Journal of Financial Economics 117 (2015) 43–59

Contents lists available at ScienceDirect

Journal of Financial Economics

journal homepage: www.elsevier.com/locate/jfec

# Military CEOs ☆

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ARTICLE INFO

*Article history:*
Received 16 April 2012
Received in revised form
19 November 2013
Accepted 18 December 2013
Available online 10 May 2014

*JEL classification:*
G31
G32
J24

*Keywords:*
CEOs
Fraud
Military
Ethics
Corporate Governance

ABSTRACT

There is mounting evidence of the influence of personal characteristics of chief executive officers (CEOs) on corporate outcomes. In this paper we analyze the relation between military service of CEOs and managerial decisions, financial policies, and corporate outcomes. Exploiting exogenous variation in the propensity to serve in the military, we show that military service is associated with conservative corporate policies and ethical behavior. Military CEOs pursue lower corporate investment, are less likely to be involved in corporate fraudulent activity, and perform better during industry downturns. Taken together, our results show that military service has significant explanatory power for managerial decisions and firm outcomes.



> "I don't know what I'd be doing [without the military], but I wouldn't be here. A day doesn't go by that I don't use the leadership lessons I learned in the Navy. It was absolutely vital."
> —Anthony F. Early Jr., CEO, DTE Energy

## 1. Introduction

CEOs with military backgrounds have been disappearing from corporate America. The supply of executives who have served in the military and, in particular, of those with combat experience has diminished since World War II and Korea veterans have retired. Whereas in 1980, 59% of the CEOs of large, publicly held corporations had served in the military, today only 6.2% of CEOs of these firms have a military background (see Fig. 1). Instead, most current chief executives have been trained through business degrees and executive education programs.[1] Companies such as Wal-Mart and General Electric, decrying a lack of leadership and dedication among young managers, have started programs to recruit junior military officers who

☆ We thank Nittai Bergman, Joe Doyle, Claudia Goldin, Larry Katz, Lawrence Kryzanowski, Todd Milbourn, Bill Schwert (the editor), Jeremy Stein, Tavneet Suri, Luigi Zingales, two anonymous referees, and participants at the Ackerman Conference on Corporate Governance at Bar Ilan University, Berkeley (Haas), DePaul-Chicago Fed, Harvard (Economic History and Labor) and Harvard-MIT Organizational Economics seminar, Incentives and Risk GSU Conference, NBER Conference on Ethics in Business, Northeastern, Stanford GSB and Yale SOM for their comments. We thank Adair Morse for sharing with us the data on corporate fraud cases. Kayla Liebman, Andrew Marok, Tim Ni, Carla Tokman, Moonlit Wang, Sammy Young and Anna Zhang provided great research assistance. Benmelech is grateful for financial support from the National Science Foundation under CAREER award SES-0847392. All errors are our own.

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[1] The fraction of CEOs with a business degree has increased sharply over this period. In fact, only 16.1% of CEOs in 1980 had an MBA degree. This percentage rose to 35.2% in 2006, and to about 40.0% by 2012.

http://dx.doi.org/10.1016/j.jfineco.2014.04.009
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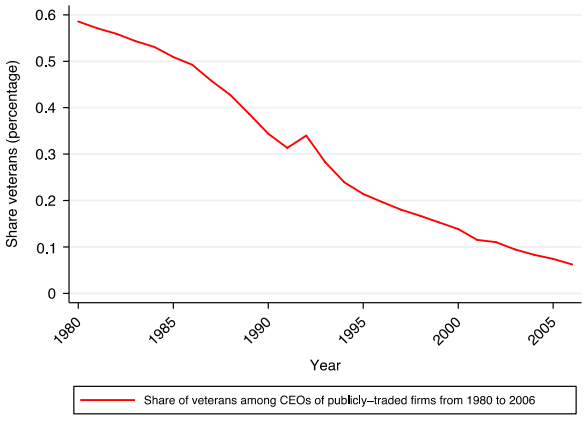


**Fig. 1.** Share of male CEOs with military experience, 1980–2006. This figure is compiled using data from the Forbes 800 surveys from 1980–1991 and Execucomp from 1992 to 2006. The increase in the share of U.S. veterans between 1991 and 1992 is caused by the decrease in the sample size when switching from Forbes data to Execucomp data.

served in Iraq and Afghanistan to solve a shortage of leadership talent (O'Keefe, 2010).

Has the disappearance of executives who served in the military from the C-suite had a real impact on corporate America? Service in the military may alter the behavior of servicemen and women in various ways that could affect their actions when they become CEOs later in life. Militaries have organized, sequential training programs that combine education with on-the-job experience and are designed to develop command skills. Evidence from sociology and organizational behavior research suggests that individuals may acquire hands-on leadership experience through military service that is difficult to learn otherwise and that they may be better at making decisions under pressure or in a crisis (Duffy, 2006). It is possible, therefore, that military CEOs may be more prepared to make difficult decisions during periods of industry distress. Moreover, military service emphasizes duty, dedication, and self-sacrifice. The military may thus inculcate a value system that encourages CEOs to make ethical decisions and to be more dedicated and loyal to the companies they run rather than pursue their own self-interest (Franke, 2001).

On the other hand, a large literature in psychology finds that military service leads to aggressiveness, overconfidence, and increased risk-taking.[2] Thus, evidence from other disciplines does not provide clear-cut predictions on how service in the military affects individual decision-making later in life.

We find that firms run by military CEOs invest less, have lower expenditures on research and development (R&D), and pursue slightly lower leverage ratios than their nonmilitary peers. We do not find effects on other variables intended to capture investment and financial policies, such as acquisitions and dividend payments. Our findings, therefore, are suggestive but not conclusive of an association between military CEOs and more conservative investment and financial policies.

While the psychology and organizational behavior literature does not provide clear guidance for the effects of military background on the aforementioned policies, it does suggest that the military may instill a stronger sense of ethics. Consistent with the findings in this literature, we find that CEOs with military experience are significantly less likely to be involved in corporate fraudulent activity compared to CEOs who have not served in the military. Our estimates indicate that military service is associated with a 70% reduction in the likelihood of fraud compared to the unconditional mean. When we run a horse race between the effect of an MBA education and military experience on fraud, we find again that military experience—but not business education—is associated with fewer incidents of alleged financial fraud.

We also consider the effect of military background on CEO performance under pressure. We find that CEOs with a military background tend to perform better during periods of industry distress, as evident by higher market-to-book ratio. Thus, the management style of CEOs who served in the military appears to be more resilient to crisis and fraud in ways that do not seem to be provided to the same extent by academic programs in business schools.

Although we would like to interpret our findings as evidence for a direct effect of service in the military on executive decisions, our results could reflect unobserved personal characteristics correlated with both military service and corporate policies. Moreover, our estimates may be biased downward due to measurement error in determining military service. To alleviate some of these concerns, we use an instrumental variables (IV) strategy. We exploit the fact that demand for manpower during wartime exogenously increases the likelihood of service among certain cohorts. Results from approaches using variation in year of birth for the entire sample or from discrete changes in the likelihood of being drafted during the Korean War are consistent with most of our ordinary least squares (OLS) findings: we document negative correlations between military service and investment and R&D expenditures, as well as a positive correlation between military service and performance in times of industry distress.

It is important to note that military experience may relate firm outcomes through two possible channels. First, firms with a need either to reduce investment and R&D expenditures or to minimize the incidence of corporate fraud may choose to hire a CEO with military experience for this purpose. Alternatively, military background may not be part of the selection criteria in choosing a CEO. Under this scenario, the imprinting of military service exogenously affects executive decisions and is therefore reflected in corporate policies. These two interpretations are consistent with an effect of military experience on firm outcomes, whether by a matching mechanism or through random assignments.

The instrumental variables approach suggests that the sorting of future CEOs into military service due to unobserved innate characteristics does not drive our findings, but it cannot address a concern about the selection of military CEOs into particular firms. We control for industry

[2] See, e.g., Elder (1986), Elder and Clipp (1989), and Elder, Gimbel, and Ivie (1991).

fixed effects in all of our specifications, so our results are unlikely to be driven by specific trends in industries that disproportionately hire military CEOs. However, the low incidence of changes in the military type of the chief executives within firms does not allow us to control for firm fixed effects. We thus cannot rule out that our estimates reflect the sorting of military CEOs into firms with more conservative investment and financial policies, as well as lower incidence of fraud, *within* industries. We therefore urge caution when interpreting our results, which suggest that there is an association (but not necessarily a causal relation) between military experience and a variety of firm outcomes.

Our paper is related to a growing literature in corporate finance emphasizing the importance of the person in charge of an organization for a firm's decisions and performance (Graham and Narasimhan, 2004; Malmendier and Tate, 2005; Pérez-González, 2006; Bennedsen, Nielsen, Pérez-González, and Wolfenzon, 2007; Bennedsen, Pérez-González, and Wolfenzon, 2008; Schoar and Zuo, 2011; Kaplan, Klebanov, and Sorensen, 2012). Likewise, Bertrand and Schoar (2003) show that top executives have person-specific managerial styles that contribute to differences in performance, financial, investment, and other organizational policies across firms. Understanding which experiences and individual traits shape these managerial fixed effects remains an open question. This paper explores the possibility that CEOs' life experiences help shape the type of manager they will become and the type of firms they will lead by focusing on whether chief executives with a military background behave differently than their nonmilitary peers. Our paper is therefore complementary to Malmendier, Tate, and Yan (2011), who find that having lived through the Great Depression or served in the military affects CEOs' financial decisions.

