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BILL B. FRANCIS, NING REN, XIAN SUN, AND QIANG WU

Do Better Managers Get Better Loan Contracts?

This paper examines the impact of managerial ability on bank loan contracting. We find that firms with higher-ability managers obtain more favourable loan contract terms, including lower loan spreads, fewer covenants, and more short-term maturities. Furthermore, the negative relation between managerial ability and loan spread is concentrated in firms with higher information asymmetry, higher default risk, or lower agency costs of debt. Finally, we find that firms with higher-ability managers are more likely to choose public bonds over bank loans.

Key words: Managerial ability; Bank loan contracting; Default risk; Information opacity; Agency costs of debt.

Bank loans are a major source of external capital for many corporations, including large public firms (e.g., Graham *et al.*, 2008; Hasan *et al.*, 2017).[1] Therefore, understanding the factors that influence bank loan contracting is of vital importance for managers, investors, and policy-makers. Prior studies mainly focus on firm-level factors that affect the contract terms of bank loans (e.g., Bharath *et al.*, 2008; Chava *et al.*, 2009; Francis *et al.*, 2012; Hasan *et al.*, 2014). However, there is little evidence on whether and how banks evaluate the quality of top management when making lending decisions. This is surprising given that firms are operated by individual managers who exert significant influence over corporate decisions and are crucial to the success of corporations (e.g., Hambrick and Mason, 1984; Bertrand and Schoar, 2003).[2] Moreover, inadequate management is believed to be the most pervasive cause of firm distress and failure (Altman and Hotchkiss, 2005).

BILL B. FRANCIS is at Lally School of Management. NING REN is at University of Redlands. XIAN SUN is at Johns Hopkins University. QIANG WU (qiang.wu@polyu.edu.hk) is at Hong Kong Polytechnic University.

[1] In fact, the total amount of bank loan financing is larger than the total amount of equity and bond financing combined. For example, according to the Loan Pricing Corporation and the Federal Reserve, in 2005, the total amount of equity issued was approximately $115 billion, the total amount of corporate bonds issued was approximately $700 billion, and the total amount of bank loans issued was approximately $1,500 billion (Hasan *et al.*, 2012).

[2] For example, Florida lawmakers are considering restoring Disney's tax privilege as Robert Iger returns as Disney's CEO as they believe Iger would avoid getting entangled in state politics (WSJ, 2022).

In a recent survey, Donelson *et al.* (2017, p. 2062) find that lenders consider the 'character, reputation, and experience of management' as the third most important factor when making lending decisions, even more important than traditional firm fundamentals such as leverage, liquidity, and profitability.

Managerial ability is a reflection of human capital (Francis *et al.*, 2008) and is one of the most important intangible assets a firm has (Gaines-Ross, 2003). A growing number of studies find that intangible capital, which is not recognized in historical cost-based accounting (Hughes, 2000),[3] plays an increasingly important role in modern firm valuation because of its potential to generate economic benefits (e.g., Amir and Lev, 1996). Consistent with this line of research, Francis *et al.* (2019) assert that intangible capital is value-relevant in the capital market, and the total value of intangible capital is about half to two-thirds of the total market value of publicly traded corporations (Hall, 2001). In this paper, we examine the *incremental* effect of managerial ability on bank loan contracting, beyond the effect of traditional firm fundamentals.

The traditional bank loan literature suggests that banks give more favourable loan terms to firms with lower default risk (e.g., Berger and Udell, 1990; Hasan *et al.*, 2014). Appropriate risk compensation, however, also depends on the quality of the information banks gather and evaluate at the time of lending. Higher information risk implies higher monitoring costs, therefore banks require more compensation for firms with higher information risk (Sufi, 2007; Bharath *et al.*, 2008; Graham *et al.*, 2008). Furthermore, conflicts between different types of investors, especially between debtholders and shareholders, are believed to be another important factor for the cost of debt. In the sense that managers are the agents of shareholders, they have incentives to expropriate wealth from debtholders to shareholders after loan initiation (Jensen and Meckling, 1976; Mueller and Inders,t 2001). Banks with such concerns would charge more expensive terms when determining the loan contract (Kim *et al.*, 2019). Prior studies show that managerial ability is associated with default risk, information risk, as well as agency risk of debt (e.g., Demerjian *et al.*, 2012). Therefore, examining how managerial ability affects bank loan contracting could help us explore how the three risks jointly affect bank loan contracts.

On the one hand, higher managerial ability could lead to more favourable loan terms by signalling borrowers' future performance and by reducing information opacity. For example, Demerjian *et al.* (2012) and Choi *et al.* (2015) show that more able managers demonstrate greater efficiency in converting firm resources into revenues, thereby improving firms' future performance and cash flows and reducing expected default risk. Baik *et al.* (2011) and Demerjian *et al.* (2013) provide evidence that managerial quality reduces information opacity through both high-quality earnings and more frequent and accurate management earnings forecasts. Because default risk and information risk are the primary determinants

[3] According to current accounting practices (e.g., Generally Accepted Accounting Principles (GAAP)), human capital is not defined as an asset of a company and does not appear on the asset side of the balance sheet.

of the cost of debt (Bhojraj and Sengupta, 2003), we expect that creditors will offer more favourable loan terms to borrowers with more able managers than to borrowers with less able managers.

On the other hand, managers of borrowing firms have incentives to expropriate wealth from debtholders to shareholders after a debt contract is finalized (e.g., Jensen and Meckling, 1976; Smith and Warner, 1979).[4] It is well documented that more able managers are more likely to receive incentive-based compensation (Milbourn, 2003; Custodio *et al.*, 2013), and that managerial incentive-based compensation exacerbates such owner–creditor conflicts (Shaw, 2012).[5] To the extent that lenders consider the agency costs of debt in their lending decisions, we expect these lenders to request more compensation, either in the form of a higher loan price, or in the form of more covenants to protect their investment, when lending to borrowers with more able managers than when lending to borrowers with less able managers.

We examine this question empirically and use Dermerjian *et al.*'s (2012) industry-year adjusted managerial ability ranking as our main measure of managerial ability. Demerjian *et al.* (2012) quantify managerial ability using a data envelopment analysis (DEA) approach to estimate the total efficiency of individual firms. They measure how much revenue can be generated from a given amount of economic resources, including net property, plant, and equipment; net operating lease; net research and development expenses; purchased goodwill; other intangible assets; cost of inventory; and selling, general, and administrative expenses. Demerjian *et al.* (2012) regress total firm efficiency on company attributes, including firm size, market share, cash availability, life cycle, operational complexity, and foreign operations. The unexplained portion of total firm efficiency is attributed to managerial ability.[6]

Using a comprehensive sample of 24,672 loan facilities between 1989 and 2016, we find that more able managers are associated with lower bank loan spreads, which are defined as the basis points a borrower pays in excess of the London Interbank Offered Rate (LIBOR) or LIBOR equivalent for each dollar drawn down. Our results are also economically meaningful. Specifically, an increase in the level of managerial ability from the 25th percentile to the 75th percentile results in an average decrease of approximately 5.25 basis points in the loan spread, implying a reduction in the total average interest expenses per loan of roughly $0.363 million per year.

[4] These expropriations could include overinvestment and claim dilution.

[5] Prior literature shows that equity-based compensation contracts provide managers with incentives to increase firms' risk-taking behaviour (e.g., Guay, 1999; Core and Guay, 2002; Low, 2009; Brockman *et al.*, 2010), and risk-shifting behaviour (e.g., Brockman *et al.*, 2010).

[6] Dermerjian *et al.* (2012) provide comprehensive validity tests demonstrating that their method of measuring managerial ability is superior to other measures (e.g., abnormal returns, performance, tenure, and media coverage) with respect to capturing the ability of a firm's top management team. Subsequent studies have used their measure and found that managerial ability is positively related to management earnings forecasts, earnings quality, firm performance, and cash flows (Baik *et al.*, 2011; Demerjian *et al.*, 2013; Choi *et al.*, 2015).

We next examine the effect of managerial ability on loan covenants and loan maturity, two important non-pricing loan terms. We find that managerial ability is negatively related to the likelihood of using covenants. Economically, a move from the 25th percentile of the managerial ability rank to the 75th percentile reduces the likelihood by 12.50% that a covenant requirement will be put in place. In addition, we find that managerial ability is positively related to the use of short-term maturity. Economically, a move from the 25th percentile of the managerial ability rank to the 75th percentile increases the likelihood of obtaining short-term loans by 13.5%.

To mitigate endogeneity concerns such as omitted variables and reverse causality, we employ a difference-in-differences (DID) approach based on CEO turnovers. Specifically, we identify the following three types of CEO turnovers: turnovers with increasing managerial ability (a CEO turnover leads to at least a one-decile increase in managerial ability ranking); turnovers with decreasing managerial ability (a CEO turnover leads to at least a one-decile decrease in managerial ability ranking); and lateral turnovers (a CEO turnover leads to less than a one-decile change in managerial ability ranking). The DID results indicate that a CEO turnover with increasing managerial ability leads to a significant reduction (increase) in bank loan spread and loan covenants (short-term maturity), compared to a matched firm that experiences a CEO turnover with a lateral change in managerial ability. In contrast, we find that a CEO turnover with decreasing managerial ability leads to a significant increase (decrease) in bank loan spread and loan covenants (short-term maturity) compared to a matched firm that experiences a lateral CEO turnover. We find consistent results when we use a DID approach to test how managerial ability change affects loan covenants and short-term loans.

We contend that more able managers reduce the cost of bank loans because they reduce the information asymmetry and default risk of the borrowing firms. To validate our arguments, we first separate our sample into two subsamples based on the level of information opacity, as measured by analyst forecast dispersion or whether a firm has a Standard and Poor's (S&P) senior debt rating. Consistent with our expectation, we find that the negative relation between managerial ability and bank loan spread is driven by the subsample with the higher level of information opacity. We next divide our sample into two subsamples based on the level of default risk, as measured by the Ohlson (1980) O-score and the probability of default calculated based on the Black and Scholes (1973) and Merton (1974) option model, as illustrated in Schultz *et al.* (2017). We find that the identified negative relation is only significant for the subsample with a higher level of default risk.

Although we find an overall negative relation between managerial ability and the cost of bank loans, we cannot rule out the 'agency costs of debt effect' of more able managers. To examine the existence of such an effect, we divide our sample into two subsamples based on the level of agency costs of debt measured by overinvestment or the intensity of institutional ownership. We find that the negative relation between managerial ability and bank loan spread holds only for

firms with a lower level of agency costs of debt, suggesting that banks do consider the agency costs of debt when pricing bank loans.

