Military CEOs and Bank Loan Contracts

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JEL classification: G31, G32, J24

Keywords: CEOs, military experience, loan contracts, financing decisions

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"Transparency builds confidence, empowers people with information, and helps organizations run more smoothly." − Robert M. Gates, the former U.S. Secretary of Defense.

1 Introduction

There is a growing body of literature documenting the influence of CEO characteristics, experiences and personal behavior on corporate policies and outcomes (see, for example, Malmendier and Tate 2005; Malmendier, Tate and Yan 2011; Malmendier and Nagel 2011; Cronqvist, Makhija, and Yonker 2012; Bernile, Bhagwat, and Rau 2016; Cronqvist and Yu 2017; Schoar and Zuo 2017). An important life experience of CEOs that alter the behavior of veterans in various ways that affect their actions when they become CEOs later in life is the military service experience (Duffy 2006; Benmelech and Frydman 2015). There is a collective evidence from organizational and managerial behavior research suggesting that leadership skills and experience acquired from military service is essential in the corporate world and unique as either it is difficult to learn otherwise or it can be mastered by the CEOs at an early age (Duffy 2006). Prior studies offer evidence on the impact of CEO with military service experience (hereafter, military CEOs) on corporate activities such as corporate investment or fraudulent activities (Benmelech and Frydman 2015) or tax avoidance (Law and Mills 2017). However, there is a lack of research on how other financial market participants perceive the costs and benefits of military CEOs. We aim to fill this gap in the literature by examining the effect of military CEOs on the cost and design of bank loan contracts.

We focus on bank loan contracts because banks typically have more information about the firm, stemming from monitoring and maintain an on-going relationship with the borrower (Diamond 1984, 1991). As such, banks, as the informed lenders, are in the best position to understand the implications of CEO military experience for corporate policies, and design the loan contracts accordingly. In addition, since bank loans are one of the largest sources of funds for corporations (Graham, Li and Qiu 2008; Hasan, Hoi, Wu and Zhang 2014), it is important to understand the effect, if any, of CEO life experience on this important source of fund.

We hypothesize that military CEOs may have contrasting effects on the costs of bank loans. On the one hand, theory suggests that the strong focus on leadership in the army fosters unique leadership skills that are not acquired through education in non-military schools.[1] This is evidenced, for example, in the vision statement of the US' Army: "*We are about leadership; it is our stock in trade, and it is what makes us different*" (U.S. Army, 1999, p.7). In addition, military training prepares soldiers to make decisions in stressful environments, and military service cultivates patriotism and self-sacrifice (Benmelech and Frydman 2015). Military service should, therefore, increase CEOs' ethical conscience, resulting in lower risk of agency problems and fraudulent conducts (Franke 2001). Prior studies highlight that agency problems and fraudulent conducts increase the costs of bank loans (see, among others, Graham, Li and Qiu 2008; Kim, Song and Zhang 2011; Fields, Fraser, and Subrahmanyam 2012; Files and Gurun 2018). Guided by these strands of the literature, we hypothesize that firms with military CEOs have lower costs of bank loans.

On the other hand, other studies also show that military service is linked to aggressiveness, overconfidence, and risk-taking behavior (Elder 1986; Elder and Clipp 1989; Elder, Gimbel and Ivie 1991). Thus, military experience may encourage CEO risk-taking behavior and increase firm risk. Since banks have asymmetric payoffs in which they receive fixed future income and face substantial downside risk (Hasan et al. 2014), they will demand a higher risk premium in compensation for higher risk-taking behavior and firm risk (Pan, Wang, and Weisbach 2018). The above studies imply that banks charge higher loan costs when lending to firms with military CEOs.

To investigate these competing hypotheses on the effect of military CEOs on loan costs, we first collect information on loan contracts granted to US non-financial and non-utilities companies from the Dealscan database. We then match the Dealscan database and the Compustat Industrial Annual Files using Michael Roberts' linking file [see Chava and Roberts (2008) for

[1] For a comprehensive review of the military leadership literature, see Wong, Bliese and McGurk (2003).

more details].[2] For each of the firms in the matched sample, we identify information of the CEO from Execucomp and manually search on Marquis Who's Who for whether the CEO has military experience. Our final sample includes 8,150 loan facilities from 4,298 firm-year observations for the period 1992 to 2012.

Our baseline regression results show that firms with military CEOs pay lower loan costs. This finding is statistically and economically significant. Firms with military CEOs, on average, have about 8.40% (about 11 basis points) lower bank loan prices than firms with non-military CEOs. Our results are also robust to alternative model specifications, sampling methods, measures of loan costs and after controlling for various governance measures.

We acknowledge that our results are subject to potential endogeneity issues. First, our results could reflect unobserved personal characteristics of CEOs that are correlated with both military service and corporate policies. Second, firms with certain characteristics may prefer to hire military CEOs. Even though we have controlled for an extensive list of firm-specific characteristics in our baseline regression, our results could still be driven by omitted firm characteristics that influence both the decision to employ military CEOs and corporate policies. We use two approaches to address these issues. First, we use the propensity score matching approach. Our goal is to compare the interest costs of firms with military CEOs and the interest costs of otherwise comparable firms. We conduct the following procedure to match military CEO firms (treatment firms) and non-military CEO firms (control firms). We first run a probit regression to define which firm characteristics are significant determinants of hiring military managers (as CEOs are not selected randomly). We then match the treatment and control firms using the two-digit SIC industry, firm total assets, and two significant determinants of hiring military CEOs (*ROA* and *MTB*). We then compute the difference between the interest costs of loans obtained by the treatment firms and the interest costs of loans obtained by the control firms.

[2] We thank Michael Roberts for making the linking table publicly available.

We find that both the mean and the median of the difference is negative and significant, suggesting that loans to firms with military CEOs have lower interest costs, relative to otherwise comparable firms. Next, we take a further step and re-run our baseline model on the matched sample. We find consistent results with our baseline regression. Overall, the findings of the propensity matching method confirm our main findings.

Second, we use the two-stage least squares regression (2SLS) method with instrumental variables. Following Bedard and Deschenes (2006), Benmelech and Fryman (2015), and Law and Mills (2017), we use the CEO birth year as an instrument for military experience. Benmelech and Fryman (2015) find that there is substantial time variation in the birth year of military CEOs, as the need for military service is correlated with wars. For example, men born from 1914 to 1919 are more likely to join the army because of the World War II. As a result, the birth year of a CEO is likely correlated with his or her military experience. In contrast, it is difficult to argue that the CEO's birth year has an influence on the firm's current loan contract. As an alternative instrument, we also employ CEO birth year dummies. Using the CEO birth year and the birth year dummies as instruments for CEO military experience, we find that the instrumented CEO military experience remains negative and significant, consistent with the baseline results. Overall, our main results are robust to the use of the 2SLS method with instruments.

We next examine the economic channels underlying the relation between military CEOs and loan costs. Prior studies show that military CEOs are associated with more precise disclosure (Bamber, Jiang, and Wang 2010); less fraudulent activities and tax avoidance activities (Benmelech and Fryman 2015; Law and Mills 2017). We argue, therefore, that military CEOs affect loan pricing because military CEOs cultivate a transparent information environment of the firm. Using several proxies for information environment, including analyst coverage, the probability of informed trading (PIN), earning accruals, and financial statement comparability, we show that the effect of military CEOs on loan pricing is more pronounced in firms with severe information asymmetry problems.

In addition, given that military service makes CEOs more conservative (Bamber, Jiang, and Wang 2010) and adopt conservative corporate policies (Benmelech and Fryman 2015), we expect the overall firm risk to be lower for firms with military CEOs. The lower level of firm risk, in turn, results in lower loan costs. We, therefore, conjecture that military CEOs affect loan costs through their effect in reducing overall firm risk. In subsample analyses, we observe that the effect of military CEOs on loan costs is stronger in high-risk firms, consistent with our conjecture.

We further document that, in addition to charging lower loan costs, banks also impose less restrictive non-price loan terms for firms with military CEOs. Specifically, these firms have longer loan maturity, lower covenant restrictions. In the final set of analysis, we examine if military CEOs matter for the implied cost of equity and bond financing costs. If military CEOs mitigate risk-taking and information asymmetry issues, we expect that the implied costs of equity and bond spread will be lower for firms with military CEOs. We find support for this conjecture whereby firms led by military CEOs have 6.8 percent lower implied cost of equity capital than firms run by non-military CEOs.

Our study contributes to the literature in the following ways. First, we extend the prior studies that highlight the significant effect of managers' background, characteristics, and experiences on various corporate decisions (Malmendier and Tate 2005; Malmendier, Tate and Yan 2011; Malmendier and Nagel 2011; Cronqvist, Makhija, and Yonker 2012; Bernile, Bhagwat, and Rau 2017; Cronqvist and Yu 2017; Schoar and Zuo 2017). Prior studies, however, provide little evidence on how military service experience affects financing decisions. We provide the first evidence that military CEOs matter for corporate financing costs. In doing so, we compliment recent studies on the effects of CEO military experience on corporate policies [see, for example, Bamber, Jiang, and Wang (2010), Benmelech and Fryman (2015), and Law and Mills (2017)].

We also extend the ongoing literature on the determinants of loan contract design. Prior studies emphasize the importance of firm policies such as financial reporting quality (Bharath,

Sunder and Sunder 2008; Ertugrul, Lei, Qiu and Wan 2017; Graham, Li and Qiu 2008; Fang, Li, Xin and Zhang 2016; Sunder, Sunder and Zhang 2018); claw-back provisions (Chan, Chen and Chen 2013); takeover defenses (Chava, Livdan and Purnanandam 2009); tax aggressiveness (Hassan et al. 2014) in shaping loan contracts. Our study instead focuses on the CEOs, who implement these policies, and show that the military experience, which facilitates transparency and mitigates risk-taking, has important implications for bank loan contract design.

The remainder of this paper proceeds as follows. Section 2 describes the data collection and our final sample. Section 3 discusses our baseline regression findings. We provide the empirical analyses that address endogeneity issues in Section 4. In Section 5, we discuss the economic mechanisms through which military CEOs affect loan pricing. Section 6 present further analyses on non-price loan terms; costs of equity capital and bond financing; and firm-level evidence on the relation between military CEOs and information asymmetry and firm risk. Section 7 concludes.

