substitution role of informal institutional factors are in line with prior studies. Hartlieb et al. (2020) show that there is a substitution role between corporate governance and societal trust in reducing asymmetry in cost behavior. Kanagaretnam et al. (2018) report a stronger relationship between societal trust and the likelihood of tax aggressiveness when the legal institutions are weaker.

5.8. Societal trust and the potential channel of voluntary information disclosure

As a mechanism, voluntary information disclosure can help to decrease the information asymmetry gap between retail and institutional investors (Feng and Yan, 2019; Balakrishnan et al., 2014) as it creates a more appropriate firms' information situation that engages more retail stock investors and increase liquidity in the market (Feng and Yan, 2019; Balakrishnan et al., 2014; Schoenfeld, 2017; Frino et al., 2013). Amihud and Mendelson (2000) suggest that providing an increased material and value-relevant information to investors can contribute to stock liquidity. Disclosure of high-quality information can improve firms' transparency (causing firms' richer information environment) and mitigate the information asymmetry and principal–agent problems. Along this line, we have evidence that companies located in high societal trust areas enjoy a less obscure tone in their 10-K filings (Kanagaretnam et al., 2020) and Jha (2019) finds that the quality and readability of financial reports is positively associated with societal trust. He also reports that the probability of having fraud, financial misstatements, and disclosing misleading information are negatively associated with societal trust since their managers respect trust, altruism, and honor their obligations (Jha, 2019). Such transparency and richness in the improved information environment of companies headquartered in high societal trust areas can increase their stock liquidity.

We also have evidence in literature implying that strong social networks in high societal trust areas expedite information collection and acquisition and reduce informational friction costs,

[27] We also use financial analyst coverage (*COVERAGE*) calculated by the log of one plus the number of analysts pursuing a company as the alternative proxy of *OPA* (Habib and Hasan, 2017). Lower *COVERAGE* implies higher *OPA*. Our findings regarding the moderating role of *OPA* still hold when we utilize this substitute measure.

[28] Firm-level opaqueness is a multidimensional and relative concept, and it is impacted by various aspects of a company. For example, the nature of company business and its complexity level, growth and industry conditions, structure of investors and their sophistication level, and capital market status all can influence firm-level opaqueness. Although, regional social trust can contribute to reducing opaqueness, but opaqueness is also related to many other factors such as mentioned ones and, when a firm is located in a high (low) societal trust region, it does not imply that it should necessarily have low (high) firm-level opaqueness.

[29] We also utilize board independence (*BIND*) as another measure to capture *GOV* (Jaggi et al., 2009; Hartlieb et al., 2020). Jaggi et al. (2009) show that independent corporate boards supply powerful control on managerial activities and can alleviate agency concerns. Our inference regarding the moderating function of *GOV* still holds when we use *BIND* as the alternative proxy of *GOV*. Jha (2019) also utilizes the percentage of institutional investors to capturer *GOV*.

[30] The substitution effect between *GOV* and *SCapital* is partial as the sum of coefficients *SCapital* and *GOV * SCapital* is not equal to zero ($p < 0.05$) in Table 9.

[31] Our inference regarding the moderating roles of firm-level opaqueness and corporate governance still holds when we use *LIQ2* and *LIQ3* as the substitute proxies for stock liquidity.

[32] Jha (2019) use this example to clarify the concept of moderating role. He explains "Consider the following example: in the presence of a strict teacher all students are likely to behave. But in the absence of a strict teacher, naughty children are more likely to misbehave. Put differently, the effects of naughtiness (intrinsic nature) are more salient when the disciplinarian (external monitoring) is weak".

information, and transaction costs for investors (Jha, 2019; Dai, 2018). Furthermore, liquidity providers are more possibly to trust managers who are trusted by those around them (e.g., high societal trust regions) (Gupta et al., 2018). Thus, information disclosed by management teams of companies located in these areas is considered more reliable if the managers are viewed to be more trustworthy (i.e., more managerial trustworthiness because of norms and social networks). In addition, if reputational punishments for misconduct are larger in regions with more powerful ethical norms, then managers of companies located in these areas unlikely behave in a self-centered manner that reduces shareholder value (Gupta et al., 2018). Hence, we can expect that *SCapital* improves the authenticity and reliability of voluntary information disclosures, which in turn increases managers' incentives to issue voluntary disclosures.

