Does It Pay to be Socially Connected with Wall Street?
Evidence from Cost of Equity

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Abstract

We investigate whether social connections of a firm's executives and directors with brokerage houses that follow the firm will affect the firm's cost of equity. We find that a firm's cost of equity significantly decreases with its social connectedness with brokerages, and that the effect is more pronounced for firms with more soft information, opaque information environment, tight financial constraints, or weak corporate governance. We use two types of quasi-natural experiments to address endogeneity concerns: 1) exogenous brokerage exit and 2) CEO turnover with internal CEO replacement. We find that an exogenous reduction in firm-brokerage social connections leads to an economically large increase in the firm's cost of equity, indicating that the effect of social connections in reducing cost of equity is likely causal. Our results are robust to using alternative measures of cost of equity. Further, consistent with the evidence on cost of equity, we find that firm-brokerage social connections improve the firm's equity valuation.

Keywords: Firm-brokerage Social Connections; Cost of Equity; Information Asymmetry

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1. Introduction

Brokerage houses serve a crucial role in obtaining and disseminating value-relevant information to investors in capital markets. Brokerage houses' social connections with corporate executives and directors are important conduits of information, providing brokerages with competitive advantage in accessing and processing public and/or private information. Recent studies have demonstrated how such social connections benefit brokerages and their employed analysts.[1] For example, social connections with corporate executives and directors benefit brokerages with larger trading commissions and stock coverage, and benefit their employed analysts with more accurate forecasts and more profitable stock recommendations so that these analysts are more likely to become All-Stars (Cohen, Frazzini and Malloy, 2010; Fang and Huang, 2017; Bradley, Gokkaya and Liu, 2019a; Bradley, Gokkaya and Liu, 2019b).

However, despite these documented benefits to brokerages and their analysts, it remains unclear whether and how firms can benefit from being socially linked to Wall Street brokerages.[2] This study provides the first piece of empirical evidence on the effect of social connections between brokerage houses and executives and directors of a firm on one of the most important financial aspects of the firm—cost of equity.

Cost of equity plays a central role in a firm's capital budgeting and valuation processes and greatly affects the firm's fortune. It is the internal rate of return that the market applies to the firm's future cash flows to determine its current market value of equity. It has been well recognized that a firm's information asymmetry affects its cost of equity capital (e.g., Diamond

[1] Besides social connections with corporate executives and directors, brokerage house political connections are also a resource that allows sell-side analysts to collect value-relevant information so that they can issue more informative recommendations (Christensen, Mikhail, Walther and Wellman 2017).

[2] A survey conducted by Bank of New York Mellon based on 693 CEOs and CFOs in 2013 reported that out of the total time CEOs and CFOs spend with the investment community, about 20% is with sell-side analysts (Global Trends in Investor Relations, Bank of New York Mellon, 2013).

and Verrecchia, 1991; Easley and O'hara, 2004).[3] More and better information in capital markets arguably reduces investors' uncertainty about the size and timing of future cash flows, thereby lowering the firm's cost of equity (Christensen, de la Rosa and Feltham, 2010).

A firm's social connections with brokerages are an important channel through which the firm disseminates information to capital markets. It is well known that information is shared and diffused among colleagues and top-down in a brokerage house.[4] Firm-brokerage social connections thus enable analysts of connected brokerages to obtain private and soft information from management and build a better 'mosaic' of value-relevant information about the firm through repeated interactions with management.[5] Analysts' research is extensively used by buy-side clients in evaluating firm performance, forming investment strategies and allocating resources across stocks (e.g. Francis, Lafond, Olsson and Schipper, 2005; Loh and Mian, 2006). Analysts of connected brokerages are more likely to convey the private and soft information (such as information about research and development programs, mergers and acquisitions, and product market competition) obtained from firm management to capital markets through their research reports or verbally communicating with their clients (Cohen, Frazzini and Malloy, 2010; Bradley, Gokkay and Liu, 2019a).[6] Social connections with brokerage houses also give

[3] Diamond and Verrecchia (1991) predict that information disclosure decreases information asymmetry, which reduces the firm's cost of capital. Similarly, Easley and O'hara (2004) predict that a firm whose stock contains relatively more private information and less public information faces a higher cost of equity. Empirical studies provide evidence that is generally consistent with these theory predictions (e.g., Easley, Hvidkjaer, and O'Hara, 2002; Francis, LaFond, Olsson, and Schipper, 2005; Leuz and Verrecchia, 2000; Hail and Leuz, 2006).

[4] For example, Brown, Call, Clement and Sharp (2015) show that group discussions and house-wide seminars are often held in brokerage houses, aiming to facilitate private information exchange within the house on the firms the analysts follow. Empirical evidence also shows that executives' human capital including their social and political connections is transferred to analysts so that analysts' forecasts are more accurate compared to cases where the executives lack such connections (Christensen, Mikhail, Walther and Wellman, 2017; Bradley, Gokkay and Liu, 2019b). Further, there is information transmission among in-house analysts and analysts discuss and exchange information with colleagues who cover the same industry sectors (e.g., Hwang, Liberti and Sturgess, 2018; Phua, Tham and Wei, 2018).

[5] Analysts who have been frequently interacting with management could also be able to glean value-relevant information from management's body language or vocal cues (Mayew and Venkatachalam, 2012).

[6] We had conversations with two analysts who are working and have worked in large brokerage firms. They stated they are more likely to have private interactions with management who were previously work-mates. While management is more cautious about releasing material information to analysts privately after Reg FD, the firm management may point out directions for analysts by suggesting them to check other analysts' forecasts or one of the many business transactions. For example, one analyst indicated that management from a large firm once

corporate management opportunities to interact with important client investors of brokerages through brokerage-hosted conferences (Green, Jame, Markov and Subasi, 2014a,b; Bradley, Gokkaya and Liu, 2019a). These mechanisms should reduce information asymmetry in the stock markets on the fundamental value of the firm and result in investors charging a lower risk premium for holding the firm's shares, thereby decreasing the firm's cost of equity (Diamond and Verrecchia, 1991; Easley and O'hara, 2004).

It is not obvious, however, whether the effect holds after the enactment of Regulation Fair Disclosure (Reg FD).[7] Reg FD has the potential to disrupt private communications between firm management and Wall Street, removing connected analysts' competitive information advantage due to their privileged access to management. Prior evidence shows that analysts who share school ties with management in the covered firms are no better than their counterparts without such ties in issuing profitable stock recommendations in the post-Reg FD period, while school ties gave analysts information advantage before the regulatory change (e.g., Cohen, Frazzini and Malloy, 2010). If Reg FD reduces the additional private information flowing into stock markets through analysts, firm-brokerage social connections may not influence the firm's cost of equity in the post-Reg FD era.

Furthermore, conflicts of interest may arise particularly when brokerage houses are socially connected with the firms they follow. For example, analysts may be unwilling to downgrade a connected firm and disseminate negative news about the firm to the stock markets

suggested she/he to have another look at the corporate merger and acquisition transaction. While the information is immaterial, the analyst was able to extract value-relevant information by closely scrutinizing the transaction and incorporate this information into their research outputs.

[7] Reg FD was promulgated by the U.S. Securities and Exchange Commission (SEC) in October 2000. It requires companies to make significant information public simultaneously to all investors and analysts in the case of intentional disclosures, or within 24 hours in the case of unintentional disclosures. Mohanram and Sunder (2006), Agrawal, Chadha, and Chen (2006), and Gintschel and Markov (2004) find that Reg FD is effective in leveling the information playing field among analysts. However, recent evidence (Brown, Call, Clement and Sharp 2015, Solomon and Soltes 2015, Guo and Qiu 2016) suggest that selective disclosures continue to exist even in the post-Reg FD period.

because she or her employer is connected with the firm's CEO.[8] Major brokerage firms have paid significant fines to settle lawsuits on biased analyst research (Swissinfo, 2002). Such conflicts of interest may even lead to greater information asymmetry on a connected firm's value in capital markets in the post-Reg FD era, thereby resulting in higher cost of equity for the firm.

Using a dataset of social connections between brokerage houses and corporate executives and directors obtained from BoardEx for the periods 2001 to 2016, we investigate the effect of firm-brokerage social connections on the connected firm's cost of equity. We follow the literature and define social connections as those established via educational background, past co-working experiences, joint memberships in non-employment activities such as sports clubs, charity, voluntary associations, etc. (Hwang and Kim, 2009; Abernethy, Kuang, and Qin, 2018). Specifically, we construct four social connection variables to capture the connectedness between a firm and brokerages that follow the firm, including the presence of such social connections, the types of social connections, the number of socially connected brokerage houses to the firm, and the aggregate number of social connections. We estimate a firm's ex-ante cost of equity using the average measure obtained from four widely applied implied-cost-of-equity models (i.e., Claus and Thomas, 2001; Easton, 2004; Gebhardt, Lee, and Swaminathan, 2001; Ohlson and Juettner-Nauroth, 2005).

We find that the social connection variables are significantly and negatively related to firms' cost of equity. The uncovered negative relations are robust to controlling for industry and year fixed effects and a host of firm characteristics including firm size, market-to-book

[8] Analysts' conflicts of interest in equity research has been well documented in the literature (e.g., Das, Levine, and Sivaramakrishnan, 1998; Hong, Kubik, and Solomon, 2000; Gu and Wu, 2003; Hong and Kubic 2003; O'Brien, McNichols, and Lin, 2005; Ke and Yu, 2006; Mola and Guidolin, 2009; Groysberg, Healy, and Maber, 2011). A Wall Street Journal article (Ng and Gryta, 2017) reports an analyst stating that "*It's a decision I have to make on my sell-rated stocks: whether I will forgo the opportunity for corporate access, which clients will explicitly pay for,"* and that many brokerage firms ask their analysts to just drop coverage instead of putting out sell ratings..

equity ratio, leverage, profitability, investment, stock beta, past stock returns, and importantly, analyst coverage, and analyst earnings forecast dispersion. Moreover, we examine the plausible impact of within-firm variation in the association and find that the negative relation between social connections and cost of equity continues to hold after we control for firm fixed effects, suggesting that time-invariant unobservable firm heterogeneity is not an endogeneity concern.

The social network literature argues that not all social ties are the same and they might be formed in different situations (Hwang and Kim, 2009; Bruynseels and Cardinaels, 2014). We next explore whether various types of firm-brokerage social connections affect cost of equity differently. We find that connections derived from non-employment social activities have the largest effect in reducing the firm's cost of equity, followed by employment-based connections. In addition, we do not find school ties to significantly affect the firm's cost of equity, in line with prior literature (Cohen, Frazzini and Malloy, 2010). Overall, our findings suggest that firms benefit from being socially connected with Wall Street (i.e., through employment ties and other social activities), as reflected in reduced cost of equity.

To corroborate our conjecture that firm-brokerage social connections facilitate information transmission from firms to capital markets and thus reduce cost of equity, we investigate settings in which we expect the effects of firm-brokerage social connections on firms' cost of equity to vary. We find the effect of social connections in reducing firms' cost of equity to be greater when a firm possesses more proprietary and hard-to-verify soft information relating to research and developments, mergers and acquisitions, product market competition, and external equity raising. We further find the effect to be more pronounced for firms operating in more opaque information environments, firms facing tighter financial constraints, and firms that are subject to weaker external and internal corporate governance. These results indicate that firm-brokerage social connections are more useful when there is a greater need of disseminating value-relevant information from firms to capital markets.

We are aware that the uncovered effect of firm-brokerage social connections on firms' cost of equity is subject to potential endogeneity concerns. For example, analysts may prefer to establish social connections with firms that have lower cost of equity (such firms are typically larger, more transparent, and better governed). That is, it can be lower cost of equity that leads to better social connections with analysts, rather than the other way around as conjectured. Moreover, an omitted-variable concern is also relevant as unobserved (and thus uncontrolled) firm-specific, time-varying omitted variables may drive both social connections and cost of equity, rendering the documented relations spurious. We use two types of quasi-natural experiments to address these concerns.

The first type of quasi-natural experiments we use is exogenous brokerage closures or mergers (Kelly and Ljungqvist, 2012; Derrien and Kecskes, 2013; Irani and Oesch, 2013; Chen, Harford and Lin, 2015). Closure of a connected brokerage represents a negative exogenous shock to the firm's social connections with brokerage houses; so does a takeover of a connected brokerage by another brokerage house due to the restructuring and laying off subsequent to the takeover.[9] The second type of quasi-natural experiments involves exogenous CEO turnover (Eisfeldt and Kuhnen, 2013) where the replacement CEO is promoted from the same firm. In those cases, the CEO turnover is related to factors such as planned retirement, health issue or sudden death and thus is exogenous to firm performance. Further, the inside successor is likely to continue with the firm's current strategy and corporate policies, thereby limitedly affecting the markets' prospect on the firm (Gilson and Vetsuypens, 1993; Farrell and Whidbee, 2003; Clayton, Hartzell, and Rosenberg, 2005). The departure of the old CEO can lead to a reduction in social connections with brokerages, while the new CEO brings no new connections with the

[9] We control for the number of analysts following in the analyses as brokerage closure or merger also negatively affects the number of analysts following the firm. Note that the second type of quasi-natural experiments we use—exogenous CEO turnover—does not affect the number of analysts following.

firm since she comes from the same firm. Thus, CEO departure with internal replacement represents a negative exogenous shock to firm-brokerage social connections.