2 Data collection and sample description

2.1 Loan sample

Our loan sample comes from the Dealscan database, where the majority of loan contracts are syndicated loans. Syndicated loans involve multiple institutions jointly lending to a borrower. Each bank in the syndicate has a direct claim on the borrower. However, one (or at times, many) bank acts a lead lender, who represents the syndicate when negotiating the loan contract, monitoring the borrower, and performing other tasks (Dennis and Mullineaux 2000). Each loan contract might come as a package of multiple loan facilities. Following prior literature (Bharath et al. 2011; Bharath, Sunder and Sunder 2008; Hasan et al. 2014, 2017; Hollander and Verriest 2016; Nini, Smith and Sufi 2009, 2012), we treat each loan facility as an independent observation.[3]

[3] We acknowledge that this could bias our results, as loan facilities belonging to the same loan package might be highly correlated. We address this issue later on in Section 3.3.

2.2 Measuring military experience

We obtain a full list of Standard & Poor (S&P) 1500 firms and their CEOs in the period of 1992-2012 from Execucomp. We obtain information on the personal characteristics and military background of executives from *Marquis Who's Who*, one of the most comprehensive databases with CEOs' personal biographical details.[4,5] Following Bamber, Jiang, and Wang (2010), Benmelech and Frydman (2015), and Law and Mills (2017), we classify a manager as a military manager (*MILITARY*) if *Marquis Who's Who* indicates he or she has military service in the U.S Air Force, Amy, Marines, or Navy, or other related military experience (i.e., Coast Guard and military reserve forces).

2.3 Control variables

We include standard control variables, following prior literature (Bharath, Sunder and Sunder 2008; Graham et al., 2008; Hasan et al. 2014, 2017; Valta 2012; Ertugrul et al. 2017; Sunder et al. 2018). Our firm-level control variables include the natural log of total assets (*LOGASSETS*), the ratio of total debt to total assets (*LEVERAGE*), the ratio of plant, property and equipment to total assets (*PPE*), operating income before depreciation to total assets (*ROA*), market-to-book ratio (*MTB*), earnings volatility (*EARNVOL*), Z-score (*Z_SCORE*), and credit rating fixed effects. Our loan-level control variables include the log of the principal amount (*LOAN_SIZE*), the log of the number of months till maturity (*LOAN_MATURITY*), an indicator variable for whether the loan is syndicated (*SYNDICATION*), and loan type and loan purpose fixed effects. To control for time-invariant and industry-specific unobservable factors, we include year and industry fixed effects, whereby a borrower's industry is defined by the two-digit SIC code. Finally, we include the term

[4] *Marquis Who's Who* is an American publisher of a number of directories containing short biographies. Several other studies (e.g., Cronqvist and Yu (2017); Schoar and Zuo (2017); Bernile, Bhagwat and Rau (2016); Benmelech and Frydman (2015); and Duchin and Sosyura (2013)) have also collected personal biographical information from *Marquis Who's Who* to construct their key CEO idiosyncratic variables.

[5] Because *Marquis Who's Who* explicitly asks for information on military background, this source of data minimizes the measurement error in our main variable of interest (Benmelech and Frydman 2015).

structure of interest rates and the credit default spread, measured as the average of the daily values over the fiscal year. We explain our variables in detail in Appendix A.

2.4 Other CEO characteristics

In order to control for other known CEO characteristics, we hand-collect information on the CEO's country of birth, educational qualifications, gender, past military service, year of birth, and various other personal biographical details from *Marquis Who's Who* database and Boardex.[6] Specifically, from a full list of firms and their CEOs from Execucomp, we manually search CEO names in the *Marquis Who's Who* and Boardex databases to find their biographies. We also cross-check with several other databases, including *NNDB.com, Reference for Business, Bloomberg.com, Wikipedia*, or *Google* for each CEO characteristic obtained from *Marquis Who's Who*. This process allows us to compile a comprehensive and fine-grained dataset of several CEO attributes. Finally, we compute CEO risk incentives (*DELTA* and *VEGA*) from compensation contract data following the methodology in Core and Guay (2002).

2.5 Descriptive statistics

Our final sample includes 8,150 loan-year observations and 4,298 firm-year observations for the period 1992-2012. Table 1 presents the descriptive statistics of loan facilities in our sample. For each variable, we provide information about the total number of observations, the mean and median values, the standard deviation, and the values at the 25th and 75th percentiles.

In Panel A, we report the CEO characteristics at the loan level as well as at the firm level (in parentheses). The proportion of CEOs with military experience in our sample accounts only for 7.1% of the total number of companies. Approximately 21% of the CEOs have an MBA degree, while under 7% have a Ph.D. qualification. About 17% of the CEO graduated from prestigious universities (the Ivy League), and 22% have a background in finance. The proportions of foreign

[6] Prior studies document that CEO's personal characteristics play significant roles in corporate tax avoidance (Law and Mills 2017; Dyreng et al 2010), conservative policies (Malmendier et al. 2011; Hutton et al. 2014; Schoar and Zuo 2017), merges and acquisitions activities (Masulis et al. 2012), corporate tax reporting (DeBacker et al. 2015; Christensen et al. 2015).

CEOs and female CEOs are rather small (5% and 3%, respectively). The proportion of CEOs born during the Great Depression (1920-1929) is just under 1%. These statistics are consistent with Law and Mills (2017). In terms of risk incentives, the mean values of the logarithm of CEO's *Delta* and *Vega* are 5.54 and 3.65, respectively, which is consistent with prior studies (e.g., Billings et al., 2014; Chen et al., 2015).

The firm characteristics are reported in Panel B (the values in parentheses are measured at the firm level). The average firm size is about $4 billion, and the book leverage ratio is 0.452. Asset tangibility (*PPE*) is 0.291. Cash flow volatility is 0.043 on average. Our firm characteristics are in line with studies using loan contracts over similar time frames (Bushman, Williams and Wittenberg-Moerman 2017; Hasan et al., 2017; Valta 2012).

Turning to the loan characteristics (Panel C), on average, our sample loan facilities have a lower loan spread, short maturity, and are larger in size, relative to prior studies (Hasan et al. 2014, 2017; Valta 2012). Most of these loans are syndicated. About 30% of the loans have a collateral requirement, and about 26% have covenant restrictions.

[Insert Table 1 here]

3 The effect of CEO military experience on loan costs

3.1 Baseline results

We study the relation between CEO military experience and the cost of bank loans using the following equation:

$$SPREAD_{i,j,t} = MILITARY_{j,t-1} + FIRMCTRL_{j,t-1} + LOANCTRL_{i,j,t} + MACRO_{t-1} + FEs, \quad (1)$$

where $SPREAD_{i,j,t}$ denotes the natural log of the spread between the loan interest rate and the LIBOR or LIBOR-equivalent rate for loan *i* granted to firm *j* in year *t*; $MILITARY_{j,t-1}$ denotes a dummy variable that takes the value of one if the CEO has military experience, and zero otherwise; $FIRMCTRL_{j,t-1}$ denotes firm-level control variables obtained in the fiscal year prior to the loan

year; $LOANCTRL_{i,j,t}$ denotes other key features of the same loan observation; FEs denotes industry and year fixed effects.

Our firm-level control variables include the natural log of total assets, the leverage ratio, asset tangibility, return on assets, market-to-book, the Z score, earnings volatility and cash flow volatility. We further control for the firm's credit rating using credit rating fixed effects. Our loan-level control variables include the log of loan size, the log of loan maturity, a loan syndication dummy, and loan type and loan purpose fixed effects. We also control for macroeconomic conditions, including the term structure of interest rates and the credit spread. Finally, to control for unobservable time-invariant and industry-specific factors, we include the year and industry fixed effects. We use the two-digit Standard Industrial Classification (SIC) code to define a company's industry.

We report the results of estimating Equation (1) using the OLS regression method in Table 2. Model 1 shows the relation between the military dummy and loan spreads without any control variables. In Models 2 and 4, we include firm- and loan-level control variables. In Models 3 and 5, we include the full set of control variables, including firm-level, loan-level, and macroeconomic control variables. Furthermore, while several studies use earnings volatility to control for firm risk (Hasan et al. 2014), others, such as Graham, Li, and Qiu (2008) and Valta (2012), use cash flow volatility. As a result, we use earnings volatility (Models 2 and 3) and cash flow volatility (Models 4 and 5) as alternative measures of firm risk. For all models, we cluster standard errors at the firm level. We find that across all models in Table 2, the coefficient of *MILITARY* is negative and significant. The size of the coefficient is -0.0840 in the full model with earnings volatility as a measure of risk, and -0.0868 when we use cash flow volatility to proxy for firm risk. The magnitude of these effects is economically significant, with firms led by military CEOs, on

average, having about 8.40% (about 11 basis points) lower bank loan prices than firms headed by non-military CEOs.[7]

Turning to the control variables, the majority of the control variables carry expected signs and are consistent with the prior literature (Bushman, Williams and Wittenberg-Moerman 2017; Hasan et al. 2014; Houston et al. 2014; Valta 2012). We find that larger firms and firms with lower leverage borrow at a cheaper rate. Firms with a higher market-to-book ratio also have a lower loan spread. In contrast, riskier firms (firms with a lower Z score, higher earnings volatility or higher cash flow volatility) borrow at a higher rate. Similarly, we find that loan maturity are negatively associated with loan spreads. We also find a negative coefficient for loan size in most regressions, although the coefficient is not significant.

[Insert Table 2 here]

3.2 Controlling for other CEO characteristics

A large body of literature investigates several attributes of corporate executives that affect accounting activities and information environment of the firms they manage. Aier, Comprix, Gunlock, and Lee (2005), for example, show that financial expertise and educational background of executives are related to the likelihood of accounting restatements. Malmendier and Tate (2005) show that managerial overconfidence can account for corporate investment distortions. Malmendier, Tate, and Yan (2011) find that CEOs who grew up during the Great Depression are averse to debt and lean excessively on internal finance. Cronqvist, Makhija, and Yonker (2012) find a consistent and positive correlation between corporate level and CEO personal leverage. Jain, Jiang, and Mekhaimer (2016) find firms with a larger divergence of appropriation horizons in the

[7] We estimate this difference as the coefficient on *MILITARY* multiplied by the average of sample loan spread (e.g., -0.0840 ×131 bps = -11 bps). Bharath et al. (2008), Francis et al. (2012), Hasan et al. (2014), Hasan et al. (2017), and Ertugrul et al. (2017) document a similar magnitude of effects on the cost of bank loans of firms and conclude such effects to be economically significant.

top management team are more liquid. Pan, Wang, and Weisbach (2015) document a decline of return volatility over CEO tenure. Bishop, DeZoort, and Hermanson (2017) document that CEO social influence pressure and CFO accounting experience can affect reporting judgments and decisions. Bernile, Bhagwat, and Rau (2017) find a consistent association between CEO's early-life exposure to fatal disasters and several corporate policies including leverage, cash holdings, stock volatility, and acquisitiveness. More recently, Cronqvist and Yu (2018) find that when a firm's CEO has a daughter, the corporate social responsibility rating is about 9.1% higher, compared to the median firm.

