2020

Midair Refueling for Sensation Seeking? Pilot CEOs and Corporate Debt Contracting

Steven Freund

Tunde Kovacs

Nam H. Nguyen
The University of Texas Rio Grande Valley

Hieu V. Phan

Midair Refueling for Sensation Seeking?
Pilot CEOs and Corporate Debt Contracting

Steven Freund, Tunde Kovacs, Nam H. Nguyen, and Hieu V. Phan*

* Steven Freund, steven_freund@uml.edu, Manning School of Business, University of Massachusetts Lowell, 72 University Avenue, Lowell, MA 01854, phone: (978) 934-2818; Tunde Kovacs, tunde_kovacs@uml.edu, Manning School of Business, University of Massachusetts Lowell, 72 University Avenue, Lowell, MA 01854, phone: (978) 934-2535; Nam H. Nguyen, namhoang.nguyen@utrgv.edu, Department of Economics and Finance, Robert C. Vackar College of Business & Entrepreneurship, University of Texas Rio Grande Valley, 1201 W University Dr, Edinburg, TX 78539, phone: (956) 665-5317; Hieu V. Phan, hieu_phan@uml.edu, Manning School of Business, University of Massachusetts Lowell, 72 University Avenue, MA 01854, phone: (978) 934-2633.

Midair Refueling for Sensation Seeking?
Pilot CEOs and Corporate Debt Contracting

Abstract

We examine the relation between chief executive officer (CEO) sensation seeking, which captures the desire for varied, novel, and complex personal sensations and experiences, and corporate debt contracting. Using pilot certificates as a proxy for the personality trait of sensation seeking, we find that firms with pilot CEOs use longer maturity debt financing even when long-term debt is more costly than short-term debt. Our findings are robust to controlling for the endogenous matching between firms and CEOs. Our evidence indicates that CEOs with sensation-seeking personality traits prefer long-term debt financing to avoid the liquidity risk associated with short-term debt financing that may hamper other corporate activities motivated by their sensation seeking.

JEL classifications: G32, G34

Keywords: CEO Personality; Sensation Seeking; Debt Contracting; Corporate Debt Maturity; Cost of Capital; Liquidity Risk

1. Introduction

Managers' personality traits can affect corporate policies and their outcomes. Previous studies report that chief executive officer (CEO) overconfidence relates significantly to corporate risk-taking and financial reporting (Malmendier and Tate, 2005; Hirshleifer, Low, and Teoh, 2012; Ahmed and Duellman, 2013). Using CEOs' pilot certifications as a proxy for their sensation seeking, Cain and McKeon (2016) and Sunder, Sunder, and Zhang (2017) document that firms led by sensation-seeking CEOs are associated with risk-increasing corporate policies. Specifically, these authors find that firms with sensation-seeking CEOs are more likely to engage in mergers and acquisitions (M&As), have higher financial leverage, invest more in research and development (R&D), and have more patents and citations.

Debt maturity is an important component of corporate financial policy and closely related to firm liquidity, real investments, and shareholder value (Johnson, 2003; Aivazian, Ge, and Qiu, 2005; Harford, Klasa, and Maxwell, 2014). Previous studies document that creditors shorten the maturity and increase the cost of debt provided to firms with high-powered managerial incentives to mitigate the effects of corporate risk-taking induced by such managerial incentives (Billet, Mauer, and Zhang, 2009; Brockman, Martin, and Unlu, 2010). However, no prior research has investigated the relation between CEO sensation seeking and corporate debt contracting. In this study, we investigate the relation between CEO sensation-seeking personality traits, proxied by CEO's pilot certificate, on corporate debt maturity structure and the cost of debt.

We develop two competing hypotheses regarding the relation between CEO sensation-seeking personal trait and corporate debt maturity. In the *risk-taking hypothesis*, we predict that firms with pilot CEOs have higher short-term debt ratios than firms with nonpilot CEOs. Previous

studies document that pilot CEOs have sensation-seeking personalities (Zuckerman, 1971) and pursue riskier corporate policies than nonpilot CEOs (Cain and McKeon, 2016; Sunder et al., 2017). To the extent that short-term debt is associated with lower cost, albeit higher refinancing risk (Calomiris and Kahn, 1991; Diamond, 1991; Benmelech 2007), the *risk-taking hypothesis* suggests that firms with pilot CEOs may favor short-term debt financing. Alternatively, since external creditors are likely to be concerned about the risk-taking behavior of sensation-seeking CEOs that increases the borrowing firms' risk of default, they may prefer to lend shorter term debt and subject the borrowing firms to more frequent refinancing. This argument also suggests a negative relation between pilot CEOs and corporate debt maturity.

Our second hypothesis, labeled *liquidity concern hypothesis*, is motivated by the idea that sensation-seeking behavior is more nuanced and not necessarily associated with risk-seeking across all corporate policies. Sensation seekers can be motivated by risk, but risk-taking is a means rather than the ultimate goal of the trait; indeed, sensation seekers are willing to overlook or tolerate risk to obtain novel experiences (Zuckerman, 1994, 2007, 2009).[1] For example, pilot CEOs may pursue innovations (Sunder et al., 2017) or acquisitions (Cain and McKeon, 2016) to satisfy their desire for sensation despite the fact that such risk-increasing behavior may increase the firm's bankruptcy risk and adversely affect the shareholder's interest. The *liquidity concern hypothesis* predicts that firms led by pilot CEOs have lower short-term debt ratios than firms led by nonpilot CEOs. Short-term debt restricts managerial discretion due to the need to refinance

[1] Even if some sensation-seekers are driven by risk-taking, not all gambles are equally attractive. Lopes (1987) argues that attitude towards risk is governed not just by fear of loss but also by sensitivity to opportunity. If CEO's sensation-seeking behavior is rooted in the latter, then it might manifest in the pursuit of risky corporate policies where skill and effort can influence the outcome, but not necessarily in the funding for those pursuits.

more frequently (Calomiris and Kahn, 1991; Diamond, 1991). Furthermore, Roberts and Sufi (2009) find that over 90 percent of long-term debt contracts are renegotiated prior to maturity. For these reasons, a pilot CEO may choose longer debt maturity, even at a higher cost, because it reduces refinancing risk, allows firms to renegotiate debt terms in bad states of the world, and facilitates CEOs' sensation-seeking behavior in potentially more novel corporate decisions than debt contracting. In addition, since firms desire to match asset-liability maturity (Aivazian et al., 2005), firms led by pilot CEOs are more likely to use long-term debt to fund long-run investments such as M&As. Since the two hypotheses lead to opposing relations between CEOs' sensation-seeking personality trait and corporate debt maturity, we need to sort them out empirically.

To examine the two competing hypotheses regarding the corporate debt maturity structure of firms led by pilot CEOs, we estimate regressions of the short-term debt ratios on a *Pilot CEO* indicator while controlling for other variables that explain short-term debt financing. Similar to Cain and McKeon (2016), we construct a *Pilot CEO* binary variable that takes the value of 1 if the CEO of a firm holds a Federal Aviation Administration (FAA) pilot certification at any point in time and 0 otherwise. The short-term debt measure is calculated as the proportion of debt maturing within one year using firms' balance sheet data. For robustness, we use alternative measures of short-term debt, which are proxied by the proportion of short-term debt maturing within two, three, four, or five years.

Using a sample of 15,181 firm-year observations of 1,875 unique firms over the period 1994-2014, we find a negative and significant relation between pilot CEOs and short-term debt ratios. This finding is robust to alternative measures of short-term debt and to controlling for potential endogenous matching between CEOs and firms. The negative relation between pilot CEOs and corporate short-term debt persists when we control for potential omitted variables

including CEO overconfidence, military experience, managerial ability, economic recessions, capital supply, and corporate governance measures. Our estimation indicates that firms with pilot CEOs have about 3-7% less short-term debt compared to firms with nonpilot CEOs. This evidence supports the *liquidity concern hypothesis*.

Previous studies suggest that firms are not likely to change their leverage and debt maturity structure frequently (Leary and Roberts, 2005; Strebulaev, 2007). Thus, the negative relation between pilot CEOs and short-term debt ratios may be a result of past decisions. Guedes and Opler (1996) suggest that it is more useful to employ new debt issues to investigate the determinants of corporate debt maturity because this approach can mitigate the short-term debt measurement error due to maturing long-term debt. Following their recommendation, we examine the effect of pilot CEOs on the maturity of new debt issues. We run a regression of *Bond maturity* on *Pilot CEO* and other control variables, where *Bond maturity* is measured as the natural logarithm of the years to maturity of new debt issues, and find that firms with pilot CEOs issue new debt with longer maturities, which is consistent with our findings based on balance sheet data. The economic effect of sensation-seeking CEOs on debt maturity is also noteworthy: Our coefficient estimates indicate that the maturity of new debt issues by the firms with pilot CEOs is 1.94 to 8.03 years longer than that of the firms with nonpilot CEOs.

Firms with pilot CEOs and firms with non-pilot CEOs could be systematically different, and their debt maturity structures may diverge even without the pilot CEOs appointments. To address this concern, we consider a firm that appoints a pilot CEO during the sample period as a treatment firm. We use propensity score matching (PSM) to identify control firms that are similar to the treatment firms along several observable dimensions but have nonpilot CEOs throughout the sample period. We run the debt maturity regressions using the difference-in-differences

approach and the propensity score-matched sample. The analysis results indicate that the effect of pilot CEOs on debt maturity is significant only after the pilot CEOs appointments but not beforehand.

We next investigate the relation between pilot CEOs and the cost of debt using the new debt issue data. The risk-taking behavior of sensation-seeking CEOs can lead to volatile future cash flows that potentially harm external creditors' interests. Consequently, creditors may demand higher risk premiums as compensation for the additional risk they have to take when lending to firms with pilot CEOs. Thus, we predict a positive relation between pilot CEOs and the costs of new debt issues. We use *Yield spread*, which is measured as the difference between a corporate bond's yield to maturity and that of a Treasury bond with similar maturity, as a proxy for the cost of debt. The estimation results of the yield spread regressions indicate a positive relation between pilot CEOs and the cost of new debt issues, which is consistent with our prediction. We further estimate a simultaneous equation that allows debt cost and maturity to be jointly determined, but our findings are qualitatively similar. In an alternative analysis, we find a positive relation between pilot CEOs and payment default risk proxied by its distance-to-default, which corroborates the positive relation between pilot CEOs and the cost of debt.

Our paper contributes to the finance literature in several ways. We add to an established line of research in corporate financing that considers the determinants of corporate debt maturity structure (e.g., Barclay and Smith, 1995; Johnson, 2003) by demonstrating that managerial behavioral motivations also have explanatory power for debt maturity. Our evidence indicates that firms led by sensation-seeking CEOs, proxied by their pilot certification, prefer long-term debt financing to avoid the liquidity risk associated with short-term debt financing, even though long-term debt is generally costlier. Our research also adds to a growing stream of literature that

examines the effects of a manager's personality traits on corporate decisions (Malmendier, Tate, and Yan, 2011; Cronqvist, Makhija, and Yonker, 2012). Previous research reports that firms with sensation-seeking CEOs are associated with risk-increasing behavior in investments and financial leverage (Cain and McKeon, 2016; Sunder et al., 2017). To the best of our knowledge, this is the first study providing evidence that CEOs' sensation-seeking personality traits do not translate into across-the-board risk-increasing corporate activities. Our research provides innovative evidence about the precaution that sensation-seeking CEOs exercise when they decide on debt maturity. Our finding implies that pilot CEOs' precautions in debt financing would help facilitate their sensation-seeking behavior and that the effects of CEO personality traits on corporate policies are more nuanced than previously documented.

The remainder of the paper is organized as follows. Section 2 presents a description of the sample selection, variable construction, and summary statistics. Section 3 discusses the empirical predictions, research methods, and results. Section 4 discusses the robustness tests and Section 5 concludes the paper.