We first conduct a reduced-form estimation employing the stacking event-window cohort approach in a difference-in-differences (DiD) regression framework (e.g., Gormley and Matsa, 2011) for each type of quasi-natural experiments. We find that relative to control firms, treatment firms on average experience a significant increase in cost of equity by around 1.5 percentage points after the exogenous CEO turnovers and more than 1 percentage points after the exogenous brokerage exits. We then conduct two-stage least square (2SLS) instrumental-variable regressions. We use the DiD term (i.e., *Treat*Post*) from the aforementioned reduced-form analyses as the instrument to extract the exogenous component of social connections and then relate the extracted exogenous component to cost of equity. We find that in the first stage of the 2SLS regressions, *social connections are significantly and negatively related to the DiD term*, which validates that exogenous CEO turnover or brokerage exit is indeed an exogenous negative shock to firm-brokerage social connections. In the second stage, the extracted exogenous component of social connections is significantly and negatively related to cost of equity. A one-standard-deviation increase in our instrumented social connection variables is on average related to a decrease in cost of equity by 0.6 to 0.9 percentage point in the first setting (brokerage exit) and 0.6 to 0.7 percentage point in the second experimental setting (exogenous CEO turnover). Thus, the reduction effect of firm-brokerage social connections on the firms' cost of equity is likely causal.

Our cost of equity measure in the main tests is estimated using consensus analyst earnings forecasts.[10] As a first robustness check, we follow Hou, van Dijk and Zhang (2012) and Li and Mohanram (2014) and run cross-sectional regressions using lagged information to estimate

[10] Analysts' earnings forecasts may contain optimistic bias. Such optimistic bias, however, makes us more difficult to find a significant effect of social connections in reducing cost of equity as it will upwardly bias the implied cost of equity estimate, which is the discount rate that equates the firm's stock price to the present value of its expected future cash flows.

future earnings for horizons of 1 to 5 years. We then use the earnings forecasts from these cross-sectional regression models to replace analysts' forecasts and estimate the implied cost of equity. Second, we estimate cost of equity using Fama and French's (1993) three-factor model. Third, we repeat our main regressions after dropping those firms with analysts' forecast biases being in the top 30% of the sample. Our results are robust to using all of these alternative measures of cost of equity. Finally, we find that social connections with brokerage houses are significantly and positively related to firms' equity valuation (proxied by market-to-book equity ratio), which corroborates the uncovered reduction effect of such social connections on firms' cost of equity.

This paper makes several contributions to the literature. First, it contributes to the burgeoning literature on how corporate executives and directors' social connections shape a firm's financial policies and performance outcomes. Prior literature documents mixed results on the effects of social connections. Some studies find that firms with well-connected boards experience higher future stock returns and firm performance, and firms with well-connected CEOs invest more in innovations and receive more and higher-quality patents (Larcker, So and Wang, 2013; Faleye, Kovacs and Venkateswaran, 2014). However, social connections can be detrimental to firm value. For example, CEO-director social connections are found to be associated with CEO entrenchment, suboptimal compensation contracts, and low turnover-to-performance sensitivity (Hwang and Kim, 2009; Kramarz and Thesmar, 2013). Well-connected CEOs who are self-interested engage in value-destroying acquisitions (Fracassi and Tate, 2012; El-Khatib, Fogel and Jandik, 2015).[11] We contribute to this growing literature by documenting the first evidence that a firm's social connections with Wall Street brokerage houses benefit the firm by reducing its cost of equity.

[11] Relatedly, Ishii and Xuan (2014) show that social connections between acquirers and targets lead to poor M&A outcomes for shareholders but benefit corporate executives.

Second, extant studies on firms' social connections with brokerage analysts focus on how such connections improve brokerage analysts' decision outputs and career outcomes (e.g., Cohen, Frazzini and Malloy, 2010; Fang and Huang, 2017). Our study complements these studies by documenting evidence on how firms benefit from social connections with brokerages, directly speaking to why firms have economic incentives to establish and maintain social connections with brokerage firms. Further, our empirical evidence suggests that investors also appreciate the establishment of firm-brokerage social connections by charging lower risk premium.

Finally, our study also contributes to the vast literature on cost of equity. Prior literature has demonstrated a range of determinants of cost of equity such as firm risk (e.g., Pastor, Sinha, and Swaminathan, 2008; Lee, Ng, and Swaminathan, 2009; Chava and Purnanandam, 2010), disclosures (e.g., Botosan, 1997; Francis, Khurana, and Pereira, 2005), earnings attributes (e.g., Francis, LaFond, Olsson, and Schipper, 2004), taxes (e.g., Dhaliwal, Heitzman, and Li, 2006), legal institutions and securities regulation (e.g., Hail and Leuz, 2006), cross-listings (e.g., Hail and Leuz, 2009), legal protection, corporate governance and shareholder rights (e.g., Chen, Chen, and Wei, 2009, 2011), operating inflexibility (e.g., Chen, Kacperczyk, and Ortiz-Molina, 2011), diversification (e.g., Hann, Ogneva and Ozbas, 2013) and asset illiquidity (e.g., Ortiz-Molina and Phillips, 2014). We add to the literature by showing that a firm's social connections with brokerage houses are an important driver of the firm's cost of equity.

The rest of the paper proceeds as follows. Section 2 describes the data and presents sample descriptive statistics. Section 3 documents the relation between firms' social connections with analysts and cost of equity. Section 4 addresses endogeneity concerns using two types of quasi-natural experiments. Section 5 presents the robustness results. Section 6 concludes. The Appendix provides a variable definition table and additional empirical results.

2. Empirical Methodology

2.1. Data Sources and Sample Selection

We follow the literature and compile the social connection information from the BoardEx database (e.g., Engelberg, Gao, and Parsons, 2012; Fracassi and Tate, 2012; Bruynseels and Cardinaels, 2014). In particular, we obtained BoardEx Core Reports and started our initial sample with brokerage houses that are covered by BoardEx in its private firm section. To identify those brokerage houses, we developed an algorithm and matched firms in BoardEx with a list of brokerage houses by broker names.[12] In this way, we identified twenty-three brokerage houses that are included in the BoardEx database and have at least one social connection to the covered firms. These brokerage houses followed 2,160 firms, result in 12,036 firm-years observations.[13]

We then obtained financial data from Compustat, stock returns from the Center for Research in Security Prices (CRSP), and analyst forecasts from Institutional Brokers' Estimate System (I/B/E/S). We further impose a constraint that firms included in our sample need to have at least one social connection to the brokerage industry over our entire sample period, even if the connected brokerage houses do not follow the firm. This sample selection constraint is to help address the concern that firms that share no connection with brokerage industry at all might be fundamentally different from those that are connected. That is, we impose this constraint to help tackle the potential non-randomness in the social connectedness between a firm and the brokerage industry.[14] After removing observations with missing values, our final sample consists of 7,291 firm-years from 1,343 firms.

[12] In case of multiple matches, a research assistant and a co-author independently cross-checked with other information of the firm, such as names of executives or directors, to ensure correct matches.

[13] Table A2 in the Appendix provides the names of these twenty-three brokerage houses, which are mostly large and well known brokerages in the United States.

[14] In the robustness section, we show that the results are qualitatively similar if we lift this sample selection constraint.

2.2. Variable Definitions

2.2.1. Social Connection Measures

We consider a firm and a brokerage house to be socially connected if directors and executives in the firm share at least one social tie with an employee (including analysts, executives and directors) in the brokerage house via past employments, joined social activities such as shared memberships in voluntary associations, charity organizations and sports clubs, or alma mater based on data available on BoardEx [15] To ensure that individuals are genuinely linked, we require that they overlapped for at least one year when being employed by the same company. In case of social activities or educational experiences, we consider two individuals linked when they participated in the same activities or graduated from the same school.[16] The status of social connectedness between a firm and analysts is estimated at the end of year *t*-1.

We construct a set of variables to capture the incidence and strength of social connections between a firm and brokerage houses that follow the firm. Variable *Connected?* is an indicator for the existence of any types of social connections between a firm and at least one broker among those who follow the firm. Variable *#Brokers_Connected* counts the number of brokerage houses that follow the firm and are socially connected with the focal firm. The literature shows that different types of social ties (employment-based vs. friendship-based) might be used in different situations (Gibbons, 2004; Bruynseels and Cardinaels, 2014). We thus treat different types of social ties independently and construct two additional social-tie

[15] We acknowledge the limitation of the social connection information in BoardEx as the database compiles the information from public sources (e.g., annual reports, social media, etc.) and senior management or directors in a brokerage house are more likely to be covered compared to individual analysts. However, evidence shows that in a brokerage house information is shared and diffused among colleagues and top-down (see footnote 4 for a discussion of the evidence). Our measures of social connections capture a relatively complete set of connections through which a firm is linked to brokerage houses.

[16] We follow the literature and drop the requirement for overlapping time periods when estimating social ties via education and other social activities, because BoardEx often does not cover the start and end year of these activities (Bruynseels and Cardinaels, 2014; Abernethy, Kuang and Qin, 2018). Prior literature also shows that ties established via social activities tend to sustain over a long period of one's life as they attract people with similar religion, belief, and status (Westphal and Khanna, 2003; McPherson, Smith-Lovin and Cook, 2001), which supports our choice in removing overlapping period constraint in defining social activity-related social ties.

variables. Specifically, we follow the literature and categorize social ties into three groups based on the platforms where the connections are established: via employment history, social activities, or educational activities. Variable *#Connection_Type* counts the types of social ties a focal firm has with all brokers that follow the firm, with a highest possible value of three and a lowest of zero; variable *#Connections* instead counts the total number of social connections between a focal firm and individual brokerage houses incorporating all the three types of social ties and the number of connected personnel between firms and brokerage houses.

Using a hypothetical example, we demonstrate how the set of social-tie variables is defined. Assume that the executives and directors of Firm A are socially connected with three brokerage houses—Brokers aaa, bbb, and ccc, one social tie to each of Brokers aaa and bbb, and two social ties to Broker ccc. The connection to Broker aaa is established via past co-working experiences and the same for the connection to Broker bbb. The two social ties to Broker ccc are through joint educational background and past co-working experiences, respectively. In this case, the variable of *Connected?* has a value of one and *#Brokers_Connected* equals three because three brokerage houses that follow the firm are socially connected with the firm; *#Connection_Type* equals two as the firm shares two types of social ties (employment and education) with the brokerage houses; moreover, *#Connection* counts the aggregate number of ties and thus has a value of four.

Table 1 presents the descriptive statistics of the variables used in our main analysis. The mean of the indicator *Connected?* is 0.66, which suggests that about 66% of firm-year observations in our final sample have social connection(s) with brokerage houses that follow the firm. The means of *#Connection_Type* and *#Brokers_Connected* are both about one with the medians being one, suggesting that the connections are normally made through single channel, and a firm is generally connected with one brokerage house. Furthermore, the mean of the aggregate number of social connections (*#Connections*) is about two with the median

being one in the sample. The sample standard deviations of the four social-tie variables (0.48, 0.95, 1.01 and 1.77, respectively) are relatively large compared with their respective means and medians, suggesting large variations in these variables in the sample.

[Insert Table 1 around here]

2.2.2. Cost of Equity Measures

We measure the cost of equity in line with prior literature. Specifically, we estimate the ex-ante cost of equity implied in current stock prices and analyst forecasts. We estimate the cost of equity using four different models: the Claus and Thomas's (2001) model, the Gebhardt, Lee and Swaminathan's (2001) model, the Ohlson and Juettner-Nauroth's (2005) model, and the Easton's (2004) model.[17] We then compute the average cost of equity estimated by each model, *R_avg*, to proxy for the cost of equity. Table 1 shows that an average firm in our sample has a cost of equity of about 10% with the median being 9%, generally consistent with the results reported in the original studies (Claus and Thomas, 2001; Gebhardt, Lee, Swaminathan, 2001; Ohlson and Juettner-Nauroth, 2005; Easton, 2004).

2.3. Model Specification

To test Hypothesis 1, we estimate the following OLS regression:

$$Cost\ of\ Equity_{i,t} = \alpha + \beta_1\ Social\ Connection_{i,t-1} + Controls_{i,t-1} + \varepsilon_{i,c,t} \quad (1)$$

where $Social\ Connection_{i,t-1}$ stands for one of the four social-connection variables we use to capture social connections between a focal firm *i* and brokerage houses that follow the firm as measured at the end of year *t-1*. According to Hypothesis 1, we expect that a firm's social

[17] Measuring cost of equity using ex-post realized stock returns is inaccurate (e.g., Elton, 1999; Fama and French, 1997) because realized returns can be far off from expected returns. Thus, the literature advocates using an ex-ante measure—implied cost of equity—to measure the firm's cost of equity, which is the internal rate of return that makes the firm's stock price equal to the present value of its expected future cash flows. The implied cost of equity measure has been widely applied in finance and accounting literatures (e.g., Francis, LaFond, Olsson, and Schipper, 2005, Dhaliwal, Heitzman, and Li, 2006, Hail and Leuz, 2006, 2009, Pastor, Sinha, and Swaminathan, 2008, Lee, Ng, and Swaminathan, 2009, Chava and Purnanandam, 2010, Chen, Chen, and Wei, 2011, Ortiz-Molina and Phillips, 2014, and many others). Nevertheless, our findings are robust to using alternative measures of cost of equity.

connections with brokerage houses that cover the firm will significantly reduce its cost of equity. That is, we expect a significantly negative sign on β_1 in Equation (1).