To ensure that our results are not driven by other CEO characteristics, we consider controlling for various CEO characteristics such as experience, skills, educational background and their risk incentives from the compensation contracts. Specifically, we modify our baseline regression by including *GENERAL*, *MBA*, *PHD*, *IVY_EDUC*, *FINTECH_EDUC*, *DEPRESSED_BABY*, *FOREIGN_CEO*, *MA_SCORE*, *DELTA*, and *VEGA.*

In our setting, *GENERAL* refers to the general managerial skills of the CEOs over their executive lifetime work experience, estimated following Custódio, Ferreira, and Matos (2013). *MBA* (*PHD)* is a dummy variable that takes a value of one if the CEO holds an MBA degree (a Ph.D. degree) and zero otherwise. *IVY_EDUC* is a dummy variable that takes a value of one if the CEO attended one of the Ivy-League institutions and zero otherwise.[8] *FINTECH_EDUC* is a dummy variable that takes the value of one if the CEO has a financial education background and zero otherwise (Cronqvist, Makhija, and Yonker 2012). *DEPRESSED_BABY* is a dummy variable that takes the value of one if the CEO was born during the Great Depression period of 1920 to 1929 (Malmendier and Nagel 2011; Malmendier, Tate, and Yan 2011; Malmendier and Tate 2005)

[8] The Ivy institutions include Brown University, Columbia University, Cornell University, Dartmouth College, Harvard University, the University of Pennsylvania, Princeton University, and Yale University.

and zero otherwise.[9] *DELTA* (*VEGA)* is the natural logarithm of one plus the dollar change in wealth associated with a 1% change in the firm's stock price (the standard deviation of the firm's returns) (Coles, Daniel, and Naveen 2006; Core and Guay 2002; Anantharaman and Lee 2014). *MA_SCORE* is the managerial ability score estimated in Demerjian, Lev, and McVay (2012). We report the results of controlling for CEO characteristics in Table 3. We find that none of the CEO characteristics we consider has an impact on our baseline results. There is no material change in the size of the coefficient for *MILITARY*, and it is significant across all models of Table 3. The results reported in this table thus suggest that the effect of CEO military experience on loan costs is not confounded by any of the CEO characteristics considered in this analysis.

[Insert Table 3 here]

3.3 Further robustness checks

We further conduct a battery of tests to ensure our results are not biased by model specifications. We report these results in Panel A of Table 4. First, since the decision to hire a CEO with a military background is made by the firm, it is possible that certain firm-specific factors influence both the presence of a military CEO and loan costs. To address this concern, we include firm fixed effects in our regression. Second, loans originated by the same lead bank might not be independent, which could bias the standard errors (Hasan et al. 2014). Thus, we also re-estimate our baseline model and cluster standard errors at both the borrowing firm- and the lead bank-levels. Finally, to circumvent the effect of outliers, we use a median regression. We find that the coefficient of *MILITARY* is negative and significant across all models, consistent with the results documented in Table 2.

[9] Malmendier and Nagel (2011) document that individuals who were born in the decade leading up to the Great Depression express lower willingness to take financial risk. Malmendier and Tate (2005, 2009) find that corporate managers who are "*Depression Babies*" are averse to debt and excessively rely on internal financing. Graham and Narasimhan (2004) find that those who experienced the Great Depression as managers choose a more conservative capital structure. An implication from these studies is that firms led by "*Depression Babies*" CEOs are generally less risky and auditors may consider this factor in the pricing of their audit service.

In Panel B, we consider the impact of alternative robustness checks for our results. First, if a loan package includes multiple facilities, and we treat each facility as an independent observation, our standard errors might be biased because these facilities are related. As an alternative approach, we include only the largest facility in each loan package in our sample, following Anantharaman, Fang, and Gong (2013). We find that for this test, the coefficient of *MILITARY* is -0.057, and is statistically significant, consistent with our baseline results. Second, if soft information such as the CEO military experience is valuable to banks, we argue that banks value CEO military experience more when they lack information regarding the borrowing firm. To test this hypothesis, we examine the relation between CEO military experience and loan costs for first loan initiations. Specifically, following Hasan et al. (2014), we construct a reduced sample by focusing on the first bank loan the firm obtained during the sample period of 1992–2012, and if the firm has multiple facilities in its first loan then we use the largest facility obtained by the firm in its first loan. We estimate the baseline regression model again using this firm-level cross-sectional sample. We find the result to be significant and stronger than the baseline results, suggesting that banks value CEO military experience more when they have no prior lending relationship with the borrower. Third, we examine if our results are driven by the financial turmoil in the period 2008-2009 by excluding all loans granted after 2007. Our results (Model 6) remain robust with the exclusion of post-2007 loans.

Besides the interest cost, a borrower might pay additional fees on their loan. As our main dependent variable is the interest spread, a potential problem could be that while firms with military CEOs pay lower interest spreads, they may pay higher fees. Consequently, the total cost of bank loans for firms with military CEOs might be similar or even higher than firms without military CEO, once various loan fees are accounted for. To investigate whether this is the case, following Berg, Saunders, and Steffen (2016), we employ a measure of total loan costs, which

take into account the interest costs and various components of fees, as the dependent variable.[10] Using this measure, we still obtain a negative and significant coefficient for *MILITARY*, indicating that our overall conclusion remains unchanged.

Finally, we control for corporate governance. While we argue that our results are driven by military CEOs' conservatism (thus reducing firm risk and information asymmetry), one could argue that firms with good corporate governance tend to appoint CEOs with military experience. In other words, our results might be driven by the strength of the firm's corporate governance. This is possible, as prior studies document the importance of corporate governance for debt financing decisions (Bradley and Chen 2011; Fields, Fraser and Subrahmanyam 2012; Rahaman and Al Zaman 2013). To rule out this possibility, we control for corporate governance in our analysis. The measures of corporate governance include the G-index (Gompers, Ishii and Metrick 2003), institutional ownership (Hartzell and Starks 2003; Ljungqvist et al. 2007; Ramalingegowda and Yu 2012), and the takeover index (Cain, McKeon and Solomon 2017). We report the results of controlling for corporate governance in Panel C. In the first three models (Models 8 to 10), we augment our baseline model with each of the above governance proxies individually. We find that our results remain consistent even after controlling for corporate governance. In Model 10, we include all governance measures in our regression. The coefficient of *MILITARY* remains negative and strongly significant. These findings indicate that CEO military experience has a significant impact on loan pricing, beyond the effect of corporate governance. Overall, the analyses presented in Table 4 show that the effect of CEO military experience on loan pricing is robust across various model specifications and sampling methods.

[Insert Table 4 here]

[10] We thank Tobias Berg for making the total loan cost measure publicly available.

4 Identification strategies

While we find a robust negative relation between CEO military experience and loan costs, our analyses so far have not yet established causality. Our findings could suffer from an omitted variable bias. In particular, firms might endogenously appoint military CEOs based on certain unobservable characteristics. At the same time, these characteristics might influence bank lending decisions. We attempt to control for unobservable firm-specific factors using an OLS regression with firm fixed effects, as discussed in the previous section (Model 1 of Table 4). Nevertheless, there could be other unobservable factors that we fail to control for. In the discussion that follows, we make several attempts to alleviate this concern.

4.1 Propensity score matching

We first use the propensity score matching approach to ensure that we compare the loan costs of firms with military CEOs and the loan costs of otherwise similar firms. Following Law and Mills (2017), we first estimate a probit model with the military dummy variable as the dependent variable. The explanatory variables include all firm-level variables outlined in Equation (1) above. From this regression, we identify that ROA and MTB are significant determinants of the probability of having a military CEO. This is consistent with the results presented in Table 7 of Law and Mills (2017). Guided by the results of the probit regression above, we then perform a matching along the following firm characteristics: ROA, MTB, SIZE and the two-digit SIC industry. Our treatment firms are those with a military CEO, and our control firms are those with a non-military CEO. For each firm in the treatment group, we select a matched peer with the closest propensity score, along with the four dimensions discussed above. All matched pairs are drawn without replacement. Following Benmelech and Fryman (2015), we limit loan observations to those granted in the year a new CEO is appointed.

The average treatment effects (*Control – Treatment*) are reported in Panel B. We test for mean difference using the paired *t*-test, and we test for median difference using the Wilcoxon signed rank test. In both cases, we find positive and significant differences between the loan

spreads of the control firms and the loan spreads of the treatment firms. This indicates that the loans in our treatment group (firms with military CEOs), on average, have a lower loan spread than loans in our control group (firms without military CEOs), thus confirm our main findings.

Next, we take a further (and more conservative) step to employ regression framework and rerun our baseline model [Equation (1)] on the sample of treated loans and their matched control loans. We report the findings in Panel C of Table 5. Accordingly, we still observe a negative and significant coefficient for *MILITARY*. The magnitude of the coefficient is -0.085, similar to the baseline result. Overall, the analysis presented here suggests that our results are robust to adjusting for firms self-selecting CEO with a military background based on their own characteristics.

[Insert Table 5 here]

4.2 Instrumental variable approach

To address the concern that our OLS estimates may be biased by unobserved personal traits inherent to the individual correlated both with military service and with CEO decisions, we use an instrumental variables approach. This strategy also helps us to address the potential downward bias in our coefficient of interest introduced by an error in the measurement of whether a chief executive served in the military. Following Bedard and Deschenes (2006), Benmelech and Fryman (2015), and Law and Mills (2017), we use the CEO birth year as an instrument for military experience. The probability of being drafted is associated with war times. For example, during World War II, men born between 1914 and 1919 were eligible [see Benmelech and Fryman, footnote 24, page 54, for further information]. As such, the birth year of the CEO is likely to be correlated with the CEO military experience. At the same time, it is unlikely that the CEO birth year would influence bank lending decisions in the current year. We then perform a two-staged least squares (2SLS) regression as follows:

$$MILITARY_{j,t} = CEOBIRTHYR_{j,t-1} + CEOCTRL_{j,t-1} + FIRMCTRL_{j,t-1} + LOANCTRL_{i,j,t} + MACRO_{t-1} + FEs, \quad (2)$$

$$SPREAD_{i,j,t} = \overline{MILITARY}_{j,t-1} + CEOCTRL_{j,t-1} + FIRMCTRL_{j,t-1} + LOANCTRL_{i,j,t} + MACRO_{t-1} + FEs \quad (3)$$

Equation (2) is the first-stage regression, and Equation (3) is the second-stage equation under our 2SLS regression framework. *CEOBIRTHYR* represents the CEO's year of birth; $\overline{MILITARY}$ is the predicted probability of the CEO having a military background. The second-stage equation is analogous to Equation (1) above, except we replace the actual CEO military dummy variable with the predicted probabilities obtained from estimating the first-stage regression. In both Equations (2) and (3), we include all control variables specified under Equation (1). All specifications control for year fixed effects, industry fixed effect using two-digit industry classification, credit rating fixed effect, loan types, syndication, and purposes fixed effects. All models also include three indicators for CEO educational background (*IVY*, *FINTECH_EDUC*, and *MBA*) and an indicator for whether the age of the executive is above the median age in the entire sample, as in Benmelech and Frydman (2015), macroeconomic control variables, and all firm-level control variables as presented in the baseline model. Finally, we use bootstrapped standard errors with 200 replications to correct for any potential correlation of residuals across firms and across time.

