Military CEOs and Bank Loan Contracts

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Abstract

We show that banks charge lower loan costs for firms headed by CEOs with military background. Our findings are robust to controlling for other CEO characteristics and addressing endogeneity issues using instrumental variable analysis and propensity score matching. Firms led by military CEOs are also subject to lower collateral requirements and covenant restrictions. Further analyses suggest that the effect of military CEOs on bank loans arises as a result of the role of military CEOs in improving firm information environment and reducing firm risk. Overall, our findings highlight the importance of CEO military experience in shaping the design of private debt contracts.

JEL classification: G31, G32, J24

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

"I did not learn about leadership in business school. I learned about leadership when I was 18 years old and was first introduced to the United States Marine Corps, where leadership is not taught by a favored professor in a three-credit-hour course. It is taught by every officer and every NCO in every minute and every hour of every day, in every action, every word, every deed, and every circumstance." - Robert Stevens, Former CEO of Lockheed Martin

1 Introduction

Several psychological studies argue that military service functions as a turning point that has enduring effects on service members' lives (Elder 1986; Elder, Gimbel and Ivie 1991; London and Wilmoth 2016). There is a collective body of evidence from organizational and managerial behavior research suggesting that the leadership skills and experience acquired from military service is unique and essential in the corporate world as either it is difficult to learn otherwise or it can be mastered by the Chief Executive Officers (CEOs) at an early age (Duffy 2006). Recognizing this important formative early-life experience, recent studies examine how the military experience of CEOs (hereafter, military CEOs) influence corporate policies and yields mixed results (see, for example, Malmendier, Tate, and Yan 2011; Benmelech and Frydman 2015; Law and Mills 2017). However, much less is known about 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 value soft information about the borrowers (Liberti and Petersen 2018). In addition to hard information from financial reports, default histories and other public disclosures, banks collect soft information through maintaining on-going relationships with borrowers (Diamond 1984, 1991; Bharath et al. 2011). This includes hard-to-quantify information, such as information about the management, or the borrowing firm's image within the community. We argue therefore that banks are more likely to value CEO military experience, relative to other participants in financial markets, because CEO military experience is a form of soft information. 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.

Prior literature offers contradicting predictions concerning the effect of CEOs' military experience on the costs of bank loans. On the one hand, military experience instills values such as duty, honor, integrity, "service before self" (Elder et al. 1991; Franke, 1998, 2001; Benmelech and Frydman 2015; Koch-Bayram and Wernicke 2018). These values have a profound impact on veterans' post-military working life and behavior (Elder 1986; Elder et al. 1991; Sampson and Laub 1996; MacLean and Elder 2007). Military service, therefore, increase CEOs' ethical conscience, resulting in lower risk of agency problems and fraudulent conducts (Franke 2001). Consistent with this literature, Benmelech and Frydman (2015) find that relative to non-military peers, military CEOs pursue less risky corporate policies, such as investing less in research and development (R&D) investments or maintaining lower leverage ratios. 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 conjecture that firms led by military CEOs are associated with lower costs of bank loans.

On the other hand, other studies show that military service is linked to aggressiveness, overconfidence, and risk-taking behavior (Elder 1986; Elder and Clipp 1989; Elder et al. 1991). Thus, military experience may encourage CEO risk-taking behavior and increase firm risk. Supporting this view, Malmendier, Tate, and Yan (2011) show that military CEOs are associated with aggressive corporate policies, such as higher leverage. Since banks have asymmetric payoffs in which they receive fixed future income and face substantial downside risk (Hasan et al. 2014), they are likely to demand higher risk premium in compensation for a higher level of firm risk. The above studies imply that banks may charge higher loan costs when lending to firms headed by military CEOs.

The literature surveyed above suggests that the effect of CEO military experience on bank loan contracting is an empirical question. To investigate this effect, we first collect information on

loan contracts granted to US non-financial and non-utilities companies from the Dealscan database. We further identify information of the CEO from Execucomp and manually search on Marquis Who's Who for whether the CEO has previous military experience. Our final sample includes 8,662 loan facilities from 4,274 firm-year observations for the period 1992 to 2012. Our baseline regression results show that firms led by military CEOs pay lower loan costs. This finding is statistically and economically significant. Firms headed by military CEOs, on average, have about 8.71% (about 11.4 basis points) lower loan costs than firms led by non-military CEOs. The economic significance of military CEOs is comparable favorably to that of accounting quality (6.65 bps) (Bharath, Sunder and Sunder 2008); board independence (5.5 bps) (Francis et al. 2012); tax avoidance (4.87 bps) (Hasan et al. 2014); and corporate defined benefit pension deficits (7.68 bps) (Balachandran, Duong and Vu forthcoming).

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 self-select into hiring military CEOs. Even though we have controlled for key firm 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 take a number of steps to alleviate these concerns. First, we use the two-stage least squares regression (2SLS) method with instrumental variables. Following Bedard and Deschenes (2006), Benmelech and Frydman (2015), and Law and Mills (2017), we use the CEO birth year as an instrument for military experience. Benmelech and Frydman (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.

Second, we use the propensity score matching approach to compare the interest costs of firms led by military CEOs and the interest costs of otherwise comparable firms. Our treatment (control) firms are firms headed by military (non-military) CEOs. We match the treatment firms with the control firms based on firm total assets, profitability, market-to-book, and the two-digit Standard Industrial Code (SIC) industry. We compare the interest costs of loans obtained by the treatment firms and control firms and find that loans to firms led by military CEOs have lower interest costs, relative to otherwise comparable firms. We take a further step and re-run our baseline model on the matched sample. The results are consistent with our baseline regression. Overall, the findings of the propensity matching method confirm our main findings.

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 less tax avoidance activities (Benmelech and Fryman 2015; Law and Mills 2017; Koch-Bayram and Wernicke 2018). 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 the probability of informed trading, information opaqueness, analyst coverage, and financial statement comparability, we show that the effect of military CEOs on loan pricing is more pronounced among firms with severe information asymmetry problems.

We further examine the effect of CEO military experience on loan costs in different scenarios where the bank lender has limited information regarding the borrower or its management. First, a change in management induces greater uncertainty regarding the firm's future performance (Pan, Wang, and Weisbach 2015, 2018). If CEO military experience provides valuable information to bank lenders, this information should become more valuable when there is high uncertainty regarding management. Using CEO tenure as a proxy for management uncertainty, we find that the effect of

CEO military experience is stronger when the CEO is newly appointed. This is consistent with banks valuing the information conveyed by CEO military service more highly when they have little information about the CEO's management style. Second, the information embedded in CEO military experience should be more valuable when the bank has no existing lending relationship with the borrower. Lending relationships enable banks to obtain soft information regarding the borrower (Bharath et al. 2011). Without this channel, non-relationship lenders might find other information channels more important, such as the CEO military experience. Similarly, we argue that CEO military experience is more important when the bank lends to the borrower for the first time. We find empirical results supportive of these conjectures.

In addition, given that military service makes CEOs more conservative (Bamber, Jiang, and Wang 2010; Benmelech and Fryman 2015), we expect the overall firm risk to be lower for firms led by 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. Consistent with this conjecture, we observe that the effect of military CEOs on loan costs is stronger in riskier firms (i.e.: those with higher earnings volatility, cash flow volatility, or default risk). Further investigation reveals that banks value CEO military experience more highly (i.e., a larger decrease in loan costs for military-CEO-headed firms) during periods with high competition threats from the product market. As greater product market competition increases firm risk (Gaspar and Massa 2006; Hoberg and Phillips 2010; Valta 2012; Hoberg, Phillips and Prabhala 2014), this finding reinforces our argument that CEO military experience influences the costs of bank loans by reducing firm risk.

In the final sets of analysis, we perform additional tests to support the main relation between military CEOs and bank loan costs. First, we examine how the military experience of the Chief Financial Officers (CFOs) affects loan costs. One may argue that since CFOs make financing decisions, in the context of loan financing, CFO military experience (hereafter, military CFO) may be more important for the loan costs rather than CEO military experience. Contrary to this argument, Malmendier, Tate and Yan (2011) posit that while CFOs design the financing decision, the CEO has

the final say. Nevertheless, we hand-collect the CFO military experience information and conduct further tests to ensure our results are not explained by CFO military experience. We find that military CEOs still impart significant influence on loan cost, even after controlling for CFO military experience.

Second, we document that, in addition to charging lower loan costs, banks also impose less restrictive non-price loan terms, in the form of lower collateral requirement and covenant restrictions, for firms headed by military CEOs. Third, we examine if military CEOs also matter for the costs for other sources of funding. If military CEOs mitigate risk-taking and information asymmetry, we expect that the implied costs of equity and bond spread will also be lower for firms headed by military CEOs. We find support for this conjecture, whereby firms led by military CEOs have 6.24% lower implied cost of equity capital and 4.81% lower bond yield spreads than firms run by non-military CEOs. Finally, we show that our results are robust to alternative model specifications, sampling methods, measures of loan costs and after controlling for various governance measures.[1]

Our study contributes to the literature in the following ways. First, we extend prior studies that highlight the significance of managers' background, characteristics, and experiences on 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 research, however, provides little evidence on how military service experience affects financing costs. We provide the first evidence that military CEOs matter for corporate financing costs. In doing so, we complement recent studies on the effects of CEO military experience on corporate policies [see, for example, Bamber, Jiang, and Wang (2010), Benmelech and Frydman (2015), Law and Mills (2017), and Koch-Bayram and Wernicke 2018].

[1] In the Internet Appendix, we further show that our findings are not driven by the effect of leverage, governance, or tax avoidance on loan costs. In addition, we show that the effect of executive's military experience on loan costs is not driven by the joint determination of loan contract features.

We also extend the ongoing literature on the determinants of loan contract design. Prior work emphasizes the importance of firm policies such as financial reporting quality (Bharath, Sunder and Sunder 2008; Graham, Li and Qiu 2008; Ertugrul et al. 2017); 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 devise and implement these policies, and show that the CEO's military experience, which facilitates transparency and mitigates risk-taking, has important implications for bank loan contract design. In doing so, we also contribute to the emerging literature on the effect of management risk, ability and network on loan costs (see, among others, Bui, Chen, Hasan, and Lin 2018; Fogel, Jandik, and McCumber 2018; Pan, Wang, and Weisbach 2018).

The remainder of this paper proceeds as follows. Section 2 describes the data collection and our sample. Section 3 discusses our baseline regression findings. We provide the empirical analyses that address endogeneity issues in Section 4. In Sections 5, we discuss the economic mechanisms through which military CEOs affect loan pricing. We provide additional analyses and robustness checks in Section 6. Section 7 concludes the paper.

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 as the 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, Sunder and Sunder 2008; Bharath et al. 2011; Hasan et al. 2014, 2017; Hollander and Verriest 2016; Nini, Smith and Sufi 2009,

2012), we treat each loan facility as an independent observation.[2] We exclude financial (SIC code falls between 6000 and 6999) and utilities firms (firms with SIC codes between 4900 and 4999) and firms with missing or negative total sales. Similar to Kahle and Stulz (2013), we further remove firms whose total assets are less than US$1 million, or whose share price is less than US$1.