We further include a battery of control variables following the prior literature (e.g., Hail and Leuz, 2006; Gebhardt, Lee, and Swaminathan, 2001; Dhaliwal, Heitzman, and Li , 2006; Ghoul, Guedhami, Kwok, and Mishra, 2011). The controls include *Size*, defined as the natural logarithm of total assets; *Market-to-Book*, which is the market-to-book equity ratio; *Leverage*, computed as the debt to asset ratio; *Profitability*, which is income before extraordinary items scaled by total assets ; *Investment*, which is the ratio of investment to total assets; *Beta*, which is the market beta of the firm's stock; *Past Stock Return*, which is the buy-and-hold stock return of the firm over the financial year; *Forecast Dispersion*, computed as the monthly average of the inter-analyst standard deviation of analyst earnings forecasts scaled by absolute mean forecasts for the year; and *Number of Analysts*, which counts the number of analysts following the firm during the year. We further include industry and year fixed effects to control for industry-specific factors and macroeconomic factors. Standard errors are clustered at the firm level. The Appendix provides the definitions of all variables included in our analysis.

3. Empirical Results

3.1. Primary Analysis

We estimate Equation (1) and the regression results are reported in Table 2. The coefficient on *Connected?* (β = -0.265) is significantly negative at the 1% level, suggesting that firms on average have lower cost of equity if their corporate executives and directors are socially connected with brokerage houses who follow the firms. The reduction effect of social connections on the cost of equity does not change when we measure firm-broker connections differently. The coefficients on *#Brokers_Connected* (β = -0.139) are significantly negative at the 1% level while the coefficients on *#Connection_Type* (β = -0.137) and *#Connections* (β =

-0.070) are both significantly negative at the 5% level, indicating that a firm's cost of equity is negatively related to the number of connected brokerage houses, the number of social connection types and the total number of social connections, respectively.[18] The results of control variables are generally consistent with the prior literature (e.g., Ghoul, Guedhami, Kwok, and Mishra, 2011; Ortiz-Molina and Phillips, 2014; Goh, Lee, Lim, and Shevlin, 2016). We find that *Market-to-Book, Profitability* and *Number of Analysts* are all negatively related to firm's cost of equity, while *Leverage*, *Beta* and *Forecast Dispersion* increase cost of equity.

In summary, the results are consistent with our conjecture that firm-brokerage social connections decrease the firm's cost of equity.

[Insert Table 2 around here]

3.2. Types of Social Connections

In this section, we distinguish between different types of firm-brokerage social connections (i.e., employment, education, and social activity) and re-estimate Equation (1) for each type of connections. Table 3 summarizes the results.

We find that firm-broker connections derived from social activity have the largest effect on the firm's cost of equity (β = -0.250, t = -2.60), followed by connections based on past co-working history (β = -0.167, t = -1.78). Connections established via mutual educational background have insignificant effects on the firm's cost of equity. This finding is consistent with Cohen, Frazzini and Malloy (2010), who find no return premium of the stocks recommended by analysts who share school ties with covered firms in the post-Reg-FD period. Taken together, our results indicate that the effect of firm-brokerage social connections on firms' cost of equity is primarily driven by past employment and social activity connections.

[Insert Table 3 around here]

[18] We also use firm fixed-effects regressions to control for unobserved firm heterogeneity. We discuss these results in robustness tests.

3.3. Cross-Sectional Analysis

To add more credence to our argument that a firm's social connections with analysts reduce its cost of equity through decreasing information asymmetry, we next explore settings in which the relation between firm-brokerage social connections and firms' cost of equity is likely to vary.

3.3.1. Soft Information

When a firm's value-relevant information is mostly soft in nature that requires a greater extent of verification and interpretation, connected brokerages are likely to play a larger role. Connected brokerages are more likely to have direct access to corporate executives and directors and thus are better able to verify and interpret soft information such as those related to research and development programs, mergers and acuiqsitions, product market competition, and external equity raising. Analysts of connected brokerages can then convey the correct content of such soft information in their earnings forecasts and/or research reports, thereby reducing information asymmetry regarding the value of the firm.[19] Thus, we expect the effect of firm-brokerage social connections on a firm' cost of equity to be greater when a considerable amount of soft information is related to the firm's business activities.

We use research and development (*R&D*), mergers and acuiqsitions (*MA_Value*), product market competition (*Fluidity*),[20] and external equity raising (*Equity_Raising*) to capture different types of business activities that give rise mostly to soft information. We add *R&D*, *MA_Value*, *Fluidity*, and *Equity_Raising* and their interactions with our social connection measures to Equation (1). Table 4 reports the findings. Component terms and control variables are included in the regressions but are omitted from reporting for brevity.

[19] Asquith, Mikhail and Au (2005) investigate the information content of analysts' reports and demonstrate that analysts typically comment on various firms' decisions relating to cost efficiencies, business strategies, and mergers and acquisitions activities to justify their earnings forecasts, price targets and stock recommendations.

[20] The data is available at http://hobergphillips.tuck.dartmouth.edu/. We thank Gerard Hoberg and Gordon Phillips for generously providing the data on their research website.

The coefficients on the interaction terms are negative across all models and statistically significant in most of the models (except for the cases where social connections interact with *fluidity*). This finding is consistent with the conjecture that firm-brokerage social connections help reduce the firm's cost of equity particularly when the firm has a large amount of soft information that is hard to verify and interpret.

[Insert Table 4 around here]

3.3.2. Information Environment

We next examine the relation between firm-brokerage social connections and a firm's cost of equity conditional on the firm's information environment. If the reduced cost of equity is attributable to the fact that firm-brokerage social connections mitigate information asymmetry on firm value, we expect that the marginal effect of social connections on cost of equity should be more pronounced for firms with opaque information environments than firms with transparent information environments.

Following the prior literature, we use four measures to capture the opaqueness of a firm's information environment: firm size, idiosyncratic volatility, analyst earnings forecast dispersion, and probability of informed trading (Barron and Stuerke, 1998; Easley, Hvidkjaer, and O'Hara, 2002; Fang and Peress, 2009). While firm size is negatively correlated with the opaqueness of firm's information environment, the latter three have a positive association with the opaqueness of a firm's information environment. We split our sample into two groups each year based on the sample median, and construct an indicator variable for each measure. *Small_Size* equals one if the firm's size is below the sample median of the year and equals zero otherwise. *High_IV*, *High_Dispersion* or *High_PIN* equals one if the firm's idiosyncratic volatility, analyst earnings forecast dispersion, or probability of informed trading is above the respective sample median of the year, respectively, and equals zero otherwise. These indicators are proxies for an opaque information environment. We then add *Small_Size*, *High_IV*,

High_Dispersion and *High_Pin* and their interactions with our social connection measures to Equation (1). Table 5 summarizes the findings.

The coefficients on the interaction terms are significantly negative in all models except for the cases where *#Connection_Type* interacts with *High_Dispersion* or *High_PIN*. The results indicate that the negative effect of firm-brokerage social connections on the firm's cost of equity is more salient when the firm's information environment is more opaque and thus the firm is subject to greater information asymmetry.

[Insert Table 5 around here]

3.3.3. Financial Constraints

We then examine how the relation between the firm's social connections with brokerage houses and its cost of equity varies with financial constraints of the firm. Prior research shows that firms with high information asymmetry have increased financial constraints (e.g., Stiglitz and Weiss, 1981; Myers and Majluf, 1984). The more severe the information asymmetry, the more likely that external finance will be either costly or unavailable (Fazzari, Hubbard and Petersen, 1988). We thus expect the impact of firm-brokerage social connections on cost of equity to be stronger for financially constrained firms than for unconstrained firms.

We follow the literature and use the Kaplan and Zingales Index (Lamont, Polk and Saa-Requejo, 2001), the Whited and Wu Index (Whited and Wu, 2006), and the Hadlock and Pierce Index (Hadlock and Pierce, 2010) as proxies for financial constraints. The higher value of these index-based measures, the more financial constrained the firms are facing. As financially constrained firms generally pay less or no dividends (Fazzari, Hubbard and Petersen, 1998), we also classify non-dividend-paying firms as constrained firms. For each index measure, we split our sample into groups based on the respective sample median of each year, and construct one indicator variable for each measure—*High_WW*, *High_HP* or *High_KZ* equals one if the

index-based financial constraint measure is above the respective sample median of the year and equals zero otherwise. We create an indicator variable, *Non_Dividend_Payer*, that equals one if a firm pays no dividend at the end of the fiscal year and equals zero otherwise. We then add *High_WW*, *High_HP*, *High_KZ* and *Non_Dividend_Payer* and their interaction terms with our social connection measures to Equation (1).

As shown in Table 6, the coefficients on the interaction terms are negative and statistically significant in most models (except for the interactions of *#Connection_Type* with *High_HP*, and *Connected?* with *Dividend_Payer*) when we measure financial constraints using Whited-Wu and Hadlock-Pierce indices and non-dividend-payer. We do not find significant results when we use the Kaplan-Zingales index as the proxy for financial constraints, likely because this index is not the best proxy for financial constraints (e.g., see Hadlock and Pierce, 2010, and Farre-Mensa and Ljungqvist, 2015). The results in Table 6 suggest that the effect of firm-brokerage social connections in reducing cost of equity is stronger for firms with tighter financial constraints. Again, the findings are consistent with the conjecture that firm-brokerage social connections are more important when a firm's information asymmetry is high.

[Insert Table 6 around here]

3.3.4. Corporate Governance

Finally, we examine the effect of firm-brokerage social connections on cost of equity conditional on firms' corporate governance. A general consensus in the literature suggests that firms with weaker corporate governance is associated with greater information asymmetry because of high monitoring costs (Demsetz and Lehn, 1985; Hermalin and Weisbach, 1998; Almazan and Suarez, 2003; Raheja, 2005; Adams and Ferreira, 2007; Harris and Raviv, 2008; Duchin, Matsusaka, and Ozbas, 2010). Thus, there is a greater need for analysts from connected brokerage houses to acquire and ascertain information for these firms and to disseminate the information to the capital market. We hence expect that the marginal effect of firm-brokerage

social connections in decreasing the firm's information asymmetry and its cost of equity is higher when the firm's corporate governance is weaker.

We follow the prior literature and create a set of governance indicator variables that equal one if the connected firm is associated with weaker external governance proxied by low takeover threats and low institutional ownership (Chung and Zhang, 2011; Cain, McKeon and Solomon, 2017), and weaker internal governance proxied by low board independence and low CEO pay-for-performance sensitivity (Hwang and Kim 2009). For each measure, we split our sample into groups based on the respective sample median of each year. *Low_Takeover_Treat, Low_IO, Low_Independence,* or *Low_CEO_PPS* equals one if the takeover threats, institutional ownership, board independence or CEO pay-for-performance sensitivity is below the respective sample median of the year and equals zero otherwise. We then add *Low_Takeover_Treat, Low_IO, Low_Independence,* or *Low_CEO_PPS* and their interaction terms with our social connection measures to Equation (1). The results are reported in Table 7.

The coefficients on the interaction terms between the social connection variables and the proxies for weak corporate governance are negative across all models of Table 7. Moreover, the interaction terms are statistically significant in all models when weak corporate governance is proxied by low board independence, low institutional ownership and low CEO pay-for-performance sensitivity. When the hostile takeover index (Cain, McKeon and Solomon, 2017) is used to proxy for weak governance, the coefficients on the interaction terms, *Low_Takeover_Treats×#Broker_Connected* and *Low_Takeover_Treats×#Connections*, are also both significantly negative. These results indicate that the effects of firms' social connections on cost of equity are stronger for firms with weaker corporate governance, consistent with our expectation that firm-brokerage social connections are more important in a situation where disseminating information to the capital market is most needed.

[Insert Table 7 around here]

In summary, consistent with the conjecture that firm-brokerage social connections decrease firms' cost of equity through enhancing information propagation from firms to the capital markets and reducing information asymmetry, we find that the effect of firm-brokerage social connections on cost of equity is more pronounced in firms with hard-to-interpret soft information, opaque information environments, tight financial constraints and/or weak corporate governance.

4. Addressing Endogeneity Concerns

4.1. Quasi-natural Experiments

Our findings are potentially subject to endogeneity concerns. Specifically, there is a reverse causality concern—brokerage firms may prefer to establish social connections with firms that have lower cost of equity. That is, it can be lower cost of equity that leads to better social connections with analysts, rather than the other way around. Moreover, an omitted-variable concern is also relevant in our setting as unobserved firm-specific, time-varying omitted variables may drive both social connections and cost of equity, rendering the documented relations spurious.

To address endogeneity concerns in our setting, our identification strategy exploits two types of quasi-natural experiments that create potential exogenous variation in firm-brokerage social connections. The first type of quasi-natural experiments is exogenous brokerage closures or mergers (Kelly and Ljungqvist, 2012; Derrien and Kecskes, 2013; Irani and Oesch, 2013; Chen, Harford and Lin, 2015). Brokerage closures or mergers are mostly triggered by business strategy considerations in the wake of significant changes to the economics of producing equity research (Kelly and Ljungqvist, 2012). As a result, the exit of a connected brokerage due to closure or merger is a negative exogenous shock to the firm's social connections with brokerage houses (i.e., it exogenously reduces the number of social connections with

brokerages), uncorrelated with firm-specific characteristics. Out of the twenty-three brokerage houses included in our sample, we identified one brokerage merger (Bear Stearns) and one brokerage closure (Gleacher & Co) during our sample period. We then select firms covered by these exiting brokerages in year *t-1* as treatment firms.[21]

The second type of quasi-natural experiments we use is exogenous CEO turnover with replacement CEO coming from within the firm (Eisfeldt and Kuhnen, 2013). In those CEO turnover cases, the departure of CEO is due to factors such as planned retirement, health issue or sudden death, and is not related to firm performance. We argue that exogenous CEO departures with internal replacements represent negative exogenous shocks to the firm's social connections with brokerages but not to its corporate strategy and policies as inside successors are likely to continue with the firm's current strategy and corporate policies (e.g., Gilson and Vetsuypens, 1993; Farrell and Whidbee, 2003; Clayton, Hartzell, and Rosenberg, 2005). We obtain CEO turnover data from Eisfeldt and Kuhnen (2013), which records CEO departures and their reasons from 1992 to 2006.[22] During our sample period, we identify 36 socially connected firms that experienced exogenous CEO departures with replacements coming from within the firm. These firms are the treatment firms in our sample.