The first-stage regression yields a negative and significant coefficient for the instrument variable (-0.069 with t = -4.48), consistent with the declining trend in the likelihood of military service. The F-statistic obtained from the first-stage regression is 10.98, indicating that our instrument is relevant.[11] The results for the second-stage regression are reported in Model 1 of Table 6 below. In the second stage, we observe a coefficient of -0.088 (t = -3.30) on *MILITARY*. The results of the 2SLS regression method are consistent with the baseline results (Table 2), supporting our hypothesis that banks charge lower loan rates if the CEO has military experience.

[11] Staiger and Stock (1997) suggest a critical value of 10. We find that our second-stage 2SLS results are as strong as those in Benmelech and Frydman (2015) and Law and Mills (2017).

As an alternative approach, we consider birth year dummy variables as instruments. We report the results of this test in Model 2. We obtain a coefficient of -0.099 (t = -9.60) for *MILITARY* when the year of birth dummies variables are used as instrumental variables. Overall, our results are consistent with those reported in the baseline results.

[Insert Table 6 here]

5 Economic channels

We argue that CEO military experience helps reduce loan costs because of two reasons. First, Law and Mills (2017) find that firms led by military CEOs are less likely to engage in earnings management, announce financial restatements, backdate option exercise dates, and are less subject to class action lawsuits. These findings indicate that these firms are more transparent relative to non-military CEO firms. We, therefore, argue that CEO military service influences loan pricing through the channel of information asymmetry. Second, CEOs with a military background have a better sense of ethics (Bamber, Jiang and Wang 2010; Benmelech and Frydman 2015). As a result, they are less likely to engage in excessive risk-taking behavior that might increase firm risk. In other words, CEO military experience should be associated with lower risk. If this is the case, we would expect the value of CEO military experience to be more important in riskier firms. We investigate these channels in the following discussions.

5.1 Information asymmetry

Daboub et al. (1995), Damon (2004) and Franke (2001), among others, argue that the military culture values honesty and integrity, which encourages ethical decision making. Consistent with this argument, Bamber, Jiang, and Wang (2010) show that CEO military experience is associated with more conservative reporting practices and more precise disclosures. Law and Mills (2017) further show that firms with military CEOs are less tax aggressive, as evidenced by higher levels of cash and GAAP effective tax rates. Taken together, these studies highlight that CEO military experience is associated with a more transparent information environment for the firm.

It has been long established in the bank loan literature that banks charge higher loan rates when the borrower faces severe information asymmetry (Armstrong, Guay and Weber 2010; Bharath, Sunder and Sunder 2008; Ertugrul et al. 2017; Graham, Li and Qiu 2008). As CEO military experience helps increase information transparency (and hence reducing information asymmetry problems), we expect that banks value CEOs with a military background more highly when the borrowing firm faces a high degree of information asymmetry. Thus, the effect of CEO military service on loan costs should be stronger as the degree of information asymmetry increases.

To investigate the information asymmetry channel, following Kim and Zhang (2014), we perform subsampling tests. The purpose is to compare the effects of CEO military experience on loan costs among firms facing high and low levels of information asymmetry. We employ four commonly used proxies for information asymmetry, including the number of analysts following the borrowing firm, the probability of informed trading (PIN), accruals, and financial statement comparability (Bharath, Sunder and Sunder 2008; Brown and Hillegeist 2007; De Franco, Kothari and Verdi 2011; Dechow and Dichev 2002; Dechow, Sloan and Sweeney 1995b; Hasan et al. 2014; Imhof, Seavey and Smith 2017; Kim et al. 2016).

More analyst coverage (a larger number of analysts following) implies that information regarding the borrowing firm is more accessible to the public, and consequently should be associated with a lower level of information asymmetry. We compute the analyst coverage measure using data from the I/B/E/S database. The PIN measure captures the proportion of informed trading relative to uninformed trading [see, for example, Easley et al. (1996) and Easley, Kiefer, and O'Hara (1997)]. In a transparent information environment, the benefit for an informed trader is smaller, implying that they are less likely to trade. This corresponds to a lower PIN. A higher PIN, therefore, indicates a more opaque information environment (i.e., higher information

asymmetry) when informed traders are able to make more profits (and hence more likely to trade). We collect the PIN score from Stephen Brown's website [see Brown and Hillegeist (2007)]. [12]

Our third measure is the abnormal discretionary accruals, which captures the risk of face-to-face IRS audit. A higher level of discretionary accruals might indicate a higher incentive for tax avoidance, thus triggering the IRS audit. We measure abnormal discretionary accruals based on the modified Jones (1991), following Dechow, Sloan, and Sweeney (1995). Our final proxy for information asymmetry is financial report comparability. Financial report comparability measures how closely a firm's financial reports follow its actual economic performance. De Franco, Kothari and Verdi (2011) find that higher financial report comparability is positively associated with analyst forecast accuracy and negatively associated with analyst dispersion. This implies that financial report comparability is negatively associated with the degree of information asymmetry.

For each fiscal year, we sort firms into terciles based on the value of each of the information asymmetry variables mentioned previously. For the analyst coverage and financial statement comparability measures, we define firms in the bottom (top) tercile as having high (low) information asymmetry. In contrast, for the PIN and accruals measures, we define firms in the top (bottom) tercile as having high (low) information asymmetry. We then re-estimate our baseline regression [Equation (1)] on each subsample and compare the coefficients of *MILITARY* obtained for firms with high and low information asymmetry.

We report the results of these tests in Table 7 below. Models 1, 3, 5, and 7 report the results of estimating Equation (1) for firms defined as having a high degree of information asymmetry. The remaining models report the results for firms having a low degree of information asymmetry. We find that the negative relation between *MILITARY* and loan pricing is significant only when firms are faced with a high degree of information asymmetry. There is no significant relation

[12] We thank Stephen Brown for making the PIN score publicly available.

between CEO military experience and loan pricing among firms facing fewer information problems. This finding is consistent across all four measures of information asymmetry and supports our conjecture that CEO military experience influences loan pricing through the channel of information asymmetry.

[Insert Table 7 here]

5.2 Firm risk

Another channel through which CEO military experience influences loan costs is a firm risk. If military training makes CEOs more conservative (Bamber, Jiang and Wang 2010), they should be less inclined to take the risk. Empirical evidence shows that banks charge higher loan rates to compensate for higher default risk (Bharath, Sunder and Sunder 2008; Ertugrul et al. 2017; Graham, Li and Qiu 2008; Valta 2012). As a result, if CEO military experience is negatively related to firm risk, CEO military experience should also be negatively related to loan pricing.

To examine the role of risk in explaining the relation between CEO military experience and loan pricing, we perform subsampling tests, similar to those described in the previous section. We measure firm risk using (1) earnings volatility (Graham et al., 2008; Hasan et al., 2014), (2) cash flow volatility (Graham et al., 2008; Valta, 2012), and (3) Merton (1976) expected default probability developed by Bharath and Shumway (2008) (Brogaard et al., 2017). For each fiscal year of our sample period, we sort firms into terciles based on one of these measures of firm risk. We define high (low) risk firms as firms belonging in the top (bottom) tercile. We then re-estimate Equation (1) on these groups separately and report the results in Table 8. Our findings indicate that the effect of CEO military service (*MILITARY*) on loan costs is highly significant in high-risk firms (the odd-numbered columns), whereas it is either insignificant or marginally significant in low-risk firms (the even-numbered columns). These results support our argument that the effect of CEO military on loan costs is through its impact on firm risk.

[Insert Table 8 here]

6 Further analyses

6.1 CEO military experience and bank monitoring

In this section, we study the effect of CEO military experience on loan monitoring provisions, including covenant restrictions and collateral requirements (security). Debt covenants are in place to prevent the borrowing firm from taking actions detrimental to debtholders, thereby aligning shareholder and debtholder interests (Bradley and Roberts 2015; Diamond 1984; Smith and Warner 1979). In addition, performance-based covenants act as tripwires, helping to monitor the performance of borrowing firms (Christensen and Nikolaev, 2012). Loan covenants are effective monitoring tools; managers have an incentive to ensure the company does not breach any loan covenant, since this triggers a transfer of control from the managers to the lenders (Armstrong, Guay and Weber 2010; Dichev and Skinner 2002). Similarly, Rajan and Winton (1995) posit that collateralization incentivizes bank monitoring because it ensures the bank's claim in the event of bankruptcy.

If military CEOs are more conservative and are less likely to engage in fraudulent activities (Benmelech and Frydman 2015; Law and Mills 2017), the need to monitor the borrowing firm might be less. As such, we expect a negative relation between the presence of military CEOs and the use of covenants and security. We examine the effect of CEO military experience on (1) the likelihood of the loan having a covenant restriction, (2) the number of covenants in the loan, and (3) the likelihood of the loan having a collateral requirement. We report the results of these analyses in Models 1 to 3 of Table 9, respectively. In Model 1, our dependent variable is a dummy variable that equals one if the loan has at least one covenant restriction (Ivashina 2009; Demerjian 2011; Hasan et al. 2017). We estimate the effect of the CEO military dummy variable (*MILITARY*) on the covenant dummy variable using a probit regression. We include all control variables as specified in the baseline model [Equation (1)]. The coefficient of *MILITARY* is -0.087 and is significant at the 5% level. We find that the appearance of a military CEO reduces the likelihood that banks impose at least one covenant by approximately 0.6%.

In Model 2, our dependent variable is the covenant intensity, estimated as the natural logarithm of 1 plus the total number of covenants in a loan facility (Graham et al. 2008; Hasan et al. 2017). To estimate the effect of CEO military experience on covenant intensity, we employ an OLS model that includes all control variables specified in Equation (2) above. We also find a negative and significant coefficient for *MILITARY* in Model 2, indicating that the number of loan covenants decreases if the CEO has a military background.