Finally, we examine whether managerial ability affects a firm's choice between issuing a public bond or obtaining a bank loan. Prior studies find that firms with higher information asymmetry prefer private debt (bank loans) to public debt, because bank loans incur lower incremental costs imposed by information risk (Hasan *et al.*, 2014). Moreover, firms with less able managers could have more difficulties or face higher costs in accessing public debt markets. Consistent with previous research and our prediction, we find that firms with less able managers are more likely to use bank loans over public bonds.

Our research contributes to the growing literature on the determinants of bank loan contracting terms. We identify executives' ability as a new and economically significant determinant of bank loan contracting that is beyond the effects of firm fundamentals. Our paper contributes to the loan contracting literature by adding the 'people' factor to loan contracting. We suggest that managerial ability affects the pricing and non-pricing terms of loan contracts.

Our paper also contributes to the growing body of literature on how managerial attributes affect the cost of capital, which examines how loan contracts reflect default risk and information asymmetry. Through channel tests, we identify that the managers' effects through default risk and information risk dominate the agency cost of debt effects on loan contracting. Our findings provide fresh evidence of the benefits of managerial ability for creditors.

RELATED LITERATURE AND HYPOTHESES DEVELOPMENT

Managerial Ability Literature Review

Managerial ability, which captures the dimension of managerial human capital, is of vital importance for the success of corporations (e.g., Francis *et al.*, 2008; Shavinina and Medvid, 2009). Prior studies show that managerial ability significantly impacts various corporate decisions, including investment policies (Bertrand and Schoar, 2003), initial public offerings (Chemmanur and Paeglis, 2005), compensation (Custodio *et al.*, 2013), accounting choices (Demerjian *et al.*, 2013), auditor decisions (Krishnan and Wang, 2015), and tax decisions (Francis *et al.*, 2022). Because managerial ability significantly affects corporate policies and outcomes, it is therefore not surprising, as documented in the extant literature, that shareholders value it. For example, Chemmanur and Paeglis (2005) find that better managers are associated with lower underpricing and larger IPO offer sizes. Demerjian *et al.* (2012) examine the market reaction to CEO turnovers and find that the stock market reacts positively (negatively) to outgoing CEOs with low (high) ability. Similarly, Hayes and Schaefer (1999) show that differences in managerial ability can have large consequences for shareholder wealth. In particular, firms losing more able managers to other firms experience an average abnormal return of –1.51%. Francis *et al.* (2019) find a positive relation between managerial ability and the value relevance of earnings.

Hypotheses Development

Credit risk refers to the likelihood that a borrower will fail to repay a loan or be unable to meet its debt obligations. Prior literature (e.g., Bhojraj and Sengupta, 2003; Hasan *et al.*, 2014) suggests that creditors' assessments of a borrower's credit risk depend mainly on three factors. The first is expected future cash flows, that is, whether borrowers can generate sufficient cash flows to repay the principal and other debt obligations. The second is the information risk of borrowers, that is, the quality and quantity of information that lenders rely on to evaluate borrowers' default risk. The third is managerial agency costs, that is, the costs arising from the propensity of the borrower's management to engage in self-serving or wealth transfer behaviour, which would reduce the borrowers' expected cash flows to the lenders. Below, by linking managerial ability to each of the three factors, we discuss how more able managers could affect bank loan contracting. Specifically, following the bank loan literature, we focus our analysis of the effect of managerial ability on the three aspects of bank loans, namely price (e.g., Bharath *et al.*, 2008; Chava *et al.*, 2009; Hasan *et al.*, 2014), covenants (e.g., Smith, 1993; Denis and Wang, 2014), and maturity (e.g., Berger *et al.*, 2005; Brockman *et al.*, 2010).[7]

Managerial ability and bank loan spread Traditional banking theory tells us that the likelihood of default is the most important determinant in the pricing of bank loans. Numerous studies show that firms with lower default risk can borrow at more favourable pricing terms than firms with relatively higher default risk (e.g., Berger and Udell, 1990; Hasan *et al.*, 2014). Prior literature shows that managerial ability affects firm performance and default risk. For example, Chemmanur and Paeglis (2005) show that managers with higher ability are more likely to select better projects and implement them more efficiently than less able managers. They also show that firms led by more able managers have better operating performance and, therefore, lower expected default risk. The benefits of having more able managers also extend to firms facing financial distress. For instance, Leverty and Grace (2012) show that managerial ability reduces the length of time a firm spends in distress, as well as the likelihood and costs of insolvency. Demerjian *et al.* (2012) find that replacing CEOs with more (less) able CEOs is associated with improvements (declines) in subsequent firm performance. Choi *et al.* (2015) provide further evidence that the relationship between managerial ability and firms' future cash flows is positive. We label the effect of more able managers on default risk as the *default risk effect*.

In addition, information opacity represents the amount of due diligence that investors must apply to investigate and monitor borrowers (Sufi, 2007). Information risk has been well documented as an important factor that impacts the cost of bank loans because lower information opacity leads to more timely and accurate information being conveyed about the state of the firm. For example, Bharath *et al.* (2008) find that firms with higher earnings quality enjoy lower costs

[7] Acknowledging that these bank terms might be interrelated, we conduct robustness tests and discuss the simultaneity issue in Appendix B.

for bank loans, indicating the importance of accounting information quality in lenders' decision-making. Graham *et al.* (2008) find that banks increase loan prices after financial restatements, suggesting that, subsequent to the divulgence of borrowers' information problems to the market, banks demand more compensation. Similarly, Francis *et al.* (2017) find that information risk is one of the determinants of the cost of bank loans.

The managerial ability literature shows that managerial ability reduces firms' information opacity. For instance, Aier *et al.* (2005) suggest that managerial ability reduces the likelihood of financial restatement, and Baik *et al.* (2011) show a positive relation between CEO ability and the likelihood, frequency, and accuracy of management earnings forecasts. Demerjian *et al.* (2013) document that more able managers are associated with higher persistence in earnings and accruals, fewer occurrences of earnings restatement, and reduced errors in the provisions for bad debt. We label the effect of more able managers on information opacity the *information risk effect*.

Furthermore, financial theory suggests that managers work primarily for shareholders and pursue policies that are in the best interests of the shareholders. Prior studies suggest that managers of borrowing firms have incentives to expropriate wealth from debtholders to shareholders after a debt contract is finalized (e.g., Jensen and Meckling, 1976; Smith and Warner, 1979).[8] Empirical evidence supports the existence of the agency costs of debt.[9] To control the agency costs of debt, lenders would have to monitor borrowers closely, subsequent to the loan initiation. Thus, lenders would set a higher interest rate as compensation for the expected higher monitoring costs when designing bank loan contracts. Empirical evidence supports this argument. For example, Kim *et al.* (2019) find that banks charge higher loan spreads for borrowers with more short-term institutional investors.

Managers with higher ability could exacerbate the agency costs of debt due to their incentives and their better execution capability. Prior studies show that more able managers are more likely to receive incentive-based compensation (Milbourn, 2003; Custodio *et al.*, 2013), which could motivate them to undertake riskier investment projects, leading to an increase in the agency costs of debt. Milbourn (2003) finds that managerial ability is positively associated with (equity) pay–performance sensitivity, which implies that more able managers are more likely to make riskier corporate decisions. Existing empirical evidence shows a direct link between managerial ability and the agency costs of debt. For instance, Adams and Mansi (2009) find that the hiring of more able CEOs with the intention of turning around poorly performing firms leads to a decrease in debtholders' value. This supports the argument that more able CEOs implement

[8] This agency cost of debt is typically described in terms of the asset substitution or the risk-shifting problem.

[9] For example, Mueller and Inderst (2001) show that firms with concentrated ownership structures face higher agency costs of debt compared to firms with more diversified ownership, while Barth *et al.* (2008) find that equity value is positively associated with credit risk.

significantly riskier firm policies, some of which transfer wealth from debtholders to shareholders.[10] We label the effect of more able managers on the agency costs of debt the *agency costs of debt effect*.

Based on the discussion above, we expect the default risk effect and information risk effect to dominate the relation between managerial ability and bank loan spread. Thus, we propose our first hypothesis in the alternative form:

H1: Managerial ability is negatively related to bank loan spread.

Managerial ability and loan covenants Debt covenants are constraints imposed on borrowers. To keep borrowers on a tighter leash, lenders could impose a greater number of covenants. Previous empirical work generally shows a positive relationship between covenant intensity and the level of information risk. For example, Kim *et al.* (2011) find that enhanced disclosures due to IFRS adoption alleviate information risk and lead to fewer covenants. Graham *et al.* (2008) show that, due to increased information risk, banks impose more covenants after financial restatements. Hasan *et al.* (2012) find that firms with more predictable earnings have lower information risk, and therefore banks include fewer covenants in loan contracts when lending to these firms.

The extant literature shows that borrowers with good credit quality can borrow with fewer or no covenants, whereas loans made to riskier borrowers carry a number of covenants (Berger and Udell, 1990). Existing studies show a negative relation between the use of covenants and the borrower's performance and default risk. For example, Graham *et al.* (2008) find that banks are less likely to use covenants when firms have higher market-to-book (M/B) ratios and lower default risk. Hasan *et al.* (2012) also show a negative relation between firms' operating performance and the use of covenants.

However, studies also indicate that covenants are an effective loan feature, commonly used by banks to control for the agency risk of debt (e.g., Jensen and Meckling, 1976; Smith and Warner, 1979; Smith, 1993). Gorton and Kahn (2000) argue that the role of the initial contract is to allocate bargaining power in the renegotiation game that always happens. Because of concerns such as asset substitution, overinvestment, and claim dilution, creditors have the incentive to include more intensive and restrictive covenants in debt contracts, *ex ante*. Smith (1993) points out that covenants can be either affirmative thresholds, such as those for net assets or working capital that are required to be met, or negative covenants, which prevent borrowers from taking certain actions, such as altering the fundamental nature of the business, making excessive investments in capital

[10] The higher spreads do not only increase the bargaining power of creditors in renegotiations after loans are granted (Gorton and Kahn, 2000) but also require firms to make higher payments when servicing their debt, thereby reducing their ability to undertake alternative investments that could be detrimental to the debtholders' value.

structure, or paying dividends. The purpose of these covenants is to reduce the lenders' risk by constraining shareholders to creditor-friendly actions.