2.2. Measuring military experience

We obtain a full list of Standard and Poor's (S&P) 1500 firms and their CEOs in the period of 1992-2012 from Execucomp. We collect information on the personal characteristics and military background of executives from *Marquis Who's Who*.[3] 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). 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).

2.3. Control variables

Following prior literature (Bharath, Sunder and Sunder 2008; ; Valta 2012; Hasan et al. 2014, 2017), 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*), cash flow volatility (*CFVOL*), Z-score (*Z_SCORE*), and the borrower's S&P long-term issuer 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*),

[2] 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 in the Internet Appendix.

[3] *Marquis Who's Who* is an American publisher of a number of directories containing short biographies. This database is the major resource to collect management characteristics. See, for example, Duchin and Sosyura (2013), Benmelech and Frydman (2015), Bernile, Bhagwat and Rau (2016), Cronqvist and Yu (2017), and Schoar and Zuo (2017).

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 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. 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 8,662 loan-year observations and 4,274 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 25^{th} and 75^{th} 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 9.3% of the total number of companies. Approximately 23% of the CEOs have an MBA degree, while under 9% have a Ph.D. qualification. About 20% of the CEO graduated from prestigious universities

(the Ivy League), and 21% have a background in finance or engineering. The proportions of foreign CEOs and female CEOs are rather small (5% and 2%, respectively). The proportion of CEOs born during the Great Depression (1920-1929) is just under 1%. A typical CEO in our sample is a 57-year-old male with about 6 years of experience. These statistics are consistent with those reported in Benmelech and Frydman (2015), Law and Mills (2017) and Pan, Wang, and Weisbach (2018). In terms of risk incentives, the mean values of the logarithm of CEO's *Delta* and *Vega* are 5.66 and 3.92, 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 logarithm of firm size (LOGASSET) is about 7.99, and the book leverage ratio is 0.449. Asset tangibility (*PPE*) is 0.309. Cash flow volatility is 0.040 on average. Turning to the loan characteristics, the average loan size is $648 million and the average maturity of our sample loans is 46 months. The loan spread is on average 130 basis points above the LIBOR rate. Most of these loans are syndicated. About 30% of the loans have a collateral requirement, and about 64% have at least one covenant requirement. Our firm- and loan-characteristics are in line with prior studies (Valta 2012; Hasan et al. 2014, 2017; Hollander and Verriest 2016; Bushman, Williams and Wittenberg-Moerman 2017).

We also compare the characteristics of firms with and without military CEOs in Panel B. We find that firms run by military CEOs tend to be larger, have better performance and lower risk (i.e., lower leverage, higher Z-score, and lower cash flow volatility). We also find that the loan spreads for firms led by military CEOs are significantly lower than those of firms led by non-military CEOs.

[Insert Table 1 here]

3 The effect of CEO military experience on loan costs

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

(1) $LOAN\_SPREAD_{j,i,t} = f\,(MILITARY_{j,t-1}, FIRMCTRL_{j,t-1}, LOANCTRL_{i,j,t}, MACRO_{t-1}, FEs)$,

where $LOAN\_SPREAD_{i,j,t}$ 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 the two-digit SIC 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 or 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.

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 Model 2, we include firm- and loan-level control variables. In Model 3, 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), Valta (2012) and Pan, Wang, and Weisbach (2018), use cash flow volatility. As a result, we use earnings volatility (Models 2 and 3) and cash flow volatility (Model 4) as alternative measures of firm risk. T-statistics are computed using standard errors that are robust to both heteroscedasticity and clustering 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 -0.0871 in the full model with earnings volatility as a measure of risk, and -0.0932 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 8.71% (about 11.4 bps) lower bank loan prices than firms headed by non-military CEOs.[4]

Turning to the control variables, the majority of the control variables carry expected signs and are consistent with the prior literature (Valta 2012; Hasan et al. 2014; Houston et al. 2014; Bushman et al. 2017). 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 is negatively associated with loan spreads.

[Insert Table 2 here]

4 Identification strategies

While we find a robust negative relation between CEO military experience and loan costs, our findings could suffer from an omitted correlated variable bias. In particular, firms might endogenously appoint military CEOs based on certain firm characteristics. At the same time, these characteristics might influence bank lending decisions. Even though we have controlled for various firm characteristics in our baseline regression model, 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 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. 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. We use

[4] We estimate this difference as the coefficient on *MILITARY* multiplied by the average of sample loan spread (e.g., -0.0871 ×131 bps = -11.4 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.

the CEO birth year as an instrument because the probability of being drafted is associated with war times. For example, during World War II, men born between 1914 and 1919 were eligible. Similarly, the drafting for the Vietnam War was based on age. As such, the birth year of the CEO is likely to be correlated with CEO military experience. On the other hand, it is unlikely that the CEO birth year would influence bank lending decisions several years after the CEO was born. We, therefore, argue that choosing the CEO birth year as our instrument fulfills the relevance and exclusion conditions for identification test (Roberts and Whited, 2013). We then perform a two staged least squares (2SLS) regression as follows:

(2) $MILITARY_{j,t} = f\,(BIRTH\_YEAR_{j,t-1}, CEOCTRL_{j,t-1}, FIRMCTRLj_{,t-1}, LOANCTRL_{i,j,t}, MACRO_{t-1}, FEs),$

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

Equation (2) is the first-stage regression, and Equation (3) is the second-stage equation under our 2SLS regression framework. *BIRTH_YEAR* 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 effects, credit rating fixed effect, loan type, syndication, and purpose fixed effects. All firm-level control variables and macroeconomic control variables, as presented in the baseline model, are included in all Models (1) to (4). In Models (3) and (4), we further control for four additional control variables as in Benmelech and Frydman (2015), including 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. Finally, we use bootstrapped standard errors with 500 replications to correct for any potential correlation of residuals across firms and across time.

The first-stage regressions yield negative and significant coefficients for the instrument variable (-0.063 with t = -6.00 and -0.069 with t = -4.73), consistent with the declining trend in the likelihood of military service. The F-statistics obtained from the first-stage regressions pass the weak identification tests at the 1% level.[5] The Kleinberg-Paap statistics pass the associated under-identification tests. The results for the second-stage regressions are reported in Models (1) and (3) of Table 3. We observe coefficients of -0.078 (t =-7.14) and -0.083 (t =-4.46) 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. As an alternative approach, we consider birth year dummy variables as instruments. We report the results of this test in Models (2) and (4). We obtain coefficients of -0.119 (t = -3.23) and -0.108 (t = -5.24) for *MILITARY* when year of birth dummies variables are used as instrumental variables. Overall, our results are consistent with those reported in the baseline results.

[Insert Table 3 here]

4.2 Propensity score matching

Panel B of Table 1 shows that the characteristics of firms headed by military CEOs are different from those of firms headed by non-military CEOs. Thus, a potential concern of our findings is that the relation between CEO military experience and loan pricing is driven by the differences in firm characteristics. To ensure that we compare the loan costs of firms with military CEOs and the loan costs of otherwise similar firms, we use the propensity score matching approach. Following Benmelech and Frydman (2015) and Law and Mills (2017), we first examine the factors influencing the decision to hire a CEO with military background. We do so by estimating a probit model with the military dummy variable as the dependent variable and all firm characteristics specified under Equation (1) as explanatory variables. For this analysis, we limit the sample to the year immediately

[5] Stock and Yogo (2005) 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).

before a new CEO is appointed. 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. Following Law and Mills (2017), we compute the propensity score of control and treatment firms using information from the previous three years. 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.

The average treatment effects (*Treatment– Control*) are reported in Panel B. We test for the mean difference using the paired *t*-test, and for the median difference using the Wilcoxon signed rank test. In both cases, we find negative 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 headed by military CEOs), on average, have a lower loan spread than loans in our control group (firms led by nonmilitary CEOs), thus confirm our main findings.

Next, we 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 4. For this matched sample, we 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 a CEO with military background based on their own characteristics.

[Insert Table 4 here]

5 Economic channels

Having established a negative relation between military CEOs and loan costs, we next examine the economic mechanism underlying this relation. We argue that CEO military experience helps reduce loan costs because of the role of military CEOs in enhancing firm information environment and reducing firm risk. We investigate these channels in the following discussions.

5.1. Information asymmetry

Daboub et al. (1995) 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. Firms led by military CEOs are also less tax aggressive and less likely to engage in earnings management, announce financial restatements, backdate option exercise dates, and are less subject to class action lawsuits (Law and Mill 2017; Koch-Bayram and Wernicke 2018). Prior studies show that earnings management and tax avoidance are two important channels for hoarding bad news (see, for example, Hutton, Marcus, and Tehranian 2009; Kim, Li and Zhang 2011). Taken together, these studies highlight that CEO military experience is associated with a more transparent information environment for the firm.

Several studies have established that banks charge higher loan rates when the borrower faces severe information asymmetry (Graham, Li and Qiu 2008; Bharath, Sunder and Sunder 2008; Armstrong, Guay and Weber 2010; Ertugrul et al. 2017). 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 (1) the probability of informed trading (*PIN*), (2) the information opaqueness (*OPAQUE*), (3) the number of analysts following the borrowing firm, and (4) 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 1995; Hutton et al. 2009; Hasan et al. 2014; Imhof, Seavey and Smith 2017; Kim et al. 2016).

First, 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)].[6] Our second measure, *OPAQUE*, is the information opaqueness measure of Hutton, Marcus, and Tehraninan (2009). Following Hutton et al. (2009) and Kim, Li, and Zhang (2011) and Kim and Zhang (2016), we measure OPAQUE as a three-year moving sum of absolute discretionary accruals, where discretionary accruals are estimated on the modified Jones (1991), following Dechow, Sloan and Sweeney (1995).

Third, 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 (Easly and O'Hara, 2004; Bowen et al. 2008; Yu, 2008). We compute the analyst coverage measure using data from the Institutional Brokers' Estimate System (I/B/E/S) database. Our final proxy for information asymmetry is financial report comparability.[7] 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

[6] We thank Stephen Brown for making the PIN score publicly available at http://scholar.rhsmith.umd.edu/sbrown/pin-data.
[7] We thank Rodrigo Verdi, S.P Kothari, and Gus De Franco for making their financial report comparability data available through their websites: http://mitmgmtfaculty.mit.edu/rverdi/.

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 *PIN* and *OPAQUE*, 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 5. 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 between CEO military experience and loan pricing among firms facing less 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 5 here]

5.1.1 Uncertainty regarding management

If CEO military experience forms an important source of information, we argue that the effect of CEO military experience on loan contracts should be stronger in situations where banks are more likely to rely on soft information. We examine this premise as follows. First, we examine the value of CEO military experience when there is uncertainty regarding management. Pan, Wang, and Weisbach (2015, 2018) document that uncertainty surrounding a change in management increases stock volatility and financing costs. As the CEO tenure increases, more information regarding her

management style becomes known to the market, which reduces this uncertainty. If CEO military experience provides banks with important insights into the new management, we expect the effect of CEO military experience on loan costs to be stronger when the CEO has not been in the office for too long.