2. Samples, Variables Construction, and Descriptive Statistics

We construct a sample using several data sources to investigate how CEOs with sensation-seeking personality traits, proxied by their pilot certificates, influence different aspects of corporate debt contracting. First, we obtain CEO names and compensation data from the Standard & Poor's ExecuComp database. Then, we hand-collect CEO pilot certificate data by matching CEO names to names on the FAA's Airmen Certification database. For verification, we use Bloomberg and public records to obtain the CEOs' dates of birth and home addresses. Following Cain and McKeon (2016), we exclude CEOs who assumed their positions before 1992 to avoid

any survivorship bias problems. Additionally, we omit any CEOs whose names are matched in the FAA database but cannot be verified by the date of birth or home address. The debt maturity sample and new debt data are obtained from Compustat and Thomson Reuters' SDC Platinum, respectively. We obtain stock return data from the Center for Research in Security Prices (CRSP) database. We also use the Federal Reserve Bank of St. Louis' FRED database to retrieve short-term and long-term government bond yields. Our sample spans the period 1994 through 2014.

Following the literature, we exclude utility firms (Standard Industrial Classification (SIC) codes 4900-4999) and financial corporations (SIC codes 6000-6999) from our sample since they tend to be highly regulated. We also filter out firm-year observations with missing debt and book value of assets. The final sample includes 15,181 firm-year observations of 1,875 unique firms.[2] The sample consists of 656 pilot CEO-year observations of 119 pilot CEOs and 14,525 nonpilot CEO-year observations of 2,777 nonpilot CEOs. The number of CEOs is higher than the number of firms in the Execucomp database because a firm may change its CEO during our sample period.

The primary test variable in this research, *Pilot CEO*, is an indicator that takes the value of 1 if the CEO of a firm holds an FAA pilot certification at any point in time and 0 otherwise. Following prior research (e.g., Johnson, 2003; Brockman et al., 2010), we use the ratios of debt

[2] The original sample of ExecuComp has 38,045 observations during our sample period. The number of observations decreases to 29,987 after deleting utility firms and financial corporations. The sample has 22,651 observations after filtering out those who became CEOs before 1992 to avoid any survivorship bias problems since the Excecucomp database is available from 1992. Our sample size decreases to 19,538 observations after we drop any CEOs whose names are matched in the FAA database but cannot be verified by the date of birth or home address. Finally, after deleting any firms with missing short-term debt, book value of assets, or other independent variables, our final sample includes 15,181 firm-year observations of 1,875 unique firms.

maturing within one year or debt maturing within four years to total debt, labeled *ST1* and *ST4* respectively, as measures of short-term debt in our analysis. In robustness tests, we also consider the ratios of debt maturing within two, three, five years, or debt in current liabilities excluding the current portion of long-term debt to total debt. We control for the following variables in the regressions: firm size, firm size squared, market-to-book, abnormal earnings, asset maturity structure, asset volatility, firm leverage, R&D expenses, R&D missing indicator, and the term premium of interest rates (Johnson, 2003; Datta, Iskandar-Datta, and Raman, 2005; Brockman et al., 2010; Custódio, Ferreira, and Laureano, 2013a; Harford et al., 2014). Appendix A provides the definitions of the variables. To mitigate the effects of outliers, we winsorize all continuous variables at the 1st and 99th percentiles.

Table 1 reports the annual and 2-digit SIC code industry distributions of pilot CEOs in Panels A and B, respectively. The number of pilot CEOs increased rapidly from 9 observations in 1994 to a peak of 43 in 2005 before decreasing slightly in recent years. Industries that have relative large number of pilot CEOs include business services, industrial machinery and equipment, chemical and allied products, electronic and other electric equipment, transportation equipment, transportation by air, trucking and warehousing, communications, general merchandise stores, and wholesale trade-nondurable goods.

[Insert Table 1 about here]

We report the summary statistics of the sample in Panel A of Table 2. The means of *ST1* and *ST4* are 18.9% and 51.5%, respectively. The summary statistics for alternative measures of short-term debt and other control variables are similar to those reported by Datta et al. (2005) and Brockman et al. (2010). On average, 50% of CEOs are overconfident while only 4.5% of CEOs have military experience. The average CEO age and CEO tenure are 55 and 9.14 years,

respectively. In Panel B of Table 2, we report the coefficients of the pairwise correlations of *Pilot CEO* and other CEO characteristics. The results indicate that *Pilot CEO* is positively correlated with military experience and CEO tenure but insignificantly correlated with CEO overconfidence, CEO age, and managerial ability.

[Insert Table 2 about here]

3. Empirical Predictions, Research Methods, Results, and Discussions

3.1. Pilot CEOs and Debt Maturity Structure

We develop two competing hypotheses about the relation between pilot CEOs and corporate debt maturity. Both hypotheses stem from the assumption that CEOs with pilot certificates have sensation-seeking personalities (Zuckerman, 1971; Cain and McKeon, 2016; Sunder et al., 2017). Zuckerman (1994) defines the sensation-seeking personality trait as "the seeking of varied, novel, complex and intense sensation and experiences, and the willingness to take physical, social, legal and financial risk for the sake of such experience", but he also points out that "risk-taking behavior is a correlate of sensation seeking but not an essential part of the definition" (Zuckerman, 1994). In subsequent studies, Zuckerman reiterates that many sensation seekers do not seek risk for its own sake; some sensation seeking activities are not even risky, while for others that are, the risk is accepted because it enables the ultimate goal of novel sensations and experiences (Zuckerman, 2007, 2009). One non-business activity that exemplifies sensation-seeking with risk avoidance is mountaineering which, along with piloting an airplane, appears on

Zuckerman's sensation seeking scale (Zuckerman, 1971).[3]

The willingness of sensation seekers to engage in greater risk-taking has been examined in the finance literature. Using prior speeding convictions as a proxy for sensation-seeking, Grinblatt and Keloharju (2009) find that investors with speeding convictions trade more frequently. Brown et al. (2018) use automotive ownership as a proxy for sensation-seeking and find that hedge-fund managers as well as investors in hedge funds that own high-torque or high-horsepower sports cars take on greater investment risk.

Using CEO pilot certificates as a proxy for managers' risk-taking, Cain and McKeon (2016) document that a CEO's flying hobby is associated with higher fatality rate.[4] These authors find that compared to firms with nonpilot CEOs, firms with pilot CEOs engage in riskier corporate behavior, such as pursuing M&As or maintaining higher financial leverage, and experience higher stock return volatility. These findings imply that pilot CEOs with a sensation-seeking personality are likely to pursue risky corporate policies to satisfy their desire for sensation even though such risk-increasing behavior may increase the firm's bankruptcy risk and adversely affect

[3] Mountaineers seeking to conquer Mt. Everest, with a fatality rate exceeding 4%, need to acclimatize to avoid life threatening cerebral or pulmonary edema by making multiple trips up and down the mountain as their bodies adapt to the lack of oxygen at extreme altitudes (Woodward 2019). Although climbers aim to achieve their sensation-seeking goal of reaching the peak, they often practice risk-mitigation such as acclimating on nearby peaks and ridges rather than make multiple trips through the treacherous direct route to the summit through the Khumbu Ice Fall, fraught with objective danger such as avalanches, falling ice, or deep crevasses (Mallory 2016).

[4] Some examples of pilot CEOs who lost their lives include Steven Appleton CEO of Micron (2012), Daniel Dorsch, former CEO of Checkers Drive-In Restaurants, Inc. (2009), Bruce R. Kennedy, former CEO of Alaska Airlines (2007), Michael A. Chowdry, CEO of Atlas Air, Inc. (2001), among others (Cain and McKeon, 2016).

shareholders' interests.

In the *risk-taking hypothesis*, we predict that firms with pilot CEOs have higher short-term debt ratios than those with nonpilot CEOs. Short-term debt, which typically has lower cost, exposes firms to higher refinancing risk because firms need to roll over debt more frequently (Calomiris and Kahn, 1991; Diamond, 1991). Given that short-term debt is associated with higher liquidity risk but lower cost, the *risk-taking hypothesis* suggests that firms with pilot CEOs may favor short-term debt financing. In addition, creditors may also be concerned about the risk-taking behavior of pilot CEOs and reduce their risk exposure by lending short-term debt. These discussions suggest a positive relation between pilot CEOs and short-term debt financing.

Our second hypothesis, *the liquidity concern hypothesis*, predicts that firms led by pilot CEOs have lower short-term debt ratios than firms with nonpilot CEOs. Short-term debt could be an effective monitoring mechanism that restricts managerial discretion because it exposes firms to refinancing risk and increases creditors' controlling power (Calomiris and Kahn, 1991; Diamond, 1991). Sensation-seeking CEOs will prefer long-term financing to short-term financing if greater discretion and lower refinancing risk allows them to pursue future M&As (Cain and McKeon, 2016) or innovative investment strategies (Sunder et al., 2017) more freely.[5] Long-term debt allows more flexibility in debt renegotiations (Roberts and Sufi, 2009) and better asset-liability maturity matching (Aivazian et al., 2005), both of which can better support long-run novel and varying corporate investment policies. O'Hare and Smitheram (1995) suggest that pilots analyze the decision to continue a flight carefully and make critical decisions depending on anticipated

[5] In an unreported analysis, we find positive relations between pilot CEOs and corporate innovation and M&As for our sample firms.

outcomes. In the same manner, CEO pilots may forego the riskiest financing to increase their flexibility to pursue their ultimate sensation-seeking goals. The foregoing discussions suggest that firms with pilot CEOs may prefer long-term debt due to its low refinancing risk, the possibility of debt contract renegotiation, and asset-liability maturity matching. Given the possible opposing effects of pilot CEOs on corporate debt maturity, we need to sort them out empirically.

To examine the relation between the CEOs with pilot certificates and corporate debt maturity, we estimate the following regression model:

$$\begin{aligned} ST_{it} = {} & \beta_0 + \beta_1 * \text{Pilot CEO}_i + \beta_2 * \text{Size}_{i,t-1} + \beta_3 * \text{Size squared}_{i,t-1} + \beta_4 * \text{Market-to-book}_{i,t-1} + \\ & \beta_5 * \text{Abnormal earnings}_{i,t-1} + \beta_6 * \text{Asset maturity}_{i,t-1} + \beta_7 * \text{Asset volatility}_{i,t-1} + \\ & \beta_8 * \text{Leverage}_{i,t-1} + \beta_9 * \text{R\&D}_{i,t-1} + \beta_{10} * \text{Missing R\&D}_{i,t-1} + \beta_{11} * \text{Term premium}_{i,t-1} + \\ & \beta_{12} * \text{Credit rating}_{i,t-1} + \varepsilon_{ijt} \end{aligned} \quad (1)$$

The dependent variable is short-term debt ratio estimated as the fraction of the firm *i*'s total debt maturing within one year (i.e., *ST1*) or within four years (i.e., *ST4*), respectively. The variable of interest is the *Pilot CEO* indicator, which is a binary variable that takes the value of 1 if the CEO of a firm holds an FAA pilot certification at any point in time and 0 otherwise. We follow previous studies (e.g., Johnson, 2003; Datta et al., 2005; Brockman et al., 2010; Custódio et al., 2013a; Harford et al., 2014; Dang and Phan, 2016) to include control variables such as firm size, firm size squared, market-to-book, abnormal earnings, asset maturity structure, asset volatility, firm leverage, R&D expenses, R&D missing dummy, the yield spread between 10-year and 6-month government bonds' yields, year fixed effects, and 2-digit SIC code industry fixed effects. We additionally control for credit ratings, which is an indicator variable that equals 1 for firms with below investment-grade or no credit ratings and 0 otherwise. Appendix A provides the

definitions of the variables.