Finally, we examine the effect of military CEOs on the likelihood of collateral requirements and report the results in Model 3. The dependent variable is a dummy variable that takes the value of one if the loan facility is secured, and zero otherwise. Using a probit regression, we find a negative effect of military CEOs on the likelihood of collateral requirements. Overall, the evidence presented in Table 9 suggests that banks impose fewer covenant restrictions and collateral requirement on firms with military CEOs. Thus, consistent with our expectation, we find that CEO military experience is associated with a lower need for monitoring the borrowing firm.

[Insert Table 9 here]

6.2 The effect of CEO military experience on other types of financing

While the focus of our paper is on the costs of bank loans, we also explore whether military CEOs matter for other financial suppliers, namely equity investors and bondholders. Thus far, we have argued that firms run by Military CEOs are associated with lower cost of bank loans by exhibiting lower information risks. Given information risk results in a higher firm cost of capital (Aboody et al. 2005; Francis et al. 2008; Kim and Qi 2010; Ng 2011; Kim and Sohn 2013), we conjecture that firms headed by these CEOs exhibit lower cost of equity by associating with lower information risks.

To study the effect of CEO military experience on the implied cost of equity, we estimate the following equation:

$$ICOC_t = MILITARY_{t-1} + SIZE_{t-1} + BTM_{t-1} + LEVERAGE_{t-1} + PPE_{t-1} + ROA_{t-1} + FEs \quad (4)$$

where *ICOC* is the average of the four implied cost of equity measures, including *r*GM (Gode and Mohanram, 2003), *r*CT (based on the Claus and Thomas (2001), *r*GLS (based on the Gebhardt et al. (2001), *r*EAST (based on the Easton (2004). Given that there appears to be a lack of consensus on the superiority of any individual model in estimating the cost of equity capital, we follow Dhaliwal et al. (2006), Hail and Leuz (2006), and Naiker et al. (2013) to use the equally weighted average of the four implied cost of equity measures (denoted as *ICOC)* as our measure of cost of equity. We include in the regression model several firm-level characteristics, including firm size (*SIZE*), book-to-market ratio (*BTM*) (Gebhardt et al. 2001; Dhaliwal et al. 2007), leverage (*LEVERAGE*), asset tangibility (*PPE*), and firm profitability (*ROA*). Table 10 reports the results of testing the effect of CEO military experience on the implied cost of equity capital. The coefficient of *MILITARY* is negative and significant in both Model 1 – when we exclude all control variables – and in Model 2 – when we include all control variables as per Gebhardt et al. (2001) and Dhaliwal et al. (2007). The magnitude of these effects is economically significaret, with firms led by military CEOs having, on average, 6.8% lower implied cost of equity capital than firms run by non-military CEOs.[13] This indicates that CEO military experience is value enhancing for shareholders, consistent with the agency-based explanation (Franke 2001; Benmelech and Frydman 2015).

[Insert Table 10 here]

[13] Our results suggest that, after accounting for the impact of the control variables, firms headed by military CEOs have 6.24 percent lower implied cost of equity capital than firms run by non-military CEOs. We estimate this difference as the coefficient on *MILITARY* divided by the average implied cost of equity across the full sample (e.g., for *ICOC*, -0.0068/0.109 = -6.24 percent). Hail and Leuz (2006), Ben-Nasr et al. (2012), and Naiker et al. (2013) document a similar magnitude of effects on the cost of equity capital of firms and conclude such effects to be economically significant.

Similarly, we expect a negative relation between CEO military experience and the cost of bonds. Anderson, Mansi and Reeb (2004) find a negative relation between financial integrity and corporate bond yield spreads, suggesting that bond investors also value information transparency. To the extent that military service fosters integrity, CEOs with a military background should have higher standards for financial reporting transparency. This in turn should reduce the costs of bonds.

To examine the effect of CEO military experience on the costs of bonds, we collect information on bond issuances for firms in our sample from the SDC Global New Issues database. We measure bond costs as the log of the spread between the bond yield and a Government bond with matching maturity (item *spread-to-benchmark*). Following Hasan et al. (2014), we estimate the following equation:

$$BNSPREAD_{i,j,t} = MILITARY_{j,t-1} + BNCTRL_{i,j,t} + FIRMCTRL_{j,t-1} + MACRO_{t-1} + FEs, \quad (5)$$

where *BNSPREAD* is the log of the bond spread; *MILITARY* is a dummy variable that takes the value of one if the CEO served in the army, and zero otherwise; *BNCTRL* is a set of bond-level control variables, including the log of bond maturity, the log of bond size, a callability dummy variable, a private bond dummy variable, and a senior bond dummy variable; *FIRMCTRL*, *MACRO*, and *FEs* are as previously defined in Equation (1).

The results of estimating Equation (5) with the OLS regression method are shown in Table 11. We find a coefficient of -0.0563 for the military CEO dummy variable (*MILITARY*). This coefficient is significant at the 5% level. The size of this coefficient becomes -0.053 when we include all control variables as specified above. Overall, this result is consistent with the negative effect of CEO military service on loan pricing, suggesting that bond investors also value CEO military experience. Taken together, our baseline results and the results reported in this section support the notion that the military equips CEOs with a unique set of leadership skills and ethical conscience (Franke 2001; Benmelech and Frydman 2015). From a financial supplier's point of

view, this is beneficial because information problems and firm risk are less of a concern, which helps reduce firms' financing costs.

[Insert Table 11 here]

6.3 Does CEO military experience decrease information asymmetry and firm risk? A firm-level analysis

We argue in this paper that CEO military experience helps reduce the costs of financing because firms with military CEOs tend to have lower information asymmetry and risk (see Section 5). In this section, we provide empirical support for this argument by investigating the relation between CEO military experience and the firm's information environment, as well as its overall risk. We discuss our findings below.

First, we conduct a firm-level analysis to examine whether CEO military experience is associated with the firm's information environment. Similar to the analyses presented in Section 5.1, we proxy for firms' information environment using financial report comparability and accounting accruals. To investigate the effect of CEO military service on the firm's information environment, we estimate an OLS regression with a proxy for information asymmetry as the dependent variable and the CEO military dummy variable as the independent variable of interest. We include all firm-level control variables as specified in Equation (1) and year and industry fixed effects in our regression. In addition, as we conduct a firm-level analysis, we do not exclude observations with missing loan data. This results in a larger sample compared to our baseline sample. The empirical results are reported in Panel A of Table 12.

For both measures of information asymmetry, we report the results of estimating the effect of *MILITARY* on the information asymmetry proxy without controlling for additional firm characteristics (Models 1 and 3), as well as the results of estimating the effect of *MILITARY* while controlling for the full set of firm-level characteristics (Models 2 and 4). We find the results to be consistent regardless of whether we include further control variables. With regard to financial

reporting comparability, we document a positive and significant effect of *MILITARY*, suggesting that firms with a military CEO have more transparent financial reports. For accounting accruals, we observe a negative coefficient for *MILITARY*. This indicates that firms with military CEOs report smaller accounting accruals, holding everything else equal. These findings are consistent with more transparent information environment in firms with military CEOs.

We next turn to firm risk. In a similar fashion to the analysis reported above, to examine the effect of CEO military experience on firm risk, we regress a proxy of firm risk against *MILITARY* using the OLS regression method with industry and year fixed effects. We employ three proxies for firm risk, including earnings volatility (*EARNVOL*), cash flow volatility (*CFVOL*), and Merton (1976) expected default probability (*MEDF*). These proxies are analogous to the proxies we use in Table 8. We report the results of estimating the effect of CEO military experience on firm risk in Panel B of Table 12. Across all measures of firm risk, we observe a negative and significant coefficient for *MILITARY*, indicating that military CEO firms have a lower firm risk. Overall, the results of Tables 12 are consistent with our argument of the channels through which CEO military experience influences the costs of bank loans.

[Insert Table 12 here]

5. Conclusions

We find that banks charge lower loan costs for firms run by military CEOs. This finding is robust when we use alternative model specifications, sampling methods, and identification strategies. The effect of military CEOs on loan cost is stronger when the firms are subject to higher information asymmetry issues and have a higher business risk. Collectively, these findings suggest that military CEOs affect loan costs through their effect in mitigating information asymmetry and reducing firm risk. The benefits of military CEOs extend to non-price loan terms in the form of the less restrictive covenant and collateral requirements. Military CEOs are also associated with

lower implied costs of equity and costs of new bond issues. Overall, our study is the first to highlight the importance of military experience for corporate financing costs.

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Appendix A: Variable description

Variable	Description
CEO characteristics collected from Marquis Who's Who, Execucomp and Boardex	
MILITARY	A dummy that equals one if the CEO attended military service and zero otherwise.
GENERAL	General managerial skills over executive lifetime work experience.
MA_SCORE	Managerial ability index, estimated in Demerjian, Lev, and McVay (2012).
MBA	A dummy that equals one if the CEO has an MBA degree and zero otherwise.
PHD	A dummy that equals one if the CEO has a Ph.D. degree and zero otherwise.
IVY_EDUC	A dummy that equals one if the CEO attended one of the Ivy-League institutions and zero otherwise.
FINTECH_EDUC	A dummy that equals one if the CEO obtained an MBA or has a degree in accounting or economics and zero otherwise.
DEPRESSED_BABY	A dummy that takes the value of one if the CEO was born between 1920 and 1929 and zero otherwise.
FOREIGN_CEO	A dummy that equals one if the CEO was born outside the U.S and zero otherwise.
DELTA	Natural logarithm of one plus the dollar change in wealth associated with a 1% change in the firm's stock price.
VEGA	Natural logarithm of one plus the dollar change in wealth associated with a 0.01 change in the standard deviation of the firm's returns.
BIRTH_YEAR	CEO's year of birth
Bank Loan characteristics obtained from Dealscan	
LOAN_MATURITY	The natural log of the number of months until maturity (item *maturity*).
LOAN_SIZE	The natural log of the size of the loan facility (item *facility amt*).
LOAN_PURPOSE	A categorical variable representing different loan purposes, including corporate purposes, debt repayment, working capital, acquisitions, backup loans, and others (item *primary purpose*).
LOAN_TYPE	A categorical variable representing different loan types, including term loans, revolver less than one year, revolver greater than one year, 364-day facility, bridge loans, and others (item *type*).
SECURITY	A dummy variable that equals one if the loan is secured, and zero otherwise.
LOG_SPREAD	The log of the difference (in bps) between the interest charged on the loan facility and LIBOR or LIBOR-equivalent rate (item *all-in-drawn spread*).
COVENANT_ DUMMY	A dummy that equals one if a loan obtained by a firm in year *t* contains at least one covenant requirement, and 0 otherwise.
COVENANT_INTENSITY	The natural logarithm of 1 plus the total number of covenants in the loan facility a firm obtains in year *t*.
SYNDICATION	A dummy variable that equals one if the loan involves more than one lender, and zero otherwise.
Firm characteristics obtained from Compustat	
LOGASSETS	*Log assets = log(at)*
LEVERAGE	*Leverage =(dltt+dlc)/at*
MTB	*MTB=(prcc_f*csho+dltt+dlc)/at*