More broadly, our paper adds to the literature that emphasizes the role that culture plays in economic activity (Guiso, Sapienza, and Zingales, 2006, 2008; Tabellini, 2008), and, in particular, to the role that culture and ethics play in the theory of the firm (Kreps, 1990; Erhard, Jensen, and Zaffron, 2007) and in corporate governance and valuations (Edmans, 2011; Guiso, Sapienza, and Zingales, 2013).

The remainder of the paper is organized as follows. Section 2 presents a summary of the multidisciplinary research that looks into the effects of military service on postmilitary behavior, values, and leadership. Section 3 presents the data and summary statistics. We discuss the empirical relation between military experience and firm outcomes in Section 4 and address endogeneity and selection concerns in Section 5. We conclude in Section 6.

## 2. Military service leadership and ethics

There is a large literature that investigates the effect of military service on leadership.[3] According to the US Army's official vision statement, the army is "about leadership; it is our stock in trade, and it is what makes us different" (US Army, 1999, p. 7). Indeed, as Wong, Bliese, and McGurk (2003) discuss, leadership and military are practically inseparable, and the names of such military notables as George S. Patton, Dwight D. Eisenhower, and Robert E. Lee have become synonymous with leadership.

Whether leadership and, in particular, former military leaders play an important role in the performance of organizations is debated by academics. Organizational theorists, for example, question the role of individual leadership in the performance of organizations (Pfeffer, 1977) and caution about the romance of leadership (Meindl and Ehrlich, 1987). In contrast, some economists argue that leaders do matter (Jones and Olken, 2005).

The literature in psychology that examines the effect of military service on postmilitary behavior finds that service in the military is associated with overconfidence, aggressiveness, and risk-taking (Elder, 1986; Elder and Clipp, 1989; and Elder, Gimbel, and Ivie, 1991). For example, Wansink, Payne, and van Ittersum (2008) conduct a survey of 526 World War II combat veterans and find that leadership, loyalty, and risk-taking are three main characteristics of combat-decorated heroism. They write: "Perhaps the most common characteristic anecdotally associated with acts of heroism is that of taking a risk" (p. 549).

In addition, some business experts as well as organizational scholars and sociologists argue that military service builds unique and valuable leadership skills. For example, according to Duffy (2006):

> *Military offers an early opportunity to acquire hands-on leadership experience that cannot be found in the corporate world or at similarly early stage in people's careers…. Some of the most powerful [lessons in leadership] were learning how to work as part of a team; organizational skills, such as planning and effective use of resources; good communication skills; defining a goal and motivating others to follow it; a highly developed sense of ethics; and calmness under pressure*. (p. 3)

The notion that service in the military is associated with a value system that promotes integrity and ethical behavior has found some support in academic research. For example, Franke (2001) compares the value orientation and attitudes of cadets in the United States Military Academy (USMA) at West Point to those of civilian undergraduate students. While the evidence is far from being conclusive, he finds that being a cadet at the USMA is associated with conservatism and patriotism. Also, when presented with the statement, "Honesty is the best policy in all cases," 81% of the cadets agree, compared to 68% of the civilian undergraduate students. Similarly, more cadets than civilian students agree that "one should take action only when one is sure that it is morally right" (64% vs. 51%). Finally, 23% of the cadets believe that "it is hard to get ahead without cutting corners here and there," compared to 53% of the undergraduate students who agree with this statement. However, these results do not necessarily point to a causal effect of service in the military on value orientation since they are subject to a selection concern in which individuals with a particular value system may self-select to serve in the military.

[3] See Wong, Bliese, and McGurk (2003) for a review of military leadership.

Military experience may also help executives handle pressure and make decisions under stress. In his book on corporate turnarounds, Shein (2011) argues that "situations like this, though somewhat extreme, illustrate the first rule of leadership in a corporate crisis: leaders absolutely must display courage" (p. 59). He writes:

> *I have found that employees often respond best to these communications when they include military or medical metaphors. The concepts of war or medicine seem to connote the urgency of the company's situation and the "win-at-all-costs" nature of the necessary response. In turnarounds, managers… talk of being "in the trenches" or needing to "take the hill." It may seem overly simple, but these metaphors resonate immediately with employees, who find themselves in a highly emotional situation with uncertainty and fear swirling around them. They want someone to lead.* (pp. 68–69)

Our summary of the literature reveals that there is no one "big unified theory" of military leadership. Anecdotal evidence, as well as academic research in psychology, sociology, and organizational behavior, suggests that people who serve in the military tend to be aggressive and overconfident, as well as ethical and loyal. We use these suggestive findings and anecdotes to motivate our empirical examination of the association between military service and corporate and financial outcomes.

## 3. Data and summary statistics

To determine whether military experience affects CEO performance, we construct a manager-firm matched panel data set. We start with data from the Forbes 800 surveys for 1980–1991 and use Execucomp from 1992 to 2006. The Forbes survey identifies the names of the chief executives of the 800 largest US firms. From Execucomp we obtain the names of the CEOs of about 1,500 publicly traded US firms in each year.[4]

To obtain information on the personal characteristics and the military background of the executives, we first search for biographical information in *Who's Who in Industry and Commerce*.[5] Because *Who's Who* explicitly asks for information on military service, using this resource as our primary source of data minimizes measurement error in our main variable of interest. However, many executives do not appear in *Who's Who* or, if listed, have sparse information. To complement this source, we also use the more descriptive biographies from the Gale Research Group, as well as such other sources as companies' proxy statements and corporate Web pages.[6] For each executive we collect information on the date and place of birth, the educational background, and military service. We restrict our analysis to those CEOs for which we observe their year of birth.

Fig. 1 shows that the fraction of CEOs who served in the military has experienced a steady decline from a level of 59% in 1980 to merely 6.2% in 2006. In each year in the sample, the share of veterans diminished by one to five percentage points. The small increase in military CEOs between 1991 and 1992 depicted in the figure is an artificial blip due to a reduction in the sample size when we switch from Forbes to Execucomp data.[7] As we discuss below, controlling for birth cohort is central to our analysis, in order to avoid confounding effects that could be attributed to both military service and age. We find biographies reporting the year of birth for a total of 4,190 CEOs (about 62% of the executives we search), and we restrict our data to the executives born from 1913 to 1960.[8] The resulting sample contains a total of 4,013 managers, 2,402 firms, and 22,044 manager–year observations.[9] When we exclude financial and insurance companies in our investment regressions, the number of firms is reduced to 1,508. For each firm-year, we obtain accounting data from Compustat, and we restrict the sample to firms with non-missing values of total assets.

Panel A of Table 1 presents the summary statistics for the executives' personal characteristics by military background. Executives from earlier cohorts are more likely to serve in the military, reflecting the secular decline in military enrollment among the general population and especially among highly educated individuals. Moreover, all executives are highly educated, although CEOs without military experience appear to have studied a year longer than executives with a military background (18.9 years compared to 17.9 years, respectively). It is important to note, however, that our data on the completed years of education are subject to some measurement error, as they are based on the reported year of graduation for different degrees, whereas we do not observe whether individuals have worked in the years between pursuing different academic degrees.[10]

[4] Until 1994, the information in Execucomp is limited mostly to the Standard & Poor's (S&P) 500; thus, our sample size is significantly smaller in 1992 and 1993. Starting in 1994, the database expands to include the S&P 1500. Execucomp provides information on at least the five highest-paid executives in each firm. We limit the sample to CEOs for comparability with the Forbes data and because the likelihood of finding biographical information for non-CEOs is significantly lower.

[5] We initially accessed *Who's Who* through the Biography Resource Center from the Gale Research Group. This source is now available through LexisNexis Academic.

[6] Proxy statements and corporate web pages are less likely to report information on military service. These sources allow us to increase the sample size because they often provide information on year of birth when these data are not reported in *Who's Who*.

[7] Execucomp covers only S&P 500 firms in 1992. As a result, the number of CEOs in the sample declines from 603 in 1991 to 359 in 1992, and then increases to 888 in 1993. Thus, our sample is more skewed toward larger firms in 1992 than in other years, leading to an increase in the share of veterans. When we control for firm size, we do not find that the small increase in military CEOs in 1992 relative to the levels in 1991 or 1993 is statistically significant. Moreover, we do not find any significant differences in the personal characteristics (including details of their military service, education, and place of birth) of the chief executives in 1991 and 1992.

[8] For the birth cohorts 1913–1960, we observe at least 30 individual executives in each year of birth.

[9] The matching of Forbes firms to Compustat is not trivial because the firm identifiers are not consistent across samples and because some of the firms in the Forbes surveys are not in Compustat. Thus, we lose an additional 295 executives in the matching process.

[10] The years of education for executives with military experience are adjusted by the number of years of military service when the military service was conducted between periods of academic study.

To compare the educational background of executives, we collect information on the institution they attended, the type of degree obtained, the field of study, and the year of graduation for each educational degree we observe in the biographical sources. We find that military executives are more likely than nonmilitary managers to have attended an Ivy League institution for at least one of their degrees; 33.3% of military executives have attended Ivy League institutions compared to 27.4% of the nonmilitary executives.

We define an executive as having financial education if, for example, the individual obtained an MBA or has a degree in accounting or economics. Similarly, we define the CEO as having a technical education if the field of study was, for example, engineering or physics or if the individual obtained a bachelor's or a master's degree in a field such as science.[11] Using these broad definitions of educational backgrounds, we find that more than a third of the executives have financial education and almost half have a degree in a technical discipline. CEOs with military service are less likely to have a financial education, but there are no differences in the likelihood of having a technical education across military types. Perhaps not surprisingly, we find that military executives are significantly more likely (27.9% versus 22.1%) to have been born in southern states.[12] Military executives are less likely to be foreigners: foreigners account for 9.4% of nonmilitary CEOs, but only 3.2% of military CEOs are foreign-born.