4.2. Difference-in-differences Regressions

We first conduct a reduced-form estimation employing the stacking event-window cohort approach in a difference-in-differences regression framework (e.g., Gormley and Matsa, 2011) for each type of quasi-natural experiments.[23] In each setting, we compare the changes in cost of equity of the treatment firms, who experienced either connected brokerage exits or

[21] In the analysis of brokerage exits, we drop firms that experienced both connected brokerage exits to avoid confounding effects.

[22] The data is available at https://sites.google.com/site/andrealeisfeldt/. We thank Andrea Eisfeldt for generously providing the data on her research website.

[23] The results in Table 9 below validate that both types of quasi-natural experiments indeed cause significant exogenous reduction in firm-analyst social connections in the treatment firms compared with size- and industry-matched control firms.

exogenous CEO departure, and the changes in cost of equity of the control firms. Control firms are firms in the same industry and with the same quintile of firm size as the treatment firms but experiencing no connected brokerage exit (for the first experimental setting) or CEO turnover (for the first experimental setting). Following Chen, Harford and Lin (2015), for each event, we construct a cohort of treatment and control firms using firm-year observations of one year before and one year after the event to ensure that we capture only the direct effects of the exogenous drop in firm-brokerage social connections. For each type of experiments, we then pool the data across cohorts and estimate the average treatment effect, using the following difference-in-differences regression specification:

$$Cost\ of\ Equity_{i,c,t} = \alpha + \beta_1\ Treat_{i,c} \times Post_{c,t-1} + Controls_{i,c,t-1} + \gamma_{c,i} + \omega_{c,t} + \varepsilon_{i,c,t} \quad (2)$$

where $Treat_{i,c}$ equals 1 for the treatment firms in cohort c and equals 0 otherwise. $Post_{c,t-1}$ equals 1 for cohort c and year t-1 if the year is after the event and equals 0 otherwise. We include firm-cohort fixed effects, $\gamma_{c,i}$, to control for any time-invariant differences between treatment firms and control firms in different cohorts. Year-cohort fixed effects, $\omega_{c,t}$, are added to control for any common shocks to treatment and control firms in different cohorts. The coefficient β_1 on the interaction term, $Treat_{i,c} \times Post_{c,t-1}$, in Equation (2) captures the average treatment effect of the exogenous shocks to firm-brokerage social connections on cost of equity. Robust standard errors are clustered at the firm level.

Gormley and Matsa (2011) raise the concern on endogenous control variables in the difference-in-differences framework. Exogenous shocks (in our case, exogenous CEO turnover or brokerage exits) may affect some time-varying firm-level variables. Therefore, including these variables may bias the estimates of β_1. However, if these control variables are not affected by the quasi-natural experiments, including them will help soak up the variations in the regression residuals and improve our estimation precision. We thus present the difference-in-

differences regression results, both with and without time-varying firm-level control variables, in Table 8.

Columns 3 and 7 present the difference-in-differences regression results without time-varying firm-level accounting variables. We find that relative to the control firms, the treatment firms on average experienced a significant increase in cost of equity by more than 1 percentage points after the exogenous brokerage exits and around 1.5 percentage points after the exogenous CEO turnovers. The results are qualitatively similar when we control for time-varying firm-level control variables (Columns 4 and 8). Thus, these reduced-form estimation results clearly indicate that the exogenous negative shocks to firm-brokerage social connections caused an increase in the treatment firms' cost of equity relative to the control firms.

We further conduct placebo experiments by falsely assuming that the CEO turnover or brokerage exit occurs three years or two years before it actually does. We then re-estimate the difference-in-differences regression models. Columns 1, 2, 5, and 6 show that the coefficients of $Treat_{i,c} \times Post_{c,t-1}$ are close to zero and statistically insignificant in these placebo regressions, suggesting that the uncovered treatment effect is unlikely driven by nonparallel trends in cost of equity in the treatment and control groups before the onset of treatment.

[Insert Table 8 around here]

4.3. 2SLS Instrumental-Variable Regressions

We next address the endogeneity concerns by conducting two-stage least square (2SLS) instrumental-variable regressions. We use the DiD term (i.e., *Treat*×*Post*) from the earlier reduced-form analyses as the instrument, to extract the exogenous component of social connections and then relate the extracted exogenous component to cost of equity. As we use brokerage exits that are exogenous to treatment firms and use CEO departure events that are not caused by firm-specific reasons and, our instrumental variable satisfies the exclusion restriction.

Panel A and Panel B of Table 9 report the 2SLS regression results for brokerage exits and exogenous CEO turnover, respectively. Columns (1) to (4) of Panels A and B present the first-stage regression results, where we regress each of the social-tie variables on the instrumental variable (*Treat*Post*), a set of controls, as well as firm-cohort and year-cohort fixed effects. The *p*-values of Cragg-Donald F-statistics strongly reject the null hypothesis of weak instrument at the 1% level.

The first-stage regression results in Panel A show that after the brokerage exits, the treatment firms experienced significant reductions in firm-brokerage social connections across all four social-tie variables. The first-stage regression results in Panel B show that *#Connection_Type, #Brokers_Connected* and *#Connections* of the treatment firms declined significantly after the CEO departure shocks, but not the *Connected?* indicator. This is likely because *Connected?* is an indicator that reflects whether a firm is socially connected with brokerages, a weaker measure relative to the other three. Following exogenous CEO turnover, the treatment firms experienced reductions in the number of connections, but these firms may still stay connected with brokerages as they have other connections. As a result, we do not find a significant decrease in the *Connected?* indicator. Thus, the first-stage regression results clearly show that the treatment firms that experienced connected brokerage exits or exogenous CEO turnover indeed suffered significant reductions in their social connections with brokerage houses, compared with the control firms, validating that brokerage exit or exogenous CEO turnover indeed imposed an exogenous negative shock to firm-brokerage social connections.

Columns (5) to (8) of Panels A and B present the second-stage regression results, where we regress cost of equity on the fitted values of social-tie variables and the same set of controls used in the first stage. The extracted exogenous components of social connections are significantly and negatively related to cost of equity. A one-standard-deviation increase in our instrumented social-tie variables is on average related to a decrease in cost of equity by 0.6 to

0.9 percentage point in the first setting (exogenous brokerage exits) and 0.6 to 0.7 percentage point in the second experimental setting (exogenous CEO turnover). Thus, the negative impact of social connections with analysts on firm's cost of equity is likely causal and economically significant.

[Insert Table 9 around here]

5. Robustness Checks

In this section, we conduct multiple robustness checks. First, we re-estimate Equation (1) using the same battery of control variables, year fixed-effects and firm fixed-effects, instead of industry fixed-effects. That is, we focus on the impact of within-firm variation in social connections over time on cost of equity (Wooldridge, 2012). As reported in Table 10, all the social-tie variables remain significant and negative.

[Insert Table 10 around here]

Second, brokerage analysts may generate favorable earnings forecasts for firms with which they are socially connected. However, as discussed earlier, such favorable earnings forecasts will bias against us finding a negative relation between social connections and cost of equity (since the implied cost of equity of connected firms will be overestimated). Nevertheless, to test the robustness of our inferences, we re-estimate Equation (1) using the implied cost of equity models that are not relied on analyst earnings forecasts. We follow Hou, Van Dijk and Zhang (2012) and Li and Mohanram (2014), and estimate cross-sectional models using past accounting variables to estimate future earnings for horizons of 1 to 5 years. We then reestimate the implied cost of equity using the earnings forecasts generated from the Residual Income (RI) models specified in Li and Mohanram (2014) and from the Hou, van Dijk and Zhang's (2012) (HVZ) model, as a replacement for analyst earnings forecasts. We

obtain very similar inferences from the regressions using these new cost of equity estimates as the dependent variables. These results are presented in Panels A and B of Table 11.

Moreover, we use an alternative model to estimate the firm's cost of equity. Specifically, we run rolling time-series regressions using monthly data from year $t - 4$ to t to estimate the Fama and French's (1993) three-factor loadings of a firm's stock. We then use the estimated factor loadings and the average factor returns from 1926 to 2016 to estimate the firm's cost of equity. Our inferences remain unchanged using this alternative cost-of-equity measure (Panel C of Table 11). To further address the issue of analyst forecast biases, we repeat our main regressions after dropping those firms whose forecast biases are in the top 30% of the sample. Again, the results remain qualitatively unchanged (Panel D of Table 11).

[Insert Table 11 around here]

Moreover, as mentioned earlier, we impose a sample-selection constraint that firms included in our sample need to have at least one social connection to the brokerage industry over our entire sample period. As a robustness check, we remove this constraint and replicate our baseline regressions in a broad Compustat/CRSP/IBES merged sample of 31,024 firm-year observations over our sample period.[24] The results are reported in Table A3 in the Appendix. All four social-connection measures are negatively and highly significantly related to future cost of equity at the 1% level.

Finally, if social connections with analysts help bring down firms' cost of equity, all else equal (e.g., holding constant the expected future cash flows) we should find higher equity valuation for connected firms. This is because a lower discount rate (lower cost of equity) will lead to higher equity valuation. We thus re-estimate Equation (1) using market-to-book equity ratio instead of cost of equity as the dependent variable. Table A4 in the Appendix show that

[24] We merge this broad sample with our social-connection sample and replace missing values of the social-tie variables with zero.

all four social-connection measures are significantly and positively associated with firms' equity valuation at the 1% level. These results further corroborate the uncovered effect of firm-brokerage social connections in reducing the firm's cost of equity.

6. Conclusion

In this paper, we investigate whether social connections of a firm's executives and directors with brokerage houses that follow the firm will affect the firm's cost of equity. We conjecture that firm-brokerage social connections may reduce the firm's cost of equity because the firm disseminates value-relevant information to capital markets through connected brokerage houses, resulting in reduced information asymmetry on the firm's fundamental value. Using a sample of 7,291 U.S. firm-year observations during the 2001-2016 period, we find that firm-brokerage social connections significantly decrease the firm's cost of equity. This reduction effect is primarily driven by social connections established via past employment and joint non-employment social activities, but not via mutual educational background.

We further demonstrate that the effect is more pronounced for firms with more hard-to-verify soft information, opaque information environments, greater financial constraints, or weaker corporate governance. We use two quasi-natural experiments—exogenous brokerage exits and CEO turnover with internal replacements—to address potential endogeneity concerns. Our results from difference-in-differences and instrumental-variable regression analyses suggest that the effect of firm-brokerage social connections on the firm's cost of equity is likely causal. Our results are robust to alternative measures of cost of equity. Further, consistent with the evidence on cost of equity, we find that firm-brokerage social connections improve the firm's equity valuation.

Our findings may be of interests to academics, practitioners, and regulators. We provide initial evidence on how firms can benefit from building and maintaining social connections to

brokerage houses, which contributes to the growing literature on social network. Our results also indicate that firm-brokerage social connections are another important determinant of a firm's cost of equity, adding to the vast literature on cost of equity. Finally, our results provide policy insights to regulators, particularly in the post-Reg FD era. Private information that flows from firms to connected brokerage firms may be beneficial to firms and their shareholders as long as such information is properly disseminated to capital markets. If such private information flow is prohibited, the firm's cost of equity is likely to increase.

References

Abernethy, M. A., Kuang, Y. F. and B. Qin. 2018. The Relation between Strategy, CEO Selection, and Firm Performance. *Contemporary Accounting Research*, forthcoming.

Adams, R. B., and D. Ferreira. 2007. A Theory of Friendly Boards. *Journal of Finance* 62:217-50.

Allen, F., J. Qian, and M. Qian. 2005. Law, Finance, and Economic Growth in China. *Journal of Financial Economics* 77:57-116.

Almazan, A., and J. Suarez. 2003. Entrenchment and Severance Pay in Optimal Governance Structures. *Journal of Finance* 58:519-47.

Armstrong, C. S., J. E. Core, D. J. Taylor, and R. E. Verrecchia. 2011. When Does Information Asymmetry Affect the Cost of Capital? *Journal of Accounting Research* 49:1-40.

Barron, O. E., and P. S. Stuerke. 1998. Dispersion in Analysts' Earnings Forecasts as a Measure of Uncertainty. *Journal of Accounting, Auditing & Finance* 13:245-70.

Botosan, C. A. 1997. Disclosure Level and the Cost of Equity Capital. *Accounting Review* 72:323-49.

Bradley, D., Gokkaya, S. and X. Liu, 2019a. Ties That Bind: The Value of Professional Connections to Sell-Side Analysts. *Management Science, Forthcoming*.

Bradley, D., Gokkaya, S. and X. Liu , 2019b. The boss knows best: Directors of research and subordinate analysts. *Journal of Financial and Quantitative Analysis* 54: 1403-1446.

Brown, L. D., A. C. Call, M. B. Clement, and N. Y. Sharp. 2015. Inside the "Black Box" of Sell-Side Financial Analysts. *Journal of Accounting Research* 53:1-47.

Bruynseels, L., and E. Cardinaels. 2014. The Audit Committee: Management Watchdog or Personal Friend of the CEO? *Accounting Review* 89:113-45.