Turning to the control variables, previous studies suggest that larger firms are more likely to have good credit quality and lower information asymmetry (Scherr and Hulburt, 2001; Johnson, 2003; Dang and Phan, 2016), which suggests that larger firms are less likely to use short-term debt financing. To account for a possible nonlinear relation between a firm's credit quality and debt maturity structure, we control for firm size squared (Diamond, 1991; Dang and Phan, 2016). Myers (1977) argues that high growth firms are more likely to use short-term debt financing to reduce the underinvestment problem, thus, we expect that market-to-book ratio is positively related to short-term debt. Since firms with larger abnormal earnings may use short-term debt financing to signal their financial strength (Flannery, 1986), we expect a positive relation between abnormal earnings and short-term debt ratio. We further expect asset maturity to be negatively related to corporations' short-term debt ratio since firms are more likely to match the maturities of their assets and liabilities (Myers, 1977; Aivazian et al., 2005). Kane, Marcus, and McDonald (1985) and Dang and Phan (2016) report that firms with higher earnings volatility are less likely to use short-term debt to avoid liquidity risk. Similarly, higher leveraged firms are less likely to use short-term debt to reduce refinancing risk (Johnson, 2003). Previous studies also suggest a positive relation between corporate R&D spending and short-term debt ratio since higher R&D spending is positively related to information asymmetry (Custódio et al., 2013a). Because many firms have missing R&D spending in Compustat, we replace missing R&D observations with zeros and add an *R&D missing* indicator which takes the value of 1 if R&D expenditure is missing and 0 otherwise (Flannery and Rangan, 2006). Prior studies suggest a negative relation between the term premium and short-term debt ratio since firms are more likely to take advantage of longer-term debt financing for tax purposes when the term structure of interest rate is upward sloping (Brick

and Ravid, 1991; Dang and Phan, 2016).

We run the regression of *ST1* (*ST4*) on the *Pilot CEO* indicator while controlling for other variables that explain short-term debt financing and report the results in Columns 1-3 (Columns 4-6) of Panel A, Table 3. We find that the coefficient estimates of *Pilot CEO* are negative (ranging from -0.018 to -0.080) and statistically significant at the 5% and 1% levels, which indicates that firms with pilot CEOs have lower short-term debt ratio. The coefficient estimates indicate that, depending on the model specification, firms with pilot CEOs have approximately 2-5% (5-7%) less debt in their capital structure maturing within one (four) years. The effects of other control variables on corporate short-term debt are in line with those reported in the literature (Johnson, 2003; Brockman et al., 2010). Specifically, firm size, asset maturity, asset volatility, financial leverage, and term premium are negatively related to the short-term debt ratio, while size squared, market-to-book ratio, R&D expenditure, and the credit rating indicator are positively related to the short-term debt ratio.

[Insert Table 3 about here]

In additional analysis, we re-estimate the short-term debt baseline regressions with alternative proxies for short-term debt, which include the ratio of total debt maturing within two, three, or five years, or debt in current liabilities, excluding the current portion of long-term debt scaled by total debt. The estimation results reported in Panel B of Table 3 indicate that the coefficients of *Pilot CEO* remain negative and statistically significant, implying that the negative relation between pilot CEOs and short-term debt is robust to alternative measures of short-term debt ratio.

3.2. Pilot CEOs and Maturity of New Debt Issues

Previous research suggests that firms do not change their leverage and debt maturity

structure frequently (Leary and Roberts, 2005; Strebulaev, 2007). It is possible that the negative relation between pilot CEOs and short-term debt is a result of past decisions. Guedes and Opler (1996) point out that it is more useful to employ new debt issues to examine the determinants of corporate debt maturity because this approach can mitigate the short-term debt measurement error due to maturing long-term debt. Thus, we further examine the effect of the *Pilot CEO* indicator on the maturity of newly issued debt using the following regression model:

$$\begin{aligned}\text{Bond maturity}_{it} = {} & \theta_0 + \theta_1 * \text{Pilot CEO}_i + \theta_2 * \text{Size}_{i,t-1} + \theta_3 * \text{ Size squared}_{i,t-1} + \theta_4 * \text{Market-to-book}_{i,t-1} \\ & + \theta_5 * \text{Abnormal earnings}_{i,t-1} + \theta_6 * \text{Asset maturity}_{i,t-1} + \theta_7 * \text{Asset volatility}_{i,t-1} \\ & + \theta_8 * \text{Leverage}_{i,t-1} + \theta_9 * \text{R\&D}_{i,t-1} + \theta_{10} * \text{Missing R\&D}_{i,t-1} \\ & + \theta_{11} * \text{Term premium}_{i,t-1} + \theta_{12} * \text{Credit rating}_{i,t-1} + \varepsilon_{ijt} \end{aligned} \quad (2)$$

We construct the dependent variable, *Bond maturity*, as the natural logarithm of the number of years to maturity of new corporate bond issues.[6] Other control variables are similar to those in the short-term debt baseline regressions, which include firm size, firm size squared, market-to-book, abnormal earnings, asset maturity structure, asset volatility, firm leverage, R&D expenses, R&D missing indicator, the yield spread between 10-year and 6-month government bonds, credit rating indicator, and year and industry or firm fixed effects.

The estimation results of the bond maturity regressions reported in Table 4 indicate that the coefficients of *Pilot CEO* are positive and statistically significant, implying that firms with a pilot CEO are more likely to issue debt with longer maturities. This evidence is consistent with the

[6] Similar to previous research on debt maturities, our sample includes only straight debt and excludes callable, puttable, and convertible bonds.

liquidity concern hypothesis. The economic effect of pilot CEO on debt maturity is also important: Using the coefficient estimates in Table 4 for calculation, we find that the maturity of new debt issues by firms with pilot CEOs is 1.94 to 8.03 years longer than that of firms with nonpilot CEO.

[Insert Table 4 about here]

3.3. Pilot CEOs and Cost of New Debt Issues

We next investigate the relation between pilot CEOs and the cost of debt using the new debt issue data. The risk-taking behavior of pilot CEOs can lead to volatile future cash flows, which harms external creditors' interests. Consequently, creditors may demand higher risk premiums as compensation for the additional risk they have to take when lending to firms with pilot CEOs. Following this argument, we predict a positive relation between pilot CEOs and the costs of new debt issues. Following Dang and Phan (2016), we use the following model to examine the relation between pilot CEOs on the cost of newly issued debt:

$$\begin{aligned}\text{Yield spread}_{it} = {} & \gamma_0 + \gamma_1 * \text{Pilot CEO}_i + \gamma_2 * \text{Bond maturity}_{it} + \gamma_3 * \text{Size}_{i,t-1} + \gamma_4 * \text{Size squared}_{i,t-1} \\ & + \gamma_5 * \text{Asset volatility}_{i,t-1} + \gamma_6 * \text{Average return}_{i,t-1} + \gamma_7 * \text{Credit rating}_{i,t-1} + \\ & \gamma_8 * \text{ROS}_{i,t-1} + \gamma_9 * \text{Leverage}_{i,t-1} + \gamma_{10} * \text{Interest coverage}_{i,t-1} + \gamma_{11} * \text{Issue size}_{i,t-1} + \gamma_{12} * \text{Term premium}_{i,t-1} + \varepsilon_{ijt} \end{aligned} \quad (3)$$

The dependent variable, *Yield spread*, is measured as the difference between a corporate bond's yield to maturity and that of a Treasury bond with similar maturity. Control variables that capture firm and bond characteristics include firm size, firm size squared, standard deviation of monthly stock returns, average daily return, bond rating, return on sales, firm leverage, interest coverage ratio, issue size, yield spread between 10-year and 6-month government bonds, year fixed

effects, and 2-digit SIC code industry fixed effects (Brockman et al., 2010). The results of the cost of debt regressions reported in Columns 1-3 of Table 5 indicate a positive relation between *Pilot CEO* and *Yield spread*, which is consistent with our prediction that firms with pilot CEOs pay higher cost of debt for their new bond issues, ceteris paribus. The results also hold after controlling for *Bond maturity*.

[Insert Table 5 about here]

Bond maturity and the cost of new debt issues can be jointly determined, which raises an endogeneity concern that biases our coefficient estimates. We address this endogeneity concern in two ways. First, we use a two-stage estimation procedure with the first stage modeling bond maturity and the second stage modeling the yield spread of new issues (Dang and Phan, 2016). The estimated results of the second stage reported in Column 4 of Table 5 indicate that the coefficient of *Pilot CEO* remains positive (0.013) and statistically significant at the 5% level, implying that the positive relation between pilot CEOs and the cost of new debt issues is robust to correction for potential endogeneity. Second, we estimate the bond maturity and cost of debt regressions jointly using a simultaneous equations model. The results reported in Column 5 are qualitatively similar and consistent with the view that lenders recognize that pilot CEOs tend to pursue riskier corporate investment policies, therefore, they charge higher interest rates.

4. Robustness Checks

4.1. Other Endogeneity Concerns

Corporate debt maturity and financial leverage can be determined simultaneously, which raises another endogeneity concern (Barclay et al., 2003; Johnson, 2003; Billett, King, and Mauer, 2007). To dispel this concern, we follow previous studies (e.g., Johnson, 2003; Aivazian et al., 2005; Datta et al., 2005; Brockman et al., 2010) and employ an instrumental variable (IV)

regression using asset tangibility as an instrument for financial leverage. Asset tangibility satisfies both the relevance and exclusion conditions of an instrument because tangible assets are an important determinant of financial leverage (Frank and Goyal, 2009), but it is not theoretically related to debt maturity structure (Aivazian et al., 2005; Dang and Phan, 2016). Specifically, we estimate financial leverage as a function of asset tangibility and other explanatory variables in the first stage. Then, we run a regression of *ST1* or *ST4* on the predicted level of financial leverage, *Pilot CEO*, and other control variables.[7] We report the results of the IV regressions in Columns 1 and 2 for ST1 and ST4, respectively, in Table 6. The negative and significant coefficient estimates of *Pilot CEO* indicate that our findings continue to hold. In an alternative analysis, we estimate the debt maturity and financial leverage regressions jointly using a simultaneous equation model. The results, reported in Columns 3 and 4, are qualitatively similar.

[Insert Table 6 about here]

It is possible that firms select CEOs with personality traits that fit firm characteristics (e.g., risky firms select pilot CEOs) (Benmelech and Frydman, 2015); thus, our observed results may be due to firm effects rather than CEO effects. Moreover, firms are not likely to change their corporate debt maturity structure frequently (Leary and Roberts, 2005; Strebulaev, 2007), implying that our results could be driven by past financing decisions. Although our debt maturity regressions have controlled for firm fixed effects, to further address concerns about a possible endogenous matching between firms and CEOs with pilot certificates, we follow Sunder et al. (2017) and re-estimate the short-term debt ratio baseline regressions that additionally control for firm short-term debt ratio in the year preceding the current CEO's appointment. By controlling for the firm's short-term debt

[7] The Cragg-Donald Wald weak identification test statistic indicates that the selected instrument is relevant.

level when the previous CEO was in charge, other firm characteristics, and firm fixed effects, we can attribute the effect of pilot CEOs on debt maturity to the current CEO. The results reported in Table 7 indicate that the coefficient estimates of *Pilot CEO* remain negative and statistically significant. Taken together, the evidence suggests that the negative relation between pilot CEO and short-term debt is unlikely to be driven by endogenous matching between firms and CEOs.