Finally, only a handful of the executives in our sample with military experience had a long-run career in the military. On average, managers spent fewer than four years in the military. In fact, only 1.6% of the executives for whom we observe the length of military service stayed in the military for ten or more years. The fact that the CEOs in our sample do not have an extensive career in the military is validated by their service ranks. Most of the military CEOs in our sample for whom we have information on highest rank achieved were officers (see Table 2). However, about 90% were lower-ranking officers. Indeed, less than 5% of the executives in the sample have a rank of major or higher. Thus, the effects documented in the paper are unlikely to be driven by career officers who are hired in corporate positions later in life because of their long career in the military, their high rank, and their professional connections.

Comparing the sample means for firms run by military and nonmilitary types, we find important differences in the characteristics of firms (Panel B of Table 1). Individuals with no military experience tend to work in firms that are smaller (measured by total assets), are marginally more profitable (measured by return on assets (ROA)), have a higher Tobin's Q (measured as the market-to-book ratio), have higher expenditures on R&D (relative to lagged assets), and are more likely to be involved in acquisitions (measured by the value of acquisitions as a fraction of lagged assets).[13] In contrast, firms that are run by executives with military background have higher book and market values of leverage, pay out more dividends (relative to their lagged assets), and invest more (measured by capital expenditures as a fraction of lagged assets).

Using Dyck, Morse, and Zingales's (2010) sample of firms against which a securities class action lawsuit was filed under the provisions of the Federal 1933–1934 Exchange Acts, we match our data to a sample of corporate fraud cases. Interestingly, as Table 1 shows, military CEOs are significantly less likely to engage in fraudulent activities.

However, while the differences that emerge from the univariate analysis are suggestive, they may be driven by time trends, firm characteristics, and other factors that may correlate with military background and selection of military CEOs into firms that require their skills. Therefore, in the next section, we investigate the relation between military experience and corporate outcomes in a multivariate regression setup. We use instrumental variables to obtain exogenous variation in the propensity to serve in the military in these regressions in order to address the concern that an omitted characteristic, such as conservatism or having a sense of ethics, may lead individuals to enroll in the military and affect the decisions that they make as CEOs. Yet a remaining concern is that unobserved firm characteristics may drive the results. Although we would like to include firm fixed effects in the multivariate OLS and IV regressions to address this concern, we are unable to do so owing to a low number of firms that actually switch between CEOs with and without a military background.

## 4. Military CEOs and firm outcomes

### 4.1. Effects of military service on firm performance, investment policy, and financial policy

Following the literature on CEO styles, we begin our analysis by running panel OLS regressions that relate military experience to a variety of corporate outcomes. We focus on three main types of outcomes: investment decisions (for which we look at investment, R&D expenditure, and acquisitions), financial policies (for which we analyze book and market measures of leverage, and dividends payout), and overall firm performance (measured by Tobin's Q and profitability). Specifically, we estimate the following model:

$$y_{i,t} = \alpha * Military_j + \beta * Characteristics_{j,t} + \delta * X_{i,t} + \nu_t + \upsilon_{sic} + \varepsilon_{i,t}, \quad (1)$$

in which $y_{i,t}$ is either a corporate decision or one of our two measures of a firm's performance and $X_{i,t}$ is a vector of

[11] The classification of educational background is not unique in the sense that an executive can have both a technical and a financial background.

[12] More than 40% of all new personnel enlisted or commissioned in 2002 came from the South, where about 36% of the total US population ages 18–24 lives. In 2002, southerners were overrepresented among new recruits in all services, ranging from 39% in the Marines to 42% in the Air Force (Segal and Wechsler-Segal, 2004).

[13] To correct for the large outliers in Tobin's Q, we follow the procedure of Baker, Stein, and Wurgler (2003) and force Q to take a value between zero and ten.

**Table 1**
Summary statistics, by firm-year.

This table reports summary statistics for both personal characteristics of CEOs (Panel A) and firm characteristics (Panel B). The sample is based on all executives from the cohorts 1913–1960 with non-missing biographies and the firms that were matched to these CEOs. *Ivy League school* is an indicator variable that takes the value of one if the CEO attended an Ivy League University, and zero otherwise. *Finance and Technical education* are indicator variables that take the value of one if the CEO studies are related to finance or engineering, respectively, and zero otherwise. *Foreign* is an indicator variable that equals one for CEOs who were not born in the U.S., and zero otherwise. *South* is an indicator variable that equals one for CEOs who were born in the Southern region of the U.S., and zero otherwise. *Length of service* is the number of years that a CEO served in the military. *Firm size* is defined as the logarithm of Total Assets. *Return on assets* is EBITDA divided by Total Assets. *Tobin's Q* is [Assets+Market Value of Equity – Book Value of Equity /Assets. *Investment* is CAPEX divided by lagged Total Assets. *Acquisitions* is the total value of acquisition activities during the year divided by lagged Total Assets. *R&D* is R&D expenses divided by lagged Total Assets. *Book Leverage* is defined as [Total Current Liabilities+Long-term Debt]/[Total Assets]. *Market Leverage* is defined similarly to *Book Leverage* but is divided by the Market value of Assets. *Dividend Payout* is defined as the sum of preferred and common dividends paid, divided by lagged Total Assets. The *Fraud* variables are dummies that take the value of one for the first firm-year, or for all firm-years, in which a firm has been alleged to have committed securities fraud, and zero otherwise. Statistics for *Investment*, *R&D*, *Book leverage*, and *Market leverage* are restricted to manufacturing and retail industries (SIC codes between 20 and 59).

| | Nonmilitary CEOs | | | Military CEOs | | | Difference in means |
|---|---|---|---|---|---|---|---|
| | Mean | Std. dev. | # Firm-year obs. | Mean | Std. dev. | # Firm-year obs. | *t*-Test |
| *Panel A: Personal characteristics* | | | | | | | |
| Year of birth | 1940.99 | 9.505 | 16557 | 1931.008 | 7.991 | 5918 | 72.21 |
| Years of education | 18.863 | 3.476 | 12382 | 17.865 | 3.322 | 5447 | 17.90 |
| Ivy League school | 0.274 | 0.446 | 15228 | 0.333 | 0.471 | 5736 | −8.36 |
| Finance education | 0.379 | 0.485 | 15208 | 0.311 | 0.463 | 5736 | 9.12 |
| Technical education | 0.475 | 0.499 | 15208 | 0.480 | 0.500 | 5736 | −0.57 |
| Foreign | 0.094 | 0.292 | 11584 | 0.032 | 0.175 | 5326 | 14.48 |
| South | 0.221 | 0.415 | 10481 | 0.279 | 0.449 | 5157 | −7.95 |
| Length of service | | | | 3.836 | 1.848 | 5300 | |
| *Panel B: Firm characteristics* | | | | | | | |
| Firm size | 7.930 | 1.637 | 15916 | 8.088 | 1.471 | 5290 | −6.23 |
| Return on assets | 0.132 | 0.133 | 15638 | 0.127 | 0.096 | 5182 | 2.43 |
| Tobin's *Q* | 1.630 | 0.824 | 15835 | 1.368 | 0.594 | 5252 | 21.29 |
| Investment | 0.079 | 0.090 | 10694 | 0.083 | 0.056 | 3427 | −2.57 |
| Acquisitions | 0.036 | 0.122 | 9851 | 0.030 | 0.094 | 3009 | 2.22 |
| R&D | 0.053 | 0.082 | 6493 | 0.033 | 0.042 | 1843 | 9.89 |
| Book leverage | 0.258 | 0.189 | 9778 | 0.273 | 0.148 | 3104 | −3.95 |
| Market leverage | 0.253 | 0.214 | 9725 | 0.299 | 0.206 | 3075 | −10.36 |
| Dividend payouts | 0.015 | 0.026 | 15822 | 0.021 | 0.054 | 5261 | −9.38 |
| Fraud (first year) | 0.010 | 0.098 | 9970 | 0.003 | 0.052 | 1814 | 2.92 |
| Fraud (all years) | 0.024 | 0.152 | 9970 | 0.007 | 0.084 | 1814 | 4.52 |

**Table 2**
Military background of CEOs with military experience.

Sample based on 1,115 CEOs with military experience. Officer identifies individuals reporting a rank of lieutenant, captain, colonel, major, or other unidentified officers. Low-level officer takes a value of one for non-colonel lieutenants, captains, and majors. Major and above identifies individuals with a rank of lieutenant colonel, colonel, major, or major general.

| | Percentage | Number of executives |
|---|---|---|
| *Military branch* | | |
| US Army | 41.32 | 457 |
| US Navy | 40.32 | 446 |
| US Air Force | 15.10 | 167 |
| US Coast Guard | 1.18 | 13 |
| Foreign military service | 1.63 | 18 |
| Other military service | 0.45 | 5 |
| # Executives with observed branch | | 1,106 |
| Marines | 6.25 | 69 |
| Reserves | 21.88 | 242 |
| *Military ranks* | | |
| Officer | 92.34 | 446 |
| Low-level officer | 90.06 | 435 |
| Lieutenant | 66.46 | 321 |
| Captain | 19.88 | 96 |
| Major and above | 4.76 | 23 |
| # Executives with observed rank | | 483 |

firm-level controls that includes, depending on the specification, *Q*, cash flow, firm size, asset tangibility, profitability, and leverage. In some specifications we also control for a vector of executive characteristics $Characteristics_j$ that includes the executive's age, whether the individual was born in a southern state or a foreign country, and characteristics of the CEO's educational background. All the regressions include three-digit standard industrial classification (SIC) industry fixed effects $\upsilon_{sic}$ as well as year fixed effects $\nu_t$ to control for differences across industries as well as time trends in the outcome variables. We cluster the standard errors at the firm level.[14] The coefficient of interest in our regressions is $\alpha$, which relates military service to corporate decisions and firm performance.