To test this hypothesis, we create a dummy variable (*SHORT*) that takes the value of one if the CEO tenure is lower than the sample median.[8] The variable, *LONG*, captures longer-tenure CEOs and equals one minus *SHORT*. We create two interaction terms between military CEO and these dummy variables. The idea is to delineate the effects of military experience in short-tenure CEOs as opposed to long-tenure CEOs. We then modify the baseline model by replacing military CEOs (*MILITARY*) with two interaction terms *SHORT*×*MILITARY* and *LONG*×*MILITARY*, as shown in Equation (4) below:

(4) $LOAN\_SPREAD_{j,i,t} = f(SHORT \times MILITARY_{j,t-1}, LONG \times MILITARY_{j,t-1,} FIRMCTRL_{j,t-1}, LOANCTRL_{i,j,t}, FEs)$,

where *SHORT* and *LONG* are as described above. Other variables are analogous to those described in Equation (1). If banks value CEO military experience more highly when management uncertainty is high, we expect a larger coefficient for $SHORT \times MILITARY_{j,t-1}$, relative to $LONG \times MILITARY_{j,t-1}$.

We report results for this test in Panel A of Table 6. We find that the effect of CEO military experience on loan costs is stronger in firms with CEOs whose tenure is shorter than the median. *SHORT*×*MILITARY* has a coefficient of -0.1632 (*t*-stat of -2.15), while *LONG*×*MILITARY* has a coefficient of -0.0656 (*t*-stat of -1.79). The difference between these coefficients (*SHORT*×*MILITARY* – *LONG*×*MILITARY*) is positive and statistically significant. This finding indicates that banks value the information conveyed by CEO military experience more highly when the CEO is newer to the firm, consistent with our hypothesis.

[8] We alternatively use three-year as the cutoff as in Pan, Wang, and Weisbach (2018) and redefine *SHORT* (*LONG*) as a dummy that takes the value of one if the CEO tenure is lower (higher) than three years and zero otherwise. We find that results (untabulated for brevity) are robust to alternative proxy for management uncertainty.

5.1.2 Relationship banking

If CEO military experience forms an important source of information, we argue that this information should be less important if the bank has access to alternative sources of soft information. Bharath et al. (2011) provide evidence that maintaining a lending relationship allows banks to collect valuable soft information regarding a borrower. Following Bharath et al. (2011), we argue that, as relationship banks have access to more soft information than non-relationship banks, the informational role of CEO military experience becomes less important. This hypothesis predicts that the effect of CEO military experience on loan costs is weaker for relationship banks, relative to non-relationship banks.

We measure relationship lending following Bushman, Williams and Wittenberg-Moerman (2017). For each loan facility, we create a dummy variable (*RELATION*) that takes the value of one if the lead arranger lends at least 50% of the total loan amount to the borrower in the previous five years.[9] We create another dummy variable (*NO_RELATION*) that equals one minus *RELATION* to capture non-relationship loans. We only consider the lead lender rather than other loan participants because the lead arranger is in charge of collecting information regarding the borrower (e.g., through screening and monitoring) (Bharath et al. 2011; Ivashina 2009).

To test our hypothesis, we modify the baseline model by replacing the military CEO dummy (*MILITARY*) with two interaction terms *RELATION*×*MILITARY* and *NO_RELATION*×*MILITARY*, as shown in Equation (5) below:

(5) $LOAN\_SPREAD_{j,i,t} = f(RELATION \times MILITARY_{j,t-1}, NO\_RELATION \times MILITARY_{j,t-1,} FIRMCTRL_{j,t-1}, LOANCTRL_{i,j,t}, FEs),$

[9] We follow Ivashina (2009) in identifying the lead lender of each facility. Specifically, we first identify the administrative agent. If the loan does not have an administrative agent, we define the lead lender as either the agent, arranger, book runner, lead arranger, lead bank, or lead manager. We exclude loan facilities for which we are unable to identify the lead lender.

where *RELATION* and *NO_RELATION* are defined above, and other variables are analogous to those described in Equation (1). Consistent with our hypothesis, we expect the coefficient of $NO\_RELATION \times MILITARY_{j,t-1}$ to be stronger than that of $RELATION \times MILITARY_{j,t-1}$.

We report results for this test in Panel B of Table 6. We find that *RELATION*×*MILITARY* has a coefficient of 0.0026 (*t*-stat of 0.09), while *NO_RELATION*×*MILITARY* has a coefficient of -0.0848 (*t*-stat of -1.88). The difference between these coefficients (*NO_RELATION*×*MILITARY* – *RELATION*×*MILITARY*) is positive and statistically significant. These findings are consistent with our argument that CEO military experience is more valuable when the bank has little information regarding the firm (i.e., non-relationship banks).

5.1.3 First loan initiations

In the final set of tests, we explore the effect of CEO military experience when the bank lends to the borrower for the first time. If CEO military experience has an important informational role for banks, we expect this information to have a larger effect on loan costs for first loans, as opposed to repeated loans, because there is greater uncertainty when the bank lends to the borrower for the first time (Hasan et al. 2014).

To test this prediction, following Hasan et al. (2014), we create a dummy variable, *FIRST_LOAN*, that takes the value of one for first loan initiations and zero otherwise. We then create another dummy variable, *REPEATED_LOAN*, which equals one minus *FIRST_LOAN*. We create two interaction terms between military CEO and these dummy variables to delineate the effects of military experience on first loans as opposed to repeated loans. We modify the baseline model by replacing military CEOs (*MILITARY*) with two interaction terms *FIRST_LOAN*×*MILITARY* and *REPEATED_LOAN*×*MILITARY*, as shown in Equation (6) below:

(6) $LOAN\_SPREAD_{j,i,t} = f(FIRST\_LOAN \times MILITARY_{j,t-1}, REPEATED\_LOAN \times MILITARY_{j,t-1,} FIRMCTRL_{j,t-1}, LOANCTRL_{i,j,t}, FEs)$,

where *FIRST_LOAN* and *REPEATED__LOAN* are as described above, and other variables are analogous to those described in Equation (1).

We report results for this test in Panel C of Table 6. We find that the effect of CEO military experience on loan costs is stronger in first loan initiations. Specifically, *FIRST_LOAN*×*MILITARY* has a coefficient of -0.2706 (*t*-stat of -4.20), while *REPEATED_LOAN*×*MILITARY* has a coefficient of -0.1380 (*t*-stat of -2.93). The difference between these coefficients (*FIRST_LOAN*×*MILITARY* – *REPEATED_LOAN*×*MILITARY*) is negative and statistically significant, suggesting that the effect of CEO military experience is stronger for first loan initiations.

Overall, our findings presented in Table 6 indicate that the effect of CEO military experience on loan pricing is stronger in circumstances when there is greater uncertainty regarding the CEO (i.e., when the CEO is new to the firm)), or when the bank knows little about the borrower (i.e., when the bank has no relationship with the borrower, or when the bank lends to the borrower for the first time). Taken together with the findings in Table 5, these results highlight that banks value CEO military experience because it conveys additional information about the borrower.

[Insert Table 6 here]

5.2 Firm risk

Another channel through which CEO military experience might influence loan costs is firm risk. If military training makes CEOs more conservative (Bamber, Jiang and Wang 2010), they should be less inclined to take risk. Empirical evidence shows that banks charge higher loan rates to compensate for higher default risk (Bharath, Sunder and Sunder 2008; Graham, Li and Qiu 2008; Valta 2012; Ertugrul et al. 2017). 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 7. 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 less 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 7 here]

5.2.1 Competition threat from product market

We next examine whether the nature of firm's business environment affects the relation between CEO military experience and bank loan pricing. We conjecture that the effect of CEO military experience on loan cost is more pronounced for firms that are more exposed to product market threats as military CEOs tend to respond better to competitive environment (Benmelech and Frydman 2015). We use the product market fluidity measured in Hoberg, Philips, and Prabhala (2014) to capture product market threats. The dummy variable, *HIGH*, indicates higher competitive threats with a fluidity measure that is higher than the sample median. The variable, *LOW*, captures lower competitive threats and equal one minus *HIGH*. We create two interaction terms between military CEO and these dummy variables and modify the baseline model by replacing military CEOs (*MILITARY*) with two interaction terms *HIGH*×*MILITARY* and *LOW*×*MILITARY*, as shown in Equation (7) below

(7) $LOAN\_SPREAD_{j,i,t} = f(HIGH \times MILITARY_{j,t-1}, LOW \times MILITARY_{j,t-1,} FIRMCTRL_{j,t-1}, LOANCTRL_{i,j,t}, FEs),$

where *HIGH* and *LOW* are as described above. Other variables are analogous to those described in Equation (1).

We report results for this test in Table 8. We find that the effect of CEO military experience on loan costs is stronger in firms that face competitive threats. Specifically, *HIGH*×*MILITARY* has a

coefficient of -0.1187 (*t*-stat of -2.20), while *LOW*×*MILITARY* has a coefficient of -0.0303 (*t*-stat of -0.67). The difference between these coefficients (*HIGH*×*MILITARY* – *LOW*×*MILITARY*) is negative and statistically significant. This indicates that military CEOs are better in weathering the company through periods of high competition threats from the product market. Our findings in Table 8 further illustrates how military CEOs help reduce firm risk, which results in lower financing costs.

[Insert Table 8 here]

6 Further analyses

We develop various analyses to further understand the effect of CEO military experience on the costs of borrowing. First, while the CEO makes strategic decisions, it is the CFO that makes financing decisions. As a result, the military experience of the CFO might have a more important impact on the costs of bank loans. We examine the effect of CFO military experience in Section 6.1. In Section 6.2, we explore how CEO military experience influences other terms of the loan contract, besides the interest costs. In Section 6.3, we document the effect of CEO military experience on loan costs, while controlling for other important CEO characteristics. We investigate the effect of CEO military experience on the costs of alternative sources of finance, namely the implied costs of equity and the costs of public bonds, in Section 6.4. We discuss various additional robustness checks in Section 6.5.

6.1 Military CEOs, military CFOs and loan costs

In our baseline regression, we have established a negative relation between military CEO and loan costs. The CEO, however, is not the only member of the management team who sets the "tone at the top". Given that CFOs also play an important role in financial decisions (see, for example, Chava and Purnanandam 2010; Jiang, Petroni, and Wang 2010; Francis, Hasan, and Wu 2013; Francis, Hasan, Park, and Wu 2015; Fogel et al. 2018), we further examine whether military CFO explains loan costs and how the relation between military CEOs and loan costs changes once we control for military CFOs. We collect CFO information from Execucomp. We then obtain information on military experience of CFOs from *Marquis Who's Who*. We are able to identify military CFO information for a sample of 1,178 loan facilities. We report results for this test in Table 9. In the sample of

observations that we can identify the biographies of CFOs, we find that the coefficients of *MILITARY CFO* are insignificant across all models in Table 9. Accordingly, there is no evidence that the military experience of CFOs affects the costs of bank loans. More importantly, in Models (3) and (4), we still observe a negative and significant relation between military CEO and loan costs even after controlling for military CFO. Overall, results of Table 9 are consistent with previous findings, confirming that firms led by military CEOs, on average, have lower bank loan prices than firms headed by non-military CEOs.

