

CEO Narcissism, Management Team Characteristics, and Corporate Credit Risk

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Abstract

We empirically investigate whether and how CEO narcissism affects a firm's credit risk from the new potential mechanisms of management team characteristics. We first find that CEO narcissism is significantly and positively related to corporate credit risk (measured by bond yield spread) via the theoretical channels of increasing asset value volatility and financial constraint due to the risk-taking behaviors of a narcissistic CEO. In addition, we provide the new evidences that CEO narcissism boosts firm credit risk under the situations that top management team have higher levels of shared working experience and social networks, which both enforce the CEO risk-taking incentives and thus increase CEO narcissism effect on bondholders. Moreover, we also find that subordinate executives' power weakens the CEO narcissism effect due to the internal monitoring function. Finally, our findings are robust when considering the endogeneity issue.

Keywords: CEO narcissism; Credit risk; Management team characteristics; Shared working experience; Social network; Bond yield spread

I. Introduction

Many studies in the credit risk literature explore the determinants of corporate credit risk from the perspective of firm idiosyncratic risks, such as financial leverage (Merton, 1974; Collin-Dufresne et al., 2001), equity volatility (Merton, 1974; Campbell and Taksler, 2003), firm profitability (Merton, 1974; Collin-Dufresne et al., 2001), and incomplete accounting information (Duffie and Lando, 2001; Yu, 2005; Lu et al., 2010; Bonsall IV and Miller, 2017; Chen and Tseng, 2021). However, most of these risks result from managerial decision-making for corporate operations, investments, and financing policies, especially decision-making by CEOs. Hence, several recent studies explore the determinants of firm credit risk from the perspective of managers' individual characteristics, such as CEO ability (Bonsall IV et al., 2017a) and CEO overconfidence (Lin et al., 2020). However, CEO narcissism, a CEO personality trait, is rarely discussed in the credit risk literature. Since narcissism can reflect an individual's psychological construct information (Olsen et al., 2014), CEO narcissism affects a firm's management decisions, including investment policies (Ham et al, 2018), earnings management activities (Olsen et al., 2014), and risk-taking behaviors (Campbell et al., 2004; Chatterjee and Hambrick, 2011), which may in turn shape a firm's observed asset value distributions and contribute to a firm's idiosyncratic risks. Therefore, the purpose of this study is to address this important gap by investigating the effects of CEO narcissism on corporate credit risk (measured by bond yield spread).

According to the definitions of American Psychiatric Association (APA, 2000) and Olsen et al. (2014), narcissism is a psychological construct defined as a sense of arrogance, exhibitionism, exploitativeness, entitlement, vanity, self-absorption, self-admiration, self-importance, and uniqueness. A narcissistic CEO generally lacks empathy and cares little about others' feelings, which can affect the CEO's management decisions. Studies in the finance and accounting literature have discussed the effect of CEO narcissism on management decisions.

A narcissistic CEO may engage in more overinvestments (Ham et al., 2018)¹, exhibit more risk-taking behaviors (Campbell et al., 2004; Chatterjee and Hambrick 2011), generate lower financial productivity (Ham et al., 2018), higher financial burden (Chatterjee and Hambrick, 2007), more volatile financial performance (Chatterjee and Hambrick, 2007), engage in more earnings management activities (Olsen et al., 2014), and maintain higher observed stock prices (Olsen et al., 2014)², to seek recognition and social praise, act out self-importance, self-admiration, and exhibitionism, and draw the attention of others. Yet, CEO narcissism may be also beneficial for firm value and future growth. For instance, narcissistic CEOs have found to be closely related to firm innovation and growth strategies, because of the high competitive enthusiasm of the narcissistic personality. This finding is consistent with Cragun, Olsen, and Wright (2020), who identify a positive association between CEO narcissism and financial performance/ future growth. Using an experimental design, Byrne and Worthy (2013) find that narcissists exhibit better decision quality than non-narcissists when adding misleading information. These results demonstrate that narcissists possess better ability to filter misinformation and ambiguous information, perhaps leading to better decision-making quality.

The above discussions further suggest that (1) CEO narcissism may lead to an increase in firm asset value variation because of overinvestment and riskier behaviors in pursuit of higher future growth, resulting in more volatile financial performance;³ (2) CEO narcissism may have an uncertain impact on firm asset value based on several competing perspectives by exhibiting short-sighted behaviors (Vazire and Funder 2006; Giampetro-Meyer et al. 1998), having better decision quality (Byrne and Worthy, 2013) and engaging in more uncertain investments to

¹ Ham et al. (2018) demonstrate that a narcissistic CEO is more likely to have higher likelihood of overinvestment, primarily consisting of M&A and R&D expenditures rather than capital expenditures.

² Olsen et al. (2014) suggest that CEO narcissism is positively related to higher (observed) stock price by managing reported accounting numbers or releasing additional market-favorable information (not included in reported accounting numbers) to outside investors.