Table 3 displays the results from estimating regression (1) for each of the dependent variables using different specifications. An important concern in estimating the effect of military service on firm outcomes is that any correlation may be driven by omitted CEO characteristics. CEO age is of particular importance. The summary statistics in Table 1, as well as Fig. 1, show that military

[14] Standard errors are marginally smaller if we cluster by executive instead.

**Table 3**
Effect of military service on firm decisions and performance, OLS results.

This table examines the impact of military service on firm outcomes. *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 *Size*, year fixed effects, and three-digit SIC dummies. Columns 1 to 3 also include Tobin's *Q* and cash flows. Columns 4 and 5 include controls for Tobin's *Q* and *ROA*. Column 6 controls for Tobin's *Q*, *ROA*, and *Book Leverage*. Regressions (1)–(3) are restricted to manufacturing and retail industries (SIC codes between 20 and 59). Panel A includes dummy variables for the age quintiles for the entire age distribution in the sample (omitted category is the first quintile). Panel B also includes a dummy variable for whether the executive is foreign and whether he was born in a southern state, and three indicators for educational background (attended Ivy League school, technical education, and financial education). Variable definitions, and sample summary statistics, are provided in Table 1. Robust standard errors in parentheses are clustered by firm. +Indicates significance at 10%; * significant at 5%; ** significant at 1%.

| | Investment (1) | R&D (2) | Acquisitions (3) | Book leverage (4) | Market leverage (5) | Dividend payouts (6) | ROA (7) | Tobin's Q (8) |
|---|---|---|---|---|---|---|---|---|
| *Panel A: Age controls* | | | | | | | | |
| Military | −0.00642** | −0.00616* | 0.000349 | −0.00969 | −0.0134+ | 0.00126 | −0.00271 | −0.0183 |
| | (0.00227) | (0.00239) | (0.00302) | (0.00665) | (0.0069) | (0.00121) | (0.00278) | (0.0198) |
| Obs. | 14,015 | 8,280 | 12,759 | 12,768 | 12,768 | 16,507 | 20,820 | 21,087 |
| *R*-squared | 0.258 | 0.494 | 0.050 | 0.380 | 0.555 | 0.190 | 0.232 | 0.402 |
| *Panel B: Age controls and CEO personal characteristics* | | | | | | | | |
| Military | −0.00478+ | −0.00517* | −0.00142 | −0.0142* | −0.0159* | 0.00101 | −0.00261 | −0.0167 |
| | (0.00253) | (0.00255) | (0.00320) | (0.00713) | (0.00766) | (0.00122) | (0.00291) | (0.0214) |
| Obs. | 9,943 | 5,776 | 8,925 | 9,028 | 9.028 | 11,482 | 14,887 | 15,080 |
| *R*-squared | 0.321 | 0.508 | 0.059 | 0.431 | 0.581 | 0.203 | 0.248 | 0.447 |

experience is significantly higher in earlier cohorts. Other studies document that CEO age may be associated with risk-taking behavior and managerial style (Bertrand and Schoar, 2003). To separate the effect of military service from a pure age effect, we control for age in a flexible manner using indicator variables for the quintiles of the CEOs' age distribution.[15] This strategy addresses any concerns that our findings are driven by age in a very strict manner, as most quintiles identify executives born only three or four years apart.

We begin by relating military service to various measures of investment policies. Column 1 of Table 3 studies the correlation between military service and corporate investment. Similar to traditional investment regressions (Fazzari, Hubbard, and Petersen, 1988; Hoshi, Kashyap, and Scharfstein, 1990; Rauh, 2006), we control for a measure of Tobin's *Q* and cash flow in addition to size, year, and industry fixed effects. We focus on firms in manufacturing, retail, transportation, and communication industries in these regressions (two-digit SIC 20–59), and the sample size is 14,015 firm-year observations. In all our specifications, our results are consistent with the vast literature on investment-cash flow sensitivity: consistent with the *Q*-theory of investment, we confirm that the coefficient on *Q* is positive and significant; and consistent with the financial constraints explanation of Fazzari, Hubbard, and Petersen (1988), the coefficient on cash flow is positive and significant (coefficients are not reported in the table for brevity). Our novel result is that service in the military is negatively correlated with investment. In our baseline specification in Panel A, the coefficient on military service is −0.006 and is significant at the 1% level. Thus, military service is associated with a reduction in corporate investment of 8.1% relative to the unconditional investment mean.

The summary statistics in Table 1 show that military and nonmilitary CEOs differ on characteristics other than age. One possible concern is that the correlation of investment with military experience documented in Panel A may be driven by other CEO characteristics if, for example, southerners or individuals with less financial education are less likely to take on new investments. In Panel B of Table 3 we add controls for being a foreigner and being born in a southern state, as well as our three indicators for educational background. The various biographical sources we use often lack information on these characteristics, particularly for place of birth. Our sample size therefore shrinks considerably when we include these controls. While the economic magnitude of service in the military is marginally lower, it is still statistically significant at the 10% level. Thus, investment of firms managed by CEOs with military background is lower compared to those led by managers with no prior military exposure.

In column 2 of Table 3 we present results for regression (1) in which the dependent variable is R&D expenditure scaled by firm assets as of the beginning of the year. Our initial sample of the R&D regressions is smaller—8,280 observations—since fewer firms report R&D expenditures in their 10K filings. Our control variables are identical to those in the investment regressions, and we also focus on firms in manufacturing, retail, and transportation industries. Similar to our investment results, we find that executives with military background are less likely to invest in R&D. When controlling for age and other personal characteristics, the military coefficient is −0.005 (significant at the 5% level), representing a decline of 10.7% relative to the unconditional mean. We do not find any significant relation between military service and acquisitions (see column 3).

[15] Because the age distribution of CEOs has been very stable over time, we define the quintiles using the age of executives over the entire sample. We omit the indicator variable for the first quintile (less than 51 years of age) in all regressions.

We next study two measures of financial decisions: leverage and payout policy.[16] When we control for both firm and CEO characteristics we find that military service is associated with lower book and market measures of leverage (columns 4 and 5 in Table 3). The military coefficient is between −0.014 and −0.016, depending on the leverage measure, representing a decline between 5.4% and 6.2%, relative to the respective unconditional mean. We do not find any relation between military experience and dividend payouts (column 6 of Table 3).

Finally, while agency and incentive problems may lead CEOs to overinvest or underinvest, our findings do not indicate whether that lower investment in capital and R&D by military CEOs is optimal or suboptimal.[17] Moreover, we find no evidence that military service is correlated with profitability (measured by return on assets) and valuation (measured by Tobin's *Q*). Column 8 of Table 3 shows that the presence of a CEO with military experience is conditionally uncorrelated with Tobin's *Q*. The estimated coefficients are small, representing less than 1% of the sample's mean, and are not statistically significant in any of the specifications.

In sum, we find correlations between military service and some outcome variables but not for others. When we do find statistically significant effects, our findings suggest that military CEOs pursue more conservative—rather than aggressive—financial and investment policies. It is important to note, however, that this statistical significance is overstated because we analyze multiple outcome variables simultaneously. The possibility that some coefficients will be significant randomly is a valid concern. In our case, only four of eight variables are significant at the 5% to 10% level. Next we show these results are mostly robust to a variety of specifications (in Section 4.2) and to the use of instrumental variables (in Section 5). Although we find these results reassuring, we caution the reader that the documented relation between military service and investment and financial policies is not exceedingly strong.

### 4.2. Robustness checks

The basic OLS results discussed in Section 4.1 suggest that CEOs with military experience is correlated with different investment, R&D, and in some specifications also debt policies compared to other top executives. We investigate the robustness of these correlations and present the results in Table 4. Panel A presents results for investment, Panel B focuses on expenditures in R&D, and Panel C displays the results for market leverage. First, we examine whether the correlations between military service and corporate policies are influenced by the inclusion of foreign-born CEOs. In fact, only 12.1% of the CEOs who are foreigners have military experience, relative to 34.5% of US-born CEOs. Indeed, column 2 shows that the results are virtually unchanged when we exclude foreigners from the sample.

Another possible concern is that the findings could be largely attributable to those executives who were professional military men. Career military men may be different from other CEOs, and it is possible that an omitted factor correlated with professional service is driving the negative effects on investment, R&D, and leverage. Moreover, career military personnel may obtain an executive position at a firm in exchange for military contracts regardless of their managerial talent. We analyze this possibility in two ways. First, column 3 shows that our results for investment and R&D are robust to the exclusion of professional military men, defined as those individuals with a military career longer than six years (about 6.4% of the executives in the sample). The correlation between military service and leverage becomes somewhat smaller and is no longer statistically significant in column 3.

We also analyze the effect of time spent in the military service. We compare the effects of military service for executives with short service (defined as those who spent four years—the sample median—or less in the military) with those individuals with long service (i.e., more than four years of service). The results in column 4 of Table 4 indicate that our baseline findings for R&D and investment are indeed driven by individuals with shorter military service. The coefficients are significantly smaller and not significant for individuals with longer military service. While the pattern is broadly the same for leverage, none of the estimated coefficients are statistically significant. This result is somewhat puzzling, given Franke's (2001) finding that cadets' attitudes tended to grow more conservative the longer they were at West Point. However, longer military service can also lead to increased aggressiveness (Franke, 2001), which may lead those who stayed in the military longer to invest more.