[Insert Table 9 here]

6.2 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 (Smith and Warner 1979; Diamond 1984; Bradley and Roberts 2015). 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 (Dichev and Skinner 2002; Armstrong, Guay and Weber 2010). 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 10, 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. 2014; 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 -0.202 and is significant at the 1% level.

In Model 2, our dependent variable is the covenant intensity, estimated as the natural logarithm of one 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 (1) 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 10 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 the monitoring of the borrowing firm.

[Insert Table 10 here]

6.3 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. Pan, Wang, and Weisbach (2015) document a decline of return volatility over CEO tenure. 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 median firm.

To ensure that our results are not driven by other CEO characteristics, we control various CEO characteristics that the literature above has demonstrated to affect corporate policies. Specifically, we modify our baseline regression by including *GENERAL*, *MBA*, *PHD*, *IVY_EDUC*, *FINTECH_EDUC*, *DEPRESSED_BABY*, *FOREIGN_CEO*, *TENURE*, *MA_SCORE*, *DELTA*, *VEGA*, and *HOLDER_67*.

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.[10] *FINTECH_EDUC* is a dummy variable that takes the value of one if the CEO has financial education background and zero otherwise (Cronqvist, Makhija, and Yonker 2012). *DEPRESSED_BABY* is a dummy variable that takes value of one if the CEO was born during the Great Depression period of 1920 to 1929 and zero otherwise (Malmendier and Nagel 2011; Malmendier, Tate, and Yan 2011; Malmendier and Tate 2005, 2009). *TENURE* refers to CEO tenure. *MA_SCORE* is the managerial ability score estimated in Demerjian, Lev, and McVay (2012). *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) (Core and Guay 2002; Coles, Daniel, and Naveen 2006; Anantharaman and Lee 2014). Following Campbell et al. (2011), Hirshleifer, Low, and Teoh (2012), and Kim, Wang, and Zhang

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

(2016), we construct the modified Malmendier and Tate (2005) option-based measure of CEO overconfidence and define a CEO as overconfident if the CEO holds options that are more than 67% in the money at least twice during the sample period. *HOLDER_67* is a dummy variable that takes the value of one if a CEO is overconfident and zero otherwise.

In each model of Table 11 (Models 1 to 12), we augment our baseline model with each of the above additional CEO characteristics. In Model 13, we include all additional CEO characteristics in our regression. In all models (Models 1 to 13), we further control for CEO age as age can be associated with chances of being selected into the military service (Benmelech and Frydman (2015) or with risk-taking behavior and managerial style (Bertrand and Schoar, 2003).[11] Our sample size ranges from 7,132 to 8,662 loan observations, due to the availability of the CEO characteristics. 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 12. Taken together, these findings suggest that the effect of CEO military experience on loan costs is not confounded by any of the above CEO characteristics.

[Insert Table 11 here]

6.4 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 bond holders. Thus far, we have argued that firms run by military CEOs are associated with lower cost of bank loans by enhancing firm information environment and lowering firm risk. Given lower information risk results in lower cost of financing (Aboody, Hughes, and Liu 2005; Francis, Nanda, and Olsson 2008; Kim and Qi 2010; Ng 2011; Kim and Sohn 2013; Naiker, Navissi, and Truong 2013), we conjecture that firms headed by these CEOs have lower cost of equity.

[11] To separate the effect of military service from an age effect, we follow Benmelech and Frydman (2015) to control for age using indicator variables for the quartiles of the CEOs' age distribution.

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

(8) $ICOC_{j,t} = f\,(MILITARY_{j,t-1}, FIRMCTRL_{j,t-1}, FEs)$,

where *ICOC* is the average of the four implied cost of equity measures, including *r*GM [Gode and Mohanram 2003), *r*CT (Claus and Thomas 2001), *r*GLS (Gebhardt et al. 2001), *r*EAST (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, following prior studies (e.g., Dhaliwal et al. 2006; Hail and Leuz 2006; Naiker et al. 2013), we 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*), market-book ratio (*MTB*) (Gebhardt et al. 2001; Dhaliwal et al. 2007), leverage (*LEVERAGE*), asset tangibility (*PPE*), and firm profitability (*ROA*). Models (1) and (2) in Table 12 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 control variables as per Gebhardt et al. (2001) and Dhaliwal et al. (2007). The magnitude of these effects is economically significant, with firms led by military CEOs having, on average, 6.24% lower implied cost of equity capital than firms run by non-military CEOs.[12] This indicates that CEO military experience is value enhancing for shareholders, consistent with the agency-based explanation (Franke 2001; Benmelech and Frydman 2015).

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

[12] 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.

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*). We estimate the following equation:

(9) $BNSPREAD_{i,j,t} = f\,(MILITARY_{j,t-1}, BNCTRL_{i,j,t}, FIRMCTRL_{j,t-1}, FEs)$,

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. We further control for firm characteristics (*FIRMCTRL*) similar to Equation (8).

The results of estimating Equation (9) are shown in Models (3) and (4) of Table 12. In Model (3), we find a coefficient of -0.0527 for the military CEO dummy variable (*MILITARY*). This coefficient is significant at the 5% level. The size of this coefficient becomes -0.0481 when we include all control variables as specified above. This effect is smaller, relative to the effect of CEO military experience on the costs of bank loans. This finding is expected given that compared with arms-length investors, including public bondholders, banks are more apt to price the risks and rewards of military experience because banks have better access to the firm's proprietary information (see, e.g., Diamond, 1984; Fama, 1985; James, 1987; Hasan et al., 2014).

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 12 here]

6.5 Further robustness checks

We further conduct a battery of tests to ensure our results are not biased by model specifications. First, we re-estimate our baseline model and cluster standard errors at both the borrowing firm- and the lead bank-levels since loans originated by the same lead bank might not be independent, which could bias the standard errors (Hasan et al. 2014). Second, to circumvent the effect of outliers, we use a median regression. Third, in our baseline regression we treat each facility as an independent observation. Our standard errors might be biased because several loan facilities may belong to the same loan package. As an alternative approach, we include only the largest facility in each loan package in our sample, following Anantharaman, Fang and Gong (2013). Forth, to ensure our findings are not driven by bank lending activities during the global financial crisis (2007-2008), we exclude all loans granted in the 2007-2008 period or exclude all loan observations after 2007 and re-estimate our baseline model. We further use an alternative measure of loan costs that account for various loan fees (Berg, Saunders and Steffen 2016).[13] Finally, we control for several measures of corporate governance such as the G-index (Gompers, Ishii and Metrick 2003), institutional ownership (Hartzell and Starks 2003; Ljungqvist et al. 2007; Ramalingegowda and Yu 2012), the takeover index (Cain, McKeon and Solomon 2017), board size and ratio of independent directors on the board (Weisbach 1988; Coles, Daniel, and Naveen 2008; Dahya, Dimitrov, and McConnell 2008), and co-opted boards (Coles, Daniel, and Naveeen 2014).[14] We perform this analysis to ensure that our results are not driven by the strength of the firm's corporate governance. We present the results for these additional tests in

[13] We thank Tobias Berg for making the total loan cost measure publicly available through his website http://www.tobias-berg.com/index.php/research/

[14] We thank Lalitha Naveen for making the op-opted board data available through her website https://sites.temple.edu/lnaveen/data/.

Table A1 of the Internet Appendix. In addition, since the loan pricing and other loan terms (collateral, covenants, and maturity) may be jointly determined, we use the 2SLS method to address the joint determination of loan terms, following prior literature (Bharath et al., 2011; Dennis, Nandy and Sharpe, 2000; Hollander and Verriest, 2016; Balachandran, Duong and Vu forthcoming). We present the results of this analysis in Table A2 of the Internet Appendix. We still observe a negative relation between military CEO and loan costs. Overall, we conclude that the effect of CEO military experience on loan pricing is robust across various model specifications and sampling methods.

We also provide additional analyses to rule out alternative explanations for our results in the Internet Appendix. First, one might argue that the effect of CEO military experience on loan costs is only through its effect on leverage. Specifically, military CEOs are more risk-averse, which results in them opting for lower leverage. This, in turn, reduces loan costs (Balachandran, Duong and Vu forthcoming; Hasan et al. 2014). Second, Law and Mills (2017) find that firms run by military CEOs are less tax aggressive. Given that banks charge higher loan costs for firms with higher level of tax avoidance, the documented effect of military CEOs on loan costs could be driven purely through the effect of tax aggressiveness on loan costs. Third, since agency-related issues will be less prevalent in firms headed by military CEOs (Franke 2001; Benmelech and Frydman 2015), military CEOs may only have an indirect effect on loan costs via the effect of governance on loan costs. We address these issues and show in Table A3 of the Internet Appendix that CEO military experience has a direct effect on loan costs, independent of its effect through leverage, tax avoidance or governance.

7. Conclusions

We study how the military experience of the CEOs affects the pricing of private debt and find that that banks charge lower loan costs for firms run by military CEOs. We conduct numerous tests for endogeneity, using instrumental regression analysis and propensity score matching, and find consistent results. The effect of military CEOs on loan cost is stronger when the firms are subject to higher information asymmetry issues and have 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 less restrictive covenant and collateral requirements. Military CEOs are also associated with lower implied costs of equity and costs of new bond issues.

Our study contributes to the growing literature on the influence of managerial traits on corporate policies and outcomes (see, for example, Malmendier, Tate and Yan 2011; Malmendier and Nagel 2011; Bernile, Bhagwat, and Rau 2016; Cronqvist and Yu 2017; Schoar and Zuo 2017). We show that an important way through which managerial traits affect the firm is through their effect on financing costs. We also shed new light on the determinants of loan contract terms. In particular, we show that soft information, such as the military experience of the borrower's CEO, is acutely important for banks when designing loan contracts, especially when they have less information about the firm.

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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, estimated in Custódio et al. (2013).
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 1% change in the standard deviation of the firm's returns.
BIRTH_YEAR	CEO's year of birth
MILITARY_CFO	A dummy that equals one if the CFO attended military service and zero otherwise.
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 SandP 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, Sloan and Sweeney (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, estimated in 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 (based on the model of Gode and Mohanram, 2003), *r*CT (based on the model of Claus and Thomas (2001), *r*GLS (based on the moel of Gebhardt et al. (2001), *r*EAST (based on the model of Easton (2004).
INST	Institutional ownership, obtained from Thomson Reuter 13F
ANAL_COVERAGE	Number of analysts following a firm, obtained from I/B/E/S.
TA_CETR	Cash effective tax rate (CETR) is defined as cash tax paid (TXPD) divided by pre-tax book income (PI) less special items (SPI). We truncate CETR to the range [0, 1]. TA CETR is defined as (–1) times CETR.
TA_ETR	Effective tax rate (ETR) is total tax expense (TXT) divided by pre-tax income, which is measured as the difference between pretax book income (PI) and special items (SPI). We truncate ETR to the range [0,1]. TA ETR is defined as (–1) times ETR.
CASH_RATIO	Measured as cash taxes paid divided by pre-tax operating cash flows adjusted for extraordinary items and discontinued operations.