[Insert Table 7 about here]

Firms with pilot CEOs and firms with non-pilot CEOs could be systematically different, and their debt maturity structures may follow different trends even without the pilot CEOs appointments. To alleviate this concern, we use the PSM approach to identify control firms that are similar to the treatment firms along several observable dimensions, such as firm size, market-to-book, abnormal earnings, asset maturity structure, asset volatility, firm leverage, R&D expenses, and credit ratings. Specifically, we classify firms that replace non-pilot CEOs with pilot CEOs during the sample period as treatment firms and firms with non-pilot CEOs throughout the sample period as potential control firms. We use a probit model to estimate the likelihood of a firm being a treatment one based on firm characteristics. For each treatment firm, we select control firms that are in the same 3-digit SIC industry and have a propensity score within 1% of that of the treatment firm. We rerun the short-term debt regressions using the propensity score-matched sample and report the results in Columns 1-3 of Panel A of Table A1 in the Internet Appendix. *Treatment* is an indicator variable that takes a value of 1 for the firms that replace non-pilot CEOs with pilot CEOs during the sample period and 0 otherwise. *Post* is an indicator variable that takes a value of 1 for the year in which a firm has a pilot CEO and 0 otherwise. The results indicate that the coefficients of the interaction between *Treatment* and *Post* are negative and statistically significant in all columns, which indicates that the decrease in short-term debt ratios follows the

pilot CEOs appointments. For robustness check, we rerun the bond maturity regressions using the propensity score-matched sample and new bond issues and report the results in Columns 4-6 of Panel A of Table A1 in the Internet Appendix. The results indicate positive and significant coefficients of the interaction between *Treatment* and *Post*, suggesting that firms with pilot CEOs issue longer-term debt after their appointment.

In a complementary analysis, we estimate dynamic bond maturity regressions using the propensity score-matched sample and a series of year indicators including $Pilot\ CEO^{-2}$, $Pilot\ CEO^{-1}$, $Pilot\ CEO^{0}$, $Pilot\ CEO^{+1}$, and $Pilot\ CEO^{\geq+2}$ that are set to one if the firm will appoint a pilot CEO in the next two years, will appoint a pilot CEO next year, appoints a pilot CEO this year, appointed a pilot CEO one year ago, and appointed a pilot CEO two or more years ago, respectively. The results reported in Panel B of Table A1 in the Internet Appendix indicate that the effects of pilot CEOs on debt maturity are significant only after the pilot CEOs appointments. Figure 1 plots the coefficients of the year dummies of the regression of debt maturity for the nine-year period centered on the pilot CEO appointments using the new debt issues sample. The dashed lines correspond to the 95% confidence intervals of the coefficient estimates. The figure indicates that the positive and significant effect of pilot CEOs on the debt maturity of the treatment firms is only present after their appointments but not beforehand.

4.2. Other Personality Traits and Possible Omitted Variables

Pilot CEO could be correlated with other personality traits, such as CEO overconfidence, CEO military experience, or CEO general managerial ability (Sunder et al., 2017), and it may simply pick up the effects of these personality traits on debt maturity. To rule out the possibility that *Pilot CEO* merely picks up the effect of CEO overconfidence, we re-estimate the corporate

debt maturity regressions while additionally controlling for CEO overconfidence. Similar to Hirshleifer et al. (2012) and Cain and McKeon (2016), we construct the *CEO overconfidence* indicator variable that takes the value of 1 if the CEO's options exceed 100% moneyness and 0 otherwise. The results reported in Panel A of Table 8 indicate that the coefficients of *Pilot CEO* remain negative and highly significant while *CEO overconfidence* is generally positively related to corporate short-term debt.

[Insert Table 8 about here]

In the next analysis, we address the possible omitted variable problem arising from CEO military experience. Similar to Cain and McKeon (2016) and Sunder et al. (2017), we use CEO military background in manager biographical data reported in the Boardex database to construct the *Military experience* indicator variable that takes the value of 1 if the CEO has military experience and 0 otherwise. We then estimate the corporate debt maturity models while additionally controlling for CEO military background. The results reported in Panel B of Table 8 indicate that the negative relation between pilot CEOs and short-term debt ratios persists. On the other hand, CEO military experience is positively related to corporate short-term debt ratios, which could be explained by the risk-taking behavior of CEOs with military experience.

Another potential omitted variable problem arises from CEO managerial ability being potentially correlated with both CEO personality traits and debt maturity structure. We address this concern by estimating the short-term debt model while additionally controlling for CEOs' managerial abilities proxied by the CEO ability index developed by Custódio et al. (2013b). The estimation results reported in Panel C of Table 8 indicate that the negative relation between pilot CEOs and short-term debt is robust to controlling for CEO ability. In addition, CEO general managerial ability is positively related to corporate short-term debt, which could be explained by

skillful CEOs' willingness to roll over their firms' short-term debt. In another robustness test, we rerun the short-term debt model while controlling for all three CEO personality traits in the same regression and report the results in Panel D of Table 8. The estimation results indicate that the coefficients of *Pilot CEO* are negative and highly significant in all columns, suggesting that the negative relation between pilot CEOs and short-term debt is insensitive to controlling for other CEO personality traits.

Datta et al. (2005) and Brockman et al. (2010) argue that corporate governance and managers' equity-based incentive compensation are important determinants of corporate debt maturity structure and bond yield spreads. In the next analysis, we examine the robustness of our findings by estimating the corporate debt maturity regressions while controlling for CEO performance-based compensation, including CEO delta and CEO vega, and other corporate governance measures, including aggregate blockholder ownership and the anti-takeover G-index (Gompers, Ishii, and Metrick, 2003) or the entrenchment E-index (Bebchuk , Cohen, and Ferrell, 2009).[8] The estimation results reported in Table 9 indicate that the negative relation between pilot CEOs and short-term debt ratio is statistically significant and robust to controlling for corporate governance. The coefficient estimates of corporate governance measures are consistent with the evidence reported in the literature. Specifically, short-term debt ratio is negatively (positively) related to CEO delta and blockholder ownership (CEO vega) (Brockman et al., 2010).

[Insert Table 9 about here]

4.3. Distance-to-default

[8] Because GIM index and E-index are available until 2006, the regression samples reported in Panel B of Table 9 are smaller.

Our findings so far indicate that firms with pilot CEOs are more likely to use longer-term debt even though it is costlier during our sample period (as reported in Table 5). One potential mechanism that could explain our findings is that firms with pilot CEOs take on more risk (Cain and McKeon, 2016; Sunder et al., 2017), experience more cash-flow volatility, and are more likely to default compared to other firms. Because pilot CEOs seek sensation by pursuing activities that increases firm risk and consequently default risk, which hampers their firms' ability to repay or refinance short-term debt, they may prefer longer term debt even at higher costs.

In our next analysis, we investigate the relation between pilot CEOs and firms' default risk. Specifically, we calculate the distance-to-default using the Kealhofer-Merton-Vasicek (KMV) model, which measures a firm's default probability (Bharath and Shumway, 2008). We regress the distance-to-default on *Pilot CEO* and control variables and report the results in Table 10. We find that the coefficients of *Pilot CEO* are negative (-0.642 and -0.773) and significant at the 5% and 1% levels, indicating that firms led by pilot CEOs are closer to default than those led by nonpilot CEOs. Taken together, the evidence indicates that firms with pilot CEOs have higher default risks, leading to higher costs of debt imposed by the creditors. Faced with higher liquidity risk associated with short-term debt that adversely affects their sensation seeking, pilot CEOs choose to borrow longer term debt even through it is costlier. This evidence also implies that the positive relation between pilot CEO and debt maturity is driven by the demand side rather than the supply side.

[Insert Table 10 about here]

4.4. Economic and Credit Market Conditions

During our sample period, government bond yields decline during the 2007-2008 financial crisis before rising from 2009 to 2012. Firms may have greater incentives to use short-term debt financing during the period of declining rates compared to those in the periods of increasing

interest rates (Dang and Phan, 2016). Moreover, whereas the availability of long-term debt is more limited during financial recessions, firms may have to resort to more short-term debt financing in the crisis years (Gonzalez, 2015). These observations suggest that the negative relation between pilot CEOs and corporate short-term debt ratios may vary with the market conditions. We control for the effect of financial crisis by including a recession indicator, which takes the value of 1 for the financial crisis years (i.e., years 2001, 2007, 2008 and 2009) and 0 otherwise, in the short-term debt model and rerun the regressions. The results reported in Panel A of Table A2 in the Online Appendix suggest that the coefficient estimates of *Pilot CEO* remain negative and highly significant, implying that the negative relation between pilot CEOs and short-term debt is not sensitive to the dry-up of long-term debt during the financial crises. Consistent with the evidence in the literature (e.g., Gonzalez, 2015), the coefficient estimate of the recession indicator is positive and highly significant, indicating that firms are more likely to use short-term debt financing during the periods of financial crisis.

We further estimate the short-term debt regressions separately for the recession and growth sub-periods then compare the effects of pilot CEOs on corporate short-term debt ratio during these sub-periods. The recession and growth periods are defined by the NBER business cycles. The estimation results reported in Panel B of Table A2 indicate that pilot CEOs are negatively related to corporate short-term debt ratios in both the recession and growth subperiods although the relation is more pronounced during the recession subperiod.

The existence of an inverse yield curve during the sample period may bias our findings because firms would be better off using longer term debt, which is cheaper than shorter term debt. To address a possible effect of the inverse yield curve on the relation between pilot CEOs and corporate debt maturity, we split the sample into the inverse yield curve and normal yield curve

sub-periods and re-estimate the debt maturity regressions separately for each subsample. The estimated results reported in Table A3 in the Online Appendix suggest that pilot CEOs are significantly negatively related to corporate short-term debt ratio in both sub-periods, implying that the results are insensitive to the shape of the yield curve.

In another analysis, we re-estimate the short-term debt ratio models while additionally controlling for the money supply M2 and report the results in Table A4 in the Online Appendix. The results indicate that the coefficient estimates of *Pilot CEO* remain negative and highly significant, which confirms the robustness of our findings. The results also indicate that money supply has a negative effect on corporate short-term debt ratio.

5. Conclusions

This research examines the effect of CEO sensation-seeking personality traits, proxied by CEOs' pilot certificates, on corporate debt maturity structure and the cost of debt. We find that firms with pilot CEOs have lower short-term debt ratios than those with nonpilot CEOs, and this finding is robust to alternative measures of short-term debt and to controlling for endogenous matching between firms and pilot CEOs. The negative relation between the pilot CEOs and corporate short-term debt persists after controlling for potential omitted variables, CEO overconfidence, CEO military experience, CEO managerial ability, economic and credit market conditions, corporate governance, and prior debt maturity structure. Our findings support *the liquidity concern hypothesis* that pilot CEOs prefer long-term debt to avoid the liquidity risk associated with short-term debt financing. Further analysis of a new debt issues sample indicates that firms with pilot CEOs issue longer term debt although it is generally costlier than shorter term debt. Overall, the empirical evidence supports the argument that sensation-seeking CEOs prefer

long-term debt financing to avoid the liquidity risk associated with short-term debt financing that may hamper their sensation-seeking behavior. External creditors respond to the risk-taking and uncertainty of the future cash flows of firms with pilot CEOs by imposing a higher cost of debt.