A growing literature in corporate finance documents that early life experiences can leave a permanent imprint, affecting an individual's financial choices and even the policies that he or she would implement as CEO (Malmendier and Nagel, 2011; Malmendier, Tate, and Yan, 2011; Schoar and Zuo, 2011). Thus, in column 5 of Table 4 we study the correlations between military service and corporate policies conditional on the age in which the individual joined the military service. Executives who served in the military when young (defined as those who started their service when age 24—the sample median—or younger) have lower investment and R&D expenditures than nonmilitary CEOs. Although the magnitudes of the coefficients are similar for individuals who were older when they joined the service, they are not statistically significant. Moreover, none of the indicators are significant for market leverage.

In sum, these results suggest that there is a negative correlation between military service and capital and R&D investment, whereas the correlation between leverage and military service is less robust. In unreported results we supplement the analysis by studying the correlations

[16] We also do not find an effect of military experience on a proxy for cost-cutting policy (the ratio of selling, general, and administrative expenses to sales) or on advertising (measured by advertising expenditures relative to assets).

[17] We have tried to test the overinvestment/underinvestment hypothesis indirectly by adding to the investment and R&D regressions an interaction between *Q* and the military dummy. The coefficient on the interaction term was insignificant both economically and statistically suggesting that military CEOs are not more sensitive to investment opportunities (proxied by *Q*) than their nonmilitary peers.

**Table 4**
Robustness checks.

This table provides robustness checks for the regressions reported in Table 3. Base specification replicates the estimate from Panel B of Table 3. *Military* is an indicator variable for whether the CEO of the firm in the given year has any military experience. *Professional* military men are defined as those spending more than six years in the military. *Low service* in the military is an indicator for executives who spent four years (the median time served in the sample) or less in the military, and high service is an indicator for those executives with more than four years. *Low age* of service is an indicator for executives who began their service when 24 years of age (the median in the sample) or younger. High age is an indicator for those executives who were more than 24 years of age when they joined the service. All regressions include controls for firm size (measured by log of total assets), year fixed effects, three-digit SIC industry dummies (except when using firm fixed effects), dummy variables for the age quintiles for the entire age distribution in the sample, a dummy variable for whether the executive was born in a southern state, and three indicators for educational background (*Ivy League*, *Technical education*, and *Financial education*). Panels A and B also control for cash flows and Tobin's *Q*. Panel C includes measures of *Tangibility* (defined as Fixed Assets divided by Total Assets), *ROA*, and Tobin's *Q* as additional controls. All columns except for (2) include an indicator for whether the executive is foreign-born. Regressions are limited to manufacturing and retail industries (SICs from 20 to 59). Variable definitions, and sample summary statistics, are provided in Table 1. Robust standard errors in parentheses are clustered by firm. +Indicates significance at 10%; * significant at 5%; ** significant at 1%.

| | Base specification | Excluding foreigners | Excluding professional military | Length of service | Age of service |
|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) |
| *Panel A: Investment* | | | | | |
| Military | −0.00478+ | −0.00542* | −0.00575* | — | — |
| | (0.00253) | (0.00267) | (0.00268) | | |
| Service/age: | | | | | |
| Short/younger | | | | −0.00631* | −0.00562* |
| | | | | (0.00266) | (0.00263) |
| Long/older | | | | −0.00297 | −0.00541 |
| | | | | (0.00398) | (0.00623) |
| Observations | 9,943 | 9,167 | 9,510 | 9,675 | 9,656 |
| *Panel B: Expenditures in R&D* | | | | | |
| Military | −0.00517* | −0.00469+ | −0.00668* | — | — |
| | (0.00255) | (0.00276) | (0.00276) | | |
| Low (service or age) | | | | −0.00832** | −0.00580* |
| | | | | (0.00283) | (0.00281) |
| High (service or age) | | | | 0.00387 | −0.00624 |
| | | | | (0.00475) | (0.00752) |
| Observations | 5,776 | 5,224 | 5,529 | 5,621 | 5,602 |
| *Panel C: Market leverage* | | | | | |
| Military | −0.0159* | −0.0164* | −0.0116 | — | — |
| | (0.00766) | (0.00796) | (0.00830) | | |
| Low (service or age) | | | | −0.0128 | −0.0127 |
| | | | | (0.00792) | (0.00832) |
| High (service or age) | | | | −0.00946 | 0.00402 |
| | | | | (0.0167) | (0.0233) |
| Observations | 9,208 | 8,316 | 8,625 | 8,767 | 8,743 |

between service in the different branches of the military and our battery of outcome variables. Our estimates—available on request—suggest that the negative relation between military service and investment or R&D is not confined to serving in any particular branch of the military.

Because investment policies and firm performance vary systematically by industry, our specifications include indicator variables for the firms' three-digit standard industrial codes. Although we believe that this level of detail allows us to capture the main sources of industry variation, these estimates should be interpreted with caution because the number of firms in a given year is small for several industries when defined at the three-digit level. We obtain similar results with two-digit SIC codes, suggesting that the military coefficient is not biased when relying on different industry definitions.

It is important to note that a main limitation of our empirical strategy is that we cannot control instead for firm fixed effects. This approach would address concerns that firm unobserved characteristics confound our estimates. However, the military effect would then be identified solely from those firms that change from military to nonmilitary CEOs, or vice versa, within our sample. Unfortunately, such transitions are infrequent in our data, and we would have to rely on very limited variation to identify the effect of military service.[18] We cannot therefore rule out that the relations we find between military experience and firm outcomes are due to the sorting of military CEOs in firms with more conservative financial and investment policies *within* industries. Thus, our findings are suggestive of a relation between military experience and several firm outcomes but do not allow us to conclusively determine a causal effect of military service.

[18] This strategy would also ignore an important source of variation: some firms may hire only military CEOs precisely because of this characteristic. In Section 5.3, we propose firm demand as one of the potential mechanisms driving our results.

### 4.3. Effects of military service on corporate fraud

To explore the conjecture that the military may confer on its personnel a stricter moral code, we analyze the correlation between military experience and alleged corporate fraud. Our sample of corporate frauds comes from Dyck, Morse, and Zingales (2010) and consists of US firms against which a securities class action lawsuit was filed under the provisions of the Federal 1933–1934 Exchange Acts for the period 1994–2004. Dyck, Morse, and Zingales (2010) conduct a thorough investigation and identify a total of 216 alleged fraud cases. Given the requirements of having detailed information on CEO personal characteristics, we are able to match 132 of these cases to our data. Based on this sample, we estimate linear probability models of the likelihood of corporate fraud and report the results in Table 5.[19]

Dyck, Morse, and Zingales's (2010) data set identifies all years in which a company has allegedly committed fraud. Because it is possible that a misfeasance that began with one CEO continues during the term of the successor CEO, we define two fraud variables. The first measure of fraud is an indicator variable for only the first year of the alleged fraud case. The second variable takes a value of one for every year in which the firm is accused of having committed fraud.

CEOs with military experience are less likely to be involved in corporate fraud. The coefficient on *Military* is statistically significant and economically sizable in all specifications of Table 5.[20] Using a specification with our baseline controls, in column 1 we find that military service is associated with a 70.0% reduction in the likelihood of fraud compared to the unconditional mean. Our results hold whether we define the fraud indicator as being equal to one for only the year in which the fraud began (columns 1–2) or when the fraud dummy equals one for all the years of the fraud case (columns 3–4). When we consider all years of the fraud case, the estimated coefficients imply reductions that are between 56.6% and 57.5% relative to the mean.

It is possible that other experiences also lead CEOs to act in more ethical ways. We find that having a business school education does not serve this purpose. When we run a horse race between the effect of MBA education and military experience on fraud (columns 2 and 4), the coefficient on *Military* is unchanged, whereas the MBA indicator is not statistically different from zero.

**Table 5**
Alleged corporate fraud and military experience.

This table present regression results of the effect of service in the military on the likelihood of financial fraud. The regressions are estimated for the years 1994–2004 due to availability of fraud data. Dependent variable in regressions (1) and (2) is an indicator for the first year in which the company was identified as committing fraud, and in columns 3 and 4 is an indicator for all years in which the firm was identified as committing fraud. All regressions include controls for *Size*, year fixed effects, dummy variables for the age quintiles for the entire age distribution in the sample (omitted category is the first quintile), a dummy variable for whether the executive was born in a southern state, a dummy for whether the executive is foreign-born, three indicators for educational background (*Ivy League*, *Technical education*, and *Financial education*), and industry fixed effects at the three-digit SIC. MBA is an indicator variable for whether the executive has an MBA degree. Variable definitions, and sample summary statistics, are provided in Table 1. Robust standard errors in parentheses are clustered by firm. +Indicates significance at 10%; * significant at 5%; ** significant at 1%.

| Dependent variable | First-year fraud | | All fraud years | |
|---|---|---|---|---|
| | (1) | (2) | (3) | (4) |
| Military | −0.0070** | −0.0069** | −0.0138* | −0.0136* |
| | (0.0026) | (0.0026) | (0.0059) | (0.0060) |
| MBA | | −0.0029 | | −0.0061 |
| | | (0.0054) | | (0.013) |
| Observations | 7,657 | 7,657 | 7,657 | 7,657 |
| *R*-squared | 0.040 | 0.040 | 0.096 | 0.096 |

The results in Table 5 demonstrate that the staggering differences in alleged corporate fraud by military type evidenced in the raw data are robust. The likelihood of corporate fraud is much lower when a CEO with military experience runs the firm.

### 4.4. Military CEOs' performance during time of distress

It is often suggested that military men perform better because they can cope better in difficult situations or because they have a greater sense of ethics and commitment (Franke, 2001; Duffy, 2006). To assess whether CEOs who served in the military handle crises better, we test whether there are differential effects on the valuation of firms during periods of industry distress by CEO type.