Table 1. Descriptive statistics

Panel A: Descriptive statistics of whole sample

Variable	N	Mean	Std Dev	25th Pctl	50th Pctl	75th Pctl
			CEO Characteristics			
MILITARY	8,662 (4,274)	0.094 (0.093)	0.291 (0.290)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)
MBA	8,662 (4,274)	0.246 (0.231)	0.431 (0.422)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)
PHD	8,662 (4,274)	0.115 (0.090)	0.319 (0.286)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)
IVY_EDUC	8,662 (4,274)	0.216 (0.209)	0.411 (0.407)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)
FINTECH_EDUC	8,662 (4,274)	0.203 (0.207)	0.402 (0.405)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)
FOREIGN_CEO	8,662 (4,274)	0.055 (0.051)	0.227 (0.221)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)
FEMALE	8,662 (4,274)	0.017 (0.016)	0.129 (0.125)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)
DEPRESSED_BABY	8,662 (4,274)	0.009 (0.010)	0.095 (0.097)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)
LNDELTA	7,256 (3,617)	5.676 (5.661)	1.616 (1.613)	4.709 (4.686)	5.678 (5.656)	6.703 (6.650)
LNVEGA	7,610 (3,757)	4.015 (3.924)	1.767 (1.779)	3.054 (2.914)	4.158 (4.117)	5.225 (5.176)
AGE	8,662 (4,274)	57.37 (57.46)	7.55 (7.58)	53.00 (53.00)	57.00 (57.00)	62.00 (62.00)
TENURE	8,662 (4,274)	6.027 (6.234)	5.977 (6.070)	1.000 (1.000)	4.000 (5.000)	10.000 (10.000)
YEAR_OF_BIRTH	4,583 (2,435)	1947.47 (1947.65)	9.09 (8.89)	1942 (1942)	1948 (1948)	1954 (1954)
			Firm Characteristics			
LOGASSET	8,662 (4,274)	8.078 (7.996)	1.385 (1.386)	6.983 (6.761)	8.001 (7.801)	9.162 (8.952)
LEV	8,662 (4,274)	0.477 (0.449)	0.145 (0.143)	0.372 (0.343)	0.476 (0.443)	0.577 (0.544)
PPE	8,662 (4,274)	0.306 (0.309)	0.208 (0.214)	0.147 (0.148)	0.258 (0.255)	0.423 (0.432)
ROA	8,662 (4,274)	0.155 (0.162)	0.077 (0.080)	0.106 (0.113)	0.144 (0.153)	0.190 (0.199)
MTB	8,662 (4,274)	1.615 (1.683)	1.143 (1.889)	0.945 (0.972)	1.291 (1.345)	1.883 (2.004)
Z_SCORE	8,662 (4,274)	1.985 (2.141)	1.297 (1.431)	1.302 (1.441)	1.902 (2.087)	2.570 (2.764)
EARNVOL	8,662 (4,274)	0.695 (0.677)	1.874 (2.426)	0.196 (0.188)	0.369 (0.341)	0.715 (0.656)
CFVOL	7,649 (3,794)	0.038 (0.040)	0.030 (0.031)	0.019 (0.020)	0.031 (0.032)	0.048 (0.050)
			Loan Characteristics			
SPREAD (BPS)	8,662	130.861	111.580	40.000	100.000	200.000
LOAN_MATURITY (MONTHS)	8,662	45.966	24.110	13.000	61.000	61.000
LOAN_SIZE (US$ MIL)	8,662	647.815	1,157.477	140.780	300.000	750.000
SYNDICATION	8,662	0.975	0.157	1.000	1.000	1.000
SECURITY	8,662	0.297	0.457	1.000	1.000	1.000
COVENANT_DUMMY	8,662	0.6460	0.4782	1.000	1.000	1.000
			Macroeconomics Variables			
TERMSTR	8,662	1.531 (1.551)	1.136 (1.149)	0.523 (0.523)	1.269 (1.689)	2.646 (2.646)
CRSPREAD	8,662	-1.219 (-1.407)	5.333 (5.253)	-4.279 (-4.406)	-2.248 (-2.470)	0.242 (0.046)

Panel B: Nonmilitary CEOs vs. Military CEOs

	Nonmilitary CEO			Military CEO			Difference
	Mean	**Std Dev**	**Obs.**	**Mean**	**Std Dev**	**Obs.**	**In means**
CEO Characteristics							
MBA	0.235	0.424	7,850	0.356	0.479	812	-0.121***
PHD	0.101	0.302	7,850	0.243	0.429	812	-0.141***
IVY_EDUC	0.206	0.404	7,850	0.313	0.464	812	-0.107***
FINTECH_EDUC	0.199	0.399	7,850	0.244	0.430	812	-0.045***
FOREIGN_CEO	0.058	0.234	7,850	0.023	0.151	812	0.035***
FEMALE	0.019	0.136	7,850	0.000	0.000	812	0.019***
DEPRESSED_BABY	0.006	0.079	7,850	0.037	0.189	812	-0.031***
LNDELTA	5.641	1.621	6,568	6.008	1.528	688	-0.367***
LNVEGA	4.008	1.764	6,879	4.079	1.801	731	-0.071
AGE	56.822	7.345	7,850	62.143	7.587	812	-5.322***
TENURE	5.855	5.893	7,850	7.690	6.316	812	-1.835***
Firm Characteristics							
LOGASSET	8.058	1.383	7,850	8.271	1.390	812	-0.214***
LEVERAGE	0.479	0.146	7,850	0.467	0.136	812	0.011**
PPE	0.299	0.205	7,850	0.374	0.227	812	-0.075***
ROA	0.153	0.077	7,850	0.177	0.083	812	-0.024***
MTB	1.601	1.103	7,850	1.749	1.469	812	-0.148***
Z_SCORE	1.952	1.306	7,850	2.305	1.159	812	-0.353***
EARNVOL	0.703	1.955	7,850	0.617	0.724	812	0.086
CFVOL	0.039	0.031	6,914	0.035	0.023	735	0.004***
Loan Characteristics							
SPREAD (BPS)	134.573	113.158	7,850	94.977	87.245	812	39.596***
LOAN_MATURITY	46.272	24.174	7,850	43.007	23.285	812	3.265***
LOAN_SIZE (US$ MIL)	635.82	1153.03	7,850	763.79	1194.11	812	-127.97***
SYNDICATION	0.974	0.158	7,850	0.980	0.139	812	-0.006
SECURITY	0.309	0.462	7,850	0.181	0.385	812	0.128***
COVENANT_DUMMY	0.656	0.475	7,850	0.549	0.498	812	0.107***

Panel A of this table reports the descriptive statistics for the sample of 8,662 loan facilities obtained by US non-financial non-utility firms from 1992 to 2012. There are 4,274 firm–year observations in our sample. We report the firm characteristics at the loan-year level and at the firm–year level (in parentheses). Panel B reports the statistics of the subsamples of loans granted to firms with and without military CEOs. We collect the loan data from the Loan Connector's Dealscan database, whereas accounting information is from the Compustat Industrial Annual Files. Appendix A provides a detailed description of the variables.

Table 2. Military CEOs and cost of bank loans: Baseline results

	Models			
	(1)	(2)	(3)	(4)
MILITARY	-0.1438***	-0.0877**	-0.0871**	-0.0932***
	(-3.64)	(-2.52)	(-2.53)	(-2.82)
LOGASSET		-0.0604***	-0.0604***	-0.0547***
		(-3.28)	(-3.28)	(-2.83)
LEVERAGE		0.8091***	0.8080***	0.9308***
		(8.81)	(8.80)	(9.22)
PPE		-0.0114	-0.0117	0.0969
		(-0.14)	(-0.14)	(1.09)
ROA		-0.0188***	-0.0188***	-0.0233***
		(-2.68)	(-2.67)	(-3.09)
MTB		-1.0403***	-1.0403***	-1.1626***
		(-4.88)	(-4.88)	(-5.62)
Z_SCORE		-0.0449***	-0.0449***	-0.0387**
		(-2.88)	(-2.88)	(-2.58)
EARNVOL		0.0095**	0.0095**	
		(2.33)	(2.33)	
CFVOL				0.8644**
				(2.35)
LOAN_SIZE		-0.0114	-0.0114	0.0082
		(-0.37)	(-0.37)	(0.25)
LOAN_MATURITY		-0.1136***	-0.1137***	-0.1103***
		(-8.19)	(-8.19)	(-7.33)
TERMSTR			-0.0028	-0.0050
			(-0.29)	(-0.51)
CRSPREAD			-0.0070	-0.0079
			(-0.13)	(-0.14)
Loan type, syndication, and purpose fixed effects	Yes	Yes	Yes	Yes
Credit rating fixed effect	Yes	Yes	Yes	Yes
Industry and year fixed effect	Yes	Yes	Yes	Yes
R^2	0.698	0.745	0.745	0.757
Observations	8,662	8,662	8,662	7,649

This table reports the results on the impact of CEO military experience on the cost of bank loans. 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: 2SLS Regression with instrumental variables

	IV Birth year	**IV Birth year Dummies**	**IV Birth year**	**IV Birth year Dummies**
Second-stage regressions	**Dependent variable = LOAN_SPREAD**			
	(1)	(2)	(3)	(4)
MILITARY	-0.078***	-0.119***	-0.083***	-0.108***
	(-7.14)	(-3.23)	(-4.46)	(-5.24)
LOGASSET	-0.106***	-0.142***	-0.105***	-0.136***
	(-10.22)	(-8.33)	(-9.08)	(-9.58)
LEVERAGE	0.892***	0.843***	0.879***	0.839***
	(10.83)	(7.59)	(10.00)	(6.14)
PPE	0.022	-0.102	0.061	-0.026
	(0.30)	(-1.02)	(0.91)	(-0.32)
MTB	-0.033***	-0.041***	-0.031***	-0.035***
	(-5.07)	(-3.99)	(-4.30)	(-4.85)
ROA	-1.118***	-0.804***	-1.165***	-0.987***
	(-4.34)	(-4.16)	(-4.15)	(-4.26)
Z_SCORE	-0.024	-0.080***	-0.022	-0.075***
	(-0.82)	(-3.95)	(-0.59)	(-3.24)
EARNVOL	0.021***	0.001	0.021**	0.007
	(2.77)	(0.08)	(2.58)	(0.52)
CRSPREAD	-0.002	-0.009	-0.005	-0.018
	(-0.16)	(-0.54)	(-0.44)	(-1.39)
TERMSTR	-0.066	-0.110	-0.061	-0.085
	(-0.97)	(-1.47)	(-1.27)	(-0.98)
LOAN_MATURITY	-0.034	-0.045	-0.040	-0.059*
	(-1.03)	(-1.41)	(-1.47)	(-1.67)
LOAN_SIZE	-0.105***	-0.103***	-0.102***	-0.097***
	(-11.53)	(-6.10)	(-13.19)	(-6.28)
Industry and year fixed effect	Yes	Yes	Yes	Yes
Credit rating fixed effects	Yes	Yes	Yes	Yes
Loan type, syndication, and purpose fixed effects	Yes	Yes	Yes	Yes
Benmelech and Frydman additional controls	No	No	Yes	Yes
Observations	3,214	3,214	3,214	3,214
First-stage regressions	Dependent variables = Military experience			
BIRTH_YEAR	-0.063***	-	-0.069***	-
	(-6.00)	-	(-4.73)	-
First-stage F-statistics	13.28***	63.86***	12.39***	12.41***
Kleibergen-Paap LM Statistics	10.44***	38.99***	10.03***	10.01***

This table reports the second-stage results of estimating a two-stage least squares (2SLS) regression with instrumental variables for CEO military experience. The dependent variable is log of the all-in drawn spread (*LOG_SPREAD*). The instruments for CEO military experience include the year of birth of the CEO (Panel A) and the dummy variables of the year of birth of the CEO (Panel B). *BIRTH_YEAR* 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 macroeconomics variables as in the baseline model. Credit rating, loan type, loan syndication, and loan purpose fixed effects are included. In Models (3) and (4), we include four additional controls variables as in Benmelech and Frydman (2015), including 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. Definitions for all variables are presented in Appendix A. Standard errors are bootstrapped with 500 replications. *, ** and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively.