Cain, M. D., S. B. McKeon, and S. D. Solomon. 2017. Do Takeover Laws Matter? Evidence from Five Decades of Hostile Takeovers. *Journal of Financial Economics* 124:464-85.

Chava, S., and A. Purnanandam. 2011. The Effect of Banking Crisis on Bank-Dependent Borrowers. *Journal of Financial Economics* 99:116-35.

Chen, H., M. Kacperczyk, and H. Ortiz-Molina. 2011. Labor Unions, Operating Flexibility, and the Cost of Equity. *Journal of Financial and Quantitative Analysis* 46:25-58.

Chen, K. C. W., Z. Chen, and K. C. J. Wei. 2009. Legal Protection of Investors, Corporate Governance, and the Cost of Equity Capital. *Journal of Corporate Finance* 15:273-89.

Chen, K. C. W., Z. Chen, and K. C. J. Wei. 2011. Agency Costs of Free Cash Flow and the Effect of Shareholder Rights on the Implied Cost of Equity Capital. *Journal of Financial and Quantitative Analysis* 46:171-207.

Chen, T., J. Harford, and C. Lin. 2015. Do Analysts Matter for Governance? Evidence from Natural Experiments. *Journal of Financial Economics* 115:383-410.

Christensen, D. M., M. B. Mikhail, B. R. Walther, and L. A. Wellman, 2016. From K street to wall street: political connections and stock recommendations. *The Accounting Review* 92: 87-112.

Christensen, P. O., L. E. de la Rosa, and G. A. Feltham, 2010. Information and the cost of capital: An ex ante perspective. *The Accounting Review* 85: 817-848.

Chung, K. H., and H. Zhang. 2011. Corporate Governance and Institutional Ownership. *Journal of Financial and Quantitative Analysis* 46:247-73.

Claus, J., and J. Thomas. 2001. Equity Premia as Low as Three Percent? Evidence from Analysts' Earnings Forecasts for Domestic and International Stock Markets. *Journal of Finance* 56:1629-66.

Clayton, M., J. Hartzell, and J. Rosenberg. 2005. The impact of CEO turnover on equity volatility. *Journal of Business* 78:1779-1808.

Cohen, L., A. Frazzini, and C. Malloy. 2010. Sell-Side School Ties. *Journal of Finance*

65:1409-37.
Das, S., Levine, C., & Sivaramakrishnan, K. 1998. Earnings Predictability and Bias in Analysts' Earnings Forecasts. *The Accounting Review* 73: 277-294
Demsetz, H., and K. Lehn. 1985. The Structure of Corporate Ownership: Causes and Consequences. *Journal of Political Economy* 93:1155-77.
Derrien, F., and A. Kecskés. 2013. The Real Effects of Financial Shocks: Evidence from Exogenous Changes in Analyst Coverage. *Journal of Finance* 68:1407-40.
Dhaliwal, D., S. Heitzman, and O. Zhen Li. 2006. Taxes, Leverage, and the Cost of Equity Capital. *Journal of Accounting Research* 44:691-723.
Diamond, D. W., and R. E. Verrecchia. 1991. Disclosure, Liquidity, and the Cost of Capital. *The Journal of Finance* 46:1325-59.
Duchin, R., J. G. Matsusaka, and O. Ozbas. 2010. When Are Outside Directors Effective? *Journal of Financial Economics* 96:195-214.
Easley, D., S. Hvidkjaer, and M. O'Hara. 2002. Is Information Risk a Determinant of Asset Returns? *Journal of Finance* 57:2185-2221.
Easley, D., and M. O'Hara. 2004. Information and the Cost of Capital. *Journal of Finance* .
Easton, P. D. 2004. PE Ratios, PEG Ratios, and Estimating the Implied Expected Rate of Return on Equity Capital. *The Accounting Review* .
Eisfeldt, A. L., and C. M. Kuhnen. 2013. CEO Turnover in a Competitive Assignment Framework. *Journal of Financial Economics* 109:351-72.
El-Khatib, R., K. Fogel, and T. Jandik. 2015. CEO Network Centrality and Merger Performance. *Journal of Financial Economics* 116:349-82.
Elton, E. J. 1999. Presidential Address: Expected Return, Realized Return, and Asset Pricing Tests. *The Journal of Finance* 54:1199-1220.
Engelberg, J., P. Gao, and C. A. Parsons. 2012. Friends with Money. *Journal of Financial Economics* 103:169–88.
Faleye, O., T. Kovacs, and A. Venkateswaran. 2014. Do Better-Connected CEOs Innovate More? *Journal of Financial and Quantitative Analysis* 49:1201-25.
Fama, E. F., and K. R. French. 1993. Common Risk Factors in the Returns on Stocks and Bonds. *Journal of Financial Economics* 33:3-56.
Fama, E. F., and K. R. French. 1997. Industry Costs of Equity. *Journal of Financial Economics* 43:153–93.
Fang, L. H., and S. Huang. 2017. Gender and Connections among Wall Street Analysts. *Review of Financial Studies* 30:3305–35.
Farre-Mensa, J., and A. Ljungqvist. 2016. Do Measures of Financial Constraints Measure Financial Constraints? *Review of Financial Studies* 29:271-308.
Farrell, K. and D. Whidbee. 2003. Impact of firm performance expectations on CEO turnover and replacement decisions. *Journal of Accounting and Economics* 36:165-196.
Fazzari, S. M., G. R. Hubbard, and B. C. Petersen. 1988. Financing Constraints and Corporate Investment. *Brookings Papers on Economic Activity* .
Fracassi, C., and G. Tate. 2012. External Networking and Internal Firm Governance. *Journal of Finance* 67:153-94.
Francis, J., R. LaFond, P. Olsson, and K. Schipper. 2005. The Market Pricing of Accruals Quality. *Journal of Accounting and Economics* 39:295-327.
Francis, J. R., I. K. Khurana, and R. Pereira. 2005. Disclosure Incentives and Effects on Cost of Capital around the World. *Accounting Review* 80:1125-1162.
Gebhardt, W. R., C. M. C. Lee, and B. Swaminathan. 2001. Toward an Implied Cost of Capital. *Journal of Accounting Research* 39:135-76.
Ghoul, S. El, O. Guedhami, C. C. Y. Kwok, and D. R. Mishra. 2011. Does Corporate Social Responsibility Affect the Cost of Capital? *Journal of Banking & Finance* 35:2388-

2406.
Gibbons, D. E. 2004. Friendship and Advice Networks in the Context Professional Values. *Administrative Science Quarterly* 49:238-62.
Gilson, S. and M. Vetsuypens. 1993. CEO compensation in financially distressed firms: An empirical analysis. *The Journal of Finance* 48:425-458.
Gintschel, A., and S. Markov. 2004. The Effectiveness of Regulation FD. *Journal of Accounting and Economics* 37:293-314.
Goh, B. W., J. Lee, C. Y. Lim, and T. Shevlin. 2016. The Effect of Corporate Tax Avoidance on the Cost of Equity. *Accounting Review* 91:1647-1670.
Gormley, T. A., D. A. Matsa, and T. Milbourn. 2013. CEO Compensation and Corporate Risk: Evidence from a Natural Experiment. *Journal of Accounting and Economics* 56:79-101.
Green, T. C., R. Jame, S. Markov, and M. Subasi, 2014a. Broker-hosted investor conferences. *Journal of Accounting and Economics* 58: 142-166.
Green, T. C., R. Jame, S. Markov, and M. Subasi, 2014b. Access to Management and the Informativeness of Analyst Research. *Journal of Financial Economics* 114:239-55.
Groysberg, B., P. M. Healy, and D. A. Maber. 2011. What Drives Sell-Side Analyst Compensation at High-Status Investment Banks? *Journal of Accounting Research* 49:969-1000.
Gu, Z., and J. S. Wu. 2003. Earnings Skewness and Analyst Forecast Bias. *Journal of Accounting and Economics* 35:5-29.
Guo, H., and B. Qiu. 2016. A Better Measure of Institutional Informed Trading. *Contemporary Accounting Research* 33:815-50.
Hadlock, C. J., and J. R. Pierce. 2010. New Evidence on Measuring Financial Constraints: Moving beyond the KZ Index. *Review of Financial Studies* 23:1909-40.
Hail, L., and C. Leuz. 2009. Cost of Capital Effects and Changes in Growth Expectations around U.S. Cross-Listings. *Journal of Financial Economics* 93:428–54.
Hail, L., and C. Leuz. 2006. International Differences in the Cost of Equity Capital: Do Legal Institutions and Securities Regulation Matter? *Journal of Accounting Research* 44:485-531.
Hann, R. N., M. Ogneva, and O. Ozbas. 2013. Corporate Diversification and the Cost of Capital. *Journal of Finance* 68:1961-99.
Harris, M., and A. Raviv. 2008. A Theory of Board Control and Size. *Review of Financial Studies* 21:1797-1832.
Hermalin, B. E., and M. S. Weisbach. 1998. Endogenously Chosen Boards of Directors and Their Monitoring of the CEO. *American Economic Review* 88:96-118.
Hong, H., and J. D. Kubik. 2003. Analyzing the Analysts: Career Concerns and Biased Earnings Forecasts. *Journal of Finance* 58:313-51.
Hong, H., J. D. Kubik, and A. Solomon. 2000. Security Analysts' Career Concerns and Herding of Earnings Forecasts. *The RAND Journal of Economics* 31:121.
Hou, K., M. A. van Dijk, and Y. Zhang. 2012. The Implied Cost of Capital: A New Approach. *Journal of Accounting and Economics* 53:504-26.
Hughes, J. S., J. Liu, and J. Liu. 2007. Information Asymmetry, Diversification, and Cost of Capital. *Accounting Review* 82:705-29.
Hwang, B.-H., J. M. Liberti, and J. Sturgess. 2018. Information Sharing and Spillovers: Evidence from Financial Analysts. *Management Science*, forthcoming.
Hwang, B. H., and S. Kim. 2009. It Pays to Have Friends. *Journal of Financial Economics* 93:138-58.
Irani, R. M., and D. Oesch. 2013. Monitoring and Corporate Disclosure: Evidence from a Natural Experiment. *Journal of Financial Economics* 109:398-418.

Irvine, P.J., 2004. Analysts' forecasts and brokerage-firm trading. *The Accounting Review* 79: 125-149.
Jeffrey M. Wooldridge. 2012. Introductory Econometrics: A Modern Approach 5th Edition. *South-Western College Pub* :912.
Ke, B., and Y. Yu. 2006. The Effect of Issuing Biased Earnings Forecasts on Analysts' Access to Management and Survival. *Journal of Accounting Research* 44:965-99.
Kelly, B., and A. Ljungqvist. 2012. Testing Asymmetric-Information Asset Pricing Models. *Review of Financial Studies* 25:1366-1413.
Kramarz, F., and D. Thesmar. 2013. Social Networks in the Boardroom. *Journal of the European Economic Association* 11:780-807.
Lambert, R. A., C. Leuz, and R. E. Verrecchia. 2012. Information Asymmetry, Information Precision, and the Cost of Capital. *Review of Finance* 16:1-29.
Lambert, R., C. Leuz, and R. E. Verrecchia. 2007. Accounting Information, Disclosure, and the Cost of Capital. *Journal of Accounting Research* 45:385-420.
Lamont, O., C. Polk, and J. Saá-Requejo. 2001. Financial Constraints and Stock Returns. *Review of Financial Studies* 14:529-54.
Larcker, D. F., E. C. So, and C. C. Y. Wang. 2013. Boardroom Centrality and Firm Performance. *Journal of Accounting and Economics* 55:225-50.
Lee, C., D. Ng, and B. Swaminathan. 2009. Testing International Asset Pricing Models Using Implied Costs of Capital. *Journal of Financial and Quantitative Analysis* 44:307-35.
Leuz, C., and R. E. Verrecchia. 2000. The Economic Consequences of Increased Disclosure. *Journal of Accounting Research* 38:91-124.
Li, K. K., and P. Mohanram. 2014. Evaluating Cross-Sectional Forecasting Models for Implied Cost of Capital. *Review of Accounting Studies* 19:1152-85.
McLean D. R., and M. Zhao. 2014. The business cycle, investor sentiment, and costly external finance. *Journal of Finance* 69: 1377-1409.
Mayew,W., and M. Venkatachalam. 2012. The Power of Voice: Managerial Affective States and Future Firm Performance. *Journal of Finance* 67: 1-43.
McPherson, M., L. Smith-Lovin, and J. M. Cook. 2001. Birds of a Feather: Homophily in Social Networks. *Annual Review of Sociology* 27:415-44.
Mohanram, P. S., and S. V. Sunder. 2006. How Has Regulation FD Affected the Operations of Financial Analysts? *Contemporary Accounting Research* 23:491-525.
Mola, S., and M. Guidolin. 2009. Affiliated Mutual Funds and Analyst Optimism. *Journal of Financial Economics* 93:108-37.
Myers, S. C., and N. S. Majluf. 1984. Corporate Financing and Investment Decisions When Firms Have Information That Investors Do Not Have. *Journal of Financial Economics* 13:187-221.
Ng, S., and T. Gryta. 2017. New Wall Street Conflict: Analysts Say 'Buy' to Win Special Access for Their Clients. *Wall Street Journal*. January 19, 2017.
O'Brien, P. C., M. F. Mcnichols, and H. W. Lin. 2005. Analyst Impartiality and Investment Banking Relationships. *Journal of Accounting Research* 43:623-50.
Ohlson, J. A., and B. E. Juettner-Nauroth. 2005. Expected EPS and EPS Growth as Determinantsof Value. *Review of Accounting Studies* 10:349-65.
Ortiz-Molina, H., and G. M. Phillips. 2014. Real Asset Illiquidity and the Cost of Capital. *Journal of Financial and Quantitative Analysis* 49:1-32.
Pástor, Ľ., M. Sinha, and B. Swaminathan. 2008. Estimating the Intertemporal Risk-Return Tradeoff Using the Implied Cost of Capital. *Journal of Finance* 63:2859–97.
Phua, K., Tham, T. M., and Wei, C. 2018. Do equity analysts learn from their colleagues? *Working paper*, Nanyang Technological University, Singapore.
Raheja, C. G. 2005. Determinants of Board Size and Composition: A Theory of Corporate

Boards. *Journal of Financial and Quantitative Analysis* 40:283-306.
Solomon, D., and E. Soltes. 2015. What Are We Meeting For? The Consequences of Private Meetings with Investors. *The Journal of Law and Economics* 58:325-55.
Soltes, E. 2014. Private Interaction between Firm Management and Sell-Side Analysts. *Journal of Accounting Research* 52:245-72.
Stiglitz, J. E., and A. Weiss. 1981. Credit Rationing in Markets with Rationing Credit Information Imperfect. *The American Economic Review* 71:393-410.
Swissinfo. 2002. Credit Suisse First Boston settles up on Wall Street. Swissinfo.ch.
Westphal, J. D., and P. Khanna. 2003. Keeping Directors in Line: Social Distancing as a Control Mechanism in the Corporate Elite. *Administrative Science Quarterly* 48:361-98.
Whited, T. M., and G. Wu. 2006. Financial Constraints Risk. *Review of Financial Studies* 19:531-59.