As shown in Table 3, in a multivariate setting there is no significant direct effect of military service on Tobin's *Q*. In Table 6 we refine the analysis by interacting the military dummy with an indicator variable for whether the industry experiences economic distress during the year. We classify an industry (measured either at the three- or four-digit SIC) as being in distress if its asset-weighted profitability relative to assets in a given year is below the 25th percentile of the same measure for the entire Compustat sample during the period 1975–2006. Our analysis of the relation between industry distress and military CEOs is unlikely to be driven by firms switching the type of their CEOs during periods of industry distress, as the likelihood of replacing a nonmilitary CEO with an executive with military experience is similar in good and bad times. Indeed, a military CEO replaces a nonmilitary CEO in 7.7% of transitions while industries are experiencing distress and in 9.3% of all transitions in the sample.

[19] We use a linear probability model because we have both year and industry fixed effects in the regressions in order to avoid the incidental parameters problem. Nevertheless, our results remain unchanged when we use probit regressions. For example, the marginal effect (evaluated at the mean) of the military dummy for the first year of detected fraud is −0.007562 ($z=-2.682$), while the impact on all years of fraud is −0.012076 ($z=-2.332$).

[20] Regressions in Table 5 control for firm size, year fixed effects, CEOs' age-quintiles, a dummy for CEOs who were born in a southern state, a dummy for foreign-born CEOs, CEOs' educational background, and industry fixed effects. The inclusion of personal characteristics reduces the sample size substantially. We obtain very similar results when we do not control for the executive personal characteristics with a sample size of 11,700 firm-year observations (results are omitted for brevity).

**Table 6**
Firm performance during periods of industry distress and booms.

This table displays the results from regressions of Tobin's *Q* on military service. *Industry distress* is an indicator for years in which the profitability of the industry (defined by the asset-weighted return on assets at the three- or four-digit SIC) is below the 25th percentile of asset-weighted industry profitability from 1975 to 2006; industry boom is a similar variable for years in which the industry profitability is above the 75th percentile. All regressions control for firm size, age quintiles, three-digit SIC dummies, and year fixed effects. Personal characteristics composed of dummy variables for being foreign, born in a southern state, and three indicators for educational background (*Ivy League*, *Technical education*, and *Financial education*). *Financial education* is excluded in regression (6), which includes an indicator variable for whether the executive has an MBA degree. *Marines* is an indicator variable for whether the executive was a member of the US Marine Corps. Variable definitions, and sample summary statistics, are provided in Table 1. Robust standard errors in parentheses are clustered by firm. +Indicates significance at 10%; * significant at 5%; ** significant at 1%.

| | Tobin's *Q* | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
| Military | −0.0350+ | −0.0279 | −0.0424+ | −0.0355 | −0.0345 | −0.0362 | −0.0465* | −0.0425+ |
| | (0.0211) | (0.0232) | (0.0218) | (0.0237) | (0.0239) | (0.0237) | (0.0225) | (0.0243) |
| Industry distress | −0.0920** | −0.0751** | −0.133** | −0.110** | −0.110** | −0.0989** | −0.102** | −0.0820** |
| | (0.0138) | (0.0163) | (0.0143) | (0.0168) | (0.0168) | (0.0195) | (0.0137) | (0.0161) |
| Military*distress | 0.0662** | 0.0469* | 0.0954** | 0.0759** | 0.0741** | 0.0745** | 0.105** | 0.0876** |
| | (0.0212) | (0.0239) | (0.0219) | (0.0243) | (0.0248) | (0.0243) | (0.0207) | (0.0230) |
| Marines | | | | | −0.0144 | | | |
| | | | | | (0.0642) | | | |
| Marines*distress | | | | | 0.0263 | | | |
| | | | | | (0.0757) | | | |
| MBA | | | | | | 0.0333 | | |
| | | | | | | (0.0308) | | |
| MBA*distress | | | | | | −0.0376 | | |
| | | | | | | (0.0278) | | |
| Industry boom | | | | | | | 0.112** | 0.105** |
| | | | | | | | (0.0169) | (0.0194) |
| Military*boom | | | | | | | 0.0141 | 0.0218 |
| | | | | | | | (0.0289) | (0.0313) |
| Distress defined using: | SIC3 | SIC3 | SIC4 | SIC4 | SIC4 | SIC4 | SIC4 | SIC4 |
| Individual characteristics | No | Yes | No | Yes | Yes | Yes | No | Yes |
| Observations | 21,087 | 15,080 | 21,087 | 15,080 | 15,080 | 15,080 | 21,087 | 15,080 |
| *R*-squared | 0.402 | 0.447 | 0.404 | 0.449 | 0.449 | 0.449 | 0.406 | 0.451 |

As Table 6 demonstrates, our measure of industry distress is associated with a lower Tobin's *Q*. The regression estimates show that during a time of industry distress, Tobin's *Q* is lower by between −0.075 and −0.133, suggesting a decline that is between 5.3% and 8.7% relative to the sample mean. Tobin's *Q* is on average lower for military personnel (columns 1 and 3); this effect is likely driven by omitted CEO characteristics. Indeed, when we control for individual characteristics there is no statistically significant effect of military service on Tobin's *Q* (columns 2 and 4).

CEOs with military experience perform better than their nonmilitary peers during times of distress (column 1 of Table 6). Indeed, the coefficient on the interaction term is positive and significant, implying that military CEOs can offset about 70% of the decline that is due to the industry effect. This result is robust to including the CEO's personal characteristics in the regression (column 2), and the magnitude of the interaction effect becomes somewhat larger when we use the four-digit SIC to calculate industry distress (columns 3 and 4).[21]

One potential explanation for our findings is that military men learn how to make decisions in extreme conditions during combat. Although we cannot observe whether the executives with military experience actively participated in combat, we use the members of the US Marine Corps as a proxy. However, we find no evidence that marines perform any differently from other military personnel either in normal times or during periods of industry distress (column 5). Interestingly, and perhaps confirming a unique military leadership effect, we also find that firms led by executives with an MBA degree have no differential valuations in good or bad times (column 6).

Finally, we study whether military CEOs perform differently during periods of industry booms, defined as years in which the industry asset-weighted profitability relative to assets is in the top 25th percentile of the same measure for the entire Compustat sample during the period 1975–2006. The results are relatively similar whether or not we control for CEO personal characteristics, in columns 7 and 8. There is weak evidence that military CEOs perform worse during industry booms. Based on the estimates of column 8, we find that the linear combination of the coefficient on military and the interaction between military and industry booms is 0.021, but it is not statistically significant. Our result of better military CEO performance during periods of distress still stands: the linear combination of coefficients leads to a positive effect of 0.045, which is statistically significant (*t*-statistic=1.86). Our results do not reveal that military CEOs are associated with higher valuation. Rather, military CEOs perform better in bad

[21] The magnitude of the interaction term between military CEOs and industry distress becomes smaller when we define distress as having profitability below the *median* profitability for the industry over the entire sample period.

times but may underperform during good times. Thus, CEOs who served in the military are valuable for their firms only if their shareholders put more weight on performance during industry busts.

## 5. Selection into the military service

Thus far we have found that military experience is correlated with a battery of corporate outcomes. To the extent that individuals endogenously choose to join the armed forces and are screened by the military, the relation between military experience and firm outcomes may be driven by unobserved characteristics of each individual. For example, it is possible that more conservative individuals self-select into the military and are less likely to invest in new projects, develop new products, or violate their fiduciary duties to shareholders.

The selection criteria of the armed forces can also introduce an omitted variable bias in our OLS estimates. Each branch of the military screens candidates based on physical and mental fitness. However, the selection process changed over our sample period. Until the Korean War, deferments were mostly conferred for disability or to work in war production or agriculture. Starting in 1951, men at risk of induction were permitted to defer service to attend college. Thus, while men were positively selected based on education during the first half of the twentieth century, the source of selection changed as academically oriented men pursued higher educational attainment instead of enrolling in the armed forces.[22]

Evidence on selection by education achievement is reflected in Fig. 2, which measures the share of veterans by year of birth and education level using data from the microsample of the 1980 Decennial Census. College-educated men born before the mid-1930s were more likely to serve than all men in the population, but the proportion of highly educated men serving in the military has been disproportionately lower relative to the population since then. Fig. 2 also shows that the share of CEOs with military experience increased for those born since 1905 until the mid-1920s. The fraction of veterans among managers has mostly declined for later cohorts, and it has remained significantly lower than the share of veterans in the overall population. The lower incidence of military experience among earlier cohorts suggests that military CEOs may have been in lower supply before 1980, when our sample begins. Because the majority of CEOs managing firms in 1980 were born after the 1920s, however, the fraction of CEOs with military background has declined steadily over our sample period (see Fig. 1).

To address the concern that our OLS estimates may be biased by unobserved personal traits inherent to the individual correlated both with military service and with CEO decisions, we use an instrumental variables approach. This strategy also helps us to address the potential downward bias in our coefficient of interest introduced by error in the measurement of whether a chief executive served in the military.

An extensive literature in labor economics has employed a variety of strategies to assess the impact of veteran status on a range of outcomes (Angrist, 1990, 1998; Angrist and Krueger, 1994; Bound and Turner, 2002; Bedard and Deschênes, 2006). Unfortunately, methods that allocate the likelihood of military service in a truly random fashion, such as a draft lottery, are not available for our sample period.[23] Because the likelihood of being drafted was significantly higher for some cohorts than others, we follow this literature and use variation in the likelihood of being drafted introduced by year of birth as a way to instrument for veteran status.[24] We develop various strategies based on this idea; however, none of them are without caveats, and as such our IV results are suggestive rather than conclusive.