Appendix

Appendix A: Variable Definition

Variable	Description
Dependent variables	
ST1	The ratio of debt maturing within 1 year to total debt.
ST2	The ratio of debt maturing within 2 year to total debt.
ST3	The ratio of debt maturing within 3 year to total debt.
ST4	The ratio of debt maturing within 4 year to total debt.
ST5	The ratio of debt maturing within 5 year to total debt.
STNP	The ratio of debt in current liability minus the current portion of long-term debt, to total debt.
Bond maturity	The natural logarithm of the number of years from the date of issuance to the date of maturity.
Yield spread	The difference between yield to maturity of new corporate bond issues and the yield to maturity of a Treasury bond with similar maturity.
Independent variables	
Pilot CEO	An indicator variable that takes a value of 1 if the CEO of a firm holds a FAA pilot certification at any point in time, and 0 otherwise.
Size	The natural logarithm of the total book value of assets.
Market-to-book ratio	The ratio of the sum of the market value of equity, preferred stock, current liabilities, and long-term debt minus deferred taxes, to the total book value of asset.
Abnormal earnings	Difference between common stock (capital) adjusted income before extraordinary items at year t and t – 1, all divide by the market value of equity.
Asset maturity	The weighted average of gross long-term fixed assets and current assets.
Asset volatility	The standard deviation of the stock return (during the fiscal year) times the market value of equity, all divided by the market value of assets.
Leverage	The ratio of book value of total debt to the book value of asset.
R&D	The ratio of research and development expenditure to total book value of asset.
Missing R&D	An indicator which takes a value of 1 if R&D expenditure is missing and 0 otherwise.
Term premium	The difference between the 10-year government bond yield and 6-month government bond yield.
Credit rating	The average of the S&P's and Moody's ratings. We code ratings as 1 for "Aaa" (Moody's) or "AAA" (S&P), or 2 for "Aa1"

	"AA+" and so on increasing the number assigned by one for each lower rating level.
Lagged ST1	The firm's ST1 in the year before the CEO appointment.
Lagged ST4	The firm's ST4 in the year before the CEO appointment.
ROS	The ratio of operating income before depreciation to sale.
Interest coverage	The natural logarithm of 1 plus the pre-tax interest coverage ratio, ln(1+interest expense/EBIT).
Issue size	The natural logarithm of the total proceeds of new debt issues.
Average return	Average monthly stock return during the fiscal year.
PPE	The ratio of total book value of property, plant, and equipment to book value of assets.
CEO overconfidence	An indicator variable that takes a value of 1 if the CEO's options have a higher than 100% moneyness and 0 otherwise. The definition follows Hirshleifer et al. (2012). Moneyness is defined from ExecuComp as [PRCC_F-(OPT_UNEX_EXER_EST_VAL/OPT_UNEX_EXER_NUM)]/[OPT_UNEX_EXER_EST_VAL/OPT_UNEX_EXER_NUM] and option value is estimated as OPTION_AWARDS_BLK_VALUE/OPTION_AWARDS_NUM.
Military experience	An indicator that takes the value of 1 if the CEO has military experience and 0 otherwise.
Managerial ability	The CEO general managerial ability index developed by Custódio, Ferreira, and Matos (2013b).
GIM index	The corporate governance index developed by Gompers, Ishii, Metrick, (2003), measures the number of anti-takeover provisions adopted by a firm.
Blockholder ownership	The percent of shares owned by blockholders who each hold at least 5% of the firms' common equity.
CEO delta	A measure of the CEO's wealth's sensitivity to a $1 change in the stock price.
CEO vega	A measure of the CEO's wealth's sensitivity to a 0.01 change in stock returns volatility.
E-index	Entrenchment index developed by Bebchuk, Cohen, and Ferrell (2009), measuring the adoption of six important anti-takeover provisions.
Recession	An indicator variable that takes a value of 1 for the recession periods (i.e. years 2001, 2007, 2008 and 2009) and 0 otherwise.
Money supply M2	A measure of the money supply, obtained from St. Louis Federal Reserve FRED database.
CEO Age	The natural logarithm of the CEO's age.
CEO tenure	The number of years the CEO has been in his position.
Net debt issuance	The ratio of the change in total liabilities to total book value of assets.

Credit rating	An indicator variable that equals 1 for firms with below investment-grade or no credit rating and 0 otherwise.

References

Aivazian, V., Y. Ge, J. Qiu, 2005. Debt maturity structure and firm investment. *Financial Management* 34, 107-119.

Ahmed, A. S., S. Duellman, 2013. Managerial overconfidence and accounting conservatism. *Journal of Accounting Research* 51, 1-30.

Barclay, M., C. Smith, 1995. The maturity structure of corporate debt. *Journal of Finance* 50, 609-631.

Barclay, M., L. Marx, C. Smith, 2003. The joint determination of leverage and maturity. *Journal of Corporate Finance* 9, 149-167.

Bebchuck, L., A. Cohen, A. Ferrell, 2009. What matters in corporate governance? *Review of Financial Studies* 22, 783-827.

Benmelech, E., 2007. Managerial entrenchment and debt maturity: Theory and evidence. Working paper, Northwestern University.

Benmelech, E., C. Frydman, 2015. Military CEOs. *Journal of Financial Economics* 117, 43-59.

Bharath, S., T. Shumway, 2008. Forecasting default with the Merton distance to default model. *Review of Financial Studies* 21, 1339-1369.

Billett, M., T. King, D. Mauer, 2007. Growth opportunities and the choice of leverage, debt maturity, and covenants. *Journal of Finance* 62, 697-730.

Billett, M., D. Mauer, and Y. Zhang, 2009, Stockholder and bondholder wealth effects of CEO incentive grants. *Financial Management* 39, 463-487.

Brick, I., A. Ravid, 1991. Interest rate uncertainty and the optimal debt maturity structure. *Journal of Financial and Quantitative Analysis* 26, 63-81.

Brockman, P., X. Martin, E. Unlu, 2010. Executive compensation and the maturity structure of corporate debt. *Journal of Finance* 65, 1123-1161.

Brown, S., Y. Lu, S. Ray, M. Teo, 2018. Sensation seeking and hedge funds. *Journal of Finance* 73, pp.2871-2914.

Cain, M.D., S.B. McKeon, 2016. CEO personal risk-taking and corporate policies. *Journal of Financial and Quantitative Analysis* 51, 139-164.

Calomiris, C., C. Kahn, 1991. The role of demandable debt in structuring optimal banking arrangements. *The American Economic Review*, 497-513.

Cronqvist, H., A. K. Makhija, S. E. Yonker, 2012. Behavioral consistency in corporate finance: CEO personal and corporate leverage. *Journal of Financial Economics* 103 , 20-40.

Custódio, C., M. Ferreira, L. Laureano, 2013a. Why are US firms using more short-term debt. *Journal of Financial Economics* 108, 182-212.

Custódio, C., M. Ferreira, P. Matos, 2013b. Generalists versus specialists: Lifetime work experience and chief executive officer pay. *Journal of Financial Economics* 108, 471-492.

Dang, A., H. Phan, 2016. CEO inside debt and corporate debt maturity structure. *Journal of Banking and Finance* 70, 38-54.

Datta, S., M. Iskandar-Datta, K. Raman, 2005. Managerial stock ownership and the maturity structure of corporate debt. *Journal of Finance* 60, 2333-2350.

Diamond, D., 1991. Debt maturity structure and liquidity risk. *Quarterly Journal of Economics* 106, 709-737.

Flannery, M., 1986. Asymmetric information and risky debt maturity choice. *Journal of Finance* 41, 19-37.

Flannery, M., K. Rangan, 2006. Partial adjustment toward target capital structures. *Journal of Financial Economics* 79, 469-506.

Frank, M.Z. and Goyal, V.K., 2009. Capital structure decisions: which factors are reliably important?. *Financial management* 38, 1-37.

Gompers, P., J. Ishii, A. Metrick, 2003. Corporate governance and equity price. *Quarterly Journal of Economics* 118, 107-156.

Gonzalez, V., 2015. The financial crisis and corporate debt maturity: The role of banking structure. *Journal of Corporate Finance* 35, 310-328.

Grinblatt, M., M. Keloharju, 2009. Sensation seeking, overconfidence, and trading activity. *Journal of Finance* 64, 549-578.

Guedes, J., T. Opler, 1996. The determinants of the maturity of corporate debt issues. *Journal of Finance* 51, 1809-1833.

Harford, J., S. Klasa, W. Maxwell, 2014. Refinancing risk and cash holdings. *Journal of Finance* 69, 975–1012.

Hirshleifer, D., A. Low, and S. Teoh, 2012. Are overconfident CEOs better innovators? *Journal of Finance* 67, 1457-1498.

Johnson, S., 2003. Debt maturity and the effects of growth opportunities and liquidity risk on leverage. *Review of Financial Studies* 16, 209-236.

Kane, A., A. Marcus, R. McDonald, 1985. Policy and the rate of return premium to leverage. *Journal of Financial and Quantitative Analysis* 20, 479-499.

Leary, M., M. Roberts, 2005. Do firms rebalance their capital structures? *Journal of Finance* 60, 2575-2619.

Lopes, L.L., 1987. Between hope and fear: The psychology of risk. *Advances in Experimental Social Psychology* 20, 255-295.

Mallory, A., 2016. Project Everest: Essential steps for successfull projects. https://pmi-madison.org/index.php/events/chapter-meeting-events/chapter-meeting-presentations-2/638-2016-01-january-chapter-meeting/file (Accessed August 1, 2020)

Malmendier, U., G. Tate, 2005. CEO overconfidence and corporate investment. *Journal of Finance* 6, 2661-2700.

Malmendier, U., G. Tate, J. Yan, 2011. Overconfidence and early-life experience: The effect of managerial traits on corporate financial policies. *Journal of Finance* 66, 1687-1733.

Myers, S., 1977. Determinants of corporate borrowing. *Journal of Financial Economics* 5, 147-176.

O'Hare, D., T. Smitheram, 1995. 'Pressing On' Into Deteriorating Conditions: An Application of Behavioral Decision Theory to Pilot Decision Making. *The International Journal of Aviation Psychology* 5, 351-370.

Roberts, M. R., A. Sufi, 2009a. Renegotiation of financial contracts: evidence from private credit agreements. *Journal of Financial Economics* 93, 159-184.

Scherr, F., H. Hulburt, 2001. The debt maturity structure of small firms. *Financial Management* 30, 85-111.

Strebulaev, I., 2007. Do tests of capital structure theory mean what they say? *Journal of Finance* 62, 1747-1787.

Sunder, J., S.V. Sunder, J. Zhang, 2017. Pilot CEOs and corporate innovation. *Journal of Financial Economics* 123, 209-224.

Zuckerman, M., 1971. Dimensions of sensation seeking. *Journal of Consulting and Clinical Psychology* 36, 45-52.

Zuckerman, M., 1994. *Behavioral expressions and biosocial bases of sensation seeking*. Cambridge university press.

Zuckerman, M., 2007. *Sensation seeking and risky behavior*. American Psychological Association.

Zuckerman, M., 2009. Sensation seeking. Ch. 31 in *Handbook of individual differences in social behavior*, Leary, M. R., & Hoyle, R. H. (Eds.) Guilford Press, 455-465.

Woodward, A. 2019. Crowds, costs, and corpses: 16 misconceptions about what it's like to climb Everest. https://www.businessinsider.com/mount-everest-misconceptions-about-climbing-2019-5. (Accessed August 1, 2020)

Figure 1: Dynamic Effects of Pilot CEOs on Debt Maturity Structure

Figure 1 plots the coefficients of the year dummies of the regression of debt maturity on 9-year dummies beginning 4 years before and ending 4 years after the pilot CEOs appointments and other controls. The dashed lines correspond to the 95% confidence intervals of the coefficient estimates.