Table 1. Summary Statistics

This table reports the summary statistics. The sample consists of 7,291 firm-year observations from 2001 to 2016. All continuous variables are winsorized at the 1st and 99th percentiles. Detailed descriptions of variables are provided in Table A1 in the Appendix.

Variable	Obs	Mean	P25	Median	P75	Std. Dev.
Cost of Equity (%)	7291	10.090	8.124	9.398	11.163	3.125
Connected?	7291	0.656	0.000	1.000	1.000	0.475
#Connection_Type	7291	1.122	0.000	1.000	2.000	0.948
#Brokers_Connected	7291	1.064	0.000	1.000	2.000	1.014
#Connections	7291	1.675	0.000	1.000	3.000	1.765
Size	7291	7.878	6.621	7.838	9.023	1.675
Market-to-Book	7291	3.588	1.702	2.713	4.318	4.701
Leverage	7291	0.214	0.028	0.195	0.331	0.189
Profitability	7291	0.052	0.025	0.058	0.097	0.096
Investment	7291	0.163	0.006	0.080	0.192	0.368
Beta	7291	1.125	0.807	1.073	1.385	0.470
Past Return (%)	7291	18.090	-10.306	12.028	36.722	48.906
Forecast Dispersion	7291	0.201	0.023	0.048	0.121	0.618
Analyst Following	7291	12.205	6.000	11.000	17.000	7.607

Table 2. The Effect of Firm-brokerage social connections on Firms' Cost of Equity

This table reports the relation between firms' social connections with analysts and firms' cost of equity capital where social connections are measured using an indicator variable capturing whether a firm is socially connected with analysts (*Connected?*) in Column (1), the number of social connection types (*#Connection_Type*) in Column (2), the number of connected brokerage houses (*#Brokers_Connected*) in Column (3), and the total number of social connections (*#Connections*) in Column (4). All standard errors are clustered at the firm level. *t*-statistics are in parentheses. ∗ indicates significance at the 10% level; ∗∗ significance at 5%; ∗∗∗ significance at 1%. Variable definitions are provided in Table A1 in the Appendix.

	(1)	(2)	(3)	(4)
Connected?$_{t-1}$	-0.265***			
	(-2.61)			
#Connection_Type $_{t-1}$		-0.137**		
		(-2.49)		
#Brokers_Connected $_{t-1}$			-0.139***	
			(-3.05)	
#Connections $_{t-1}$				-0.070**
				(-2.56)
Size $_{t-1}$	-0.011	-0.002	-0.007	-0.005
	(-0.23)	(-0.05)	(-0.14)	(-0.10)
Market-to-Book $_{t-1}$	-0.069***	-0.068***	-0.069***	-0.069***
	(-6.12)	(-6.07)	(-6.08)	(-6.05)
Leverage $_{t-1}$	2.711***	2.698***	2.690***	2.683***
	(8.00)	(7.96)	(7.93)	(7.90)
Profitability $_{t-1}$	-3.847***	-3.859***	-3.875***	-3.865***
	(-6.59)	(-6.60)	(-6.66)	(-6.61)
Investment $_{t-1}$	-0.033	-0.031	-0.018	-0.022
	(-0.31)	(-0.29)	(-0.17)	(-0.21)
Beta $_{t-1}$	0.561***	0.563***	0.559***	0.561***
	(5.21)	(5.21)	(5.17)	(5.19)
Past Stock Return $_{t-1}$	-0.001	-0.001	-0.001	-0.001
	(-1.02)	(-1.00)	(-1.02)	(-1.01)
Forecast Dispersion $_{t-1}$	0.258***	0.256***	0.258***	0.257***
	(3.36)	(3.34)	(3.37)	(3.35)
Number of Analysts $_{t-1}$	-0.043***	-0.043***	-0.041***	-0.042***
	(-4.97)	(-4.91)	(-4.54)	(-4.71)
Industry FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Obs	7291	7291	7291	7291
Adj.R2	0.228	0.228	0.228	0.228

Table 3. The Effect of Different Social-Connection Types on Firms' Cost of Equity

This table reports the relation between firms' social connections with analysts and firms' cost of equity capital where social connections are derived from education (Column (1)), past employment (Column (2)) and social activity (Column (3)). All standard errors are clustered at the firm level. *t*-statistics are in parentheses. ∗ indicates significance at the 10% level; ∗∗ significance at 5%; ∗∗∗ significance at 1%. Variable definitions are provided in Table A1 in the Appendix.

	(1)	(2)	(3)
Education $_{t-1}$	-0.054		
	(-0.35)		
Employment $_{t-1}$		-0.167*	
		(-1.78)	
Social Activity $_{t-1}$			-0.250***
			(-2.60)
Size $_{t-1}$	-0.038	-0.019	-0.008
	(-0.86)	(-0.41)	(-0.16)
Market-to-Book $_{t-1}$	-0.070***	-0.069***	-0.069***
	(-6.19)	(-6.13)	(-6.07)
Leverage $_{t-1}$	2.686***	2.693***	2.685***
	(7.91)	(7.95)	(7.91)
Profitability $_{t-1}$	-3.851***	-3.857***	-3.861***
	(-6.58)	(-6.59)	(-6.61)
Investment $_{t-1}$	-0.027	-0.030	-0.025
	(-0.25)	(-0.28)	(-0.23)
Beta $_{t-1}$	0.564***	0.562***	0.561***
	(5.23)	(5.20)	(5.20)
Past Stock Return $_{t-1}$	-0.001	-0.001	-0.001
	(-0.97)	(-1.01)	(-0.98)
Forecast Dispersion $_{t-1}$	0.250***	0.253***	0.256***
	(3.28)	(3.31)	(3.34)
Number of Analysts $_{t-1}$	-0.046***	-0.044***	-0.044***
	(-5.23)	(-5.06)	(-5.01)
Industry FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Obs	7291	7291	7291
Adj.R2	0.227	0.228	0.228

Table 4. Soft Information

This table presents the results of the effect of firms' social connections with analysts on firms' cost of equity capital conditional on firms' soft information related to research and development, mergers and acquisitions, product market competition, and equity raising. All standard errors are clustered at the firm level. *t*-statistics are in parentheses. ∗ indicates significance at the 10% level; ∗∗ significance at 5%; ∗∗∗ significance at 1%. Variable definitions are provided in Table A1 in the Appendix.

	Connected?	#Connection_ Type	#Brokers_ Connected	#Connections
R&D				
× $R\&D_{t-1}$	-1.646	-0.776	-0.971**	-0.338*
	(-1.14)	(-1.03)	(-2.03)	(-1.78)
Control Variables	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Obs	7291	7291	7291	7291
Adj.R2	0.234	0.234	0.234	0.233
M&A				
× MA_Value_{t-1}	-0.488**	-0.226*	-0.154**	-0.126**
	(-1.98)	(-1.84)	(-2.14)	(-2.16)
Control Variables	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Obs	7291	7291	7291	7291
Adj.R2	0.233	0.233	0.235	0.235
Product Market Competition				
× $Fluidity_{t-1}$	-0.022	-0.007	-0.008	-0.002
	(-0.87)	(-0.62)	(-0.81)	(-0.45)
Control Variables	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Obs	7141	7141	7141	7141
Adj.R2	0.234	0.234	0.235	0.235
Equity Raising				
× $Equity\_Raising_{t-1}$	-0.288*	-0.080	-0.168**	-0.091*
	(-1.68)	(-0.85)	(-2.01)	(-1.71)
Control Variables	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Obs	5797	5797	5797	5797
Adj.R2	0.243	0.243	0.243	0.237

Table 5. Information Environment

This table presents the results of the effect of firms' social connections with analysts on firms' cost of equity capital conditional on the firm's information environment where firms' information environment is proxied by firm size, firms' idiosyncratic volatility, analyst earnings forecast dispersion, and probability of informed trading. All standard errors are clustered at the firm level. *t*-statistics are in parentheses. ∗ indicates significance at the 10% level; ∗∗ significance at 5%; ∗∗∗ significance at 1%. Variable definitions are provided in Table A1 in the Appendix.

	Connected?	#Connection_ Type	#Brokers_ Connected	#Connections
Firm Size				
× *Small_Size* $_{t-1}$	-0.401**	-0.179*	-0.228***	-0.148**
	(-2.08)	(-1.71)	(-2.62)	(-2.44)
Control Variables	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Obs	7291	7291	7291	7291
Adj.R2	0.229	0.229	0.229	0.229
Idiosyncratic volatility				
× *High_IV* $_{t-1}$	-0.601***	-0.261***	-0.323***	-0.151***
	(-3.58)	(-2.99)	(-4.59)	(-3.57)
Control Variables	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Obs	7129	7129	7129	7129
Adj.R2	0.239	0.239	0.240	0.239
Analyst earnings forecast dispersion				
× *High_Dispersion* $_{t-1}$	-0.330**	-0.094	-0.237***	-0.086**
	(-1.98)	(-1.10)	(-3.30)	(-2.01)
Control Variables	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Obs	7291	7291	7291	7291
Adj.R2	0.238	0.237	0.239	0.237
Probability of informed trading				
× *High_PIN* $_{t-1}$	-0.288*	-0.080	-0.168**	-0.091*
	(-1.68)	(-0.85)	(-2.01)	(-1.71)
Control Variables	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Obs	5797	5797	5797	5797
Adj.R2	0.243	0.243	0.243	0.237

Table 6. Financial Constraints

This table presents the results of the effect of firms' social connections with analysts on firms' cost of equity capital conditional on firms' financial constraints where financial constraints are measured based on Whited-Wu Index, Hadlock-Pierce Index, Kaplan-Zingales Index and whether the firm is a non-dividend-payer. All standard errors are clustered at the firm level. *t*-statistics are in parentheses. * indicates significance at the 10% level; ** significance at 5%; *** significance at 1%. Variable definitions are provided in Table A1 in the Appendix.

	Connected?	#Connection_ Type	#Brokers_ Connected	#Connections
Whited-Wu Index				
× *High_WW* $_{t-1}$	-0.440**	-0.195**	-0.167**	-0.093**
	(-2.56)	(-2.18)	(-2.27)	(-2.18)
Control Variables	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Obs	7010	7010	7010	7010
Adj.R2	0.231	0.231	0.231	0.230
Hadlock-Pierce Index				
× *High_HP* $_{t-1}$	-0.311*	-0.140	-0.157**	-0.084*
	(-1.71)	(-1.6)	(-2.01)	(-1.77)
Control Variables	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Obs	7039	7039	7039	7039
Adj.R2	0.229	0.229	0.229	0.229
Kaplan-Zingales Index				
× *High_KZ* $_{t-1}$	-0.002	-0.018	-0.072	-0.055
	(-0.01)	(-0.21)	(-1.01)	(-1.36)
Control Variables	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Obs	6514	6514	6514	6514
Adj.R2	0.233	0.232	0.233	0.232
Non-dividend Payer				
× *Non_Dividend_Payer* $_{t-1}$	-0.040	-0.191***	-0.161**	-0.086*
	(-0.52)	(-2.65)	(-2.12)	(-1.90)
Control Variables	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Obs	7291	7291	7291	7291
Adj.R2	0.228	0.228	0.229	0.229

Table 7. Corporate Governance

This table presents the results of the effect of firms' social connections with analysts on firms' cost of equity capital conditional on firms' corporate governance where firms' corporate governance is proxied by hostile takeover index, institutional ownership, board independence and CEO pay-for-performance sensitivity. All standard errors are clustered at the firm level. *t*-statistics are in parentheses. ∗ indicates significance at the 10% level; ∗∗ significance at 5%; ∗∗∗ significance at 1%. Variable definitions are provided in Table A1 in the Appendix.