Table 4. Propensity score matching

Panel A. Determinant of hiring military managers

	Independent Variables							
	LOGASSET	**LEVERAGE**	**PPE**	**MTB**	**ROA**	**Z_SCORE**	**EARNVOL**	**CFVOL**
Dependent Variable	*Estimated Coefficients*							
MILITARY	-0.1332	-0.7100	-1.8713	-0.7960**	8.6905**	0.1344	0.0570	-0.0243
	(-0.97)	(-0.67)	(-1.48)	(-2.64)	(2.38)	(0.58)	(0.16)	(-0.01)

Panel B: Propensity score matching tests

	LOAN_SPREAD			
Matching criteria	Mean difference	p-value	Median difference	p-value
Industry/Size/MTB/ROA	-0.2668***	(0.00)	-0.2734***	(0.00)

Panel C: Regression analysis after matching

	LOAN_SPREAD	**R^2**	**Observations**	**All control variables**	**All fixed effects**
Independent Variable	-0.085**	0.816	1,730	Yes	Yes
MILITARY	(-2.00)				

Panel A reports the results of the logistic regression regressing military experience on firm characteristics, year fixed effects and industry fixed effects. 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 includes 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 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*-value for mean (median) difference are estimated using paired t-tests (Wilcoxon signed rank tests). Panel C reports the results of estimating the baseline regression [Equation (1)] on the matched sample. For brevity, we report only the coefficient on *MILITARY*. We cluster standard errors at the firm level and correct for heteroscedasticity. *t*-statistics are reported in parentheses. *, ** and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively.

Table 5. Information asymmetry and the effect of CEO military experience on loan costs

	PIN		**OPAQUE**		**ANAL_COVERAGE**		**COMPARABILITY**	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
MILITARY	-0.1251**	-0.041	-0.1408***	-0.0739	-0.0921*	-0.0098	-0.1270**	-0.0379
	(-2.52)	(-0.70)	(-2.93)	(-1.28)	(-1.91)	(-0.22)	(-2.06)	(-0.68)
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
R^2	0.657	0.789	0.760	0.773	0.649	0.782	0.756	0.808
Observations	2,550	2,671	2,551	2,657	3,137	2,705	1,926	1,711

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), the information opaqueness (*OPAGUE*) (Models 3 and 4), analyst coverage (*ANAL_COVERAGE*) (Models 5 and 6), and financial statement comparability (*COMPARABILITY*) (Models 7 and 8), 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 *OPAQUE* measure, we define firms as having a high (low) level of information asymmetry if they belong to the top (bottom) tercile of the information opaqueness. 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. *T*-statistics computed using standard errors robust to both clustering at the firm level and heteroscedasticity are reported in parentheses. The symbols ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively. We provide detailed description of the variables in Appendix A.

Table 6. Management uncertainty, relationship banking, and first loan initiations

Panel A: CEO tenure

	LOAN_SPREAD	
	coeff.	t-stat.
MILITARY × SHORT (β_1)	-0.1632**	(-2.15)
MILITARY × LONG (β_2)	-0.0656*	(-1.79)
All control variables	Yes	
Loan type, syndication, and purpose fixed effects	Yes	
Credit ratings fixed effects	Yes	
Year and industry fixed effects	Yes	
F (p-value) for test: $\beta_1 = \beta_2$	6.63 (0.01)	
R^2	0.774	
Observations	7,649	

Panel B: Relationship banking

	LOAN_SPREAD	
	coeff.	t-stat.
MILITARY × RELATION (Λ_1)	0.0026	(0.09)
MILITARY × NO_RELATION (Λ_2)	-0.0848*	(-1.88)
All control variables	Yes	
Loan type, syndication, and purpose fixed effects	Yes	
Credit ratings fixed effects	Yes	
Year and industry fixed effects	Yes	
F (p-value) for test: $\Lambda_1 = \Lambda_2$	4.31(0.04)	
R^2	0.756	
Observations	7,647	

Panel C: First loan initiations

	LOAN_SPREAD	
	coeff.	t-stat.
MILITARY × FIRST_LOAN (Ω_1)	-0.2706***	(-4.20)
MILITARY × REPEATED_LOAN (Ω_2)	-0.1380***	(-2.93)
All control variables	Yes	
Loan type, syndication, and purpose fixed effects	Yes	
Credit ratings fixed effects	Yes	
Year and industry fixed effects	Yes	
F (p-value) for test: $\Omega_1 = \Omega_2$	4.82 (0.03)	
R^2	0.634	
Observations	8,662	

This table reports the results of testing the moderating effects of CEO tenure, banking relationship and first loan initiations on the effect of CEO military service on loan pricing. In Panel A, *SHORT* (*LONG*) is a dummy variable that indicates shorter- (longer) tenure CEOs with a tenure that is lower (higher) than the sample median. In Panel B, *RELATION* (*NO_RELATION)* is a dummy variable that takes the value of one if banks has an (no) existing relationship with the borrowing firm and zero otherwise. We measure relationship lending following Bushman, Williams and Wittenberg-Moerman (2017). In Panel C, the dummy variable, *FIRST_LOAN*, takes the value of one if it is the first loan initiations and zero otherwise. The variable, *REPEATED_LOAN*, equals one minus *FIRST_LOAN*. The dependent variable in all analyses is the log of the *all-in-drawn spread* variable obtained from Dealscan. We cluster standard errors at the firm level and correct standard errors for heteroscedasticity. *T*-statistics are reported in parentheses. The symbols ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively. We provide detailed description of the variables in Appendix A.

Table 7. Firm risks and the effect of CEO military experience on loan costs

	EARNVOL		**CFVOL**		**MEPF**	
	(1)	(2)	(3)	(4)	(5)	(6)
MILITARY	-0.1641***	-0.1127**	-0.0818*	-0.0224	-0.1316**	-0.0192
	(-3.23)	(-2.08)	(-1.91)	(-0.48)	(-2.42)	(-0.38)
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
R^2	0.779	0.762	0.757	0.808	0.707	0.779
Observations	2,852	2,923	2,518	2,574	2,828	2,899

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 standard errors at the firm level and correct standard errors for heteroscedasticity. *T*-statistics are reported in parentheses. The symbols ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively. We provide detailed description of the variables in Appendix A.

Table 8. Product market competition

	LOAN_SPREAD	
	coeff.	t-stat.
MILITARY × HIGH (γ_1)	-0.1187**	(-2.20)
MILITARY × LOW (γ_2)	-0.0303	(-0.67)
All control variables	Yes	
Loan type, syndication, and purpose fixed effects	Yes	
Credit ratings fixed effects	Yes	
Year and industry fixed effects	Yes	
F (p-value) for test: $\gamma_1 = \gamma_2$	4.34 (0.03)	
R^2	0.781	
Observations	6,518	

This table reports the results of moderating effect of market competition on the effect of CEO military experience on loan spreads. *HIGH* (*LOW*) indicates higher (lower) competitive threats with a fluidity measure that is higher (lower) than the sample median. We use the product market fluidity measured in Hoberg, Philips, and Prabhala (2014) to capture product market threats. The dependent variable in all analyses is the log of the *all-in-drawn spread* variable obtained from Dealscan. We cluster standard errors at the firm level and correct standard errors for heteroscedasticity. *T*-statistics are reported in parentheses. The symbols ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively. We provide detailed description of the variables in Appendix A.

Table 9: Military CEOs, military CFOs, and loan costs

	Dependent variable: LOAN_SPREAD			
	(1)	(2)	(3)	(4)
MILITARY CFO	0.2332	0.1003	0.1643	0.0373
	(1.18)	(0.36)	(1.12)	(0.20)
MILITARY			-0.3332***	-0.2024**
			(-2.80)	(-2.11)
LOGASSET		-0.1056***		-0.1665***
		(-2.94)		(-4.98)
LEVERAGE		0.8079***		0.7220***
		(3.46)		(3.28)
PPE		0.5947***		0.6980***
		(3.24)		(3.83)
ROA		-0.0326*		-0.0208
		(-1.91)		(-1.36)
MTB		-1.2593***		-1.3477***
		(-2.62)		(-2.61)
Z_SCORE		-0.0112		-0.0074
		(-1.17)		(-0.93)
EARNVOL		-0.0150		0.0734*
		(-1.00)		(1.68)
LOAN_SIZE		-0.0935***		-0.0260
		(-3.38)		(-1.01)
LOAN_MATURITY		-0.0336		-0.0594
		(-0.48)		(-0.78)
Control for CEO age	No	No	Yes	Yes
Loan type, syndication, and purpose fixed effects	Yes	Yes	Yes	Yes
Credit rating fixed effects	Yes	Yes	Yes	Yes
Industry and year fixed effect	Yes	Yes	Yes	Yes
R^2	0.748	0.793	0.785	0.820
Observations	1,178	1,178	993	993

This table reports the results of estimating the effect of CEO military experience while controlling for CFO military experience. *MILITARY_CFO* denotes a dummy variable that takes the value of one if the CFO has military experience, and zero otherwise. In Model 1, we include *MILITARY*, *MILITARY_CFO* in the regression. In Model 2, we replace CEO military (*MILITARY*) with *MILITARY_CFO* in the baseline regression model [Equation (1)]. In Model 3, we include all explanatory variables specified in Equation (1), as well as *MILITARY_CFO*. All models include credit rating, loan type, loan syndication, and loan purpose fixed effects. Constant term, year fixed effects, and industry fixed effects based on two-digit SIC codes are included. We cluster standard errors at the firm level and correct standard errors for heteroscedasticity. *T*-statistics are reported in parentheses. The symbols ***, **, and * denote statistical significance level at the 1%, 5%, and 10% levels, respectively. We provide detailed description of the variables in Appendix A.