We empirically investigate whether companies situated in high *SCapital* areas have higher quality voluntary disclosure that ultimately improves stock liquidity. To capture voluntary disclosure quality, we utilize management earnings guidance[33] (Balakrishnan et al., 2014). We define *Disclosure* based on management earnings forecast accuracy calculated as "the absolute difference between management's earnings forecast and actual earnings scaled by actual earnings, where management's earnings forecasts are either point forecasts or the midpoint of range forecasts. For a firm-year with multiple forecasts, *Disclosure* is based on the mean forecast error of all forecasts issued by a firm in a given year". We multiply our proxy by minus one for easier interpretation. Higher values of *Disclosure* imply higher disclosure quality (Hlel et al., 2020; Ciftci and Salama, 2018). Findings in Table 10 (Column 3) indicate that the coefficient of *SCapital* is positive and significant that supports our prediction. In summary, we provide empirical evidence that companies situated in high *SCapital* areas provide more accurate management earnings guidance, and it can be a possible mechanism through which societal trust improves stock liquidity.

Table 10
OLS findings for the effect of societal trust on the potential mechanism of management earnings guidance accuracy.

Dependent variable: *Disclosure*			
	(1)	(2)	(3)
SNetwork	0.101**		
	(2.26)		
SNorm		0.074**	
		(2.08)	
SCapital			0.122**
			(2.19)
SIZE	0.094***	0.093***	0.093***
	(3.32)	(3.22)	(3.26)
REVT	−0.033***	−0.033***	−0.032***
	(−3.14)	(−3.02)	(−3.18)
BMR	−0.108**	−0.107**	−0.108**
	(−2.31)	(−2.22)	(−2.28)
Return	0.000	0.000	0.000
	(0.81)	(0.98)	(1.03)
PR	−0.009	−0.008	−0.009
	(−0.76)	(−0.93)	(−1.08)
Age	0.082***	0.081***	0.082***
	(3.17)	(3.27)	(3.20)
TANG	0.051***	0.050***	0.051***
	(3.01)	(2.87)	(2.81)
LEV	−0.042**	−0.041**	−0.041**
	(−2.11)	(−2.16)	(−2.07)
County-level controls	Yes	Yes	Yes
Ind dummies	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes
Adj R^2	0.132	0.132	0.132
Observations	22 166	22 166	22 166

Note: This table reports the findings related to the influence of regional societal trust on the potential channel of management earnings guidance accuracy. Robust *t* amounts have been shown in parentheses.
*, ** and *** imply statistical significance at the ten, five, and one percent levels. Appendix provides explanations about variables.

5.9. Insight from path analysis

To better understand the function of *Disclosure* on the association between *SCapital* and *LIQ1*, we follow the approach proposed by Hayes et al. (2017) (using SPSS PROCESS macro). Particularly, we execute a mediator analysis through the bootstrapping method.[34] Using bootstrapping to investigate the significance of direct and indirect effects is a robust technique for identifying such effects without taking for granted their distribution as normal (Hayes et al., 2017). This approach disentangles the direct and indirect effects of *SCapital* on *LIQ1*. For a more understandable depiction, we show the direct and indirect effects of *SCapital* through Figure[35] 1. Fig. 1 shows a positive and significant association between *SCapital* and *LIQ1* (0.058, $p < 0.05$); total effect that is consistent with our hypothesis. In addition, *SCapital* is positively related to *Disclosure* (0.122, $p < 0.05$) and *Disclosure* is positively associated with *LIQ1* (0.174, $p < 0.05$) that is consistent with our expectations. Finally, to compute the indirect effect of *SCapital* on *LIQ1* through *Disclosure*, we multiply two coefficients of (0.122) and (0.174) (i.e., (0.122) * (0.174) = 0.021). The results of the Sobel (1982) test (i.e., $p < 0.05$) suggest that the indirect influence of *SCapital* on *LIQ1* through *Disclosure* is significantly different from zero. Our findings show that more than 36% (0.021 is divided by 0.058) of the effect of *SCapital* on *LIQ1* originates from the mediating function of *Disclosure*, which indicates *Disclosure* serves as an intermediary in the association between *SCapital* and *LIQ1*.[36]