	Connected?	#Connection_ Type	#Brokers_ Connected	#Connections
Hostile Takeover Index				
× *Low_Takeover_Threat* $_{t-1}$	-0.216	-0.244	-0.157**	-0.079*
	(-1.16)	(-1.54)	(-2.01)	(-1.73)
Control Variables	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Obs	6718	6718	6718	6718
Adj.R2	0.230	0.230	0.230	0.230
Institutional Ownership				
× *Low_IO* $_{t-1}$	-0.508***	-0.269***	-0.157**	-0.109***
	(-2.92)	(-3.15)	(-2.18)	(-2.68)
Control Variables	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Obs	6913	6913	6913	6913
Adj.R2	0.239	0.239	0.239	0.239
Board Independence				
× *Low_Independence* $_{t-1}$	-0.343**	-0.197**	-0.190***	-0.107***
	(-2.03)	(-2.35)	(-2.71)	(-2.64)
Control Variables	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Obs	7243	7243	7243	7243
Adj.R2	0.230	0.230	0.230	0.230
CEO Pay-For-Performance Sensitivity				
× *Low_CEO_PPS* $_{t-1}$	-0.338**	-0.134*	-0.136**	-0.067*
	(-2.00)	(-1.74)	(-2.01)	(-1.66)
Control Variables	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Obs	5783	5783	5783	5783
Adj.R2	0.256	0.257	0.257	0.257

Table 8. Difference-in-Differences Regressions

This table presents the difference-in-differences regression results for brokerage exit and exogenous CEO turnover. Columns 1, 2, 5, and 6 present the results based on placebo shocks, in which we falsely assume that the brokerage exit or CEO turnover (i.e., the treatment) occurs three years or two years before it actually does. Columns 3, 4, 7 and 8 present the results based on actual brokerage exit or CEO turnover. All standard errors are clustered at the firm level. *t*-statistics are in parentheses. ∗ indicates significance at the 10% level; ∗∗ significance at 5%; ∗∗∗ significance at 1%. Variable definitions are provided in Table A1 in the Appendix.

	Brokerage Exit				CEO Turnover			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Placebo		Actual		Placebo		Actual	
	3yr before	2yr before			3yr before	2yr before		
Treat × Post$_{t-1}$	-0.001	0.001	1.134**	1.217**	-0.015	0.007	1.549***	1.339***
	(-0.15)	(0.37)	(2.49)	(2.52)	(-0.79)	(1.08)	(3.54)	(3.32)
Size $_{t-1}$				1.565**				1.618*
				(2.04)				(1.81)
Market-to-Book $_{t-1}$				0.051				-0.067
				(1.38)				(-0.73)
Leverage $_{t-1}$				2.717				-0.269
				(1.48)				(-0.14)
Profitability $_{t-1}$				4.259				1.449
				(1.61)				(0.67)
Investment $_{t-1}$				-0.345				0.230
				(-0.99)				(0.52)
Beta $_{t-1}$				-0.550				-1.075***
				(-1.14)				(-3.08)
Past Stock Return $_{t-1}$				0.005				-0.006
				(1.19)				(-1.45)
Forecast Dispersion $_{t-1}$				-0.007				-0.268
				(-0.01)				(-1.19)
Number of Analysts $_{t-1}$				-0.017				-0.044

				(-0.44)				(-0.94)
Firm-Cohort FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year-Cohort FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Obs	666	680	688	688	644	650	660	660
Adj.R2	0.413	0.365	0.406	0.438	0.349	0.378	0.332	0.343

Table 9. 2SLS Instrumental-Variable Regressions

This table presents the 2SLS regression results for brokerage exit (Panel A) and exogenous CEO turnover (Panel B). Columns (1) to (4) of Panels A and B present the first-stage regression results, whereas Columns (5) to Columns (8) of Panels A and B present the second-stage regression results. All standard errors are clustered at the firm level. *t*-statistics are in parentheses. ∗ indicates significance at the 10% level; ∗∗ significance at 5%; ∗∗∗ significance at 1%. Variable definitions are provided in Table A1 in the Appendix.

Panel A. Brokerage Exit

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Connected?	#Connection_Type	#Brokers_Connected	#Connections	Cost of Equity			
	1st Stage				2nd Stage			
Connected? $_{t-1}$					-6.235**			
					(-2.53)			
#Connection_Type $_{t-1}$						-3.839***		
						(-2.66)		
#Brokers_Connected $_{t-1}$							-2.542**	
							(-2.36)	
#Connections $_{t-1}$								-1.571**
								(-2.46)
Instrumental Variable								
Treat*Post $_{t-1}$	-0.172***	-0.264***	-0.389***	-0.775***				
	(-3.10)	(-2.69)	(-2.89)	(-3.53)				
Size $_{t-1}$	-0.043	0.025	-0.083	-0.026	1.261	1.682	1.306	1.525*
	(-0.46)	(0.17)	(-0.49)	(-0.10)	(1.11)	(1.45)	(1.29)	(1.66)
Market-to-Book $_{t-1}$	0.010	0.011	-0.003	-0.009	0.125	0.102	0.041	0.037
	(1.32)	(1.10)	(-0.22)	(-0.39)	(1.51)	(1.44)	(0.65)	(0.69)
Leverage $_{t-1}$	-0.191	-0.121	0.375	0.519	1.363	2.160	3.889	3.532
	(-0.72)	(-0.32)	(0.79)	(0.82)	(0.49)	(0.82)	(1.49)	(1.55)
Profitability $_{t-1}$	-0.036	-0.075	0.606	0.639	4.000	3.914	6.155**	5.262*
	(-0.24)	(-0.23)	(1.48)	(0.91)	(1.34)	(1.31)	(2.00)	(1.83)

Investment $_{t-1}$	-0.004	0.040	-0.016	0.100	-0.371	-0.163	-0.395	-0.189
	(-0.09)	(0.61)	(-0.18)	(0.58)	(-0.76)	(-0.32)	(-0.90)	(-0.43)
Beta $_{t-1}$	-0.021	-0.098	-0.223**	-0.287*	-0.701	-1.001	-1.248*	-1.001
	(-0.41)	(-1.12)	(-2.33)	(-1.86)	(-1.05)	(-1.36)	(-1.70)	(-1.62)
Past Stock Return $_{t-1}$	0.000	-0.001	-0.001	-0.001	0.006	0.001	0.003	0.003
	(0.14)	(-0.87)	(-0.55)	(-0.71)	(1.02)	(0.20)	(0.48)	(0.52)
Forecast Dispersion $_{t-1}$	0.008	0.001	0.073	0.099	0.049	-0.000	0.222	0.148
	(0.13)	(0.01)	(0.89)	(0.76)	(0.07)	(-0.00)	(0.35)	(0.27)
Number of Analysts $_{t-1}$	0.009*	0.004	0.034***	0.043*	0.049	-0.000	0.091	0.051
	(1.93)	(0.37)	(2.60)	(1.82)	(0.77)	(-0.00)	(1.08)	(0.77)
Firm-Cohort FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year-Cohort FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Obs	688	688	688	688	688	688	688	688
Adj.R2	0.567	0.670	0.560	0.627	0.481	0.414	0.494	0.570

Panel B. Exogenous CEO Turnover

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Connected?	#Connection _Type	#Brokers_ Connected	#Connections	Cost of Equity			
	1st Stage				2nd Stage			
Connected? $_{t-1}$					-12.35			
					(-0.20)			
#Connection_Type $_{t-1}$						-2.707**		
						(-2.24)		
#Brokers_Connected $_{t-1}$							-2.424*	
							(-1.89)	
#Connections $_{t-1}$								-1.243**
								(-2.36)
Instrumental Variable								
Treat*Post $_{t-1}$	-0.108	-0.576***	-0.552**	-1.368***				
	(-0.88)	(-2.94)	(-2.20)	(-3.20)				
Size $_{t-1}$	0.046	0.176	0.301	0.189	1.044	2.028**	2.348**	1.803**
	(0.38)	(0.92)	(1.44)	(0.68)	(1.12)	(2.07)	(2.37)	(1.99)
Market-to-Book $_{t-1}$	0.002	-0.010	-0.009	-0.046	-0.065	-0.091	-0.090	-0.113
	(0.19)	(-0.43)	(-0.46)	(-1.08)	(-0.7)	(-0.96)	(-0.88)	(-1.14)
Leverage $_{t-1}$	0.791**	0.473	-0.011	0.773	1.01	0.829	-0.296	0.487
	(2.38)	(0.77)	(-0.01)	(0.61)	(0.54)	(0.34)	(-0.11)	(0.21)
Profitability $_{t-1}$	0.288	1.286**	0.561	1.467	5.27	4.437	2.808	2.885
	(1.04)	(2.49)	(0.99)	(1.17)	(1.48)	(1.57)	(1.09)	(1.18)
Investment $_{t-1}$	0.002	-0.014	0.217**	0.123	0.119	0.197	0.757	0.350
	(0.03)	(-0.11)	(2.20)	(0.61)	(0.03)	(0.33)	(1.28)	(0.70)
Beta $_{t-1}$	0.108	-0.010	0.039	-0.281	-1.27	-1.099**	-0.980*	-1.350***
	(1.37)	(-0.09)	(0.30)	(-1.13)	(-3.71)	(-2.53)	(-1.92)	(-2.83)
Past Stock Return $_{t-1}$	-0.000	-0.001	0.000	-0.000	-0.002	-0.007	-0.005	-0.006
	(-0.12)	(-0.68)	(0.07)	(-0.16)	(-0.91)	(-1.55)	(-1.03)	(-1.19)

Forecast Dispersion $_{t-1}$	0.035	0.067	0.039	-0.013	-0.129	-0.112	-0.173	-0.281
	(1.04)	(0.99)	(0.88)	(-0.14)	(-0.23)	(-0.38)	(-0.67)	(-1.06)
Number of Analysts $_{t-1}$	-0.009	-0.008	-0.016	-0.002	-0.068	-0.062	-0.083	-0.047
	(-1.33)	(-0.75)	(-1.36)	(-0.11)	(-1.5)	(-1.19)	(-1.39)	(-0.86)
Firm-Cohort FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year-Cohort FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Obs	660	660	660	660	660	660	660	660
Adj.R2	0.662	0.739	0.752	0.731	0.347	0.613	0.599	0.672

Table 10. Firm Fixed-Effects Regressions

This table presents the firm fixed-effect regression results of the effect of firms' social connections with analysts on firms' cost of equity capital. All standard errors are clustered at the firm level. *t*-statistics are in parentheses. ∗ indicates significance at the 10% level; ∗∗ significance at 5%; ∗∗∗ significance at 1%. Variable definitions are provided in Table A1 in the Appendix.

	(1)	(2)	(3)	(4)
Connected? $_{t-1}$	-0.166*			
	(-1.72)			
#Connection_Type $_{t-1}$		-0.105**		
		(-2.06)		
#Brokers_Connected $_{t-1}$			-0.097**	
			(-2.43)	
#Connections $_{t-1}$				-0.052**
				(-2.19)
Size $_{t-1}$	0.495***	0.494***	0.499***	0.495***
	(3.54)	(3.53)	(3.57)	(3.54)
Market-to-Book $_{t-1}$	-0.024*	-0.024*	-0.024*	-0.024*
	(-1.89)	(-1.88)	(-1.88)	(-1.87)
Leverage $_{t-1}$	1.474***	1.478***	1.463***	1.466***
	(3.13)	(3.13)	(3.10)	(3.11)
Profitability $_{t-1}$	-1.261*	-1.255*	-1.272*	-1.260*
	(-1.92)	(-1.91)	(-1.94)	(-1.92)
Investment $_{t-1}$	-0.051	-0.049	-0.044	-0.045
	(-0.48)	(-0.47)	(-0.42)	(-0.42)
Beta $_{t-1}$	-0.095	-0.093	-0.094	-0.093
	(-0.96)	(-0.94)	(-0.96)	(-0.94)
Past Stock Return $_{t-1}$	-0.001	-0.001	-0.001	-0.001
	(-0.99)	(-0.99)	(-1.00)	(-1.00)
Forecast Dispersion $_{t-1}$	0.018	0.017	0.019	0.018
	(0.24)	(0.23)	(0.25)	(0.24)
Number of Analysts $_{t-1}$	-0.008	-0.007	-0.006	-0.007
	(-0.84)	(-0.82)	(-0.67)	(-0.74)
Firm FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Obs	7291	7291	7291	7291
Adj.R2	0.444	0.444	0.444	0.444

Table 11. Alternative Cost-of-Equity Measures

This table presents the results of the effect of firm-brokerage social connections on firms' cost of equity using alternative measures of cost of equity, including estimating cost of equity using earnings forecasted from the residual income model by Li and Monhanram (2014) (Panel A) and from the Hou, Van Dijk and Zhang (2012) model (Panel B), using Fama-French three-factor model (Panel C) and excluding firms with analysts' forecast bias in the top 30% of the distribution (Panel D). All standard errors are clustered at the firm level. *t*-statistics are in parentheses. ∗ indicates significance at the 10% level; ∗∗ significance at 5%; ∗∗∗ significance at 1%. Variable definitions are provided in Table A1 in the Appendix.