We present the results for the investment, R&D, leverage, and fraud measures in Table 7 and for the effects during times of industry distress in Table 8. All specifications control for year fixed effects, the relevant time-variant firm controls, industry fixed effects using two-digit industry classification, a dummy variable for median CEO age, and indicators for the education of the CEO. We cluster the standard errors at the firm level.[25]

### 5.1. Estimates for firm policies and fraud

Our first approach is to exploit variation in the likelihood of being drafted into the military across cohorts as an instrument for CEO military experience. As Fig. 1 suggests, the likelihood of military service has declined over our sample period. In Panel A of Table 7 we use a linear trend in year of birth as an instrument for military status. The first row in Panel A shows that the first stage is strong for all dependent variables. Moreover, all of the *F*-statistics are above ten. The second row shows the effect of the military indicator from the second stage. The estimated effects go in the same direction as in the OLS, and their magnitudes get larger, indicating that selection into the military resulted in underestimates of the association between military experience and firm outcomes. The coefficients for investment, R&D, and the indicator

[22] This historical description draws from Angrist (1991), Angrist and Krueger (1994), Bound and Turner (2002), and several publications from the Selective Service.

[23] For example, a strategy similar to that of Angrist (1990), who restricts the analysis of the Vietnam draft to men born from 1950 to 1953, would be difficult to apply to our sample because only two CEOs served in the military out of the 193 executives born in those years.

[24] That the probability of being drafted is related to year of birth is well known. During World War II, the United States first required men born from 1914 to 1919 to contact draft boards and, until 1942, added both individuals who came of draft-eligible age as well as older men. To satisfy the demand for manpower, men in the age group 18–21 became part of the registrant pool in the later years of the war. The draft eligibility for the Vietnam War lotteries, for example, was based on age.

[25] Since it is important to have sufficient power to perform two-stage least-squares (2SLS), we do not control for place of birth indicators to conserve our sample size. We are also forced to use two-digit SIC instead of the three-digit definitions that we used for the OLS results. There are many instances in which we would observe only one firm within the more detailed industry definition, and perfectly predict the military dummy outcome in the first stage, which prevents us from inverting the variances and covariances matrix.

for first year of fraud are negative and statistically significant.

Panel A uses as a control for the executive's age an indicator variable that takes the value of one if the CEO is younger than 57 years of age—the median age in the sample, and zero otherwise. Given that 90% of the CEOs are between the ages of 48–64 years, by adding a median age dummy, the year of birth effects are mostly identified within executives born no more than ten years apart. Even with this control, a linear trend in year of birth may not satisfy the exclusion restriction because earlier cohorts may behave differently than executives born in recent decades for a variety of reasons. As an alternative method, we use year of birth dummy variables as instruments, to allow the effect of selection into the military to vary in a nonlinear manner within age groups.

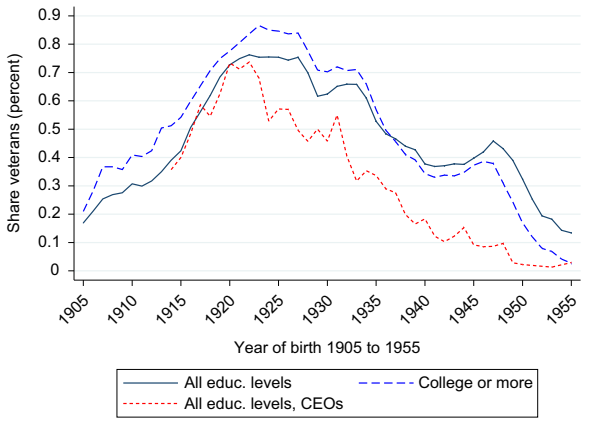


**Fig. 2.** Share of veterans in the U.S. population and among top executives by birth cohort. This figure is compiled using data from the 1% sample of the 1980 Decennial Census. Based on all men of birth cohorts, 1905–1955.

Panel B of Table 7 presents the results. As the table shows, there is a significant negative effect of military service on investment and R&D, and most of the other coefficients have signs that are similar to the OLS results. Because of the large number of instruments used, we do not present the results from the first stage. The *F*-statistics that are reported in the table range from 5.7 to 7.5, a bit below the ideal number of ten proposed by Stock and Yogo (2005).

It is important to note that the instruments we use thus far are not without criticism. Individuals born a decade apart could have had different experiences that may also have shaped the types of decisions they would make as CEOs. As an alternative identification strategy, we consider a local specification that exploits more precise variation in an individual's likelihood of being drafted in the military. Specifically, we compare individuals who came of eligible age during the peak of a war with those less likely to serve because they turned 18 when demands for manpower had diminished after the end of the war. As shown in Fig. 3, the high frequency of military conflicts during the period of interest poses a challenge because most men are likely to

**Table 7**
Instrumenting for military experience: firm performance and fraud.

This table reports the results of Instrumental Variable regressions. 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 firm size (measured by total assets), year fixed effects, two-digit SIC dummies, an indicator for whether the age of the executive is above the median age in the entire sample, and three indicators for educational background (*Ivy League*, *Technical education*, and *Financial education*). Columns 1 and 2 control for Tobin's *Q* and cash flows; columns 4 and 5 control for *Tangibility*, *ROA*, and *Q;* column 6 controls for *Tangibility*, *ROA*, and *Book Leverage*. Columns 1, 2, 4, and 5 and are restricted to manufacturing and retail industries (SIC codes between 20 and 59). Panel C restricts the sample to executives born in cohorts 1931–1942, and instruments military service with an indicator for whether the executive was born from 1931 to 1936. Robust standard errors in parentheses are clustered by firm. Variable definitions, and sample summary statistics, are provided in Table 1.+Indicates significance at 10%; * significant at 5%; ** significant at 1%.

| Dependent variable | Investment | R&D | Book leverage | Market leverage | First-year fraud | Fraud |
|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) |
| *Panel A: IV=Year of birth* | | | | | | |
| First stage | −0.0134** | −0.00984** | −0.0131** | −0.0131** | −0.0134** | −0.0134** |
| | (0.00194) | (0.00236) | (0.00200) | (0.00200) | (0.00181) | (0.00181) |
| Military | −0.0728** | −0.117** | −0.0236 | −0.00136 | −0.0251+ | −0.0398 |
| | (0.0202) | (0.0409) | (0.0480) | (0.0508) | (0.0143) | (0.0286) |
| *F* test | 47.5 | 17.3 | 42.7 | 42.7 | 55.0 | 55.0 |
| Obs. | 13,012 | 7,658 | 11,834 | 11,834 | 10,738 | 10,738 |
| *Panel B: IV=Year of birth dummy variables* | | | | | | |
| Military | −0.0317** | −0.0257* | −0.0271 | −0.0103 | −0.0110 | −0.0248 |
| | (0.0103) | (0.0108) | (0.0298) | (0.0294) | (0.00789) | (0.0199) |
| *F* test | 7.5 | 5.7 | 6.3 | 6.3 | 7.2 | 7.2 |
| Obs. | 13,012 | 7,658 | 11,834 | 11,834 | 10,738 | 10,738 |
| *Panel C: IV=Indicator for Korea draft cohort* | | | | | | |
| First stage | 0.180** | 0.207** | 0.189** | 0.189** | 0.144** | 0.144** |
| | (0.0372) | (0.0483) | (0.0375) | (0.0375) | (0.0338) | (0.0338) |
| Military | −0.0382+ | −0.0456* | 0.0509 | 0.0296 | −0.00273 | −0.0163 |
| | (0.0204) | (0.0218) | (0.0574) | (0.0560) | (0.0215) | (0.0484) |
| *F* test | 23.4 | 18.2 | 25.3 | 25.3 | 18.2 | 18.2 |
| Obs. | 5,342 | 3,034 | 4,798 | 4,798 | 4,671 | 4,671 |

**Table 8**
Instrumenting for military experience: performance in times of distress.

This table reports the results of Instrumental Variable regressions. *Military* is an indicator variable for whether the CEO of the firm in the given year has any military experience. *Industry distress* is an indicator for years in which the profitability of the industry (defined by the asset-weighted return on assets at the four-digit SIC) is below the 25th percentile of asset-weighted industry profitability from 1975 to 2006. All regressions include controls for firm size (measured by total assets), year fixed effects, two-digit SIC dummies, an indicator for whether the age of the executive is above the median age in the entire sample, and three indicators for educational background (*Ivy League*, *Technical education*, and *Financial education*). Sample is restricted to executives born in cohorts 1931–1942. *Military* and *Military*Industry* distress are instrumented by an indicator for whether the executive was born from 1931 to 1936, and this indicator interacted with industry distress. Variable definitions, and sample summary statistics, are provided in Table 1. Robust standard errors in parentheses are clustered by firm. +Indicates significance at 10%; * significant at 5%; ** significant at 1%.

| Dependent variables | First stage Military (1) | First stage Military * distress (2) | Second stage Tobin's Q (3) |
|---|---|---|---|
| Korea draft | 0.1559** | −0.0166* | |
| | (0.0326) | (0.00683) | |
| Korea draft*distress | 0.0410 | 0.243** | |
| | (0.0301) | (0.0389) | |
| Military | | | −0.573* |
| | | | (0.267) |
| Military*distress | | | 0.330+ |
| | | | (0.187) |
| Industry distress | | | −0.208** |
| | | | (0.0595) |
| *F* test | 14.2 | 21 | |
| Observations | 7,919 | 7,919 | 7,919 |
| *R*-squared | 0.179 | 0.359 | 0.223 |

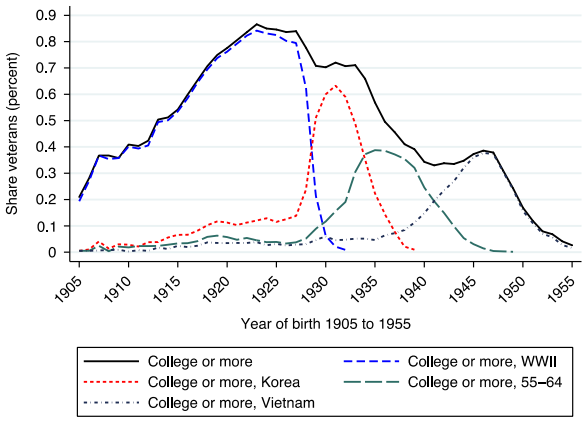


**Fig. 3.** Share of college-educated veterans in the U.S. population, total and by military conflict. This figure is compiled using data from the 1% sample of the 1980 Decennial Census. Based on all men with college education of birth cohorts, 1905–1955.

serve in the armed forces at some point in their lives. For example, a high fraction of men born in 1930, who turned 18 after the end of World War II, participated in the Korean War. Thus, the cleanest discontinuity we can find is to exploit the Korean War, since there was no major military conflict following Korea until the Vietnam War.[26]

To perform our analysis, we limit our sample to men born from 1931 to 1942, and we instrument for military service within this sample with an indicator for men born from 1931 to 1936, the cohorts that were more likely to get drafted during the Korean conflict.[27] While we are quite confident that the experiences of these individuals were more similar than when we instrument using the entire sample, we cannot rule out that executives born in 1931–1936 were exposed to events (other than serving in the military) that shaped their actions as CEOs differently from those born in the 1937–1942 cohorts.