5.10. Societal trust, stock liquidity, and cost of equity capital

We show that firms located in high societal trust regions have higher stock liquidity. Previous studies also show that firms with higher stock liquidity enjoy lower cost of equity capital (Amihud et al., 2015; Butler et al., 2005; Amihud and Mendelson, 1988). Using Putnam index (Putnam, 2001), Gupta et al. (2018) report that cost of equity capital regional is negatively associated with regional societal trust. They argue that "information emanating from managers of firms headquartered in high (low) societal trust regions may be viewed as being more (less) credible if the managers are perceived to be more trustworthy. Further, if reputational penalties for misbehavior are higher in societies with stronger social norms, then managers headquartered in high societal trust areas are less likely to take self-serving actions that reduce shareholder. Consequently, we expect investors to require a higher return on the equity of firms headquartered in low societal trust regions".

In this part, we examine whether the beneficial impact of regional societal trust on companies' stock liquidity affects their

[33] Balakrishnan et al. (2014) suggest that "managerial earnings guidance can decrease information asymmetry among retail and institutional investors" that can ultimately enhance stock liquidity.

[34] Particularly, the 95 percent bias-corrected confidence intervals are generated by utilizing 5000 bootstrap samples from the primary dataset. Path analysis is an extensively utilized methodology in the literature (e.g., Abadi et al., 2021; Ji et al., 2019).

[35] For the path analysis in Fig. 1, we report unstandardized coefficients that is consistent with prior research (e.g., Shen et al., 2021). Our inference regarding the mediating function of *Disclosure* stills holds when we use standardized coefficients.

[36] Our results regarding the mediating function of *Disclosure* still hold when we use *LIQ2* and *LIQ3*.

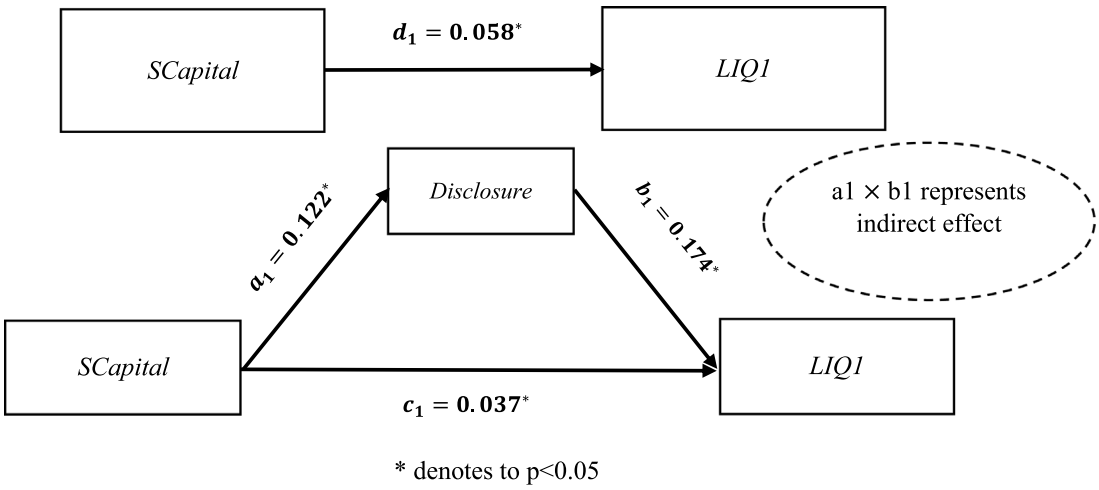

Fig. 1. Path analysis: societal trust, voluntary disclosure, and stock liquidity * denotes to p < 0.05.