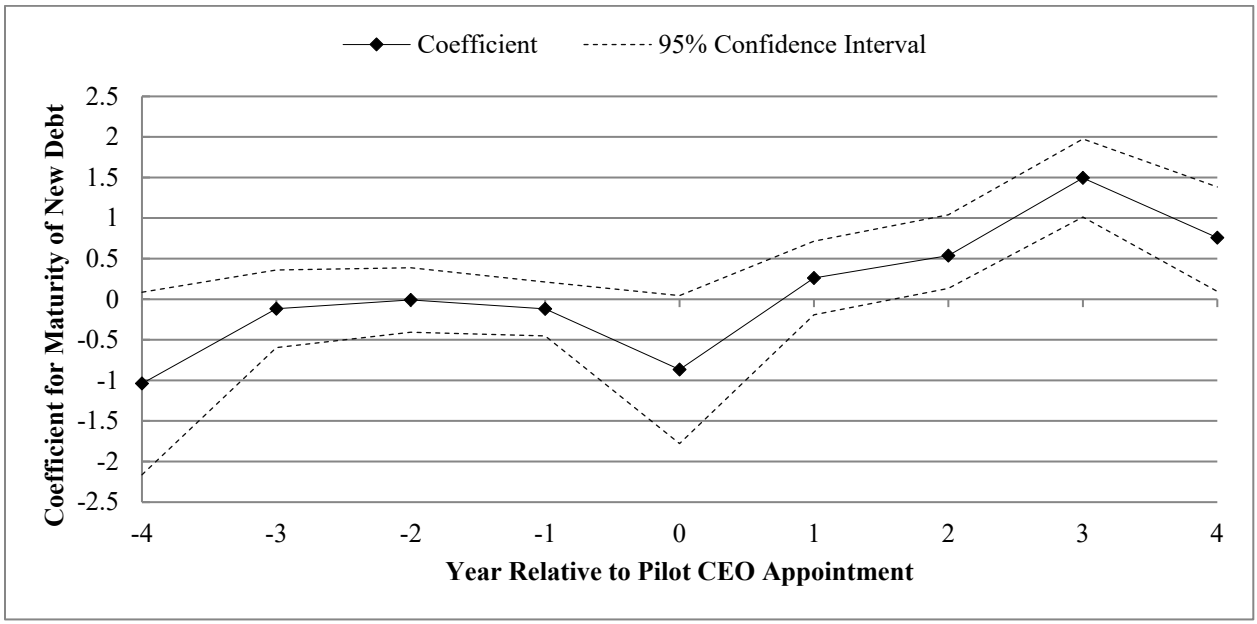

Table 1

Distribution of Pilot CEO by Year and Industry

This table reports the yearly and two-digit SIC code industries distribution of number of CEOs, number of pilot CEOs and percentage of pilot CEOs for the period of 1994-2014.

Panel A: Pilot CEOs Distribution by Year

Year	Number of CEOs	Number of Pilot CEOs	Percentage of Pilot CEOs
1994	302	9	2.98
1995	398	12	3.02
1996	486	18	3.7
1997	520	24	4.62
1998	590	26	4.41
1999	641	29	4.52
2000	691	35	5.07
2001	703	33	4.69
2002	723	35	4.84
2003	771	31	4.02
2004	773	36	4.66
2005	778	43	5.53
2006	809	40	4.94
2007	901	41	4.55
2008	910	38	4.18
2009	894	42	4.7
2010	861	34	3.95
2011	869	33	3.8
2012	863	33	3.82
2013	850	30	3.53
2014	848	34	4.01
Total	15,181	656	4.32

Panel B: Pilot CEOs Distribution by Industries

SIC 2 Code	Industry Description	Number of CEOs	Number of Pilot CEOs	Percentage of Pilot CEOs
73	Business Services	1,436	61	4.25%
35	Industrial Machinery & Equipment	1,124	43	3.83%
28	Chemical & Allied Products	1,415	42	2.97%
36	Electronic & Other Electric Equipment	1,182	41	3.47%
37	Transportation Equipment	512	41	8.01%
45	Transportation by Air	161	33	20.50%
42	Trucking & Warehousing	127	31	24.41%
48	Communications	518	31	5.98%

53	General Merchandise Stores	244	25	10.25%
51	Wholesale Trade - Nondurable Goods	221	23	10.41%
38	Instruments & Related Products	983	21	2.14%
79	Amusement & Recreation Services	162	21	12.96%
Other		7,096	243	3.42%
Total		15,181	656	4.32%

Table 2

Summary Statistics and Pairwise Correlations

This table reports the summary statistics of the full sample over the period of 1994-2014. *ST1* is the ratio of debt maturing within 1 year to total debt. *ST2* is the ratio of debt maturing within 2 years to total debt. *ST3* is the ratio of debt maturing within 3 years to total debt. *ST4* is the ratio of debt maturing within 4 years to total debt. *ST5* is the ratio of debt maturing within 5 years to total debt. *STNP* is the ratio of debt in current liability excluding the current portion of long-term debt to total debt. *Market-to-book ratio* is ratio of the sum of the market value of equity, preferred stock, current liabilities, and long-term debt minus deferred taxes, to the total book value of asset. *Abnormal earnings* is measured by difference between common stock (capital) adjusted income before extraordinary items at year *t* and *t*–1, all divided by the market value of equity. *Asset maturity* is calculated as the weighted average of gross fixed assets and current assets. *Asset volatility* is constructed as the ratio of standard deviation of stock return times the market value of equity, to the market value of asset. *Leverage* is the ratio of book value of total debt to the book value of asset. *R&D* is the ratio of research and development expenditure to total book value of asset. *Term premium* is the difference between the 10-year government bond yield and 6-month government bond yield. The definitions of other variables are provided in Appendix A.

Panel A: Descriptive Statistics

Variable	N	Mean	1st Quartile	Median	3rd Quartile	Std. Dev.
ST1	15,181	0.189	0.009	0.072	0.250	0.265
ST2	13,447	0.295	0.045	0.183	0.432	0.313
ST3	13,417	0.405	0.119	0.316	0.641	0.338
ST4	13,063	0.515	0.229	0.468	0.868	0.343
ST5	13,127	0.634	0.376	0.641	0.998	0.324
STNP	15,520	0.086	0.000	0.000	0.047	0.208
Size ($million)	15,181	6,668	572	1,608	5,088	15,683
Market-to-book	15,181	1.592	0.870	1.245	1.880	1.155
Abnormal earnings	15,181	-0.009	-0.015	0.006	0.022	0.183
Asset maturity	15,181	9.183	3.039	6.258	12.658	8.536
Asset volatility	15,181	0.070	0.040	0.059	0.087	0.045
Leverage	15,181	0.245	0.113	0.229	0.345	0.177
R&D	15,181	0.028	0.000	0.002	0.034	0.049
Term premium	15,181	0.026	0.007	0.017	0.028	0.012
Overconfidence	15,181	0.499	0.000	0.000	1.000	0.500
Military experience	15,181	0.045	0.000	0.000	0.000	0.207
CEO age	15,181	54.901	50.00	55.00	59.00	6.831
CEO tenure	15,181	9.137	6.000	9.000	12.000	4.698
CEO delta	10,059	945.62	59.320	179.68	524.88	4722.92
CEO vega	10,059	131.58	12.055	43.541	130.06	298.07

Panel B: CEO Characteristics Correlations Matrix

	Pilot CEO	Military experience	Overconfidence	Ability	Age
Pilot CEO	1				
Military experience	0.063***	1			
Overconfidence	0.005	0.037***	1		
Managerial ability	-0.046*	0.078***	0.011	1	
Age	-0.008	0.115***	-0.035***	0.204***	1
Tenure	0.031***	0.041***	-0.091***	-0.131***	0.053***

Table 3

Pilot CEOs and Short-term Debt

This table reports the results of the short-term debt regressions. The dependent variables in Panel A are *ST1* and *ST4*. *ST1* is the ratio of debt maturing within 1 year to total debt. *ST4* is the ratio of debt maturing within 4 years to total debt. The dependent variables in Panel B are *ST2, ST3, ST5* and *STNP*. *ST2* is the ratio of debt maturing within 2 years to total debt. *ST3* is the ratio of debt maturing within 3 years to total debt. *ST5* is the ratio of debt maturing within 5 years to total debt. *STNP* is the ratio of debt in current liability excluding the current portion of long-term debt to total debt. *Pilot CEO* is an indicator variable that takes a value of 1 if the CEO of a firm holds a FAA pilot certification at any point in time, and 0 otherwise. The definitions of other variables are provided in Appendix A. T-statistics based on heteroskedasticity-robust standard errors clustered by firms are reported in parentheses below the coefficient estimates. The symbols ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively.

Panel A: Pilot CEOs and Short-term Debt: Baseline Regressions

	ST1			ST4		
Variable	(1)	(2)	(3)	(4)	(5)	(6)
Pilot CEO	-0.018**	-0.047***	-0.049***	-0.025**	-0.080***	-0.079***
	(2.28)	(3.33)	(3.48)	(1.99)	(3.55)	(3.50)
Size	-0.151***	0.002	0.003	-0.251***	-0.039	-0.057*
	(9.93)	(0.11)	(0.16)	(16.28)	(1.34)	(1.95)
Size squared	0.009***	-0.001	-0.001	0.013***	0.001	0.002
	(10.74)	(1.13)	(0.24)	(14.28)	(0.47)	(1.24)
Market-to-book	0.013***	0.004	0.006*	0.012***	-0.012**	-0.002
	(4.96)	(1.27)	(1.70)	(3.40)	(2.52)	(0.44)
Abnormal earnings	-0.019	-0.002	0.001	-0.026**	-0.040***	-0.01
	(1.34)	(0.16)	(0.14)	(2.26)	(2.71)	(0.70)
Asset maturity	-0.001*	0.001	0.001**	-0.002***	-0.001	-0.001
	(1.81)	(0.87)	(2.33)	(5.24)	(0.93)	(0.29)
Asset volatility	-0.126	0.084	-0.013	-0.319***	0.262**	-0.226*
	(1.55)	(1.15)	(0.15)	(3.95)	(2.49)	(1.90)
Leverage	-0.353***	-0.248***	-0.253***	-0.329***	-0.021	-0.070**
	(16.07)	(12.48)	(12.32)	(12.61)	(0.67)	(2.20)
R&D	0.234***	0.417**	0.500***	0.141	0.007	-0.04
	(3.61)	(2.51)	(3.00)	(1.32)	(0.03)	(0.19)
Missing R&D	-0.005	-0.014	-0.017	-0.002	-0.016	-0.015
	(0.73)	(1.16)	(1.35)	(0.17)	(0.75)	(0.71)
Term premium	-0.007***	-0.007***	(0.10)	-0.015***	-0.007***	0.115
	(8.00)	(4.07)	(1.12)	(15.36)	(3.12)	(0.72)
Credit rating	0.016***	0.006	0.013*	0.032***	0.003	0.003

	(3.18)	(0.88)	(1.82)	(3.17)	(0.23)	(0.24)
Constant	0.838***	0.303***	0.392*	1.940***	0.796***	0.557
	(13.80)	(3.56)	(1.73)	(11.26)	(6.52)	(1.45)
Industry fixed effects	Yes	No	No	Yes	No	No
Year fixed effects	Yes	No	Yes	Yes	No	Yes
Firm fixed effects	No	Yes	Yes	No	Yes	Yes
Observations	15,181	15,181	15,181	13,063	13,063	13,063
Adjusted R-squared	0.16	0.43	0.43	0.19	0.37	0.39

Panel B: Pilot CEOs and Alternative Measures of Short-term Debt

	ST2	ST3	ST5	STNP
Variable	(1)	(2)	(3)	(4)
Pilot CEO	-0.046**	-0.065***	-0.047**	-0.036***
	(2.57)	(3.05)	(2.14)	(3.42)
Size	-0.084***	-0.112***	0.006	0.048***
	(3.12)	(3.92)	(0.25)	(3.02)
Size squared	0.004**	0.005***	-0.002	-0.003***
	(2.45)	(3.13)	(1.27)	(2.99)
Market-to-book	0.003	-0.001	-0.003	0.002
	(0.59)	(0.30)	(0.61)	(0.70)
Abnormal earnings	0.001	0.002	-0.006	-0.005
	(0.01)	(0.12)	(0.43)	(0.74)
Asset maturity	0.001	0.001	0.001	0.001***
	(0.87)	(0.32)	(0.50)	(4.14)
Asset volatility	-0.093	-0.188	-0.188*	-0.055
	(0.86)	(1.62)	(1.81)	(0.89)
Leverage	-0.295***	-0.229***	-0.153***	-0.120***
	(10.69)	(7.45)	(5.05)	(8.37)
R&D	0.144	0.108	0.257	0.220*
	(0.72)	(0.51)	(1.32)	(1.73)
Missing R&D	-0.017	-0.026	-0.013	-0.018*
	(1.04)	(1.37)	(0.62)	(1.77)
Term premium	-0.186	-0.067	-0.02	-0.001
	(1.55)	(0.43)	(0.15)	(0.01)
Credit rating	0.003	0.005	0.019	0.007
	(0.30)	(0.41)	(1.57)	(1.26)
Constant	1.136***	1.098***	0.785**	-0.115
	(3.83)	(2.93)	(2.34)	(0.70)
Year effects	Yes	Yes	Yes	Yes
Firm fixed effects	Yes	Yes	Yes	Yes
Observations	13,149	13,120	12,834	15,181
Adjusted R-squared	0.43	0.40	0.45	0.49

Table 4

Pilot CEOs and Maturities of New Debt Issues

This table reports the estimated results of the maturities of new debt issues regressions. The dependent variable is *Bond Maturity*, which is calculated as the natural logarithm of the number of years from the date of issuance to the date of maturity. *Pilot CEO* is an indicator variable that takes a value of 1 if the CEO of a firm holds a FAA pilot certification at any point in time, and 0 otherwise. The definitions of other variables are provided in Appendix A. *t*-statistics based on heteroskedasticity-robust standard errors clustered by firms are reported in parentheses below the coefficient estimates. The symbols ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively.