Table 10: Military CEOs and loan monitoring

	Covenant Dummy	Covenant Intensity	Security
	(1)	(2)	(3)
MILITARY	-0.202***	-0.312**	-0.284**
	(-2.83)	(-2.37)	(-2.35)
LOGASSET	-0.243***	-0.271***	-0.165***
	(-9.78)	(-5.60)	(-3.87)
LEVERAGE	1.003***	-0.366	0.370
	(6.34)	(-1.32)	(1.60)
PPE	-0.145	-0.274	-0.288
	(-0.99)	(-0.82)	(-1.06)
ROA	0.007	0.004	0.011
	(0.66)	(0.16)	(0.51)
MTB	-1.702***	0.494	-0.364
	(-4.87)	(0.83)	(-0.81)
Z_SCORE	-0.098***	-0.067	-0.057*
	(-3.82)	(-1.31)	(-1.78)
EARNVOL	0.009	-0.009	-0.011
	(1.03)	(-0.88)	(-1.43)
LOAN_SIZE	0.106**	0.226***	0.202***
	(2.15)	(6.83)	(6.46)
LOAN_MATURITY	-0.056**	-0.033	0.091
	(-2.53)	(-0.45)	(1.42)
TERMSTR	0.017	0.083**	0.058*
	(0.65)	(2.35)	(1.71)
CRSPREAD	-0.326***	-0.025	-0.019
	(-2.85)	(-0.17)	(-0.16)
Loan type, syndication, and purpose fixed effects	Yes	Yes	Yes
Credit rating fixed effects	Yes	Yes	Yes
Industry and year fixed effects	Yes	Yes	Yes
R2/Pseudo R^2	0.355	0.262	0.328
Observations	8,542	8,542	8,542

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 a dummy variable indicating whether the loan has a covenant restriction or not (*COVENANT_DUMMY*). In Model 2, we report the findings of the impact of CEO military experience on the intensity of covenant provisions (*COVENANT_INTENSITY*). *COVENANT_INTENSITY* is the natural logarithm of 1 plus the total number of covenants in the loan facility a firm obtains in year *t*. We measure *COVENANT_DUMMY* and *COVENANT_INTENSITY* following Hasan et al. (2017). In Model 3, we show the effect of CEO military experience on the probability of having a collateral requirement in the loan contract. All models include credit rating, loan type, loan syndication, and loan purpose fixed effects. Constant term, year fixed effects, and industry fixed effects based on two-digit SIC codes are included. We cluster standard errors at the firm level and correct standard errors for heteroscedasticity. *T*-statistics are reported in parentheses. The symbols ***, **, and * denote statistical significance level at the 1%, 5%, and 10% levels, respectively. We provide detailed description of the variables in Appendix A.

Table 11. Control for CEO characteristics

	Models												
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
MILITARY	-0.082**	-0.085**	-0.084**	-0.084**	-0.081**	-0.083**	-0.094**	-0.106***	-0.083**	-0.089**	-0.088**	-0.0861**	-0.085**
	(-2.30)	(-2.37)	(-2.37)	(-2.35)	(-2.27)	(-2.32)	(-2.47)	(-2.86)	(-2.30)	(-2.49)	(-2.44)	(-2.51)	(-2.19)
MBA	-0.013												-0.037
	(-0.53)												(-1.22)
PHD		0.011											0.007
		(0.31)											(0.17)
IVY_EDUC			0.013										0.034
			(0.49)										(1.02)
FIN_TECH_EDUC				0.023									0.014
				(0.82)									(0.46)
FOREIGN_CEO					0.050								0.079
					(0.84)								(1.17)
DEPRESSED_BABY						-0.041							-0.116
						(-0.63)							(-1.56)
DELTA							-0.010						-0.006
							(-1.03)						(-0.56)
VEGA								-0.001					0.004
								(-0.15)					(0.49)
TENURE									-0.002				-0.002
									(-1.29)				(-0.81)
GENERAL_CEO										0.007			-0.015
										(0.23)			(-0.52)
MA_SCORE											-0.005		0.007
											(-0.06)		(0.08)
HOLDER_67												-0.0422*	-0.045*
												(1.73)	(-1.66)
All controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
All fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	8,662	8,662	8,662	8,662	8,662	8,662	7,256	7,610	7,649	8,101	7,978	8,593	7,132
R^2	0.749	0.749	0.749	0.749	0.749	0.749	0.749	0.763	0.760	0.751	0.758	0.743	0.766

This table reports regression results on the impact of military CEOs on the cost of bank loans after controlling for other CEO characteristics. In each model from (1) to (12), 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, TENURE, GENERAL_CEO, MA_SCORE and HOLDER_67. In model (13), we include all additional CEO characteristics in the regression. Furthermore, following Benmelech and Frydman (2015), we control for age in all regressions. 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. 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. Definitions for all other variables are presented in Appendix A.

Table 12: Military CEOs and the costs of other financial sources

	Dependent variables			
	ICOC		BOND_SPREAD	
	(1)	(2)	(3)	(4)
MILITARY	-0.0086**	-0.0068**	-0.0527**	-0.0481**
	(-2.37)	(-1.99)	(-2.05)	(-2.02)
SIZE		-0.0072***		-0.1141***
		(-9.18)		(-12.77)
LEVERAGE		0.0255***		0.0732
		(4.00)		(1.48)
PPE		-0.0062		0.0760
		(-0.82)		(1.39)
ROA		0.0129		-0.6863***
		(0.82)		(-6.79)
MTB		-0.0001*		-0.0009***
		(-1.84)		(-2.78)
BOND_MATURITY				0.1626***
				(13.68)
BOND_SIZE				0.0216***
				(2.91)
DCALL				0.1069***
				(5.19)
DPRIVATE				0.0251
				(1.14)
DSENIOR				-0.0452
				(-1.41)
Year fixed effects	Yes	Yes	Yes	Yes
Industry fixed effect	Yes	Yes	Yes	Yes
Credit rating fixed effects	-	-	Yes	Yes
R^2	0.0960	0.0979	0.6488	0.6822
Observations	16,692	15,654	4,982	4,959

This table reports the results on the impact of CEO military experience on the implied cost of equity (Models 1-2) and the cost of bonds (Models 3-4). *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). *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 have military experience and zero otherwise. In Models (1) and (3), we show the effect of CEO military experience on the implied cost of equity capital and cost of bonds when we exclude all control variables. In Models (2) and (4), we include all control variables. *T*-statistics based on robust standard errors adjusted for heteroskedasticity are reported. *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively. We provide detailed description of the variables in Appendix A.

Internet Appendix
for "Military CEOs and Bank Loan Contracts"

In this Internet Appendix, we perform several additional robustness checks for the relation between military CEO and loan costs. We also discuss the 2SLS method to address the joint determination of loan terms. Finally, we discuss how we address the concern that the effect of military CEOs on bank loan costs is confounded by the effects of firm leverage, corporate governance, and tax avoidance on loan costs.

A. 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 Table A1. First, loans originated by the same lead bank might not be independent, which could bias the standard errors (Hasan et al. 2014). Thus, we re-estimate our baseline model and cluster standard errors at both the borrowing firm- and the lead bank-levels. Second, 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. Third, 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. Forth, we examine if our results are driven by the financial turmoil in the period 2007-2008. During the financial crisis, loan spreads are likely to increase for all borrowers since banks tighten lending standards (Ivashina and Scharfstein 2010). To ensure our findings are not driven by bank lending activities during this period, we exclude all loans granted in the 2007-2008 period and re-estimate our baseline model (Model 4). In an alternative test, we exclude all loan observations after 2007 (Model 5). In both cases, we find a negative and significant coefficient for *MILITARY*, consistent with our baseline

results. The magnitude of the coefficient is similar to that obtained from the baseline regression, indicating that the 2007 financial crisis does not drive our results.

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 (Model 6).[15] 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. A potential concern is that 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; Francis, Hasan, Koetter, and Wu 2012; and 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), the takeover index (Cain, McKeon and Solomon 2017), board size and ratio of independent directors on the board (Weisbach 1988; Coles, Daniel, and Naveen 2008; Dahya, Dimitrov, and McConnell 2008), and co-opted boards (Coles, Daniel, and Naveeen 2014).[16] We report the results of controlling for corporate governance in Panel B. In each model (Models 7 to 11), we augment our baseline model

[15] We thank Tobias Berg for making the total loan cost measure publicly available through his website http://www.tobias-berg.com/index.php/research/

[16] We thank Lalitha Naveen for making the op-opted board data available through her website https://sites.temple.edu/lnaveen/data/.

with each of the above governance proxies individually. We find that our results remain consistent even after controlling for corporate governance. In Model 12, 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 A1 show that the effect of CEO military experience on loan pricing is robust across various model specifications and sampling methods.

7 [Insert Table A1 here]

B. Join Determination of Loan Contract Terms

Our findings that CEO military experience influences the pricing of loan contracts might be biased by the joint determination of loan contract terms. Following prior literature (Bharath et al. 2011; Dennis, Nandy and Sharpe 2006; Hollander and Verriest 2016; Balachandran et al. forthcoming), we use the 2SLS method to address the joint determination of loan terms. We express the relation between loan spread, collateral requirement (security), maturity, and covenant intensity as follows:

(A1) $LOAN\_SPREAD_{j,i,t} = f(LNMATURITY_{j,i,t}, SECURITY_{j,i,t}, COVENANTS_{j,i,t}, MILITARY_{j,t-1}, CONTROLS).$

Since loan maturity, security, and covenant intensity are endogenous variables, in the first stage of the 2SLS procedure, we estimate Equations (A2), (A3), and (A4) using the OLS and logit regression methods, respectively:

(A2) $LNMATURITYi,j,t = f(IVs, CONTROLS),$

(A3) $COVENANTSi,j,t = f(IVs, CONTROLS),$

(A4) $SECURITYi,j,t = f(IVs, CONTROLS),$

where *IVs* denotes the set of instruments for loan maturity, security, and covenant intensity. Following prior literature (Bharath et al. 2011; Hollander and Verriest, 2016; Balachandran et al. forthcoming), we instrument loan maturity with the average loan maturity for all loans obtained the preceding three

months. The instruments for collateral requirement are loan concentration and the four-digit SIC industry median asset tangibility ratio.[17] With regard to covenant intensity, we use the 360-day historical default as an instrument.[18] Our instrument for covenant intensity is motivated by Murfin (2012), who finds that the lead bank's recent default experience influences the strictness of covenants in subsequent loans.

From the first-stage equations [Equations (A2) to (A4)], we obtain the fitted values for loan maturity, security, and covenant intensity and substitute these fitted values for the actual values for these variables in Equation (A1) in the second stage. In other words, we estimate the following equation using OLS:

(A5) $SPREADi,j,t = f(ELNMATURITY_{j,i,t}, ESECURITY_{j,i,t}, ECOVENANTS_{j,i,t}, MILITARY_{j,t-1}, CONTROLS)$,

where *ELNMATURITY* is the predicted value of loan maturity obtained from Equation (A2), *ECOVENANTS* is the predicted value of covenant intensity obtained from Equation (A3), *ESECURITY* is the predicted probability of loan security obtained from Equation (A4), and *CONTROLS* denotes all control variables outlined in Equation (1). We report the second-stage regression results in Table A2 of the Appendix.