Based on the discussion above, we expect the default risk effect and information risk effect to dominate the relation between managerial ability and bank loan covenants. Thus, we propose our second hypothesis in the alternative form:

H2: Managerial ability is negatively related to bank loan covenants.

Managerial ability and bank loan maturity Maturity is an important feature of loan contracts that creditors use to protect their interests. More able managers are associated with better firm performance and better predicted future firm performance. As such, one can reasonably conjecture that more able managers are more likely to take on short-term debt because they can refinance short-term debt at better rates when favourable news arrives in the future. This argument is consistent with the argument by Diamond (1991) that high-quality firms prefer short-term loans because they take advantage of financing flexibility and can always refinance at a lower cost.

From the creditors' perspective, short-term debt can also be an extremely powerful tool for monitoring managers as they come up for frequent renewal (Stulz, 2001). Rajan and Winton (1995) show theoretically that short-maturity debt gives creditors the opportunity to effectively monitor managers with minimal effort. Given that more able managers are likely to take on riskier projects, resulting in higher agency costs of debt, it is reasonable to assume that banks are also more willing to grant short-term loans to borrowers with more able managers, especially when concern over the agency costs of debt is high. Therefore, one would expect to find a positive relationship between managerial ability and the use of short-term debt.

Diamond (1991) also predicts that firms with very low credit quality will be forced to borrow short term as they are screened out of the long end of the maturity spectrum. There is evidence supporting this claim. For example, Barclay and Smith (1995) find that firms characterized by greater information asymmetry issue more short-term debt. Stohs and Mauer (1996) find that less-risky firms are more likely to use long-term debt. Berger *et al*. (2005) document that debt maturity is inversely related to information asymmetry, while Graham *et al*. (2008) find that banks are more likely to use short-term loans subsequent to financial restatement, which is an indication of information problems. Given that more able managers are associated with lower information risk, banks could be more willing to lend long term to borrowers with better managers.

Based on the discussion above, we expect the default risk effect and agency cost of debt effect to dominate the relation between managerial ability and short-term loans. Thus, we propose our third hypothesis in the alternative form:

H3: Managerial ability is positively related to short-term loans.

DATA, SAMPLE SELECTION, MODEL, AND SUMMARY STATISTICS

Data

We obtained managerial ability data from Professor Peter Demerjian at the University of Illinois, Chicago.[11] These data contain raw scores and industry- and year-adjusted decile rankings of managerial ability measures. In our paper, we use the decile ranking of managerial ability as our main measure to make it more comparable across time and industries and to mitigate the influence of the variation and distribution of the annual scores.[12] In online Appendix A, we provide a detailed explanation of the procedure we used to construct the measure.[13]

We obtained bank loan data from the Loan Pricing Corporation's (LPC) DealScan database. The basis of observation in DealScan is a loan, also referred to as a facility, which is the basic unit of observation in our study. We then merged the data obtained from DealScan with the borrowers' financial data obtained from the S&P Compustat database. After deleting observations with missing information, we arrived at 24,672 facility-level, bank loan observations between 1989 and 2016.

Model

We examine the impact of managerial ability on bank loan terms, including price, covenants, and maturity. Our baseline model has the following specification:

$$\begin{aligned} \textit{Loan terms}_i, t = f(&\textit{MA rank}_{it-1}, \textit{Firm characteristics}_{it-1}, \textit{Loan characteristics}_{it}, \\ &\textit{Loan purposes}, \textit{Loan types}, \textit{Industry effects}, \textit{Year effects}), \end{aligned} \quad (1)$$

where the loan terms include loan spread, loan covenants, and loan maturity. *Log (Loan spread)* is the natural logarithm of the all-in drawn spread (AISD). *Dummy (covenant)* is a dummy variable, which equals one if a loan facility has at least one covenant restriction in place, and zero otherwise. *Total number of covenants* is the total number of covenants in a loan. *Log (Loan maturity)* is the natural logarithm of the loan maturity in months. *Dummy (Short-term maturity)* is a dummy variable, which equals one if a loan maturity is equal to or less than 60 months, and zero otherwise. We use OLS or logit regressions for the model, depending on whether the dependent variable is a continuous or dummy variable. The testing

[11] Data are available at: https://peterdemerjian.weebly.com/managerialability.html

[12] Our results are quantitatively the same when we use the continuous managerial ability score as the measure of managerial ability. For brevity the results are not shown, but can be provided upon request.

[13] Please refer to Demerjian *et al.* (2012) for a detailed measurement construction process.

variable *MA rank*$_{i,t-1}$ is the managerial ability decile ranking for firm *i* in year *t*–1.[14]

Following prior studies such as Graham *et al.* (2008) and Hasan *et al.* (2014), we control for several firm characteristics that could affect loan terms in the regressions. We first use the natural logarithm of a firm's total assets to measure firm size. Prior research finds that information asymmetry is more severe in small firms. Thus, we expect firm size to be negatively associated with bank loan spreads and loan covenants. We also expect that large firms are more likely to take out short-term loans due to their financing flexibility (Diamond, 1991). We control for leverage, profitability, and the likelihood of bankruptcy (Altman (1968) Z-score), all of which capture various aspects of a firm's default risk. We use the M/B ratio to proxy for the growth opportunities of firms. All else being equal, a firm with better growth opportunities should face lower default risk. We expect leverage to be positively related to loan spreads and loan covenants and negatively related to loan maturity. Similarly, we expect profitability, Z-score, and the M/B ratio to be negatively related to loan spreads and loan covenants, and positively related to loan maturity. We also control for tangibility since lenders recover exposures in particular through tangible assets in the case of default. We expect a negative relationship between tangibility and the dependent variables, loan spreads, and loan covenants. We use discretionary accruals to proxy for firms' accounting information quality. We expect higher discretionary accruals to be positively (negatively) related to loan spreads and loan covenants (loan maturity) (Bharath *et al.*, 2008). We control for the Big Four, as previous studies show that auditor quality is important for loan contracting (Kim *et al.*, 2013). We expect the Big Four to be negatively (positively) related to loan spreads and loan covenants (loan maturity). Furthermore, we employ two-digit SIC dummies and year dummies to control for the potential differences in loan terms across industries and years.

We also control for loan characteristics. We first include loan size, as it captures economies of scale in bank loan lending. We expect loan size to have a negative relationship with bank loan spread; banks are more likely to add covenants for larger and longer loans. Thus, we expect loan size to be positively related to loan covenants and loan maturity. Previous research finds that riskier and longer borrowings use more collateral (Berger and Udell, 1990). Rajan and Winton (1995) show that the presence of collateral enhances efficient monitoring. Thus, we expect a positive relation between loan collateral and other loan terms including loan spread, loan covenants, and loan maturity. The performance pricing provision links the bank loan spread to a borrower's future performance, and it is common for lenders to reduce interest rates if they add this provision (Asquith *et al.*, 2005). Thus, we expect a negative relation between performance pricing and other loan terms including loan spreads, loan covenants, and loan maturity. Rajan (1992) emphasizes that the presence of lock-up problems associated with

[14] We use the lagged values of managerial ability and the firm characteristics to which creditors have access and which could, therefore, provide useful information when making loan decisions. Using lagged values can also partially mitigate potential endogeneity issues (i.e., reverse causality).

TABLE 1

VARIABLE DEFINITIONS

Variable names	Variable definition
Dependent variables	
Log (Loan spread)	Natural logarithm of loan spread. Loan spread is measured as all-in spread drawn (AISD), which is the amount the borrower pays in basis points over LIBOR or LIBOR equivalent for each dollar drawn down
Dummy (Covenant)	Dummy variable that equals one if a loan has at least one covenant, and zero otherwise
Total number of covenants	Total number of covenants in a loan
Log (Loan maturity)	Natural logarithm of loan maturity in months
Dummy (Short-term maturity)	Dummy variable that equals one if a loan maturity is equal to or less than 60 months, and zero otherwise
Dummy (Choice loan)	Dummy variable equals one if a firm accesses bank loan market in a given year, and zero if it chooses to issue public bonds in a given year
Independent variables	
MA score	Managerial ability score for each firm/year from Demerjian *et al.* (2012)
MA rank	Industry/year decile ranking of managerial ability score. We use the data provided by Demerjian *et al.* (2012)
Historical return	Five-year value-weighted industry-adjusted stock returns (year *t*–5, *t*–1) using monthly CRSP data
MQF	Management quality factor obtained from Chemmanur *et al.* (2015)
Control variables	
Firm size	Natural logarithm of total assets
Leverage	Long-term debt/total assets
Profitability	EBITDA/total assets
Tangibility	Net property, plant, and equipment/total assets
Z-score	Modified Altman's Z-score (1968), which equals (1.2working capital +1.4retained earnings+3.3EBIT + 0.999sales)/total assets
M/B ratio	(Market value of equity plus the book value of debt)/total assets
Discretionary accruals	Modified cross-sectional Jones model (Jones, 1991) as described in Dechow *et al.* (1995)
Big Four	Dummy variable that equals one if a firm is audited by a Big Four accounting firm
Dummy (Prior relation)	Dummy variable that equals one if the same borrower and the same lead lender have at least one pervious loan in the DealScan database
Loan size	Natural logarithm of total borrowing amounts of a facility
Dummy (Secured)	Dummy variable that equals one if a loan has collateral requirements, and zero otherwise
Dummy (Performance pricing)	Dummy variable that equals one if a loan uses performance pricing provisions, and zero otherwise
Loan purpose dummy	Dummy variables for loan purposes divided into six groups: Acquisition, MBO/LBO, Debt repay/Recap., Corp. purpose, Work. Capital
Loan type dummy	Dummy variables for loan types, including 364-Day facility, Revolver/Line <1 Year or Revolver/Line > = 1 Year, Term loan, and Term loan B-D
Industry fixed effects dummy	Dummy variables for industry fixed effect based on the first two-digit SIC code
Other variables used in this study	
Asset maturity	[PPE/(CA + PPE)]*[PPE/Depreciation] + [CA/(CA + PPE)]*[CA/COGS]
O-score	Ohlson's (1980) O-Score is computed as O = –1.32 – 0.407 (Log Total Assets) + 6.03 (Total Liabilities/Total Assets) – 1.43 (Working Capital/Total Assets) + 0.076 (Current Liabilities/Current Assets) – 1.72

(Continues)