PPE	*PPE = ppent/ at*
EARNVOL	Standard deviation of quarterly earnings (*epspiy*) in the previous four years.
CFVOL	Standard deviation of quarterly cash flows from operations (*oancfy*) in the previous four years prior to the loan initiation year scaled by the total debt (Graham et al., 2008).
RATING	A categorical variable capturing the compant's S&P senior debt rating (*splticrm*) for a firm in year *t*. This variable equals 1 if the debt rating is AAA, 2 if the debt rating is AA, 3 if the debt rating is A, etc.
ROA	*ROA = oibdp/ at*
Z_SCORE	Z = [(3.3**pi* + *sale* + 1.4**re* + 1.2*(*act* – *lct*)]/*at*
ACCRUALS	The absolute value of discretionary accruals based on the modified Jones (1991), following Dechow et al. (1995)
MEDF	Merton's distance-to-default, developed by Bharath and Shumway (2008) using the option pricing model of Merton (1976).
Macroeconomic characteristics collected from DataStream	
CRSPREAD	The difference between the ten-year AAA corporate bond yield and ten-year BAA corporate bond yield
TERMSTR	The difference between the ten-year government bond yield and three-month T-bill yield
Bond characteristics obtained from SDC Global New Issues	
BOND_SPREAD	The natural logarithm of the spread between the bond yield and a Government bond with matching maturity (item *spread-to-benchmark*) obtained from SDC Global New Issues database
BOND_SIZE	The natural logarithm of bond principal
BOND_MATURITY	The natural logarithm of bond maturity
DCALL	A dummy that equals one if the bond is callable, and zero otherwise
DPRIVATE	A dummy that equals one if the bond is private, and zero otherwise
DSENIOR	A dummy that equals one if the bond is senior, and zero otherwise
Other data	
COMPARABILITY	The financial report comparability (Franco et al., 2011).
ICOC	The implied cost of equity capital. *ICOC* is the average of the four implied cost of equity measures, including *r*GM (Gode and Mohanram, 2003), *r*CT (based on the Claus and Thomas (2001), *r*GLS (based on the Gebhardt et al. (2001), *r*EAST (based on the Easton (2004).

Table 1. Descriptive Statistics

Variable	N	Mean	Std Dev	25th Pctl	50th Pctl	75th Pctl
			CEO Characteristics			
MILITARY	8,150 (4,298)	0.077 (0.071)	0.267 (0.257)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)
YEAR_OF_BIRTH	4,379 (2,489)	1949.25 (1949.80)	10.05 (10.10)	1943 (1943)	1950 (1951)	1956 (1957)
MBA	8,150 (4,298)	0.210 (0.198)	0.408 (0.399)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)
PHD	8,150 (4,298)	0.079 (0.065)	0.269 (0.246)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)
IVY_EDUC	8,150 (4,298)	0.178 (0.166)	0.382 (0.372)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)
FIN_TECH_EDUC	8,150 (4,298)	0.218 (0.223)	0.413 (0.416)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)
FOREIGN_CEO	8,150 (4,298)	0.053 (0.050)	0.223 (0.218)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)
FEMALE	8,150 (4,298)	0.029 (0.032)	0.167 (0.176)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)
DEPRESSED_BABY	8,150 (4,298)	0.009 (0.008)	0.093 (0.089)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)
LNDELTA	6,845 (3,624)	5.542 (5.510)	1.675 (1.697)	4.472 (4.430)	5.548 (5.509)	6.599 (6.574)
LNVEGA	7,175 (3,763)	3.652 (3.535)	1.877 (1.900)	2.574 (2.372)	3.872 (3.756)	5.024 (4.926)
			Firm Characteristics			
ASSET (US$ MIL)	8,150 (4,298)	5,069.45 (4,020.38)	6,480.71 (5,085.90)	657.17 (562.11)	1,936.86 (1,591.69)	6,655.00 (5127.42)
LEVERAGE	8,150 (4,298)	0.483 (0.452)	0.168 (0.167)	0.374 (0.343)	0.480 (0.447)	0.580 (0.548)
PPE	8,150 (4,298)	0.286 (0.291)	0.201 (0.210)	0.135 (0.135)	0.241 (0.240)	0.393 (0.401)
ROA	8,150 (4,298)	0.154 (0.162)	0.080 (0.084)	0.106 (0.112)	0.142 (0.151)	0.188 (0.199)
MTB	8,150 (4,298)	3.495 (3.476)	11.221 (11.604)	1.691 (1.700)	2.550 (2.559)	4.050 (3.977)
Z_SCORE	8,150 (4,298)	2.035 (2.196)	1.270 (1.423)	1.356 (1.519)	1.934 (2.128)	2.601 (2.802)
EARNVOL	8,150 (4,298)	0.824 (0.880)	5.950 (8.485)	0.197 (0.189)	0.378 (0.346)	0.743 (0.666)
CFVOL	7,197 (3,563)	0.042 (0.043)	0.036 (0.037)	0.021 (0.021)	0.033 (0.034)	0.052 (0.053)
			Loan Characteristics			
SPREAD (BPS)	8,150	131.016	109.766	40.000	100.000	200.000
LOAN_MATURITY	8,150	37.109	23.515	13.000	59.000	61.000
LOAN_SIZE (US$ MIL)	8,150	658.050	1,193.444	135.000	300.000	750.000
SYNDICATION	8,150	0.975	0.155	1.000	1.000	1.000
SECURITY	8,150	0.298	0.458	0.000	0.000	1.000
COVENANT_DUMMY	8,150	0.259	0.438	0.000	0.000	1.000
			Macroeconomics Variables			
TERMSTR	8,117	1.505	1.134	0.523	1.117	2.646
CRSPREAD	8,117	-1.150	5.333	-4.279	-2.248	0.521

This table reports the descriptive statistics for the sample of 8,150 loan facilities obtained by US non-financial non-utility firms that sponsor DB pensions from 1992 to 2013. There are 4,298 firm-year observations in our sample. We report the firm characteristics at the loan-year level and at the firm-year level (in parentheses). We collect the loan data from the Loan Connector's DealScan database, whereas accounting information is from the Compustat Industrial Annual Files. We collect the pension data from the Compustat Pension Annual Files. All variables are winsorized at 1% and 99% level. Appendix A provides a detailed description of the variables.

Table 2. Military CEOs and Cost of Bank Loan: Baseline Result

	Models				
	(1)	(2)	(3)	(4)	(5)
MILITARY	-0.1207***	-0.0850**	-0.0840**	-0.0880***	-0.0868***
	(-2.71)	(-2.50)	(-2.50)	(-2.70)	(-2.72)
LOGASSET		-0.0601***	-0.0590***	-0.0517**	-0.0500***
		(-3.42)	(-3.35)	(-2.82)	(-2.74)
LEVERAGE		0.6484***	0.6459***	0.7314***	0.7276***
		(8.23)	(8.23)	(9.00)	(8.94)
PPE		0.0402	0.0424	0.1496*	0.1551*
		(0.49)	(0.52)	(1.67)	(1.73)
ROA		-0.0011	-0.0011	-0.0019**	-0.0019**
		(-1.08)	(-1.08)	(-2.10)	(-2.08)
MTB		-1.3785***	-1.3795***	-1.5668***	-1.5708***
		(-6.91)	(-6.86)	(-7.78)	(-7.72)
Z_SCORE		-0.0368**	-0.0370**	-0.0321**	-0.0321**
		(-2.51)	(-2.50)	(-2.24)	(-2.22)
EARNVOL		0.0153***	0.0153***		
		(2.74)	(2.76)		
CFVOL				0.6631*	0.6819*
				(1.77)	(1.81)
LOAN_SIZE		-0.0133	-0.0054	-0.0034	0.0067
		(-0.44)	(-0.18)	(-0.11)	(0.20)
LOAN_MATURITY		-0.1080***	-0.1092***	-0.1070***	-0.1084***
		(-7.38)	(-7.43)	(-6.82)	(-6.88)
TERMSTR			-0.0039		-0.0054
			(-0.38)		(-0.53)
CRSPREAD			-0.0086		-0.0071
			(-0.15)		(-0.12)
Credit rating, Loan type, syndication, and purpose fixed effects	Yes	Yes	Yes		Yes
Industry and year fixed effect	Yes	Yes	Yes		Yes
Adjusted R^2	0.696	0.749	0.747	0.761	0.759
Number of observation	8,150	8,150	8,117	7,197	7,164

This table reports the results on the impact of Military CEOs on the cost of bank loans. The dependent variable is the log of the all-in drawn spread variable obtained from Dealscan. The independent variable of interest, *MILITARY*, is a dummy that equals one if the CEO attended military service and zero otherwise. Definitions for all other variables are presented in Appendix A. Constant term, year fixed effects, and industry fixed effects based on two-digit SIC codes are included. All models include credit rating, loan type, loan syndication, and loan purpose fixed effects. *T*-statistics computed using standard errors robust to both clustering at the firm level and heteroscedasticity are reported in parentheses. *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.

Table 3. Control for CEO Characteristics

	Models										
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
MILITARY	-0.0850**	-0.0825**	-0.0885**	-0.0859**	-0.0869**	-0.0836**	-0.0846**	-0.0889**	-0.0997***	-0.0883***	-0.0858**
	(-2.50)	(-2.41)	(-2.57)	(-2.53)	(-2.54)	(-2.47)	(-2.47)	(-2.47)	(-2.90)	(-2.63)	(-2.52)
MBA		-0.0263									
		(-1.02)									
PHD			0.0200								
			(0.51)								
IVY_EDUC				-0.0007							
				(-0.03)							
FIN_TECH_EDUC					0.0180						
					(0.63)						
FOREIGN_CEO						0.0556					
						(0.94)					
DEPRESSED_BABY							-0.0540				
							(-0.85)				
DELTA								-0.0089			
								(-0.86)			
VEGA									-0.0002		
									(-0.02)		
GENERAL_CEO										-0.0032	
										(-0.11)	
MA_SCORE											0.0092
											(0.10)
All controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	8,150	8,150	8,150	8,150	8,150	8,150	8,150	6,845	7,175	7,636	7,580
R2	0.750	0.750	0.750	0.750	0.750	0.750	0.750	0.763	0.762	0.759	0.762

This table reports regression results on the impact of Military CEOs on the cost of bank loans after controlling for other CEO characteristics. Column (1) shows the estimate from the baseline regression in Table 2. In each column from (2) to (11), an additional variable is added into the baseline regression to control for different CEO characteristics, including *MBA, PHD, IVY, FIN_TECH_EDUC, DEPRESSED_BABY, DELTA, VEGA, GENERAL_CEO,* and *MANAGERIAL_ABILITY.* Other firm characteristics variables are similar to those in the baseline regressions in Table 2. All models include credit rating, loan type, loan syndication, and loan purpose fixed effects. Definitions for all variables are presented in Appendix A. Constant term, year fixed effects, and industry fixed effects based on two-digit SIC codes are included. *T*-statistics computed using standard errors robust to both clustering at the firm level and heteroscedasticity are reported in parentheses. *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.