The estimated coefficient of *MILITARY* is significantly negative, indicating that the effect of executive's military experience on loan costs is not driven by the joint determination of loan contract features. The coefficient of *MILITARY* is -0.071, suggesting that firms led by military CEOs, on average, having about 7.1% (about 9.30 bps) lower bank loan prices than firms headed by non-military CEOs. We also conduct a number of instrument validity tests. First, we test whether loan

[17] Loan concentration is measured as the current loan amount divided by the sum of the loan amount plus the borrower's existing debt.

[18] We identify default incidents using the Standard and Poor's (S&P) monthly rating report. A borrower is in default if it is assigned a "D" or "SD" long-term issuer rating in a certain month. We measure historical default as the total size of the lead bank's defaulted loans in the preceding 360 days prior to the facility start date scaled by the total amount of defaulted loans experienced by the lead bank in the three years from year *t-4* to year *t-2* to adjust for the lead bank's history of delinquent loans, with *t* denoting the year of the facility starting date.

maturity, loan security and covenant intensity are indeed endogenous with the Durbin-Wu-Hausman test. The Durbin-Wu-Hausman χ^2 statistic is 29.08, highlighting that loan spread and other non-price loan terms are endogenous, and thus supporting the use of instrumental variables for the non-price loan features in the second-staged regression. Second, we report the Anderson-Rubin Wald χ^2 statistic from testing whether the instruments are jointly zero, and thus are not valid instruments. The Anderson-Rubin Wald χ^2 is 7.81 and is significant at the 1% level. We thus reject the hypothesis that all instruments are jointly zero.

[Insert Table A1 here]

C. Military CEOs, firm leverage and loan costs

A potential concern regarding our findings is that the effect of military CEOs on loan spreads might be influenced by the effect of financial leverage on loan spreads. While we control for financial leverage in all regressions, it is possible that military CEOs affect loan spreads only through their effect on leverage. To rule out this possibility, we perform the following tests. First, we exclude the leverage ratio and re-estimate the baseline regression. In untabulated results, the coefficient of *MILITARY* in this regression is -0.0851 and is statistically significant, whereas the coefficient of *MILITARY* in the full baseline regression (Model 3 in Table 2) is -0.0871. This indicates that the effect of military CEOs on loan spreads is independent of financial leverage, both quantitatively and qualitatively.

Second, if the effect of military CEOs on loan spreads operates only through the effect of leverage on loan spreads, we expect the coefficient of *MILITARY* to be insignificant once we remove the proportion of loan spreads explained by leverage. To do so, we first regress loan spreads on leverage and obtain the residuals. The residuals from this regression reflect the proportion of loan spreads not explained by leverage. We then regress these residuals on *MILITARY* in the baseline model. We report the findings of this test in Model 1 in Table A3. We find that the effect of *MILITARY* on the proportion of loan spreads not explained by leverage is still positive and significant. This

finding shows that military CEOs have an influence on loan spread independent of the effect of leverage. Finally, we consider an alternative measure of leverage, market leverage, as in Benmelech and Frydman (2015).[19] Similarly, we first regress loan spreads on market leverage and obtain the residuals. The residuals from this regression reflect the proportion of loan spreads not explained by market leverage. We then regress these residuals on *MILITARY* in the baseline model and report the results of this regression in Model 2. Overall, these findings consistently suggest that military CEOs have an influence on loan spread independent of the effect of leverage.

[Insert Table A3 here]

D. Military CEOs, corporate governance, and loan costs

The importance of corporate governance for financing decisions has been intensively documented (Bradley and Chen 2011; Fields, Fraser and Subrahmanyam 2012; Rahaman and Al Zaman 2013). There is a possibility that military CEOs affect loan spreads only through their effect on corporate governance. Specifically, if the effect of military CEOs on loan spreads operates only through the effect of corporate governance on loan spreads, we expect the coefficient of *MILITARY* to be insignificant once we remove the proportion of loan spreads explained by governance. To do so, we first regress loan spreads on a set of governance measures, including the G-index, institutional ownership, the takeover index, board size and ratio of independent directors on the board, and co-opted boards and obtain the residuals. The residuals from these regressions reflect the proportion of loan spreads not explained by governance. We then regress these residuals on *MILITARY* in the baseline model and report the findings of these tests in Model 3 of Table A3. We find that the effect of *MILITARY* on the proportion of loan spreads not explained by governance remains positive and significant. These findings further confirm that military CEOs have an influence on loan spread independent of the effect of governance.

[19] Market leverage is defined as [Total current liability + Long-term debt] / [Market value of Asset].

E. Military CEO, tax avoidance and loan costs

Firms headed by military CEOs are associated with more precise disclosure (Bamber, Jiang, and Wang 2010) and less tax avoidance activities (Law and Mills 2017). As firms with less tax avoidance is related to lower loan spreads (Hasan et al., 2014), a potential concern regarding our findings is that effect of military CEOs on loan spreads operates solely through the effect of tax aggressiveness on loan spreads. If this is a case, one may expect the coefficient of *MILITARY* to be insignificant once we remove the proportion of loan spreads explained by tax aggressiveness.

Following prior studies (Dyreng et al. 2010; Hassan et al. 2017; Cen et al. 2017), we use three different proxies for tax aggressiveness, including the cash effect tax rate (*TA_CETR*), the effect tax rate (*TA_ETR*), and the cash ratio (*TA_CASH*). Consistent with previous analyses, we first regress loan spreads on each of proxies for tax aggressiveness and obtain the residuals separately. The residuals from these regressions reflect the proportion of loan spreads not explained by tax aggressiveness. We then regress these residuals on *MILITARY* in the baseline model and report the findings of these tests in Models 4 to 6 of Table A3. We find that the effect of *MILITARY* on the proportion of loan spreads not explained by tax aggressiveness is still positive and significant. Overall, findings of Table A3 suggest that military CEOs have an influence on loan spread independent of the effect of financial leverage, corporate governance, and tax avoidance activities.

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Table A1. Military CEOs and cost of bank loans: Further robustness checks

	MILITARY		R^2/ Pseudo R^2
	coeff.	t-stat.	
Main Specification	-0.0871**	(-2.53)	0.745
Panel A: Alternative model specifications and sampling methods			
(1) Use firm and lead bank two-way clustering	-0.1554**	(-2.27)	0.251
(2) Use median regression	-0.0794***	(-5.91)	0.562
(3) Include only the largest loan facility per loan package	-0.0567**	(-2.27)	0.727
(4) Exclude financial turmoil period (2007-2008)	-0.0775**	(-2.20)	0.753
(5) Exclude post-2007 period	-0.0886**	(-2.38)	0.724
(6) Alternative measures of borrowing costs (Berg et al. 2016)	-0.0736***	(-2.61)	0.827
Panel B: Control for corporate governance			
(7) Control for corporate governance (*GINDEX*)	-0.0916***	(-2.68)	0.758
(8) Control for institutional ownership	-0.0886**	(-2.58)	0.749
(9) Control for takeover index	-0.0896***	(-2.65)	0.750
(10) Control for board size and independent directors	-0.0727**	(-1.98)	0.765
(11) Control for board co-opted board	-0.0749**	(-2.01)	0.765
(12) Control for all governance measures	-0.0812**	(-2.23)	0.767

This table reports the results of several robustness tests performed on the regressions of 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 cost of bank loan. Other firm-level and loan-level characteristics variables are similar to those in the baseline regressions in Table 2. In Model 1, we use two-way clustering of standard errors at the firm level and at the lender level. Model 2 uses the median regression with robust standard error. In Model 3, we include only the largest loan facility within a loan package per year in our sample. In Model 4, we rerun the baseline regression after by excluding observations in financial turmoil period (2007-2008). In Model 5, we rerun the baseline regression after by excluding all loans granted after 2007. In Model 6, we use the overall cost of borrowing, including interest costs and other fees, as in Berg, Saunders, and Steffen (2016) as the dependent variable. In each model (Models 7 to 11), we augment the baseline model with each of governance proxies individually. In Model 12, we include all governance measures in our regression. Constant term, year fixed effects, and industry fixed effects based on two-digit SIC codes are included. In all models except Models 1 and 2, *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 A2. Simultaneous of Loan Terms, Military CEOs, and Cost of Bank Loans

	2SLS	
	coeff.	t.stat.
MILITARY	-0.071**	(-1.96)
ESECURITY	-0.259	(-1.47)
ECOVENANTS	0.233	(0.78)
EMATURITY	-2.526***	(-4.78)
Durbin-Wu-Hausman χ^2	29.08***	
Anderson-Rubin Wald χ^2	7.81***	
Firm-level controls	Yes	
Loan characteristics	Yes	
Loan type, syndication, and purpose fixed effects	Yes	
Credit rating fixed effects	Yes	
Industry fixed effect	Yes	
Year fixed effect	Yes	
Adjusted R^2	0.743	
Observations	5,891	

This table reports results of the 2SLS regression used to address the joint determination of loan terms. These regression models are explained in detail in Section B of this document. The symbols ***, **, and * denote statistical significance at the 1%, 5% and 10% level, respectively.

Table A3: Corporate Leverage, Governance, Tax Avoidance and the Effect of Military CEOs on Loan Costs

	Dependent variables					
	$\varepsilon_{f(LOAN\_SPREAD,\ LEVERAGE)}$		$\varepsilon_{f(LOAN\_SPREAD,\ GOVERNANCE)}$	$\varepsilon_{f(LOAN_{SPREAD},\ TAX\_AVOIDANCE)}$		
	BOOK_LEV	MKT_LEV	GOVERNANCE	TA_CETR	TA_ETR	CASH_RATIO
	(1)	(2)	(3)	(4)	(5)	(6)
MILITARY	-0.086**	-0.111***	-0.075**	-0.062***	-0.066***	-0.056***
	(-2.51)	(-2.91)	(-1.99)	(-3.09)	(-3.30)	(-2.73)
Firm-level controls	Yes	Yes	Yes	Yes	Yes	Yes
Loan characteristics	Yes	Yes	Yes	Yes	Yes	Yes
Loan type, syndication, and purpose fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Credit rating fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Industry fixed effect	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effect	Yes	Yes	Yes	Yes	Yes	Yes
R^2	0.740	0.708	0.114	0.740	0.621	0.725
Observations	8,662	8,662	6,034	7,845	7,845	7,836

This table reports the results on the impact of CEO military experience on the cost of bank loans. We first regress loan costs on measures of leverages, governance, or tax avoidance and obtain the residuals from these regressions. We then use these residuals as measures of loan costs not explained by leverages, governance, or tax avoidance and regress them on the main independent variable of interest, *MILITARY*, and other control variables as in the baseline models in Table 2. *MILITARY* is a dummy that equals one if the CEO attended military service and zero otherwise. We provide detailed description of all other variables 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 statistical significance at the 10%, 5%, and 1% levels, respectively.