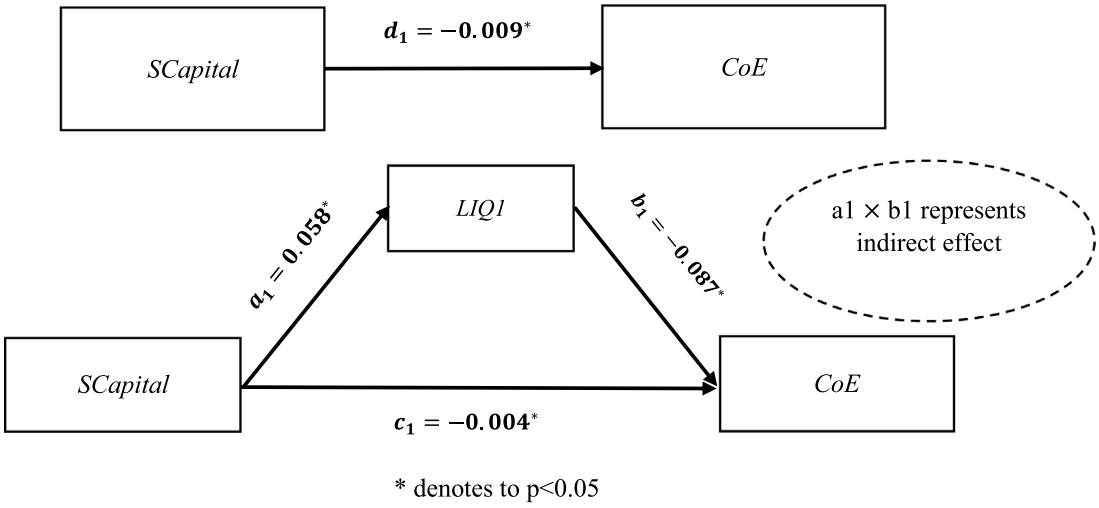

Fig. 2. Path analysis: societal trust, stock liquidity, and cost of equity capital * denotes to p < 0.05.

cost of equity capital. Particularly, we want to empirically investigate whether companies situated in high *SCapital* areas have lower cost of equity capital (*CoE*) as they have better access to equity market financing through stock liquidity. To capture *CoE*, we follow Gupta et al. (2018) and *CoE*[37] is defined as the median of the four different implied cost of estimates minus the risk-free rate (yield on 10-year treasury security). We implement a mediator analysis through the bootstrapping method (using SPSS PROCESS macro) (Hayes et al., 2017). This approach disentangles the direct and indirect effects of *SCapital* on *CoE*. For a more understandable depiction, we show the direct and indirect effects of *SCapital* through Fig. 2. Fig. 2 shows a negative and significant association between *SCapital* and *CoE* (−0.009., $p < 0.05$); total effect that is consistent with our expectation. In addition, *SCapital* is positively related to *LIQ1* (0.058, $p < 0.05$) and *LIQ1* is negatively associated with *CoE* (−0.087, $p < 0.05$) that are consistent with our expectations. Finally, to compute the indirect effect of *SCapital* on *CoE* through *LIQ1*, we multiply two coefficients of (0.058) and (−0.087) (i.e., (0.058) * (−0.087) = −0.005). The results of the Sobel test (i.e., $p < 0.05$) suggest that the indirect influence of *SCapital* on *CoE* through *LIQ1* is significantly different from zero. Our findings show that more than 55% (−0.005 is divided by −0.009) of the effect of *SCapital* on *CoE* originates from the mediating function of *LIQ1*, which indicates *LIQ1* serves as an intermediary in the association between *SCapital* and *LIQ1*.[38]