TABLE 1

CONTINUED

Variable names	Variable definition
	(1 if Total Liabilities > Total Assets, 0 otherwise) – 0.521 ((Net Income – Net Incomet–1)/(| Net Income| + | Net Income–1|))
Probability of default	Probability of default is calculated based on Black and Scholes (1973) option model as illustrated in Schultz *et al.* (2017)
Equity holding	Percentage of equity holding by CEOs
Board size	Total number of board members
Board independence	Ratio of independent board members to board size
CEO tenure	Number of years as a CEO
Analyst forecast dispersion	Five-year average of standard deviation of individual analyst forecasts deflated by actual earnings
Dual class	Dummy variable that equals one if a firm has a dual class share, and zero otherwise
Overinvestment	Dummy variable that equals one if the residual from a regression of total assets growth on sales growth run by industry year is greater than zero, and zero otherwise
Institutional ownership	Fraction of a firm's outstanding shares owned by institutional investors
IRS audit risk	Number of corporate tax return audits completed by the IRS in fiscal year *t* for a given asset size group divided by the number of corporate tax returns received in the previous calendar year for the same asset size group
Dummy (Capital market access)	Dummy variable equals one if a firm obtains financing from the equity market in a given year, and zero otherwise

established lender–borrower relationships leads to an increase in borrowing costs. To control for previous lending relationships, we construct a dummy variable, *Prior relation*, which equals one if a firm has previous loans from the same lead lender in the DealScan database and zero otherwise. We expect a positive relation between this variable and other loan terms, including loan spread, loan covenants, and loan maturity. When we test the loan spread and loan covenants, we control for loan maturity, because there is a higher repayment risk inherent in longer loan contracts. We expect a positive relation between loan maturity and both loan spread and loan covenants. When we test loan maturity, we include asset maturity as an additional control, because firms with longer asset maturities enjoy longer loan maturities (Graham *et al.*, 2008). Finally, bank loan terms may be different for different loan types and purposes.[15] We therefore control for loan types and loan purposes in our model. We cluster standard errors at the firm level.[16] In Table 1, we provide definitions of the variables that are used in our

[15] Following Francis *et al.* (2012), we separate loans into five types: 364-day facility, Revolver, Term loan, Term loan B-D (Institutional term loan), and others. We separate loan purposes into seven groups: Acquisition lines, LBO/MBO, Takeover, Debt Repay/Recapitalization, Corporate Purpose, Working Capital, and other purposes.

[16] Our results are robust when we do not cluster standard errors at the firm level. For brevity those results are not shown, but can be provided upon request.

main analysis. We also provide the predicted signs of the testing variables and control variables used for testing Hypotheses 1 to 3.

Sample Description and Univariate Tests

Panel A of Table 2 presents summary statistics of the loan and firm characteristics for the full sample.[17] The summary statistics of the loan variables are based on 24,672 facility-level observations, while the summary statistics of the firm variables are based on 15,138 firm-year observations. We find that the average value of the loan spread is 228.99 basis points. On average, 69% of loans have at least one covenant, and the average loan maturity is about 50 months. These numbers are consistent with prior studies (e.g., Hasan *et al.*, 2017). The mean value of the *MA score* is –0.01, which is also consistent with prior studies (e.g., Demerjian *et al.*, 2012, 2013).

In Panel B of Table 2, we split the sample by the median value of *MA score* and show the summary statistics separately for the *High MA ranking group* and the *Low MA ranking group*. We report the differences in the means and medians and their statistical significance in the last two columns.

The results show that the average loan spread of the *High MA ranking group* is lower than that of the *Low MA ranking group*, and the difference is statistically significant at the 1% level. We find consistent results when we compare the median values based on the Wilcoxon rank-sum test. We also find that the *High MA ranking group* enjoys fewer loan covenants and longer loan maturity than that of the *Low MA ranking group*, and the differences between the two are statistically significant. Although the above results show the differences in terms of loan terms between the *High MA ranking group* and the *Low MA ranking group*, caution should be exercised when interpreting these results because they could disappear or change when controlling for firm and loan-specific characteristics. For example, it is likely that better-performing firms have more able managers (as shown in Panel B of Table 2); thus, the univariate results may not correctly reflect the effect of managerial ability. We will therefore rely on the multivariate regression analyses reported below to draw our conclusions.

Turning to the firm characteristic results displayed in Panel B of Table 2, we see that firms belonging to the *High MA ranking group* are associated with significantly less leverage, more profitability, higher M/B ratios, and higher Z-scores than the *Low MA ranking group*. This pattern is consistent with the existing evidence that more able managers are associated with better firm performance and lower default risk. Given the significant differences between these two groups, the univariate results justify the need for multivariate analyses to isolate the empirical relation between managerial ability and the terms of bank loan contracts.

[17] To mitigate the influence of outliers, all control variables with continuous values are winsorized at the 1% and 99% levels.

TABLE 2

SUMMARY STATISTICS AND UNIVARIATE COMPARISONS

Panel A: Descriptive statistics

	N	Mean	Median	SD
Loan-level variables				
Loan spread (Basis point)	24,672	228.99	200	144.35
Facility amount (Million)	24,672	360	100	960
Dummy covenant	24,672	0.69	1	0.46
Dummy (Security)	24,672	0.76	1	0.43
Maturity (Month)	24,672	49.67	60	24.08
Dummy (Performance pricing)	24,672	0.46	0	0.49
Dummy (Prior relation)	24,672	0.63	1	0.48
Firm level variables				
MA score	15,138	–0.01	–0.03	0.12
MA rank	15,138	0.52	0.50	0.28
Total assets (Million)	15,138	3867.01	609.33	10721.01
Leverage	15,138	0.23	0.21	0.19
Profitability	15,138	0.12	0.12	0.11
Tangibility	15,138	0.31	0.24	0.24
Z-score	15,138	1.64	1.67	1.48
M/B	15,138	1.71	1.94	1.20
Discretionary accruals	15,138	0.05	0.02	2.15
Big Four	15,138	0.70	1	0.46

Panel B: Univariate comparison

	Low MA ranking group				High MA ranking group				Difference	
	N	Mean	Median	SD	N	Mean	Median	SD	Mean	Median
Loan-level variables										
Log (Loan spread (basis points))	12,336	5.48	5.42	4.96	12,336	5.40	5.30	4.95	0.08***	0.08***
Log (Loan amount (million))	12,336	5.75	4.60	6.65	12,336	6.03	4.70	7.04	–0.28***	–0.10***
Dummy (Covenant)	12,336	0.70	1	0.46	12,336	0.66	1	0.47	0.04***	0***

(Continues)

TABLE 2

CONTINUED

Panel B: Univariate comparison

		Low MA ranking group				High MA ranking group			Difference	
	N	Mean	Median	SD	N	Mean	Median	SD	Mean	Median
Dummy (Security)	12,336	0.78	1	0.41	12,336	0.73	1	0.44	0.05***	0***
Log (Loan maturity (months))	12,336	3.92	4.09	3.15	12,336	3.87	4.06	3.20	0.05***	0.03***
Dummy (Performance pricing)	12,336	0.48	0	0.50	12,336	0.44	0	0.50	0.04***	0***
Dummy (Prior relation)	12,336	0.67	1	0.47	12,336	0.60	1	0.49	0.07***	0***
Firm-level variables										
MA score	7,569	–0.10	–0.08	0.07	7,569	0.07	0.03	0.11	–0.17***	–0.11***
Log (Total assets (million))	7,569	7.97	6.27	8.95	7,569	8.51	6.48	9.49	–0.54***	–0.21***
Leverage	7,569	0.27	0.25	0.19	7,569	0.19	0.16	0.18	0.08***	0.09***
Profitability	7,569	0.11	0.11	0.10	7,569	0.13	0.14	0.12	–0.02***	–0.03***
Tangibility	7,569	0.36	0.28	0.24	7,569	0.27	0.20	0.23	0.09***	0.08***
Z-score	7,569	1.41	1.45	1.31	7,569	1.89	1.94	1.60	–0.48***	–0.49***
M/B	7,569	1.48	1.28	0.93	7,569	1.94	1.53	1.41	–0.46***	–0.25***
Discretionary accruals	7,569	0.04	–0.04	2.22	7,569	0.06	–0.03	2.21	–0.02	–0.01***
Big Four	7,569	0.69	1	0.46	7,569	0.70	1	0.47	–0.01*	0.00

This table provides detailed definitions for all variables. The sample contains 24,672 facility-level observations and 15,138 firm-year-level observations from 1989 to 2016. Panel A presents the descriptive statistics. Panel B presents the univariate comparison. The mean difference between the two samples is based on a *t*-test, and the median difference between the two samples is based on a Wilcoxon rank-sum test. Significance levels at 10%, 5%, and 1% are indicated by *, **, and ***, respectively.

EMPIRICAL RESULTS

Testing Hypotheses 1–3: Managerial Ability and Bank Loan Contract Terms

In Table 3, we test Hypotheses 1 to 3 using equation (1). We first test Hypothesis 1 regarding the relation between managerial ability and bank loan price in column (1). The dependent variable is *Log (Loan spread)*, and the key independent variable is *MA rank*. The result shows that the coefficient of *MA rank* is –0.047, which is significant at the 1% level, indicating a significant negative relation between managerial ability and the bank loan spread, after controlling for firm and loan characteristics. The result supports Hypothesis 1 and suggests that the default risk effect and information risk effect dominate the agency cost of debt effect so that we observe a negative relationship between the two.

The results indicate that the economic impact is reasonably meaningful. For example, given the coefficient estimate of *MA rank* (–0.047) and that the average loan spread in our sample is 228.99 basis points, a one-decile increase in *MA rank* reduces loan spreads by approximately 1.05 basis points.[18] Alternatively, a one-standard-deviation increase in the managerial ability rank (= 0.285) reduces the loan spread by approximately 3.00 basis points, and moving from the 25th percentile of the managerial ability rank to the 75th percentile results in a 5.25 basis points decrease of the bank loan spread. By comparison, Bharath *et al.* (2008), Francis *et al.* (2012), and Hasan *et al.* (2014) find that a one-standard-deviation increase in accounting quality, board independence, and cash effective tax rate reduces the bank loan spread by 6.65, 5.50, and 4.87 basis points, respectively. Thus, the effect of managerial ability on the cost of bank loans is reasonably meaningful and comparable to prior studies.[19]

In column (2) of Table 3, we test Hypothesis 2 regarding the relationship between managerial ability and loan covenants. The dependent variable is *Dummy (covenant)*, as defined earlier.[20] We find that the coefficient of *MA rank* is negative and significant, suggesting that firms with more able managers are less likely to have covenants in their debt contracts. Given that the coefficient of *MA rank* is –0.25, a one-decile increase in *MA rank* reduces the likelihood of having a covenant requirement by 2.5%. Thus, a move from the 25th percentile of the managerial ability rank to the 75th percentile reduces the likelihood of having a covenant requirement by 12.50%.