Panel A. Cost of equity estimated using earnings forecasted from the RI model

	(1)	(2)	(3)	(4)
Connected? $_{t-1}$	-0.941**			
	(-2.18)			
#Connection_Type $_{t-1}$		-0.713***		
		(-3.21)		
#Brokers_Connected $_{t-1}$			-0.367**	
			(-1.99)	
#Connections $_{t-1}$				-0.318***
				(-2.90)
Control variables	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Obs	6284	6284	6284	6284
Adj.R2	0.117	0.118	0.117	0.117

Panel B. Cost of equity estimated using earnings forecasted from the HVZ model

	(1)	(2)	(3)	(4)
Connected? $_{t-1}$	-1.079***			
	(-2.59)			
#Connection_Type $_{t-1}$		-0.802***		
		(-3.67)		
#Brokers_Connected $_{t-1}$			-0.722***	
			(-3.75)	
#Connections $_{t-1}$				-0.452***
				(-3.82)
Control variables	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Obs	6280	6280	6280	6280
Adj.R2	0.116	0.118	0.118	0.118

Panel C. Cost of equity estimated using Fama-French three-factor model

	(1)	(2)	(3)	(4)
Connected? $_{t-1}$	-0.410***			
	(-2.12)			
#Connection_Type $_{t-1}$		-0.219***		
		(-2.05)		
#Brokers_Connected $_{t-1}$			-0.225***	
			(-2.41)	
#Connections $_{t-1}$				-0.131***
				(-2.31)
Control variables	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Obs	7291	7291	7291	7291
Adj.R2	0.252	0.252	0.252	0.252

Panel D. Excluding firms with analysts' forecast bias in the top 30% of the distribution

	(1)	(2)	(3)	(4)
Connected? $_{t-1}$	-0.264**			
	(-2.29)			
#Connection_Type $_{t-1}$		-0.139**		
		(-2.32)		
#Brokers_Connected $_{t-1}$			-0.133***	
			(-2.76)	
#Connections $_{t-1}$				-0.066**
				(-2.39)
Control variables	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Obs	5091	5091	5091	5091
Adj.R2	0.244	0.244	0.245	0.244

Appendix

Table A1. Variable Definitions

Variables	Definitions
Cost of Equity	The average of cost of equity estimates (in percentage points) from four models, including Claus and Thomas (2001), Gebhardt, Lee and Swaminathan (2001), Ohlson and Juettner-Nauroth (2005) and Easton (2004). Data are from IBES, Compustat and CRSP.
Connected?	An indicator for the existence of any types of social connections between a firm and at least one broker among those who follow the firm (BoardEx).
#Connection_Type	The number of brokerage houses that follow the firm and are socially connected with the focal firm (BoardEx).
#Brokers_Connected	The number of brokerage houses that follow the firm and are socially connected with the focal firm (BoardEx).
#Connections	The total number of social connections between a focal firm and individual brokerage houses (BoardEx).
Education	An indicator for the existence of educational ties between a firm and at least one broker among those who follow the firm (BoardEx).
Employment	An indicator for the existence of employment ties between a firm and at least one broker among those who follow the firm (BoardEx).
Social Activity	An indicator for the existence of social activity ties between a firm and at least one broker among those who follow the firm (BoardEx).
Size	The natural logarithm of total assets (Compustat: AT) in $ millions (adjusted for 2016 real dollars).
Market-to-Book	Market value of equity divide by book value of equity (Compustat: CSHO*PRCC_F/CEQ).
Profitability	Income before extraordinary items scaled by total assets (Compustat: IB/AT).
Leverage	The total of long-term debt and debt in current liabilities divided by total assets (Compustat: (DLTT+DLC)/AT).
Investment	Following Cooper, Gulen and Schill (2008), the firm-level asset investment is measured in 1-year percentage change in total firm assets (Compustat: (AT-lagged AT)/lagged AT)
Beta	Market beta obtained from regressions of a firm's monthly excess stock returns on the corresponding CRSP value-weighted index excess returns using at least 24 months and up to 60 months ending in June of each year. Excess returns are monthly returns minus the 1-month Treasury bill rate (CRSP).

Past Stock Return	Firm's buy-and-hold stock return in percentage points for the financial year (CRSP).
Forecast Dispersion	The monthly average of the inter-analyst standard deviation of analyst earnings forecasts scaled by absolute mean forecasts for a year (IBES)
Analyst Following	The number of analysts following a firm during a year (IBES)
Idiosyncratic Volatility	Following Ang, Hodrick, Xing and Zhang (2006), idiosyncratic volatility is calculated as the standard deviation of the residuals from regressing the stock's returns in excess of the one-month Treasury bill rate on the Fama-French (1993) 3 factors (CRSP).
Probability of Informed Trading (PIN)	Easley, Hvidkjaer, and O'Hara's (2002) probability of informed trading measure (TAQ)
Small_Size	An indicator variable that equals 1 if the firm's size is below the median of the year, and 0 otherwise
High_IV	An indicator variable that equals 1 if firms' idiosyncratic volatility is above the median of the year, and 0 otherwise
High_Dispersion	An indicator variable that equals 1 if analyst forecast dispersion is above the median of the year, and 0 otherwise
High_PIN	An indicator variable that equals 1 if the probability of informed trading (PIN) is above the median of the year, and 0 otherwise
Kaplan-Zingales Index	As –1.001909[(IB + DP)/lagged PPENT] + 0.2826389[(AT + PRCC_F×CSHO - CEQ - TXDB)/AT] + 3.139193[(DLTT + DLC)/(DLTT + DLC + SEQ)] – 39.3678[(DVC + DVP)/lagged PPENT] – 1.314759[CHE/lagged PPENT], where all variables are Compustat data items.
Whited-Wu Index	As –0.091 [(IB + DP)/AT] – 0.062[indicator set to one if DVC + DVP is positive, and zero otherwise] + 0.021[DLTT/AT] – 0.044[log(AT)] + 0.102[average industry sales growth, estimated separately for each three-digit SIC industry and each year, with sales growth defined as above] – 0.035[sales growth], where all variables are Compustat data items.
Hadlock-Pierce Index	As –0.737Size + 0.043Size2 – 0.040Age, where Size equals the log of inflation-adjusted Compustat item AT (in 2016 dollars), and Age is the number of years the firm is listed with a non-missing stock price on Compustat. In calculating the index, we follow Hadlock and Pierce and cap Size at (the log of) $4.5 billion and Age at 37 years.
Non-Dividend Payer	Takes value of 1 if a firm pays no dividends at the end of the fiscal year, and 0 otherwise (Compustat: DVC).

High_WW	An indicator variable that equals 1 if the firm's financial constraints level calculated based on the Whited-Wu Index is above the median of the year, and 0 otherwise.
High_HP	An indicator variable that equals 1 if the firm's financial constraints level calculated based on the Hadlock-Pierce Index is above the median of the year, and 0 otherwise.
High_KZ	An indicator variable that equals 1 if the firm's financial constraints level calculated based on the Kaplan-Zingales Index is above the median of the year, and 0 otherwise.
Hostile Takeover Index	The firm-level index of takeover susceptibility by Cain, McKeon and Solomon (2017).
Board Independence	The percentage of independent directors on board (Execucomp).
Institutional Ownership	The fraction of shares outstanding held by all institutional investors (Thomson Reuters 13F)
CEO Pay-for-Performance Sensitivity	The fraction of performance pay relative to total compensation (Compustat: ExecuComp (TDC1-SALARY)/TDC1).
Low_Takeover_Threat	An indicator variable that equals 1 if the firm's takeover threats are below the median of the year, and 0 otherwise.
Low_IO	An indicator variable that equals 1if the firm's institutional ownership is below the median of the year, and 0 otherwise.
Low_Independence	An indicator variable that equals 1 if the firm's board independence is below the median of the year, and 0 otherwise.
Low_CEO_PPS	An indicator variable that equals 1 if the firm's CEO pay-for-performance-sensivity is below the median of the year, and 0 otherwise.
R&D	Research and Development expenses scaled by total assets (Compustat: XRD/AT).
MA_Value	The total value of M&A transactions the firm made in the year scaled by total assets (Compustat; Thomson One SDC).
Fluidity	Hoberg, Phillips and Prabhala's (2014) product market fluidity measure.
Equity_Raising	Following McLean and Zhao (2014), the change in book equity, plus the change in deferred taxes, minus the change in retained earnings, all scaled by lagged assets (Compustat: (ΔCEQ + ΔTXDB - ΔRE)/lagged AT).

Table A2. Sample Brokerage Houses

This table reports the names of the twenty-three brokerage houses in the sample.

Names of Brokerages
BEAR, STEARNS & CO.
BGC PARTNERS
CANACCORD GENUITY
CHARDAN CAPITAL MARKETS
CRT CAPITAL GROUP
DAIWA CAPITAL MARKETS AMERICA
EVERCORE PARTNERS
GLEACHER & CO. (HISTORICAL)
GOLDMAN SACHS & CO.
IMPERIAL CAPITAL, LLC
LADENBURG, THALMANN & CO., INC.
LAURENTIAN BANK SECURITIES
MORGAN JOSEPH TRIARTISAN - HISTORICAL
MORGAN STANLEY
MORNINGSTAR, INC.
PIPER JAFFRAY
SANDLER O'NEILL & PARTNERS L.P.
SCO GROUP, LLC
SIMMONS & COMPANY INTERNATIONAL
SUNTRUST ROBINSON HUMPHREY
TECHNOLOGY RESEARCH GROUP
THOMAS WEISEL PARTNERS (HIST)
WELLS FARGO SECURITIES, LLC

Table A3. Baseline Regression Results in a Broad Compustat/CRSP/IBES Merged Sample

This table reports the relation between firms' social connections with analysts and firms' cost of equity capital for all firms (both with and without history of social connections) in a merged sample from Compustat/CRSP/IBES. Social connections are measured using an indicator variable capturing whether a firm is socially connected with analysts (*Connected?*) in Column (1), the number of social connection types (*#Connection_Type*) in Column (2), the number of connected brokerage houses (*#Brokers_Connected*) in Column (3), and the total number of social connections (*#Connections*) in Column (4). All standard errors are clustered at the firm level. *t*-statistics are in parentheses. ∗ indicates significance at the 10% level; ∗∗ significance at 5%; ∗∗∗ significance at 1%. Variable definitions are provided in Table A1 in the Appendix.

	(1)	(2)	(3)	(4)
Connected? $_{t-1}$	-0.596***			
	(-7.02)			
#Connection_Type $_{t-1}$		-0.264***		
		(-5.69)		
#Brokers_Connected $_{t-1}$			-0.236***	
			(-5.43)	
#Connections $_{t-1}$				-0.111***
				(-4.31)
Size $_{t-1}$	-0.164***	-0.163***	-0.165***	-0.166***
	(-5.65)	(-5.58)	(-5.68)	(-5.68)
Market-to-Book $_{t-1}$	-0.098***	-0.098***	-0.099***	-0.099***
	(-9.47)	(-9.48)	(-9.52)	(-9.54)
Leverage $_{t-1}$	3.005***	3.004***	2.998***	3.001***
	(11.77)	(11.77)	(11.75)	(11.75)
Profitability $_{t-1}$	-5.030***	-5.031***	-5.032***	-5.027***
	(-11.97)	(-11.96)	(-11.98)	(-11.95)
Investment $_{t-1}$	0.274***	0.273***	0.280***	0.277***
	(3.08)	(3.06)	(3.14)	(3.10)
Beta $_{t-1}$	0.185**	0.187**	0.187**	0.189**
	(2.52)	(2.53)	(2.54)	(2.57)
Past Stock Return $_{t-1}$	-0.003***	-0.003***	-0.003***	-0.003***
	(-5.07)	(-5.05)	(-5.07)	(-5.05)
Forecast Dispersion $_{t-1}$	0.332***	0.332***	0.333***	0.333***
	(7.08)	(7.08)	(7.09)	(7.09)
Number of Analysts $_{t-1}$	-0.074***	-0.076***	-0.076***	-0.078***
	(-12.76)	(-13.03)	(-12.96)	(-13.31)
Industry FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Obs	31024	31024	31024	31024
Adj.R2	0.170	0.169	0.169	0.169

Table A4. The Effect of Firm-brokerage social connections on Firms' Equity Valuation

This table reports the relation between firms' social connections with analysts and firms' market-to-book equity ratio (*Market-to-Book*) where social connections are measured using an indicator variable capturing whether a firm is socially connected with analysts (*Connected?*) in Column (1), the number of social connection types (*#Connection_Type*) in Column (2), the number of connected brokerage houses (*#Brokers_Connected*) in Column (3), and the total number of social connections (*#Connections*) in Column (4). All standard errors are clustered at the firm level. *t*-statistics are in parentheses. ∗ indicates significance at the 10% level; ∗∗ significance at 5%; ∗∗∗ significance at 1%. Variable definitions are provided in Table A1 in the Appendix.

	(1)	(2)	(3)	(4)
Connected?	0.422***			
	(3.16)			
#Connection_Type		0.319***		
		(3.90)		
#Brokers_Connected			0.233***	
			(3.24)	
#Connections				0.184***
				(4.07)
Size	-0.516***	-0.556***	-0.525***	-0.561***
	(-6.18)	(-6.46)	(-6.22)	(-6.55)
Leverage	0.933	0.942	0.966	0.977
	(1.09)	(1.10)	(1.12)	(1.14)
Profitability	6.019***	6.036***	6.064***	6.053***
	(5.38)	(5.39)	(5.43)	(5.41)
Investment	0.620***	0.620***	0.598***	0.600***
	(3.80)	(3.81)	(3.65)	(3.65)
Beta	0.179	0.178	0.184	0.183
	(1.10)	(1.09)	(1.13)	(1.12)
Past Stock Return	0.014***	0.014***	0.014***	0.014***
	(8.50)	(8.47)	(8.51)	(8.50)
Forecast Dispersion	-0.046	-0.048	-0.047	-0.051
	(-0.46)	(-0.48)	(-0.47)	(-0.50)
Number of Analysts	0.116***	0.113***	0.111***	0.109***
	(8.29)	(8.07)	(7.85)	(7.74)
Industry FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Obs	7291	7291	7291	7291
Adj.R2	0.120	0.121	0.120	0.121