Table 4. Military CEOs and Cost of Bank Loan: Further Robustness Checks

	MILITARY		R^2/ Pseudo R^2
	coeff.	t-stat	
Main Specification	-0.0850**	(-2.50)	0.749
Panel A: Alternative model specifications			
(1) Include firm fixed-effects	-0.0761***	(-2.63)	0.814
(2) Use Firm and lead bank two-way clustering	-0.1496**	(-2.10)	0.348
(3) Use Median regression	-0.0384***	(-4.00)	0.560
Panel B: Alternative sampling methods and measures of borrowing cost			
(4) Include only the largest loan facility per loan package	-0.0570**	(-2.25)	0.729
(5) Use first bank loan borrowed by firm	-0.2342***	(-3.03)	0.549
(6) Exclude post-2007 period	-0.0845**	(-2.31)	0.724
(7) Alternative measures of borrowing cost: LOG_TCB	-0.0671**	(-2.38)	0.831
Panel C: Control for Corporate Governance			
(8) Control for Corporate Governance (*GINDEX*)	-0.0889***	(-2.66)	0.759
(9) Control for Institutional Ownership	-0.0862**	(-2.57)	0.750
(10) Control for Takeover Index	-0.0896***	(-2.65)	0.750
(11) Control for all governance measures	-0.0955***	(-2.87)	0.760

This table reports the results of several robustness tests performed on the regressions of the cost of bank loan. The "Main specification" shows the estimate from the baseline regression in Table 2. For brevity, the table only reports the coefficients on the cost of bank loan. Other firm-level and loan-level characteristics variables are similar to those in the baseline regressions in Table 2. Model 1 includes firm-fixed effect. In Model 2, we use two-way clustering of standard errors at the firm level and at the lender level. Model 3 use the median regression with a robust standard error. In Model 4, we include only the largest loan facility within a loan package per year in our sample. In Model 5, we include only the first bank loan borrowed by the firm during the sample period. In Model 6, we rerun the baseline regression after by excluding all loans granted after 2007 In Model 7, we use the overall cost of borrowing, including interest costs and other fees, as in Berg, Saunders, and Steffen (2016) as the dependent variable. Models 8, 9 and 10 control for different measures of corporate governance including Gompers, Ishii, and Metrick (2003) corporate governance index (*GINDEX*), institutional ownership, and Takeover index (Cain et al., 2017). In Model 11, we include all measures of governance. Constant term, year fixed effects, and industry fixed effects based on two-digit SIC codes are included. In all models except Models 2 and 3, *t*-statistics computed using standard errors robust to both clustering at the firm level and heteroscedasticity are reported in parentheses. *, ** and *** denote significance at the 10%, 5%, and 1% levels, respectively.

Table 5. Propensity score matching

Panel A. Determinant of hiring military managers

	Independent Variables					
	LOGASSET	LEVERAGE	MTB	ROA	Z_SCORE	EARNVOL
Dependent Variable	*Estimated Coefficients*					
MILITARY	-0.1509	-0.5475	-0.6546**	6.0874*	0.2004	0.0042
	(-1.14)	(-0.54)	(-2.29)	(1.90)	(0.96)	(0.01)

Panel B: Propensity score matching tests

	LOAN_SPREAD			
Matching criteria	Mean difference	p-value	Median difference	p-value
Industry/Size/MTB/ROA	0.2037**	(0.00)	0.2199**	(0.00)

Panel C: Regression analysis after matching

	LOAN_SPREAD	R2	Observation	All controls	All fixed effects
Dependent Variable	-0.085**	0.811	1,709	Yes	Yes
MILITARY	(-2.01)				

Panel A reports the results of the logistic regression regressing military experience on firm characteristics, year fixed effects, industry fixed effects, and a constant. Following Benmelech et al. (2015), regressions are limited to the year in which a new CEO was hired. Military is an indicator variable for whether the CEO of the firm has any military experience. Firm characteristics include firm size (*LOGASSET*), leverage (*LEV*), market-to-book ratio (*MTB*), return on asset (*ROA*), Atman's Z score (*Z_SCORE*), and earnings volatility (*EVOL*). Panel B reports the difference in the log of the all-in drawn spread (*LOG_SPREAD*) between firms headed by military managers and matched peers. Each firm headed by a military manager is matched with a firm not headed by a military manager based on the closest propensity score calculated using the following criteria: (a) size, (b) returns on assets (*ROA*), and (c) market-to-book ratio (*MTB*) for the past three years in the same industry. All matched peers are drawn without replacement. *P*-values for mean (median) difference are estimated using paired t-tests (Wilcoxon signed rank tests). Panel C reports results of baseline regressions in Table 2 after matching. For brevity, Panel C only reports the coefficients on *MILITARY*. *t*-statistics computed using standard errors robust to both clustering at the firm level and heteroscedasticity are reported. *, ** and *** denote significance at the 10%, 5%, and 1% levels, respectively.

Table 6. 2SLS Regression with Instrumental Variables

	IV = Year of Birth	IV = Year of Birth Dummies
Second-stage regressions	Dependent variables	Dependent variables
	LOAN_SPREAD	LOAN_SPREAD
MILITARY	-0.088***	-0.099***
	(-3.30)	(-9.60)
LOGASSET	-0.110***	-0.141***
	(-11.94)	(-7.23)
LEVERAGE	0.683***	0.607***
	(8.88)	(6.18)
PPE	0.106	0.025
	(1.36)	(0.24)
MTB	-0.037***	-0.051**
	(-2.84)	(-3.06)
ROA	-1.374***	-1.145***
	(-4.41)	(-3.49)
Z_SCORE	-0.017	-0.067***
	(-0.52)	(-2.85)
EARNVOL	0.017	0.007
	(1.36)	(0.46)
CRSPREAD	-0.004	-0.019*
	(-0.39)	(-1.87)
TERMSTR	-0.056	-0.073
	(-0.88)	(-1.40)
LOAN_MATURITY	-0.030	-0.042**
	(-1.47)	(-2.51)
LOAN_SIZE	-0.093***	-0.089***
	(-10.89)	(-7.30)
Industry and year fixed effect	Yes	Yes
Credit rating, Loan type, syndication, and purpose fixed effects	Yes	Yes
Observation	4,379	4,379
First-stage regressions	Dependent variables = Military experience	
Year of birth	-0.069***	-
	(-4.48)	-
First-stage F-statistics	10.98	9.22

This table reports the results of two-stage least squares (2SLS) regression. The dependent variable is log of the all-in drawn spread (*LOG_SPREAD*). The instruments are year of birth (Panel A) and year of birth indicator variables (Panel B). *Year of Birth* refers to a manager's birth year. *MILITARY* is an indicator variable for whether the CEO of the firm in the given year has any military experience. All regressions include controls for year fixed effect, industry fixed effect, all firm-level characteristics and macroeconomic variables as in the baseline model. Credit rating, loan type, loan syndication, and loan purpose fixed effects are included. All models also include three indicators for CEO educational background (*IVY, FINTECH_EDUC*, and *MBA*) and an indicator for whether the age of the executive is above the median age in the entire sample, as in Benmelech and Frydman (2015). Definitions for all variables are presented in Appendix A. Standard errors are bootstrapped with 200 replications. *, ** and *** denote significance at the 10%, 5%, and 1% levels, respectively.

Table 7. Information Asymmetry and the Effect of CEO Military Experience on Loan Costs

	PIN		ANAL_COVERAGE		ACCRUAL		COMPARABILITY	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
MILITARY	-0.1249**	-0.028	-0.1325**	-0.0554	-0.0890*	-0.0453	-0.1545***	-0.1047
	(-2.14)	(-0.48)	(-2.20)	-1.42	(-1.82)	(-0.87)	(-2.64)	(-1.62)
Constant and other control variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Loan type, syndication, and purpose fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Credit ratings fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year and industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R2	0.661	0.784	0.691	0.763	0.755	0.748	0.754	0.802
Observations	2,053	2,735	2,283	2,772	2,573	2,557	1,860	1,631

This table reports the results of the effect of information asymmetry on the relation between CEO military experience and the cost of bank loans. We use the probability of insider trading (*PIN*) (Models 1 and 2), analyst coverage (*ANAL_COVERAGE*) (Models 3 and 4), the absolute value of discretionary accruals estimated (Dechow et al., 1995) (*ACRRUAL*) (Models 5 and 6), and financial statement comparability (Franco et al., 2011) (*COMPARABILITY*) as proxies for information asymmetry. For each fiscal year in the sample period, we sort firms into terciles based on the value of each information asymmetry measure. Models 1, 3, 5 and 7 present the results for the subsamples with high information asymmetry, whereas, Models 2, 4, 6, and 8 show the result for the subsamples with low information asymmetry. For the *PIN* measure, we define firms as having a high (low) level of information asymmetry if they belong to the top (bottom) tercile of the information asymmetry (*PIN*) measure. For the analyst coverage measure, we define firms as having a high (low) level of information asymmetry if they belong to the bottom (top) tercile of analyst coverage. For the accrual measure, we define firms as having a high (low) level of information asymmetry if they belong to the top (bottom) tercile of discretionary accruals. For the comparability measure, we define firms as having a high (low) level of information asymmetry if they belong to the bottom (top) tercile of financial statement comparability. The dependent variable in all analyses is the log of the *all-in-drawn spread* variable obtained from Dealscan. We cluster the standard errors at the firm level. We present *t* statistics in parentheses. The symbols ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively. We provide a detailed description of the variables in Appendix A.