6. Conclusion and discussion

Our study investigates how regional societal trust proxied by social capital can affect firms' stock liquidity. We contend that ethical norms and social networks in high societal trust regions bring about transparency and organizational citizenship and can be regarded as an incremental monitoring tool that alleviates the equity holders' concern about potential agency issues. In addition, we explain that regional societal trust can positively shape firms' information environment and act as a credibility enhancing mechanism that brings about higher trust to the credibility of information provided by firms, which in turn positively influences firms' stock liquidity. Based on a panel of US companies, we present evidence of positive and significant associations between regional societal trust (as a soft quality and external informal institutional factor) and firms' stock liquidity. This relationship becomes stronger when companies are more opaque and weakly

[37] Please refer to Gupta et al. (2018) for full explanations and details.

[38] Our results regarding the mediating function of stock liquidity in the relationship between *SCapital* on *CoE* still hold when we use *LIQ2* and *LIQ3*.

Table A.1

Variable	Data source	Variable explanation
LIQ1	CRSP	The average of daily Amihud's (2002) measure "(i.e., the absolute amount of stock return scaled by dollar trading volume on a given day) in a specific year". We multiply our proxy with minus one for easier interpretation. Higher values of *LIQ1* imply higher stock liquidity.
LIQ2	As above	The average of daily volume-based Amihud's (2002) measure "(i.e., the absolute amount of stock return scaled by trading volume on a given day) in a specific year". We multiply our proxy with minus one for easier interpretation. Higher amounts of *LIQ2* denote higher stock liquidity.
LIQ3	As above	"The proportion of the number of days with zero stock returns to the total number of days with non-missing stock returns in a specific year". We multiply our proxy with minus one for easier interpretation. Higher amounts of *LIQ3* denote higher stock liquidity.
LIQ4	CRSP	Amivest Liquidity ratio, computed as "the average, over all non-zero-return days, of daily trading volume over daily stock return". Higher amounts of *LIQ4* denote higher stock liquidity.
LIQ5	As above	Bid–ask spread estimator of Corwin and Schultz (2012) based on daily high and low prices. We multiply our proxy with minus one for easier interpretation. Higher amounts of *LIQ5* denote higher stock liquidity.
LIQ6	As above	"The adverse selection component of the effective bid–ask spread calculated utilizing the method suggested by Lin et al. (1995)". We multiply our proxy with minus one for easier interpretation. Higher values of *LIQ6* imply higher stock liquidity.
SCapital	Northeast Regional Center for Rural Development (NERCRD), Rupasingha et al. (2006) (https://aese.psu.edu/nercrd/community/social-capital-resources/default)	County-level social capital as the proxy of societal trust is calculated based on the measure of Rupasingha et al. (2006). We use the first principal component from the "response rate to the surveys done by the US Census Bureau and voter turnout in the US presidential elections" (as two measures for norms), and "the number of non-government organizations and the number of social and civic associations" (as two measures for networks).
SNetwork	As above	First principal component from a factor analysis based on "the number of non-government organizations and the number of social and civic associations" to capture the county-level density of social networks.

(*continued on next page*)

governed. Our results still hold when we use substitute proxies for stock liquidity and societal trust, Instrumental-Variable regressions, propensity score matching and diff-in-diff approaches, and mitigate the omitted variable bias. Our results also suggest that both norms and networks (as two dimensions of *SCapital*) exert impacts on firms' stock liquidity. Additional analyses indicate the effect of societal trust is reasonably consistent over time, and still hold during period of financial crisis when the importance of stock liquidity is higher. We also identify a potential channel through which regional societal trust increases firms' stock liquidity. Particularly, we report that companies located in high *SCapital* areas provide more accurate management earnings guidance. Ultimately, we find that companies situated in high societal trust areas have lower costs of equity capital as they have better access to equity market financing through stock liquidity. Collectively and in line with Statman (2007) that explains "societal trust can be linked to ethics, fairness, and freedom from corruption", our findings denote that societal trust could improve companies' stock liquidity and eventually improve market efficiency.