The first row of Panel C shows that the first stage is quite strong: individuals born from 1931 to 1936 were 15% to 20% more likely to serve in the military than men born from 1937 to 1942. The IV estimates of the effect of military experience on the outcome variables of interest are reported in the second row. The results are consistent with our previous estimates, and even within this very demanding strategy, the estimated coefficients are statistically significant (at the 10% and 5% levels) for investment and R&D.[28] The magnitude of our estimates increases when we instrument military service. For example, a CEO with military experience would reduce investment by roughly 42% of the unconditional mean (albeit with somewhat sizable standard errors).

In Panels B and C we lose power, and hence, the corporate fraud estimates are not statistically significant. These results are not surprising due to the very low incidence of corporate fraud overall and, in particular, among nonmilitary CEOs. Although there is not enough variation for the more demanding instrumental variables' strategies in Panels B and C, we find it very reassuring that the sign and magnitude of the estimated coefficients remain similar to the OLS specifications.

In sum, the results from our specifications seem consistent with the view that military experience is associated with lower investment, less expenditure in R&D, and lower propensity to be involved in financial fraud.

### 5.2. Industry distress

Table 6 demonstrates that CEOs with military experience perform better in times of industry downturns. To alleviate concerns that these estimates are also affected by selection into the military, we use instrumental variables. There are two potentially endogenous variables in this specification: the indicator for military service and its

[26] As discussed earlier, only two of the executives in our sample born during cohorts drafted through the 1971–1975 Vietnam lotteries entered the military.

[27] In unreported results we verify that the personal characteristics of military and nonmilitary CEOs are much more balanced than those in the entire population (Table 1). These results reassure us that the Korean War instrument is indeed valid.

[28] The demands of this empirical strategy are particularly salient for the fraud indicators. The fraud data cover only the period from 1994 to 2004. A limited number of executives from the Korean War period survived until then. Moreover, few of the military men from those cohorts who survived engaged in corporate fraud.

**Table 9**
Linear probability model of hiring a military CEO.

This table reports the results of a linear probability model of the likelihood of a military CEO. Military is an indicator variable for whether the CEO of the firm has any military experience. Regressions are limited to the year in which a new CEO was hired. For each independent variable of interest (*Investment*, *R&D*, and Tobin's *Q*), we separately include in each row the difference between the firm's outcome to the asset-weighted industry mean (using a four-digit classification of industry) in the year before hiring the CEO, the difference between the firm's mean outcome over the three years before hiring the CEO to the asset-weighted industry mean (using a four-digit classification of industry) in those same years, and the difference between the firm's mean outcome over the five years before hiring the CEO to the asset-weighted industry mean (using a four-digit classification of industry) in those same years. All regressions include controls for firm size (measured by total assets), age quintiles, year fixed effects, and three-digit SIC dummies. Age quintiles are defined over the entire age distribution in the sample (omitted category is the first quintile). Variable definitions, and sample summary statistics, are provided in Table 1.+Indicates significance at 10%; * significant at 5%; ** significant at 1%.

| Dependent variable: Military CEO | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Investment | | | R&D | | | Tobin's *Q* | | |
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) |
| Difference to industry mean, year prior | 0.205 | | | 0.402 | | | 0.0164 | | |
| | (0.204) | | | (0.314) | | | (0.0138) | | |
| Difference to industry mean, three years prior | | 0.119 | | | 0.468 | | | 0.00906 | |
| | | (0.248) | | | (0.301) | | | (0.0155) | |
| Difference to industry mean, five years prior | | | 0.151 | | | 0.500+ | | | 0.00878 |
| | | | (0.361) | | | (0.302) | | | (0.0174) |
| Industry fixed effects | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Year fixed effects | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Observations | 697 | 674 | 649 | 432 | 406 | 384 | 961 | 946 | 900 |
| *R*-squared | 0.345 | 0.354 | 0.360 | 0.371 | 0.383 | 0.383 | 0.325 | 0.333 | 0.332 |

interaction with industry distress. As is common in cases in which an endogenous variable and its interaction with an exogenous variable are both present in the regression, we instrument using both with the Korean War dummy variable. Columns 1 and 2 of Table 8 show the results from the first-stage regressions. Both variables are significant in predicting military service and its interaction with industry distress, and the *F*-statistics are higher than ten. Column 3 presents the results from the second stage. Consistent with the OLS results, we find that, although military CEOs perform worse on average, they do perform better in times of industry distress.

### 5.3. Interpretation of the results

The instrumental variables approach helps us address the possibility that the effect of military service is due to intrinsic characteristics of the individual that are associated both with selection into military service and the corporate policies we study. Because of the various limitations with our instruments that we discussed above, these results cannot be interpreted as evidence of a treatment effect, and instead we take our findings as suggestive.

There are three possible channels through which military experience may translate into the effects we document. First, it is possible that firms which desire to reduce investment and R&D expenditures or to avoid committing (or being detected when committing) fraud hire a chief executive with military experience for this purpose. Alternatively, military background may not be a criterion on which CEOs are being selected, but the imprinting that this experience leaves on individuals translates into different firm outcomes after military personnel become CEOs. Although we cannot differentiate between these two interpretations, both mechanisms are consistent with an effect of military experience on firm outcomes.

There is also a third possibility in which the documented association of military experience and firm outcomes may not be caused by a treatment effect of military service. For example, firms that are already experiencing a decline in investment or R&D expenditures may happen to hire military CEOs disproportionately for reasons we do not explicitly control for in our regressions. Similarly, military CEOs may self-select into firms with more conservative financial and investment policies, and be less likely to engage in fraud. Because we cannot include firm fixed effects in our regressions, we cannot fully rule out these possibilities. We now turn to analyze the determinants of CEO hiring decisions to test for this possibility.

We study whether the probability of hiring a military CEO depends on firm outcomes in the years preceding the hiring decision. More specifically, we consider a linear probability model of the determinants of hiring CEOs with military experience. For this analysis, we limit the sample to the first year each CEO with available biographical information is in office (one observation per firm-CEO pair). We model the hiring probability as a function of our standard controls as well as the trend in each of the outcome variables of interest in the years before a new CEO is hired. Specifically, we separately evaluate whether deviations in investment and R&D from the asset-weighted industry mean help predict the hiring of a CEO with military experience.[29]

[29] Although we present results using a four-digit industry classification, results are similar for the two- and three-digit SIC codes.

We find that firms with a *higher* investment ratio than their industry in the year before the CEO is replaced are more likely to hire a CEO with military experience, although the coefficient is not statistically significant (column 1 of Table 9). Because investment may be lumpy, we perform a similar analysis by comparing the average firm investment ratio in the three years and the five years before the CEO transition to the industry mean over the same period. In both cases the coefficients are positive but not statistically significant (columns 2 and 3). A similar analysis reveals that firms with higher R&D relative to other corporations in the same industry are not more likely to hire a CEO with a military background, although the estimate is *positive* and marginally significant in the five-year trend regression (column 6). Moreover, military men are not more or less likely to be hired by firms that have lower market valuations than their industry peers (columns 7–9). In sum, the documented effect of military experience does not appear to be driven by military personnel becoming the CEOs of firms that experience a steady decline in investment and R&D.[30]

## 6. Conclusion

Our analysis shows that chief executives' service in the military is related to executive decisions and corporate policies and outcomes. More precisely, we find that CEOs who have served in the military tend to have lower investments and R&D; they do not use excessive leverage; and their firms are less likely to be involved in fraud. Moreover, military CEOs seem to perform better in times of industry distress. We contribute to the literature on CEO characteristics by focusing on a variable that is less subject to the usual concerns of endogeneity and omitted variables.

More important, our findings are particularly significant in light of the steady decline in corporate America of CEOs with military backgrounds in the past 25 years. The reduction in the supply of executives who have conservative investment policies, are less prone to fraud, and are plausibly better equipped to navigate through times of crisis may be detrimental for firms if these skills cannot be easily provided to individuals through alternative sources, such as MBA programs. To the extent that the growth of firms through excessive investment or corporate fraud can be inefficient, our results provide suggestive evidence that the shift away from military service to business and executive education can pose an important challenge to corporations.

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[30] On the contrary, our findings suggest that CEOs with military experience are often hired after periods of overinvestment in R&D, consistent with the idea that firms may optimally select CEOs based on their military experience to lower investments.

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