Table 8. Firm Risks and the Effect of CEO Military Experience on Loan Costs

	EARNVOL		CFVOL		MEPF	
	(1)	(2)	(3)	(4)	(7)	(8)
MILITARY	-0.1478***	-0.1059*	-0.0899*	-0.0294	-0.1484**	0.0257
	(-2.91)	(-1.95)	(-1.83)	(-0.65)	(-2.45)	(0.56)
Constant and other control variables	Yes	Yes	Yes	Yes	Yes	Yes
Loan type, syndication, and purpose fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Credit ratings fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Year and industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
R2	0.782	0.754	0.755	0.807	0.698	0.791
Observations	2,535	2,828	2,060	2,671	2,703	2,572

This table reports the results of the effect of firm risks on the relation between CEO military experience and the cost of bank loans. We use earning volatility (*EARNVOL*) (Models 1 and 2), cash flow volatility (*CFVOL*) (Models 3 and 4), and Merton's distance-to-default (*MEPF*), developed by Bharath and Shumway (2008) using the option pricing model of Merton (1976), as proxies for firm risks. For each fiscal year in the sample period, we sort firms into terciles based on the value of each firm risk measure. Models 1, 3, and 5 present the results for the subsamples with high risk, whereas, Models 2, 4, and 6 show the result for the subsamples with low risks. For each of firm risk measures, we define firms as having a high (low) level of risk if they belong to the top (bottom) tercile of the firm risk measures. The dependent variable in all analyses is the log of the *all-in-drawn spread* variable obtained from Dealscan. We cluster the standard errors at the firm level. We present *t* statistics in parentheses. The symbols ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively. We provide a detailed description of the variables in Appendix A.

Table 9: Military CEOs and Loan Monitoring

	Covenant Dummy	Covenant Intensity	Security
	(1)	(2)	(3)
MILITARY	-0.087**	-0.256**	-0.2057***
	(-2.24)	(-2.08)	(-2.87)
LOGASSET	-0.075***	-0.128***	-0.1884***
	(-5.15)	(-3.01)	(-7.91)
LEVERAGE	-0.122*	0.149	0.7288***
	(-1.76)	(0.74)	(5.57)
PPE	0.011	0.004	-0.1591
	(0.10)	(0.01)	(-1.05)
ROA	0.001*	0.004**	-0.0037**
	(1.75)	(2.03)	(-2.04)
MTB	0.001	-0.437	-2.0510***
	(0.01)	(-1.04)	(-6.15)
Z_SCORE	-0.009	-0.049	-0.0640**
	(-0.99)	(-1.47)	(-2.50)
EARNVOL	0.001	-0.000	0.0200
	(0.49)	(-0.06)	(1.43)
LOAN_SIZE	0.065***	0.196***	0.1356***
	(6.04)	(5.89)	(2.67)
LOAN_MATURITY	-0.000	0.128*	-0.0564**
	(-0.01)	(1.77)	(-2.47)
Credit rating, Loan type, syndication, and purpose fixed effects	Yes	Yes	Yes
Industry and year fixed effect	Yes	Yes	Yes
Constant	0.086	-2.140***	1.950**
	(0.47)	(-3.99)	(2.49)
R2/Pseudo R2	0.314	0.330	0.351
Number of observation	8,150	8,150	8,150

This table reports the results of the impact of CEO military experience on loan monitoring. In Model 1, we present the results of estimating the effect of military CEO on covenant dummy (*COVENANT_DUMMY*). In Model 2, we report the findings of the impact of pension deficits on the intensity of covenant provisions (*COVENANT_INTENSITY*). We measure covenant intensity and covenant dummy following Hasan et al. (2017). *COVENANT_DUMMY* is a dummy that equals one if a loan obtained by a firm in year *t* contains at least one covenant requirement, and 0 otherwise. *COVENANT_INTENSITY* is the natural logarithm of 1 plus the total number of covenants in the loan facility a firm obtains in year *t*. In Model 3, we show the effect of CEO military experience on the probability of having a collateral requirement in the loan contract. We cluster the standard errors at the firm level. We present *t* statistics in parentheses. The symbols ***, **, and * denote statistical significance level at the 1%, 5%, and 10% levels, respectively. We provide a detailed description of the variables in Appendix A.

Table 10: Military CEOs and Implied Cost of Equity

	Dependent variable: ICOC	
	(1)	(2)
MILITARY	-0.0086**	-0.0068**
	(-2.37)	(-1.99)
SIZE		-0.0072***
		(-9.18)
BTM		0.0255***
		(4.00)
LEVERAGE		-0.0062
		(-0.82)
PPE		-0.0001*
		(-1.84)
ROA		0.0129
		(0.82)
Year fixed effect	Yes	Yes
Industry fixed effect	Yes	Yes
Constant	0.1300***	0.1371***
	(20.38)	(17.11)
Observations	16,692	15,654
Adjusted R^2	0.0960	0.0979

This table reports the results of the impact of CEO military experience on the implied cost of equity capital (*ICOC*). *ICOC* is the average of the four implied cost of equity measures, including *r*GM (Gode and Mohanram, 2003), *r*CT (based on the Claus and Thomas (2001), *r*GLS (based on the Gebhardt et al. (2001), *r*EAST (based on the Easton (2004). In Model 1, we show the effect of CEO military experience on the implied cost of equity capital when we exclude all control variables. In Model 2, we include all control variables as per Gebhardt et al. (2001) and Dhaliwal et al. (2007). *t*-statistics computed using standard errors robust to both clustering at the firm level and heteroscedasticity are reported. *, ** and *** denote significance at the 10%, 5%, and 1% levels, respectively. We provide a detailed description of the variables in Appendix A.

Table 11. Military CEOs and Bond Spread

	BOND_SPREAD	BOND_SPREAD
MILITARY	-0.0563***	-0.0530**
	(-2.61)	(-1.97)
LOGASSET		-0.1102***
		(-9.43)
LEVERAGE		0.0825
		(1.31)
PPE		0.0752
		(1.08)
ROA		-0.0011**
		(-2.47)
MTB		-0.1668
		(-1.16)
Z_SCORE		-0.0614***
		(-4.50)
EARNVOL		-0.0341***
		(-2.96)
BOND_MATURITY		0.1622***
		(9.62)
BOND_SIZE		0.0223**
		(1.97)
DCALL		0.0604**
		(2.40)
DPRIVATE		0.0124
		(0.48)
DSENIOR		0.0544
		(1.45)
CRSPREAD		0.0324***
		(2.91)
TERMSTR		-0.1267***
		(-2.97)
Credit rating fixed effects	Yes	Yes
Industry and year fixed effect	Yes	Yes
Adjusted R2	0.736	0.7835
Number of observation	4817	2618

This table reports the results on the impact of CEO military experience on the cost of bonds. Dependent variable, *BOND_SPREAD*, is the log of the spread between the bond yield and a Government bond with matching maturity (item *spread-to-benchmark*) obtained from SDC Global New Issues database. The independent variable of interest, *MILITARY*, is a dummy that equals one if the CEO attended military service and zero otherwise. Constant term, year fixed effects, and industry fixed effects based on two-digit SIC codes are included. All models include set of bond-level control variables, including the log of bond maturity, the log of bond size, a callability dummy variable, a private bond dummy variable, and a senior bond dummy variable. *T*-statistics computed using standard errors robust to heteroscedasticity are reported in parentheses. *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively. We provide detailed description of the variables in Appendix A.

Table 12. Military CEOs, Information Environment, and Firm Risks: Firm-level Analysis

Panel A: Military CEOs, Report Comparability, and Accruals: Firm-level Analysis

	Comparability		Accruals	
	(1)	(2)	(3)	(4)
MILITARY	0.1329**	0.1277**	-0.0071***	-0.0054***
	(2.35)	(2.23)	(-4.39)	(-3.55)
SIZE		0.0728***		-0.0058***
		(2.68)		(-8.82)
BTM		-0.4877***		0.0061
		(-2.94)		(1.13)
LEV		-0.1705		-0.0232***
		(-0.77)		(-4.75)
PPE		-0.0035		0.0046***
		(-0.25)		(4.38)
ROA		2.2271***		-0.0606***
		(6.77)		(-5.22)
Year fixed effect	Yes	Yes	Yes	Yes
Industry fixed effect	Yes	Yes	Yes	Yes
Constant	-1.6940**	-2.3217**	0.0565***	0.1217***
	(-2.09)	(-2.57)	(29.13)	(16.45)
Observations	13,486	12,177	20,759	19,700
R2	0.1491	0.1840	0.0795	0.1375

Panel B: Military CEOs and Firm Risks: Firm-level Analysis

	EARNVOL		CFVOL		MEPF	
	(1)	(2)	(3)	(4)	(5)	(6)
MILITARY	-0.0027***	-0.0024***	-0.0043**	-0.0036*	-0.0188*	-0.0194***
	(-3.16)	(-2.76)	(-2.19)	(-1.91)	(-2.47)	(-2.78)
SIZE		-0.0034***		-0.0088***		-0.0114***
		(-4.89)		(-3.06)		(-7.16)
BTM		0.0044		-0.0143***		0.1385***
		(0.33)		(-2.79)		(8.30)
LEVERAGE		-0.0100*		-0.0715		-0.0121
		(-1.90)		(-1.49)		(-0.72)
PPE		0.0000		0.0000		0.0000
		(1.54)		(1.52)		(0.33)
ROA		-0.0235		-0.0331		-0.2395***
		(-1.59)		(-1.56)		(-8.85)
Year fixed effect	Yes	Yes	Yes	Yes	Yes	Yes
Industry fixed effect	Yes	Yes	Yes	Yes	Yes	Yes
Constant	0.0186***	0.0387***	0.0233***	0.0980***	0.0025	0.0541***
	(27.06)	(10.61)	(6.38)	(3.46)	(0.37)	(5.73)
Observations	23,029	21,770	20,609	18,700	14,349	13,381
R2	0.0405	0.0570	0.0084	0.0112	0.2538	0.3197

In this table, we conduct a firm-level analysis to examine whether CEO military experience is associated with the firm's information environment (Panel A) and firm risks (Panel B). We use financial report comparability (Franco et al. 2011) (*COMPARABILITY*) and accounting accruals (Dechow et al. 1995) (*ACCRUAL*) as proxies for firms' information environment. We use earning volatility (*EARNVOL*), cash flow volatility (*CFVOL*), and Merton's distance-to-default (*MEPF*), developed by Bharath and Shumway (2008) using the option pricing model of Merton (1976), as proxies for firm risks. We estimate an OLS regression with a proxy for information asymmetry (Panel A) and a proxy for firm risk (Panel B) as the dependent variable and the CEO military dummy variable as the independent variable of interest. Firm-level control variables, year fixed effect and industry fixed effects are included in all models. *T* statistics

computed using standard errors robust to both clustering at the firm level and heteroscedasticity are reported. *, ** and *** denote significance at the 10%, 5%, and 1% levels, respectively. We provide a detailed description of the variables in Appendix A.