Our paper is subject to some constraints and mentioning them can be helpful for future studies. Although our results continue to hold after considering numerous covariates and conducting several robustness tests, we cannot claim that the association between societal trust and firms' stock liquidity is causal. There is a possibility that we have an omitted county-level feature or time-variant driver that impacts both societal trust and stock liquidity. The degree to which this study's results can be generic and applicable at different stages, country contexts (e.g., non-US settings such as Europe or Asia), and other types of markets (e.g., emerging, developing, and undeveloped markets) is still unanswered. Eventually, as a possible path for future studies, it can be interesting to explore whether societal trust can influence the relationships within a company (e.g., employees with managers) and investigate whether this trust has economic implications and tangible influence on corporate policies.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Data availability statement

All data are publicly available from sources identified in the text.

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Ethics approval statement

The manuscript does not contain human studies. This manuscript has not been published elsewhere.

Appendix

See Table A.1.

Table A.1 (*continued*).

Variable	Data source	Variable explanation
SNorm	As above	First principal component from a factor analysis based on the "response rate to US Census Bureau and voter turnout in the US presidential elections" to capture the county-level strength of civic norms.
SCapital2	Organ Procurement and Transplantation Network (OPTN).	Substitute proxy for societal trust calculated as "state-level per capita registered organ donor multiplied by 1000".
SCapital3	National Center for Charitable Statistics (NCCS).	Alternative measure of societal trust calculated as the "state-level charitable contributions per return filed".
Company controls		
SIZE	COMPUSTAT	Natural log of total assets.
RETV	CRSP	Annualized standard deviation of monthly stock returns.
Return	As above	Annualized stock returns.
PR	As above	The natural logarithm of stock prices.
BMR	COMPUSTAT	The ratio of book equity to market equity.
Age	As above	The natural log of a company's age, approximated by the number of years listed on COMPUSTAT.
TANG	As above	Asset tangibility estimated by the ratio of net property, plant, and equipment scaled by total assets.
LEV	As above	Leverage calculated by the ratio of the sum of short-term and long-term debt to total assets.
Demographic controls (County-level controls)		
PAge	US Census Bureau	County-level median age of the population.
Pop	As above	Population measured by the log of the county's population.
PGrowth	As above	Ten-year percentage change in population in a county.
Density	As above	Population of the county scaled by the land area of the county.
Minor	As above	County-level percentage of minorities.
Income	US Bureau of Economic Analysis (BEA)	Income per capita in the county.
Religion	American Religion Data Archive (ARDA)	Percentage of religious adherents in the county.
OPA	I/B/E/S and CRSP	Firm-level opaqueness calculated as the standard deviation of the financial analysts' earnings per share forecasts, scaled by the stock price at the start of the period. Greater amounts of *OPA* imply higher firm-level opaqueness.
GOV	REFINITIVE/Thomson Reuters (Institutional (13F) holdings)	Governance quality proxied by % of common shares kept by institutional investors. Higher values of *GOV* imply higher governance quality.
Disclosure	I/B/E/S	Disclosure proxy, which is based on management earnings forecast accuracy calculated as "the absolute difference between management's earnings forecast and actual earnings scaled by actual earnings, where management's earnings forecasts are either point forecasts or the midpoint of range forecasts. For a firm-year with multiple forecasts, *Disclosure* is based on the mean forecast error of all forecasts issued by a firm in a given year". We multiply our proxy with minus one for easier interpretation. Higher values of *Disclosure* imply higher disclosure quality.
CoE	I/B/E/S, COMPUSTAT, CRSP, and Federal Reserve database	"The median of the four different implied cost of estimates minus the risk-free rate (yield on 10-year treasury security)" (Gupta et al., 2018).

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