We further estimate the managerial ability effect on the intensity of covenant requirements. Following previous studies such as Graham *et al.* (2008), we use the

[18] 1.05 = (exp (–0.047)–1)*228.99*0.1.

[19] The coefficients and signs on the control variables are in line with the existing literature. For example, we find that loan spread is positively related to leverage and negatively related to firm size, profitability, tangibility, Z-score, M/B, and loan size.

[20] Nini *et al.* (2009) find there could be missing or inaccurate covenant information in DealScan. To mitigate this potential measurement problem, we conduct a robustness check by using Nini *et al.*'s (2009) loan covenant dataset. We find that our main results hold for this alternative sample test. For brevity, the results are not shown, but can be provided upon request.

TABLE 3

MANAGERIAL ABILITY AND BANK LOAN CONTRACT TERMS

Hypotheses		H1	H2		H3	
		(1)	(2)	(3)	(4)	(5)
		OLS	Logit	Poisson	OLS	Logit
Variables	Predicted signs for H1/H2/H3	*Log (Loan spread)*	*Dummy (Covenant)*	*Total number of covenants*	*Log (Loan maturity)*	*Dummy (Short-term maturity)*
MA rank	–/–/– or +	–0.047***	–0.250**	–0.146***	–0.063***	0.271***
		(–2.61)	(–2.38)	(–4.23)	(–3.06)	(3.38)
Firm size	–/–/+	–0.057***	–0.402***	–0.111***	1.040***	–0.086***
		(–8.47)	(–13.69)	(–9.76)	(4.89)	(–3.92)
Leverage	+/+/–	0.383***	–0.098	0.332***	9.069***	–0.459***
		(12.72)	(–0.54)	(5.79)	(7.91)	(–3.54)
Profitability	–/–/–	–0.451***	–0.637*	0.457***	17.444***	–2.405***
		(–7.85)	(–1.85)	(3.75)	(7.42)	(–7.18)
Tangibility	–/–/+	–0.223***	0.244	–0.231***	–6.229***	0.867***
		(–6.65)	(1.23)	(–3.67)	(–3.94)	(4.62)
Z-score	–/–/–	–0.033***	–0.011	–0.033***	–0.140	–0.004
		(–7.29)	(–0.38)	(–3.50)	(–0.74)	(–0.18)
M/B	–/–/–	–0.037***	–0.026	–0.038***	0.077	–0.005
		(–8.27)	(–1.12)	(–4.00)	(0.45)	(–0.22)
Discretionary accruals	+/+/+	0.002	–0.011	–0.005	–0.024	0.007
		(0.62)	(–1.20)	(–1.11)	(–0.52)	(0.58)
Big Four	–/–/–	0.018	0.128	0.110***	0.717	–0.156*
		(0.95)	(1.13)	(2.58)	(0.98)	(–1.76)
Dummy (Prior relation)	+/+/–	0.054***	0.374***	0.176***	1.982***	–0.234***
		(6.91)	(7.90)	(12.61)	(6.24)	(–6.83)
Loan size	–/+/–	–0.078***	0.363***	0.149***	2.609***	–0.270***
		(–12.52)	(14.37)	(14.59)	(13.54)	(–12.58)
Loan maturity/Asset maturity	+/+/–	–0.006	–0.071	0.119***	2.436***	–0.286***
		(–0.67)	(–1.51)	(6.26)	(5.33)	(–5.29)
Dummy (Secured)	+/+/–	0.622***	–0.432***	0.413***	6.736***	–0.323***

(Continues)

TABLE 3

CONTINUED

Hypotheses		H1	H2		H3	
		(1)	(2)	(3)	(4)	(5)
		OLS	Logit	Poisson	OLS	Logit
Variables	Predicted signs for H1/H2/H3	*Log (Loan spread)*	*Dummy (Covenant)*	*Total number of covenants*	*Log (Loan maturity)*	*Dummy (Short-term maturity)*
		(41.59)	(–5.17)	(17.52)	(14.96)	(–6.01)
Dummy (Performance pricing)	–/+/–	–0.181***	2.470***	0.474***	0.180	–0.190***
		(–18.23)	(35.99)	(21.76)	(0.48)	(–4.31)
Control for						
Loan types		Yes	Yes	Yes	Yes	Yes
Loan purposes		Yes	Yes	Yes	Yes	Yes
Industry effects		Yes	Yes	Yes	Yes	Yes
Year effects		Yes	Yes	Yes	Yes	Yes
Observations		24,672	24,672	24,672	24,672	24,672
Adjusted R^2		0.563	0.376	0.299	0.342	0.235

This table presents the regression results for the relation between managerial ability and bank loan contract terms including spread, covenant, and maturity. The independent variable is *MA rank*, which is the most recent ranking but at least five months prior to bank loan initiation industry/year managerial ability ranking. Firm attributes are based on Compustat data from the most recent year but at least five months before bank loan initiation. Loan attributes are measured at year *t*. All variables are defined in Table 1. Standard errors are adjusted for heteroskedasticity and firm clustering. T/Z values are in parentheses. Significance levels at 10%, 5%, and 1% are indicated by *, **, and ***, respectively.

Total number of covenants in a loan facility to capture the intensity of covenant requirements. We then re-estimate equation (1) using the *Total number of covenants* as the dependent variable.[21] We report the results in column (3) of Table 3. We find that the coefficient of *MA rank* remains negative and significant, indicating that banks require fewer covenants in the debt contracts of firms with more able managers. In sum, the results in Table 3 suggest that banks impose fewer covenants on firms with more able managers, which provides supportive evidence for Hypothesis 2 and suggests that the default risk effect and information risk effect dominate the agency cost of debt. Thus, we observe a negative relationship between managerial ability and loan covenants.

Finally, we test Hypothesis 3 regarding the relationship between managerial ability and loan maturity. We first estimate equation (1) using *Log(Loan maturity)* as the dependent variable. The result is reported in column (4) of Table 3. We find that the coefficient of *MA rank* is negative and statistically significant at the 1% level. Economically, given that the coefficient estimate of *MA rank* is m–0.063 and the average loan maturity in our sample is 49.67 months, a one-decile increase in *MA rank* reduces loan maturity by approximately 0.4 months. Alternatively, a move from the 25th percentile of the managerial ability rank to the 75th percentile reduces the loan maturity by 1.5 months (=0.3x5).

Following prior studies (e.g., Barclay and Smith, 1995; Stohs and Mauer, 1996), we further examine whether managerial ability affects the likelihood of using short-term maturity loans. We use *Dummy (Short-term maturity)* as the dependent variable. We estimate a logit regression and report the result in column (5) of Table 3. The result shows that the coefficient of *MA rank* is positive and significant, and economically meaningful. For instance, the coefficient estimate suggests that a move from the 25th percentile of managerial ability rank to the 75th percentile increases the likelihood of having short-term loans by 13.50%.[22] The result provides supportive evidence for Hypothesis 3 and suggests that the default risk effect and the agency cost of debt effect dominate the information risk effect so that we observe a positive relationship between managerial ability and short-term loans.

Collectively, the results in Table 3 support Hypotheses 1 to 3 and suggest that banks value more able managers in debt contracting. Consequently, banks reduce loan spreads, offer short-term debt, and relax covenant requirements when lending to firms with more able managers.

Heckman Two-stage Regression Results

One concern regarding our findings is that there is a possibility of selection bias due to the sample selection process. This potential selection bias could prevent us

[21] Given that the dependent variable is an ordinal number, we use a Poisson regression to estimate the model.

[22] Loan maturity could be related to CEO tenure because, if the CEO has a shorter tenure, banks could be unwilling to provide loans with longer maturities. In a robustness check, we further control for CEO tenure in our regression model. We find that both of our results on *Loan maturity* and *Dummy (Short-term maturity)* hold after the additional control for CEO tenure.

TABLE 4

HECKMAN TWO-STAGE RESULT

Hypotheses		First stage	H1	H2	H3
		(1)	(2)	(3)	(4)
VARIABLES	Predicted signs for H1/H2/H3	*Dummy (High MA)*	*Log (Loan spread)*	*Total number of covenants*	*Dummy (Short-term maturity)*
MA rank	–/–/+		–0.043**	–0.066**	0.276*
			(–2.23)	(–2.42)	(1.77)
Equity holding	n/a	0.001***			
		(7.51)			
Board size	n/a	0.003			
		(0.23)			
Board independence	n/a	–0.228			
		(–1.22)			
Inverse mills ratio	+/+/+		0.198***	0.362***	0.768***
			(4.07)	(6.52)	(2.80)
Control for					
All control variables in Table 3		Yes	Yes	Yes	Yes
Loan types		No	Yes	Yes	Yes
Loan purposes		No	Yes	Yes	Yes
Industry effect		Yes	Yes	Yes	Yes
Year effect		Yes	Yes	Yes	Yes
Observations		9,634	9,634	9,634	9,634
Pseudo/Adjusted R^2		0.098	0.625	0.132	0.243

This table presents the Heckman two-stage result for the relation between managerial ability and bank loan contract terms. In the first stage, the dependence variable is *Dummy (High MA)*, which equals one if the MA score is above the sample median, and zero otherwise. In the second sage, the dependent variables are loan contract terms including spread, covenants, and maturity. *Equity holding* is the percentage of equity holding by CEOs. *Board size* is the total number of board members. *Board independence* is the ratio of independent board members to board size. All other variables are defined in Table 1. T/Z values are in parentheses. In all regressions, standard errors are adjusted for heteroskedasticity and firm clustering. Significance levels at 10%, 5%, and 1% are indicated by *, **, and ***, respectively.

from making a causal inference from our baseline regression results. We apply Heckman's (1979) two-stage procedure to deal with the potential self-selection bias. In the first stage, we use a logit model to obtain the probability of a firm having more able managers. Therefore, the dependent variable is *Dummy (High MA)*, which equals one if *MA rank* is above 0.5, and zero otherwise. We include all firm-level control variables in the baseline model, as well as several additional variables that could affect the selection of more able managers. These additional controls include CEOs' equity holding, board size, and board independence. Table 1 provides definitions of these additional variables.

Column (1) of Table 4 reports the results of the first-stage selection model. We find that M/B and CEOs' equity holding have a positive effect on the selection of more able managers, while firm size, leverage, tangibility, and Big Four have negative effects.