Variable	(1)	(2)	(3)	(4)	(5)	(6)
Pilot CEO	0.173*	0.177*	0.223**	0.224**	0.715***	0.688**
	(1.88)	(1.87)	(2.46)	(2.37)	(2.76)	(2.51)
Size	0.058	0.112	0.028	0.042	0.283	0.13
	(0.53)	(1.03)	(0.21)	(0.31)	(0.68)	(0.31)
Size squared	-0.003	-0.006	-0.002	-0.003	-0.018	-0.019
	(0.51)	(0.91)	(0.31)	(0.33)	(0.73)	(0.78)
Market-to-book	-0.047**	-0.051**	-0.038*	-0.038*	-0.054	-0.061
	(2.30)	(2.49)	(1.65)	(1.65)	(0.94)	(1.02)
Abnormal earnings	0.016**	0.001	0.020**	0.004	0.016	-0.008
	(2.09)	(0.14)	(2.07)	(0.34)	(1.43)	(0.71)
Asset maturity	0.005***	0.004***	-0.001	-0.001	0.002	-0.002
	(3.20)	(3.07)	(0.34)	(0.77)	(0.80)	(0.74)
Asset volatility	-0.327	0.835	-0.859	0.18	-0.993	-0.001
	(0.59)	(1.28)	(1.49)	(0.27)	(1.15)	(0.05)
Leverage	-0.255***	-0.113	-0.212*	-0.042	-0.408*	-0.111
	(2.65)	(1.19)	(1.92)	(0.38)	(1.66)	(0.43)
R&D	0.288	0.135	0.503	0.292	-0.004	-0.021
	(0.31)	(0.14)	(0.51)	(0.28)	(0.09)	(0.01)
Missing R&D	0.029	0.016	0.045	0.043	0.078	0.083
	(0.72)	(0.40)	(0.80)	(0.76)	(0.54)	(0.61)
Term premium	0.023	(0.04)	0.024*	-0.041	0.031*	0.042
	(1.43)	(1.62)	(1.77)	(1.61)	(1.66)	(1.23)
Credit rating	-0.078**	-0.083**	-0.108***	-0.118***	0.012	-0.042
	(2.29)	(2.33)	(2.97)	(3.15)	(0.10)	(0.43)
Constant	2.031***	1.841***	2.713***	2.475***	1.30	2.69
	(4.17)	(3.69)	(5.45)	(4.79)	(0.78)	(1.51)
Year fixed effects	No	Yes	No	Yes	No	Yes

Industry fixed effects	No	No	Yes	Yes	No	No
Firm fixed effects	No	No	No	No	Yes	Yes
Observations	1,388	1,388	1,388	1,388	1,388	1,388
Adjusted R-squared	0.02	0.04	0.04	0.07	0.04	0.06

Table 5

Pilot CEOs and Cost of New Debt Issues

This table reports the estimated results of the yield spread regressions. The dependent variable is *Yield Spread*, which is measured as the difference between yield to maturity of new corporate bond issues and the yield to maturity of a Treasury bond with similar maturity. *Pilot CEO* is an indicator variable that takes a value of 1 if the CEO of a firm holds a FAA pilot certification at any point in time and 0 otherwise. *Bond Maturity* is calculated as the natural logarithm of the number of years from the date of issuance to the date of maturity. The definitions of other variables are provided in Appendix A. *t*-statistics based on heteroskedasticity-robust standard errors clustered by firms are reported in parentheses below the coefficient estimates. The symbols ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively.

Variable	(1)	(2)	(3)	IV Regression Model (4)	Simultaneous Estimation Model (5)
Pilot CEO	0.001*	0.001*	0.008**	0.013**	0.007**
	(1.88)	(1.89)	(2.46)	(1.99)	(2.05)
Bond maturity		0.001*		0.006*	
		(1.72)		(1.69)	
Size	-0.009***	-0.009***	0.008	0.005	0.007
	(3.52)	(3.50)	(1.37)	(0.63)	(1.02)
Size squared	0.001***	0.001***	0.001	0.001	0.001
	(3.37)	(3.36)	(1.62)	(0.32)	(1.04)
Asset volatility	0.055***	0.055***	0.018	0.073***	0.021**
	(4.92)	(4.94)	(1.09)	(4.02)	(2.08)
Average return	-0.068***	-0.068***	-0.058***	-0.155***	-0.07***
	(4.93)	(4.97)	(2.68)	(8.98)	(4.32)
Credit rating	0.003***	0.003***	0.003***	0.003***	0.003***
	(17.31)	(17.26)	(6.61)	(9.32)	(11.49)
ROS	-0.006*	-0.006*	-0.016*	-0.017***	-0.021***
	(1.93)	(1.96)	(1.85)	(3.30)	(4.39)
Leverage	-0.001	-0.001	-0.005	-0.002	-0.007
	(0.28)	(0.24)	(0.76)	(0.56)	(1.46)
Interest coverage	0.004***	0.004***	0.002	0.001	0.003**
	(2.68)	(2.67)	(1.30)	(0.72)	(2.18)
Issue size	0.001*	0.001*	0.001**	0.002**	0.001*
	(1.76)	(1.72)	(2.03)	(2.42)	(1.95)
Term premium	0.001	0.001	0.001	-0.001	-0.004

	(0.52)	(0.57)	(0.49)	(1.07)	(0.12)
Constant	0.012	0.011	-0.063**	-0.086**	-0.053
	(0.83)	(0.76)	(2.17)	(2.38)	(0.47)
Industry fixed effects	Yes	Yes	No	No	No
Year fixed effects	Yes	Yes	Yes	Yes	Yes
Firm fixed effects	No	No	Yes	Yes	Yes
Observations	1,290	1,290	1,290	1,290	1,290
Adjusted R-squared	0.68	0.68	0.75	0.77	0.69

Table 6

Pilot CEOs and Short-term Debt: Controlling for Endogeneity

This table reports the results of the IV *short-term debt 1* and *short-term debt 4* regression models and simultaneous estimation model. The dependent variables of the second-stage regressions are *ST1* and *ST4*. *ST1* is the ratio of debt maturing within 1 year to total debt. *ST4* is the ratio of debt maturing within 4 years to total debt. *Pilot CEO* is an indicator variable that takes a value of 1 if the CEO of a firm holds a FAA pilot certification at any point in time and 0 otherwise. The IV short-term debt models use PPE as an instrument variable for financial leverage. The definitions of other variables are provided in Appendix A. *t*-statistics based on heteroskedasticity-robust standard errors clustered by firms are reported in parentheses below the coefficient estimates. The symbols ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively.

	IV Regression Model		Simultaneous Estimation Model	
	ST1	ST4	ST1	ST4
Variable	(1)	(2)	(3)	(4)
Pilot CEO	-0.027**	-0.029*	-0.020*	-0.031*
	(2.03)	(1.90)	(1.72)	(1.74)
Size	-0.117***	-0.237***	-0.152***	-0.255***
	(3.10)	(8.22)	(6.70)	(7.88)
Size squared	0.007***	0.012***	0.009***	0.013***
	(3.82)	(8.24)	(7.65)	(7.68)
Market-to-book	0.016***	0.013***	0.014***	0.012***
	(4.45)	(3.24)	(5.40)	(2.82)
Abnormal earnings	-0.030*	-0.031*	-0.015	-0.004
	(1.73)	(1.74)	(1.12)	(0.22)
Asset maturity	0.001	-0.001***	-0.001	-0.003***
	(0.30)	(2.71)	(1.50)	(4.69)
Asset volatility	-0.816	-0.659	-0.097	-0169
	(1.17)	(1.15)	(0.23)	(0.25)
Instrumented leverage	-0.934	-0.596	-0.296	-0.051
	(1.59)	(1.34)	(0.83)	(0.09)
R&D	0.305***	0.157	0.259***	0.294***
	(2.82)	(1.56)	(3.57)	(2.91)
Missing R&D	0.007	0.003	-0.007	-0.008
	(0.50)	(0.26)	(0.60)	(0.58)
Term premium	-0.151	0.152	-0.011	-0.031**
	(1.48)	(0.96)	(1.24)	(2.53)
Credit rating	0.046	0.047*	0.015	0.027

	(1.49)	(1.85)	(0.80)	(0.88)
Constant	1.208***	1.484***	1.137***	1.911***
	(4.98)	(4.02)	(13.10)	(10.46
Industry fixed effects	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes
Observations	15,181	13,063	15,181	13,063
Underidentification test:				
Kleibergen–Paap Wald *F* statistic	20.23***	20.48***		
Weak identification test:				
Cragg–Donald Wald F statistic	20.14***	20.37***		

Table 7

Pilot CEOs and Short-term Debt: Addressing Possible Endogenous Matching between Firm and CEO

This table reports the results of the short-term debt regressions after controlling for the corporate short-term debt ratio in the year preceding CEO appointment. The dependent variables are *ST1* and *ST4*. *ST1* is the ratio of debt maturing within 1 year to total debt. *ST4* is the ratio of debt maturing within 4 years to total debt. *Pilot CEO* is an indicator variable that takes a value of 1 if the CEO of a firm holds a FAA pilot certification at any point in time and 0 otherwise. *Previous ST1* and *Previous ST4* are the firm's *ST1* and *ST4* in the year before the CEO takes office. The definitions of other variables are provided in Appendix A. *t*-statistics based on heteroskedasticity-robust standard errors clustered by firms are reported in parentheses below the coefficient estimates. The symbols ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively.

	ST1			ST4		
Variable	(1)	(2)	(3)	(4)	(5)	(6)
Pilot CEO	-0.037***	-0.048***	-0.051***	-0.025**	-0.065**	-0.062**
	(5.29)	(3.09)	(3.28)	(2.49)	(2.32)	(2.19)
Previous ST1	0.274***	0.022	0.024			
	(14.33)	(1.17)	(0.80)			
Previous ST4				0.208***	-0.028	-0.028
				(11.74)	(1.28)	(1.28)
Other control variables	Yes	Yes	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	No	No	Yes	No	No
Year fixed effects	Yes	No	Yes	Yes	No	Yes
Firm fixed effects	No	Yes	Yes	No	Yes	Yes
Observations	12,751	12,751	12,751	9,919	9,919	9,919
Adjusted R-squared	0.22	0.43	0.43	0.22	0.38	0.40

Table 8

Other CEO Characteristics, Pilot CEOs, and Short-term Debt

This table reports the results of the short-term debt regressions after controlling for CEO overconfidence, CEO military experience, and CEO managerial general ability in Panels A, B and C, respectively. The dependent variables are *ST1* and ST4. ST1 is the ratio of debt maturing within 1 year to total debt. *ST4* is the ratio of debt maturing within 4 years to total debt. *Pilot CEO* is an indicator variable that takes the value of 1 if the CEO of a firm holds a FAA pilot certification, and 0 otherwise. *Overconfidence* is an indicator variable that equals to 1 if CEO's option is more than 100% moneyness. *Military experience* is an indicator variable that takes a value of 1 if CEO has military experience, and 0 otherwise. *Managerial ability* is an index developed by Custódio et al. (2013b) to measure the CEOs' general skills. The definitions of other variables are provided in Appendix A. *t*-statistics based on heteroskedasticity-robust standard errors clustered by firms are reported in parentheses below the coefficient estimates. The symbols ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively.