We obtain the inverse Mills ratio from the first-stage regression and include it in the second-stage model to mitigate the selection bias. Columns (2) to (4) of Table 4 present the second-stage results for loan spread, total number of covenants, and short-term loans, respectively. The results show that, after controlling for potential selection bias, managerial ability still has the same effect on bank loan contract terms as we find in the baseline regressions. Therefore, the Heckman (1979) two-stage procedure results confirm our main findings and suggest that self-selection bias is less likely to drive our findings.

Difference-in-differences Analyses

An additional concern is that of endogeneity. For example, our baseline model specifications may have omitted unobservable factors that affect both managerial ability and firms' bank loan contract terms, leading to spurious inferences. In addition, it is possible that better managers are more likely to choose firms with better loan terms. To mitigate these endogeneity concerns, we use CEO turnover as a natural experiment and apply a DID approach.

Specifically, we select firms that experience a CEO turnover and obtain loans both before and after the turnover event for our DID analysis. The CEO turnover data were obtained from the BoardEx database. We specify three types of CEO turnovers. In the first type, a replacement CEO results in at least a one-decile *increase* in the managerial ability ranking. In the second type, a replacement CEO results in at least a one-decile *decrease* in the managerial ability ranking. The third type is a *lateral* turnover, in which CEO turnover leads to a less than one-decile change in the managerial ability ranking. We find that there are 63, 125, and 475 CEO turnover events related to an MA rank increase, a decrease, and an unchanged MA rank, respectively.

One important assumption of a valid DID analysis is that the treatment and control firms are comparable before the event. To ensure that our analyses satisfy this condition, following Hasan *et al.* (2014), we use a propensity score matching method to identify a matched firm for each treatment firm. When calculating the propensity score in the first-step regression, we include all firm-level control variables and *MA rank*. We then match each firm-year observation in the treated

TABLE 5

DIFFERENCE-IN-DIFFERENCE MODEL FOR BANK LOAN COST

Panel A: Univariate comparison between MA rank-increasing firms (treatment firms) and MA rank no change firms (matched firms) for pre-CEO turnover period

	MA rank no change firms			MA rank increasing firms				
	N	Mean	SD	N	Mean	SD	Difference	*t* value
MA rank	54	0.54	0.24	54	0.52	0.31	0.02	0.63
Firm size	54	6.81	1.58	54	6.54	1.92	0.27	1.07
Leverage	54	0.22	0.14	54	0.24	0.19	–0.02	–0.73
Profitability	54	0.13	0.08	54	0.14	0.07	–0.01	–0.69
Tangibility	54	0.32	0.25	54	0.34	0.20	–0.02	–0.67
Z-score	54	1.68	1.22	54	1.87	1.42	–0.19	–1.06
M/B	54	1.51	0.77	54	1.66	0.87	–0.15	–1.38
Discretionary accruals	54	0.00	0.34	54	0.00	0.36	0.00	0.04
Big Four	54	0.79	0.41	54	0.81	0.34	–0.02	–0.94

Panel B: Univariate comparison between MA rank-decreasing firms (treatment firms) and MA rank no change firms (matched firms) for pre-CEO turnover period

	MA rank no change firms			MA rank decreasing firms				
	N	Mean	SD	N	Mean	SD	Difference	*t* value
MA rank	112	0.55	0.27	112	0.53	0.26	0.02	1.07
Firm size	112	6.58	1.65	112	6.44	1.66	0.14	0.87
Leverage	112	0.24	0.18	112	0.24	0.18	0.00	0.01
Profitability	112	0.13	0.09	112	0.14	0.10	–0.01	–0.34
Tangibility	112	0.33	0.25	112	0.33	0.22	0.00	0.06
Z-score	112	1.72	1.20	112	1.82	1.40	–0.10	–1.08
M/B	112	1.60	0.78	112	1.66	0.93	–0.06	–0.97
Discretionary accruals	112	–0.02	0.34	112	0.00	0.47	–0.02	–0.89
Big Four	112	0.81	0.38	112	0.84	0.32	–0.03	–1.05

Panel C: Difference-in-differences model results

Hypotheses		H1		H2		H3	
		(1)	(2)	(3)	(4)	(5)	(6)
		MA rank increasing	*MA rank decreasing*	*MA rank increasing*	*MA rank decreasing*	*MA rank increasing*	*MA rank decreasing*
Variables	Predicted signs for H1/H2/H3	*Log (Loan spread)*	*Log (Loan spread)*	*Total number of covenants*	*Total number of covenants*	*Dummy (Short-term maturity)*	*Dummy (Short-term maturity)*
Post	n/a	0.019	0.033	0.035	–0.239	–0.080	–0.021
		(0.23)	(0.84)	(0.09)	(–0.54)	(–0.15)	(–0.060)
MA rank-increasing firms	n/a	–0.081		–0.541		–0.643	
		(–0.66)		(–1.15)		(–1.17)	
*MA rank-increasing firms * Post*	–/–/+	–0.228**		–0.691*		0.797*	
		(2.28)		(–1.71)		(1.95)	
MA rank-decreasing firms	n/a		0.022		–0.625		–0.625*
			(0.23)		(–1.53)		(–1.80)
*MA rank-decreasing firms * Post*	+/+/–		0.128*		0.960**		–0.697*
			(1.84)		(1.99)		(1.83)
Control for							
Control variables in Table 3		Yes	Yes	Yes	Yes	Yes	Yes
Loan types		Yes	Yes	Yes	Yes	Yes	Yes
Loan purposes		Yes	Yes	Yes	Yes	Yes	Yes
Industry effects		Yes	Yes	Yes	Yes	Yes	Yes
Year effects		Yes	Yes	Yes	Yes	Yes	Yes
Observations		360	557	360	557	360	557
Adjusted R^2		0.607	0.605	0.235	0.233	0.163	0.164

The models are:

$$Log\,(Loan\ term) = \mathrm{f}\,(MA\ rank - increasing\ firms, Post, MA\ rank - increasing\ firms^{*}\ Post, Firm\ characteristics, Loan\ characteristics, Loan\ purposes, Loan\ types, Industry\ effects, Year\ effects);\text{and}$$

$$Log\,(Loan\ term) = \mathrm{f}\,(MA\ rank - decreasing\ firms, Post, MA\ rank - decreasing\ firms^{*}\ Post, Firm\ characteristics, Loan\ characteristics, Loan\ purposes, Loan\ types, Industry\ effects, Year\ effects).$$

MA rank-increasing firms refers to firms that experience a MA rank increase (at least one decile of MA rank increase) after a CEO turnover. *MA rank-decreasing firms* refers to firms that experience a MA rank decrease (at least one decile of MA rank decrease) after a CEO turnover. *MA rank no change firms* refers to firms that experience insignificant MA rank change (less than one decile of MA rank change) after a CEO turnover. *Post* is a dummy variable that equals one if an observation is after the CEO turnover, and zero if an observation is before the CEO turnover. The dependent variables are loan terms measured in year *t*. All other controls are specified in the baseline model. All variables are defined in Table 1. *t* values are in parentheses. In all regressions, standard errors are adjusted for heteroskedasticity and firm clustering. Significance levels at 10%, 5%, and 1% are indicated by *, **, and ***, respectively.

sample with the nearest neighbour in the matching group, without replacement. To ensure there are no significant differences between the treatment firms and the matched firms, we use the caliper matching method, in which caliper refers to the difference between the predicted probabilities of the treatment and matched firms. We match within a caliper of 1%. Following this procedure, we identify 54 pairs of unique MA rank-increasing firms and unique unchanged MA rank firms, and 112 pairs of unique MA rank-decreasing firms and unique unchanged MA rank firms.

Panels A and B of Table 5 report the comparisons of the pre-treatment firm-year characteristics. The results indicate that there are no significant differences in the firm characteristics or managerial ability in the pre-treatment period.

After identifying the matched samples as described above, we expand the event sample to include the preceding and succeeding firm-year observations in our DID estimations. Similar to Hasan *et al.* (2014), we use a (–3, 3) time window, and the CEO transition year is dropped to avoid confounding effects. After this step, we have 360 observations for the MA rank-increasing matched sample and 557 observations for the MA rank-decreasing matched sample.

We then estimate the following two DID models:

$$\begin{aligned} Log(Loan\,terms_{i,t}) = f(&MA\,rank-increasing\,firms,\ Post,\ MA\,rank\\ &-increasing\,firms^{*}\ Post,\ Firm\,characteristics_{it-1},\\ &Loan\,characteristics_{it}, Loan\,purposes,\\ &Loan\,types,\ Industry\&Year\,effects) \end{aligned} \tag{2}$$

$$\begin{aligned} Log(Loan\,terms_{i,t}) = f(&MA\,rank-decreasing\,firms,\ Post,\ MA\,rank\\ &-decreasing\,firms^{*}\ Post,\ Firm\,characteristics_{it-1},\\ &Loan\,characteristics_{it}, Loan\,purposes,\\ &Loan\,types,\ Industry\&Year\,effects) \end{aligned} \tag{3}$$

We use the dummy variables *MA rank-increasing firms*, *MA rank-decreasing firms*, and *MA rank unchanged firms* to denote the three types of CEO turnovers. We use the dummy variable *Post* to denote observations after a CEO turnover. In equation (2), our main interest lies in the coefficient of the interaction term, *MA rank-increasing firms*Post* because it captures the DID effect on the changes over time in loan terms between firms experiencing an increase in MA rank and firms experiencing no change in MA rank around the CEO turnover events. For example, if managerial ability has a negative effect on bank loan spread, we expect the interaction term to be negative and significant. Similarly, in equation (3), we expect the interaction term, *MA rank-decreasing firms*Post*, to be positive and significant.

Panel C of Table 5 reports the regression results. Columns (1)–(2) report results when we use loan spread as the dependent variable. In column (1), we report the DID results for the MA rank-increasing CEO turnovers. Consistent with our

TABLE 6

CROSS-SECTIONAL ANALYSIS

Panel A: The default risk channel

	(1)	(2)	(3)	(4)
	High default risk	Low default risk	High default risk	Low default risk
	>Median O score	<Median O score	>Median probability of default	<Median probability of default
Variables	*Log (Loan spread)*	*Log (Loan spread)*	*Log (Loan spread)*	*Log (Loan spread)*
MA rank	–0.062**	–0.035	–0.071***	–0.005
	(–2.56)	(–1.04)	(–3.14)	(–0.15)
Wald tests for MA rank coefficient differences	3.47*		7.58***	
Control for				
Control variables in Table 3	Yes	Yes	Yes	Yes
Loan types	Yes	Yes	Yes	Yes
Loan purposes	Yes	Yes	Yes	Yes
Industry effects	Yes	Yes	Yes	Yes
Year effects	Yes	Yes	Yes	Yes
Observations	12,462	12,210	12,382	12,290
Adjusted R^2	0.519	0.581	0.543	0.608

Panel B: The information risk channel

	(1)	(2)	(3)	(4)
	High information opacity	Low information opacity	High information opacity	Low information opacity
	Without debt rating	With debt rating	>Median analyst forecast dispersion	<Median analyst forecast dispersion
Variables	*Log (Loan spread)*	*Log (Loan spread)*	*Log (Loan spread)*	*Log (Loan spread)*
MA rank	–0.069**	–0.022	–0.068***	–0.019
	(–2.53)	(–0.94)	(–3.23)	(–0.60)
Wald tests for MA rank coefficient differences	3.56*		3.40*	

(Continues)

TABLE 6

CONTINUED

Panel B: The information risk channel

	(1)	(2)	(3)	(4)
	High information opacity	Low information opacity	High information opacity	Low information opacity
	Without debt rating	With debt rating	>Median analyst forecast dispersion	<Median analyst forecast dispersion
Variables	*Log (Loan spread)*	*Log (Loan spread)*	*Log (Loan spread)*	*Log (Loan spread)*
Control for				
Control variables in Table 3	Yes	Yes	Yes	Yes
Loan types	Yes	Yes	Yes	Yes
Loan purposes	Yes	Yes	Yes	Yes
Industry effects	Yes	Yes	Yes	Yes
Year effects	Yes	Yes	Yes	Yes
Observations	13,006	11,666	7,449	7,223
Adjusted R^2	0.476	0.626	0.522	0.625

Panel C: The agency costs of debt channel

	(1)	(2)	(3)	(4)
	High agency costs of debt	Low agency costs of debt	High agency costs of debt	Low agency costs of debt
	Over-investment = 1	Over-investment = 0	>Median institutional ownership	<Median institutional ownership
Variables	*Log (Loan spread)*	*Log (Loan spread)*	*Log (Loan spread)*	*Log (Loan spread)*
MA rank	–0.095***	–0.013	–0.069***	–0.005
	(–3.72)	(–0.44)	(–3.26)	(–0.15)
Wald tests for MA rank coefficient differences	8.17***		6.00**	
Control for				
Control variables in Table 3	Yes	Yes	Yes	Yes

(Continues)

TABLE 6

CONTINUED

Panel C: The agency costs of debt channel

	(1)	(2)	(3)	(4)
	High agency costs of debt	Low agency costs of debt	High agency costs of debt	Low agency costs of debt
	Over-investment = 1	Over-investment = 0	>Median institutional ownership	<Median institutional ownership
Variables	*Log (Loan spread)*	*Log (Loan spread)*	*Log (Loan spread)*	*Log (Loan spread)*
Loan types	Yes	Yes	Yes	Yes
Loan purposes	Yes	Yes	Yes	Yes
Industry effects	Yes	Yes	Yes	Yes
Year effects	Yes	Yes	Yes	Yes
Observations	10,318	7,482	9,356	9,316
Adjusted R^2	0.591	0.565	0.592	0.513

This table explores cross-sectional variations on the relation between managerial ability and the cost of bank loans. In Panel A, we explore the default risk channel. In Panel B, we explore the information risk channel, and we explore the cost of debt channel in Panel C. In Panel A, we divide the sample based on the median value of the O score or the probability of default. The O score is calculated based on Ohlson (1980) and the probability of default is calculated based on Black and Scholes (1973) as illustrated in Schultz *et al.* (2017). In Panel B, we divide the sample based on whether firms have S&P senior debt rating, or the median value of analyst forecast dispersion. Analyst forecast dispersion is the five-year average of the standard deviation of individual analyst forecasts deflated by actual earnings. In Panel C, we divide the sample based on whether a firm overinvests, or whether a firm has a high level of institutional ownership. Overinvestment is a dummy variable that equals one if the residual from a regression of total assets growth on sales growth run by industry year is greater than zero, and zero otherwise. Institutional ownership is the fraction of a firm's outstanding shares owned by institutional investors. The dependent variable is *Log (Loan spread)* measured in year *t*. The independent variable is *MA rank*, which is the most recent but at least five months prior to bank loan initiation industry/year managerial ability ranking. Firm attributes are based on Compustat data from the most recent year but at least five months before bank loan initiation. Loan attributes are facility-specific terms at year *t*. All variables are defined in Table 1. Standard errors are adjusted for heteroskedasticity and firm clustering. *t* values are in parentheses. Significance levels at 10%, 5%, and 1% are indicated by *, **, and ***, respectively.

expectation, we find that the coefficient of the interaction term, *MA rank-increasing firms*Post*, is negative (–0.228) and significant at the 5% level. This result suggests that borrowers who experience a significant improvement in managerial ability after a CEO turnover receive significantly cheaper loans than they did before the CEO turnover, compared to matched firms that do not experience a significant improvement in managerial ability after a CEO turnover. We further perform an F-test to examine the sum of the coefficients of *Post* (0.019) and the interaction term *MA rank-increasing firms*Post* (–0.228), which captures the net effect of the increase in managerial ability on the bank loan spread. Our F-test shows that this coefficient sum (i.e., 0.019 – 0.228 = –0.209) is significant at the 5% level, suggesting that the absolute change in the bank loan cost is negative after a CEO turnover that increases the MA rank.

In column (2), we report the DID results for MA rank-decreasing CEO turnovers. We find that the coefficient of the interaction term, *MA rank-decreasing firms*Post*, is 0.128, which is significant at the 10% level. This suggests that firms that experience a significant decrease in managerial ability after a CEO turnover receive significantly costlier loans than they did before the CEO turnover, compared to matched firms that do not experience a significant decrease in managerial ability after a CEO turnover. We perform an F-test to examine the sum of the coefficients of *Post* (0.033) and the interaction term *MA rank-decreasing firms*Post* (0.128), which captures the net effect of a decrease in managerial ability on the bank loan spread. Our F-test shows that this coefficient sum (0.033 + 0.128 = 0.161) is significant at the 10% level, suggesting that the absolute change in the bank loan cost is positive after a CEO turnover that decreases the MA rank.[23]

In columns (3) and (4) of Table 5, we report the results when we use loan covenants as the dependent variable, and in columns (5) and (6) of Table 5, we report the results when we use short-term loans as the dependent variable. Our results show consistent results as the main findings. Specifically, we observe that firms enjoy fewer covenants and more short-term loans after they experience a significant improvement in managerial ability. In contrast, firms face more covenants and fewer short-term loans after they experience a significant reduction in managerial ability. In sum, our results using a DID approach mitigate endogeneity concerns and suggest a causal effect of managerial ability on bank loan contract terms.[24] The results provide further support for Hypotheses 1–3.

[23] A potential criticism of our DID analyses is that CEO turnover is not a random event and is usually associated with significant changes in the firm. Thus, this type of event might not be exogenous. As such, one should interpret the results from the CEO turnover analysis with caution. While we cannot totally claim the causal effect of managerial ability on the cost of bank loans, we do provide corroborating evidence to support our main findings.

[24] We perform a series of analyses to verify the robustness of our findings. The discussions and corresponding results are reported in online Appendices B and C.

Potential Channels Through Which Managerial Ability Might Affect Bank Loan Contracts

Managerial ability and the default risk effect We first test whether the reduction in a borrower's default risk is one of the channels through which managerial ability affects the loan spread.[25] We provide subsample tests to examine the default risk effect of managerial ability. We use two proxies to capture the default risk of a firm. The first is the Ohlson's (1980) O-score, and the second is the probability of default calculated based on the Black and Scholes (1973) option model as illustrated in Schultz *et al.* (2017). We first divide the sample into two subsamples based on the median value of the O-score and then rerun the baseline model for each of the subsamples.

The results are reported in columns (1) and (2) of Panel A, Table 6. Consistent with the default risk effect in Hypothesis 1, we find that the coefficient of *MA rank* is negative and significant for firms with high default risk (>median *O-score*), whereas it is insignificant for firms with low default risk (<median *O-score*). Specifically, the coefficient of *MA rank* is –0.062 and significant at the 5% level for firms with high default risk, while the coefficient of *MA rank* is –0.035 for firms with low default risk and statistically insignificant. To examine whether the coefficients of *MA rank* are significantly different between the two groups of firms, we provide a Wald test and find that the F statistic value is 3.47 and is significant at the 10% level, indicating that managerial ability affects these two groups of firms differently.

We further bisect the sample based on the median value of the *probability of default* and then rerun the baseline model for each of the subsamples. The results are reported in columns (3) and (4) of Panel A, Table 6. Consistent with the default risk effect in Hypothesis 1, we find that the coefficient of *MA rank* is negative and significant for firms with high default risk (>median *probability of default*), whereas it is insignificant for firms with low default risk (<median *probability of default)*. The Wald test shows that the effects of managerial ability on these two groups of firms are significantly different as well. Taken together, the results in Panel A of Table 6 provide support for the default risk effect of managerial ability.[26]

Managerial ability and the information risk effect In Hypothesis 1, we also argue that managerial ability lowers the cost of bank loans by reducing the information risk of banks. To test the information risk effect, we first use the S&P senior debt

[25] We examine the relation between managerial ability and future firm performance and future default risk. We find that *MA rank* has a positive and significant association with future performance as measured by one-year to three-year ROA and M/B. Additionally, we find that *MA rank* is significantly and negatively related to future default risk as measured by the one-year to three-year Z-score. These findings support the notion that a reduction in the default risk is a viable channel through which managerial ability might affect the loan spread. For brevity, the results are not shown, but can be provided upon request.

[26] Our results hold when we use the KZ score to measure default risk. For brevity, the results are not shown, but can be provided upon request.

rating as a proxy for the level of information opacity of the borrowers. Because credit rating agencies monitor and analyze firms' default risk and their creditworthiness, borrowers with a credit rating should display less information opacity (Bharath *et al.*, 2008). We divide the full sample into those firms with an S&P senior debt rating and those without such a rating. We rerun the baseline regression model for both groups and report the results in columns (1) and (2) of Panel B, Table 6.