Panel A: CEO Overconfidence, Pilot CEOs, and Short-term Debt

	ST1			ST4		
Variable	(1)	(2)	(3)	(4)	(5)	(6)
Pilot CEO	-0.018**	-0.047***	-0.049***	-0.025**	-0.078***	-0.078***
	(2.27)	(3.31)	(3.49)	(1.98)	(3.49)	(3.44)
Overconfidence	0.010**	0.005	-0.003	0.015***	0.009	0.006
	(2.52)	(1.19)	(0.61)	(3.30)	(1.46)	(0.94)
Other control variables	Yes	Yes	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	No	No	Yes	No	No
Year fixed effects	Yes	No	Yes	Yes	No	Yes
Firm fixed effects	No	Yes	Yes	No	Yes	Yes
Observations	15,181	15,181	15,181	13,063	13,063	13,063
Adjusted R-squared	0.16	0.43	0.43	0.19	0.37	0.39

Panel B: CEO Military Experience, Pilot CEOs, and Short-term Debt

	Short-term debt 1 (ST1)			Short-term debt 4 (ST4)		
Variable	(1)	(2)	(3)	(4)	(5)	(6)
Pilot CEO	-0.018**	-0.047***	-0.049***	-0.026*	-0.081***	-0.080***
	(2.15)	(3.36)	(3.50)	(2.06)	(3.65)	(3.60)
Military experience	-0.006	0.017	0.012	0.016	0.037**	0.037**
	(0.54)	(1.36)	(0.92)	(1.61)	(2.06)	(2.06)
Other control variables	Yes	Yes	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	No	No	Yes	No	No
Year fixed effects	Yes	No	Yes	Yes	No	Yes

Firm fixed effects	No	Yes	Yes	No	Yes	Yes
Observations	15,181	15,181	15,181	13,063	13,063	13,063
Adjusted R-squared	0.16	0.43	0.43	0.19	0.37	0.39

Panel C: Managerial Ability, Pilot CEOs, and Short-term Debt

	Short-term debt 1 (ST1)			Short-term debt 4 (ST4)		
Variable	(1)	(2)	(3)	(4)	(5)	(6)
Pilot CEO	-0.017**	-0.047***	-0.048***	-0.023*	-0.079***	-0.077***
	(2.14)	(3.31)	(3.47)	(1.83)	(3.50)	(3.44)
Managerial ability	0.010**	0.007*	0.005	0.015***	0.019***	0.020***
	(2.44)	(1.79)	(1.30)	(3.53)	(3.71)	(3.85)
Other control variables	Yes	Yes	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	No	No	Yes	No	No
Year fixed effects	Yes	No	Yes	Yes	No	Yes
Firm fixed effects	No	Yes	Yes	No	Yes	Yes
Observations	15,181	15,181	15,181	13,063	13,063	13,063
Adjusted R-squared	0.16	0.43	0.43	0.19	0.37	0.39

Panel D: CEO Personality Traits, Pilot CEOs, and Short-term Debt

	Short-term debt 1 (ST1)			Short-term debt 4 (ST4)		
Variable	(1)	(2)	(3)	(4)	(5)	(6)
Pilot CEO	-0.016**	-0.047***	-0.049***	-0.024*	-0.079***	-0.078***
	(1.99)	(3.58)	(3.94)	(1.70)	(3.52)	(3.46)
Managerial ability	0.010**	0.006*	0.005	0.015***	0.018***	0.019***
	(2.39)	(1.92)	(1.59)	(3.64)	(3.56)	(3.73)
Overconfidence	0.010**	0.004	-0.003	0.015**	0.008	0.006
	(2.49)	(1.13)	(0.62)	(2.41)	(1.35)	(0.90)
Military experience	-0.008	0.015	0.011	0.013	0.033*	0.031*
	(0.75)	(1.19)	(0.81)	(0.99)	(1.79)	(1.83)
Other control variables	Yes	Yes	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	No	No	Yes	No	No
Year fixed effects	Yes	No	Yes	Yes	No	Yes
Firm fixed effects	No	Yes	Yes	No	Yes	Yes
Observations	15,181	15,181	15,181	13,063	13,063	13,063
Adjusted R-squared	0.17	0.43	0.45	0.19	0.38	0.39

Table 9

Corporate Governance, Pilot CEOs, and Short-term Debt

This table reports the results of the short-term debt regressions after controlling for corporate governance measures. The dependent variables are *ST1* and *ST4*. *ST1* is the ratio of debt maturing within 1 year to total debt. *ST4* is the ratio of debt maturing within 4 years to total debt. *Pilot CEO* is an indicator variable that takes a value of 1 if the CEO of a firm holds a FAA pilot certification, and 0 otherwise. The *GIM index,* developed by Gompers, Ishii, and Metrick (2003), is the number of anti-takeover provisions adopted by a firm. *Blockholder ownership* is the sum of ownership of blockholders who hold at least 5% of the firms' common equity. *CEO delta (CEO vega)* measures the CEO wealth sensitivity to a $1 change in stock price (0.01 change in stock return volatility). The *E-index,* developed by Bebchuk, Cohen, and Ferrell (2009), is the Entrenchment Index measuring the adoption of six important anti-takeover provisions. The definitions of other variables are provided in Appendix A. *t*-statistics based on heteroskedasticity-robust standard errors clustered by firms are reported in parentheses below the coefficient estimates. The symbols ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively.

Panel A: Pilot CEOs and Short-term Debt, Controlling for CEO Delta and CEO Vega

	Short-term debt 1 (ST1)			Short-term debt 4 (ST4)		
Variable	(1)	(2)	(3)	(4)	(5)	(6)
Pilot CEO	-0.014*	-0.039**	-0.038*	-0.023*	-0.141***	-0.139***
	(1.79)	(1.99)	(1.90)	(1.87)	(5.31)	(5.28)
CEO delta	-0.001	-0.001**	-0.001**	-0.001	-0.001	-0.001
	(1.38)	(2.37)	(2.40)	(1.04)	(0.05)	(0.12)
CEO vega	0.001**	-0.001	-0.001	0.001**	0.001	0.001
	(2.36)	(0.77)	(0.71)	(1.98)	(0.50)	(0.79)
Other control variables	Yes	Yes	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	No	No	Yes	No	No
Year fixed effects	Yes	No	Yes	Yes	No	Yes
Firm fixed effects	No	Yes	Yes	No	Yes	Yes
Observations	10,059	10,059	10,059	8,530	8,530	8,530
Adjusted R-squared	0.16	0.45	0.45	0.19	0.41	0.42

Panel B: Pilot CEOs and Short-term Debt: Controlling for GIM index, Blockholder Ownership, CEO Delta, and CEO Vega

	Short-term debt 1 (ST1)			Short-term debt 4 (ST4)		
Variable	(1)	(2)	(3)	(4)	(5)	(6)
Pilot CEO	-0.053***	-0.079*	-0.080*	-0.031*	-0.224***	-0.233***
	(3.37)	(1.89)	(1.90)	(1.72)	(3.62)	(3.76)
GIM index	0.001	0.002	0.004	-0.004*	-0.005	-0.003
	(0.01)	(0.37)	(0.84)	(1.80)	(0.67)	(0.35)

Blockholder ownership	-0.038*	-0.052	-0.042	-0.112**	-0.059	-0.042
	(1.65)	(1.32)	(1.03)	(2.41)	(1.02)	(0.71)
CEO delta	-0.001**	0.001	0.001	-0.001	0.001	0.001
	(2.25)	(0.50)	(0.53)	(1.10)	(0.47)	(0.32)
CEO vega	0.001**	0.001	0.000*	0.001	-0.001	-0.001
	(2.46)	(1.60)	(1.92)	(0.04)	(0.17)	(0.34)
Other control variables	Yes	Yes	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	No	No	Yes	No	No
Year fixed effects	Yes	No	Yes	Yes	No	Yes
Firm fixed effects	No	Yes	Yes	No	Yes	Yes
Observations	3,767	3,767	3,767	3,172	3,172	3,172
Adjusted R-squared	0.17	0.50	0.50	0.18	0.45	0.45

Panel C: Pilot CEOs and Short-term Debt: Controlling for the E-index, Blockholder Ownership, CEO Delta and CEO Vega

	Short-term debt 1 (ST1)			Short-term debt 4 (ST4)		
Variable	(1)	(2)	(3)	(4)	(5)	(6)
Pilot CEO	-0.089***	-0.152***	-0.148***	-0.032	-0.253***	-0.260***
	(3.40)	(3.13)	(3.04)	(1.08)	(3.66)	(3.76)
E-index	0.001	-0.004	-0.001	-0.001	-0.017	-0.016
	(0.38)	(0.46)	(0.03)	(0.20)	(1.26)	(1.19)
Blockholder ownership	-0.068**	-0.105**	-0.093**	-0.112**	-0.09	-0.069
	(2.85)	(2.30)	(2.00)	(2.16)	(1.36)	(1.03)
CEO delta	-0.001**	-0.001	-0.001	-0.001	-0.001	-0.001
	(2.55)	(0.26)	(0.22)	(1.41)	(0.77)	(0.91)
CEO vega	0.001**	0.001	0.001*	-0.001	-0.001	-0.001
	(2.40)	(1.35)	(1.68)	(0.15)	(0.34)	(0.40)
Other control variables	Yes	Yes	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	No	No	Yes	No	No
Year fixed effects	Yes	No	Yes	Yes	No	Yes
Firm fixed effects	No	Yes	Yes	No	Yes	Yes
Observations	3,125	3,125	3,125	2,656	2,656	2,656
Adjusted R-squared	0.18	0.51	0.51	0.18	0.45	0.45

Table 10

Pilot CEOs and Distance to Default

This table reports the results of the distance to default regressions. The dependent variable is *distance to default*, which is calculated according to the Kealhofer Merton Vasicek (KMV) model. *Pilot CEO* is an indicator variable that takes a value of 1 if the CEO of a firm holds a FAA pilot certification, and 0 otherwise. The money supply M2 is obtained from St. Louis Federal Reserve FRED database. The definitions of other variables are provided in Appendix A. *t*-statistics based on heteroskedasticity-robust standard errors clustered by firms are reported in parentheses below the coefficient estimates. The symbols ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively.

Variable	(1)	(2)
Pilot CEO	-0.642**	-0.773***
	(2.13)	(3.01)
Size	-1.169***	-0.48
	(2.76)	(1.26)
Size squared	0.088***	0.007
	(3.29)	(0.28)
Market-to-book	0.882***	0.664***
	(4.75)	(4.59)
Abnormal earning	0.234***	0.08
	(3.02)	(1.51)
Asset maturity	0.003	-0.004**
	(1.34)	(2.22)
Asset volatility	-40.670***	-20.989***
	(20.04)	(14.21)
Leverage	-14.918***	-12.720***
	(20.51)	(19.88)
R&D	-0.966	-0.137
	(0.63)	(0.09)
Missing R&D	0.026	0.404*
	(0.10)	(1.83)
Term premium	-0.002	2.912***
	(0.06)	(33.01)
Credit rating	-0.633***	-1.030***
	(3.90)	(7.27)
Constant	17.115***	12.892***
	(9.52)	(7.96)
Year fixed effects	No	Yes

Firm fixed effects	Yes	Yes
Observations	15,181	15,181
Adjusted R-squared	0.56	0.68