Consistent with the information risk effect, we find that the negative relation between managerial ability and bank loan spread is statistically significant for the subsample without a senior debt rating and insignificant for the subsample with a senior debt rating. The Wald test shows that the effects of managerial ability on these two groups of firms are significantly different.

To provide additional evidence, we use a widely used measure to capture firm-level information opacity. *Analyst forecast dispersion* is a proxy for uncertainty about future earnings (e.g., Lang and Lundholm, 1996; Barron and Stuerke, 1998) and is measured as the five-year average of the standard deviation of individual analyst forecasts deflated by actual earnings.[27] We obtained analyst information from the Institutional Brokers' Estimate System (I/B/E/S) database. We next form two subsamples by splitting the full sample based on the median value of *Analyst forecast dispersion* and estimate the baseline model for each subsample.

Columns (3) and (4) of Panel B, Table 6 contain the results. Columns (3) and (4) indicate that the coefficient of *MA rank* is negative and significant for firms with high information opacity (>median *Analyst forecast dispersion*) and insignificant for firms with low information opacity (<median *Analyst forecast dispersion*). The Wald test shows that the effects of managerial ability on these two groups of firms are significantly different. Overall, the results in Panel B of Table 6 are consistent with the information risk effect that the information role of more able managers is a plausible explanation for managerial ability having a negative and significant effect on the loan spread.

Managerial ability and the agency costs of debt effect We further test the agency cost of debt effect, that managerial ability might affect the bank loan cost positively because of the agency costs of debt. To test this effect, we divide the firms into two subsamples based on their agency costs of debt. To the extent that banks do consider the agency costs of debt when pricing bank loans, we would expect a positive impact of managerial ability on the cost of bank loans among firms with higher agency costs of debt.

Jensen and Meckling (1976) and Smith and Warner (1979) contend that overinvestment is a major moral hazard action that has the potential to benefit firms' shareholders at the expense of their debtholders. Accordingly, we use a

[27] For example, Lang and Lundholm (1996) show that firms with more information disclosure policies have a larger analyst following and less dispersion among individual analyst forecasts. Barron *et al.* (1998) show that forecast dispersion can be used to measure the quality of the common and private information available to analysts.

TABLE 7

MANAGERIAL ABILITY AND DEBT MARKET CHOICE

Variables	Predicted sign	(1) *Dummy (Choice loan)*
MA rank	–	–0.928**
		(–2.04)
Firm size	–	–0.697***
		(–7.64)
Leverage	–	–1.811**
		(–2.28)
Profitability	–	–1.128
		(–0.45)
Tangibility	–	–1.167
		(–1.08)
Z-score	–	–0.429**
		(–2.35)
M/B	–	0.198
		(0.99)
Discretionary accruals	+	0.044
		(1.11)
Big Four	–	0.348
		(0.54)
Dummy (Capital market access)	–	–0.205
		(–0.56)
Control for		
Industry effects		Yes
Year effects		Yes
Observations		19,364
Pseudo R^2		0.242

This table examines how managerial ability affects firms' choice between public bonds and private bank loans. The dependent variable is *Dummy (Choice loan)*, which equals one if a firm accesses debt from the bank loan market in a given year, and zero if a firm chooses to issue public bonds. The independent variable is *MA rank*, which is the most recent but at least five months prior to bank loan initiation industry/year managerial ability ranking. Firm attributes are based on Compustat data from the most recent year but at least five months before bank loan initiation. *Dummy (Capital market access)* is a dummy variable that equals one if a firm obtains financing from the equity market in a given year, and zero otherwise. All other variables are defined in Table 1. Standard errors are adjusted for heteroskedasticity and firm clustering. Z values are in parentheses. Significance levels at 10%, 5%, and 1% are indicated by *, **, and ***, respectively.

firm's overinvestment as our first measure of agency costs of debt. Following Ahmed and Duellman (2013), *Overinvestment* is a dummy variable that equals one if the residual from a regression of total asset growth on sales growth by industry and year is greater than zero, and zero otherwise. We separate our sample into two subsamples based on whether *Overinvestment* equals one, and then rerun the baseline model for these two subsamples. The results are reported in columns (1) and (2) of Panel C, Table 6. We find that the coefficient of *MA rank* is only significantly negative for firms with high agency costs of debt (*Overinvestment* = 1) and is not significant for firms with low agency costs of debt (*Overinvestment* = 0), suggesting that banks do consider agency costs of debt when pricing bank loans.

We run a Wald test and find that the F statistic is 8.17 and is significant at the 1% level, indicating that the effects of managerial ability on these two groups of firms are significantly different.

Mueller and Inderst (2001) show that firms with a more concentrated ownership structure face higher agency costs of debt. Thus, we further use the intensity of institutional ownership as a proxy for the level of agency costs of debt. Institutional ownership is the fraction of a firm's outstanding shares owned by institutional investors. The institutional ownership information was gathered from the Thomson Reuters Ownership Database. Our subsample results based on institutional ownership are reported in columns (3) and (4) of Panel C, Table 6. As expected, we find that the effect of managerial ability on the cost of bank loans only holds for firms with high agency costs of debt (>median *Institutional ownership*). The Wald test shows that the effects of managerial ability on these two groups of firms are significantly different. Taken together, our results in Panel C of Table 6 provide some supportive evidence for the agency costs of debt effect, that is, banks do consider agency costs of debt when pricing bank loans.

MANAGERIAL ABILITY AND DEBT MARKET CHOICE

In this section, we test whether managerial ability affects a firm's debt-financing preference for bank loans compared to public bonds. Unlike arm's-length bondholders, banks are private lenders that have access to private information, the ability and incentive to monitor borrowers, and the flexibility to renegotiate contract terms (e.g., Rajan, 1992). Therefore, banks are more efficient and effective monitors in resolving moral hazard and adverse selection issues in debt contracting than are bondholders (e.g., Diamond, 1991). Firms with a poor information environment potentially face higher adverse selection costs in the public debt market. Therefore, they are more willing to reveal proprietary information to private lenders than to a diffuse group of public investors (Bhattacharya and Chisea, 1995) and prefer bank loans to public bonds when seeking debt financing (Denis and Mihov, 2003). This argument is also consistent with the pecking-order theory (Myers and Majluf, 1984) that firms with higher information risk prefer private funds to public funds. Empirically, Bharath *et al.* (2008) and Hasan *et al.* (2017) find that firms with higher information risk and lower social capital rely more heavily on bank loans than public bonds. To the extent that higher managerial ability is associated with a lower level of information risk, we expect that more able managers have a reduced preference for bank loans relative to public bonds when seeking debt financing for their firms.

We construct a sample of firms that either issued public bonds or obtained bank loans in a given year over the period 1989–2016. We eliminate from the sample firms that issued bonds and obtained a bank loan in the same year. *Dummy* (*Choice loan)* is a dummy variable, which equals one if a firm accesses debt from the bank loan market and zero if a firm chooses to issue bonds. Following Bharath *et al.* (2008) and Hasan *et al.* (2014), we use a logit regression with *Dummy*

(*Choice loan)* as the dependent variable to examine how managerial ability affects the probability that a firm chooses to obtain debt financing from the bank loan market rather than from the public bond market. The results in column (1) of Table 7 show that the coefficient of *MA rank* is significantly negative, indicating that firms with higher managerial ability are more likely to access debt from the public bond market than the bank loan market. Furthermore, the result is economically important. Specifically, given that the coefficient of *MA rank* is –0.928, a one-decile increase in *MA rank* increases the likelihood of accessing debt from the public bond market by 9.28%. The result is consistent with our conjecture that more able managers prefer public bonds over bank loans.

CONCLUSION AND DISCUSSION

In this paper, we have examined whether and how managerial ability affects bank loan contracting. On the one hand, managerial ability could affect bank loans by signalling firms' future performance and reducing information opacity. On the other hand, banks might have concerns about the agency costs of debt associated with more able managers. We find that more able managers are associated with significantly more favourable bank loan terms, including lower bank loan spreads, less usage of covenants, and lower number of covenants if used. We further find a positive relation between managerial ability and the likelihood of obtaining short-term loans. Collectively, these results provide support for the notion that firms with more able managers receive more favourable loan contract terms.

To explore potential channels through which more able managers might affect bank loan costs, we conducted three sets of subsample tests. We find that the negative relation between the manager's ability and the bank loan spread is concentrated among firms with higher information asymmetry, higher default risk, or lower agency costs of debt. These findings confirm the information risk effect and default risk effect of more able managers and demonstrate the existence of the agency costs of debt effect on the bank loan price.

Understanding the determinants of bank loan contracting is of economic importance, because bank loans are the largest source of external capital. In this paper, rather than focusing on traditional firm-level factors, we relate banks' lending decisions to the abilities of the top executives of the borrowing firms and provide evidence that managerial ability has an *incremental* effect on bank loan contracting. Our findings are important, as they not only confirm that creditors do consider management quality to be a factor when making lending decisions, but also quantify the effect of management quality on the cost of bank loans. Our findings also provide empirical evidence that is consistent with the survey findings in Donelson *et al.* (2017, p. 2062) that the 'character, reputation, and experience of management' is an important factor that banks consider when designing bank loan contracting.

Our paper contributes to the growing body of literature on how managerial attributes affect firm value and the cost of capital. Since the upper echelons theory

was put forward by Hambrick and Mason (1984), studies have examined the idiosyncratic differences between top managers in making corporate policies, and their impact on shareholder value. The economic benefits of having more able managers are well documented from the shareholders' perspective. The findings in our study provide fresh evidence of the benefits of managerial ability to creditors. Our findings also have important implications for boards of directors when considering hiring new managers. Our results show that hiring a more able manager could help firms reduce their costs of debt financing. Thus, our paper has implications for managerial labour markets.

Our study is subject to several limitations. First, we use the Demerjian *et al.* (2012) measure to capture managerial ability. Although the measure is widely used in the literature, we acknowledge that Demerjian *et al.*'s (2012) measure might still be subject to measurement errors, primarily because the residuals from the second-stage model may still contain omitted factors that affect firm efficiency and cannot be attributed to management. Second, Demerjian *et al.*'s (2012) measure captures the overall ability of the top management team. As such, we cannot ascertain which of the top managers' ability (e.g., CEO or CFO) is the main driver of the determinants of bank loan contracting. Future research should endeavour to improve the measurement of managerial ability and develop measures that identify individual managers' ability. Future research could also explore whether managers' other characteristics play a role in debt markets. It would also be interesting and important to examine how the board of directors considers managers' talents and ability when selecting new managers.

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Appendix S1: Supplementary Appendix