³ Engaging in more earnings management activities and maintaining higher observed earnings per share and stock price both increase the assessed variance of firm asset value (Lambert et al., 2007; Chen et al., 2015).

pursue future growth (which results in lower financial productivity; Ham et al., 2018) or improve their self-image (Anderson and Tirrell, 2004)⁴; (3) CEO narcissism may lead to an increase in financial constraint due to higher financial burden and more risk-taking behaviors; and (4) CEO narcissism may lead to an increase in future growth because of the CEO's desire for recognition and social praise, acting out of self-importance, self-admiration, and exhibitionism, and desire for attention. Hence, based on the above discussions, CEO narcissism increases a firm's asset value volatility resulting from overinvestments and risk-taking behaviors, increases the firm's financial constraint, and has an uncertain impact on the firm's asset value, because narcissistic CEOs may focus on short-term performance, have better decision quality, and take on more risky investments to improve their self-image and pursue future growth. According to the structural form credit risk models of Merton (1974) and Duffie and Lando (2001), asset volatility, default threshold, and incomplete accounting information essentially and theoretically have a positive association with firm credit risk while asset value has the opposite association. Therefore, based on the above discussions, this study theoretically hypothesizes that CEO narcissism is positively associated with corporate credit risk from the perspectives of asset volatility and financial constraint, while having an uncertain impact from the perspective of asset value.

In addition to the above mentioned theoretical channels of structural form credit risk models, this study proposes another new two mechanisms that change the CEO narcissism effect on bondholders' wealth, including top management team (hereafter denoted as TMT) shared working experience and TMT social networks. For the mechanism of TMT shared working experience, higher TMT shared working experience leads to a higher likelihood of groupthink show symptoms (Esser, 1998; Turner and Pratkanis, 1998; Zhang, 2019)⁵, the more

⁴ Cragun et al. (2020) demonstrate a combined meta-analytic and narrative review of CEO narcissism.

⁵ Some common examples for the groupthink show symptoms for TMT are incomplete information search, selective information processing, rationalization of their behaviors, and so on.

routine and less flexible communications (Katz,1982; Keck, 1997), and the higher possibility of other team members' passive management or collusion with the CEO (Katz, 1982; Daboub et al., 1995; Grijalva et al., 2020). Hence, higher TMT shared working experience leads a narcissistic CEO to take more risky behaviors and overinvestments, which thus enhances the positive effect of CEO narcissism on corporate credit risk. For the mechanism of TMT social networks, social network is one of core social capital components (Ferris et al., 2017). Managers' social networks not only intensify the managers' sense of power but also provide a risk-sharing mechanism (e.g. Allen and Gale, 1997; Acemoglu and Zilibotti, 1997; Ambrus et al., 2014; Ferris et al., 2017), which increases the incentives of the managers with more social networks to engage in more risk-taking behaviors and riskier financial policy (Begley et al., 1996; Ferris et al., 2017). Hence, higher TMT social networks generate more social capital for the narcissistic CEO and lead the narcissistic CEO to have less concern on risk-taking behaviors, which thus enhances the positive effect of CEO narcissism on corporate credit risk. The above two mechanisms, TMT shared working experience and social networks, both suggest that TMT characteristics play the important role for the positive effect of CEO narcissism on corporate credit risk

In addition, this study also introduces the measure of internal governance quality and discusses whether the subordinate executives' relative power moderates the positive effect of CEO narcissism on corporate credit risk. For the subordinate executives' relative power, higher subordinate executives' relative power suggests better internal governance quality (Cheng et al., 2016). Hence, higher subordinate executives' relative power implies better monitoring mechanisms on CEO decisions, which leads a narcissistic CEO to have less incentive to engage in risk-taking behaviors and thus weakens the positive effect of CEO narcissism on corporate credit risk.

It is worth noting that there are several psychological and behavioral differences between

narcissism and overconfidence. A narcissistic individual is generally less experience-driven and establishes their image of superiority through achieving status and esteem (Olsen et al., 2014). By contrast, an overconfident individual has a tendency to generally overrate his or her ability, knowledge, and information because of previous experiences or successes, which lead the individual to expect and seek to achieve more desirable outcomes beyond those based on realistic evaluations (Bhandari and Deaves, 2006; Hsieh et al., 2014).⁶ That is, an overconfident person's decision making is driven primarily by inflated optimism about future outcomes based on previous successes. Unlike overconfident individuals, narcissistic individuals generally have strong incentives to seek others' attention and recognition (Campbell et al., 2004). Narcissistic individuals still believe they will do well in the future even though they have failure experiences, which leads them to accept more risks (Chatterjee and Hambrick, 2011; Campbell et al., 2004). The above suggests that the idea of narcissism covers CEO personality traits that are different from those driving overconfidence. Given the foregoing discussion, unlike previous studies, this work explores the effect of CEO narcissism on corporate credit risk.

This study empirically examines the effect of CEO narcissism on corporate credit risk by employing 8,397 American bond observations from 2008 to 2018. CEO narcissism is measured using the composition of the prominence of a CEO's photograph in annual reports, the CEO's photograph size, and the CEO's signature size. The controls of well-known variables that affect corporate bond yield spread are also considered in our empirical models, such as firm characteristics variables (e.g. financial leverage, equity volatility, firm asset size, firm age, return on assets, operating cash flow volatility) and bond features (e.g. coupon, bond age, maturity, issuance amount, and bond credit rating). This study finds that CEO narcissism is significantly and positively related to corporate bond yield spread (namely credit risk),

⁶ CEO overconfidence is based on the "better-than-average" effect in social psychology literature (Larwood and Whittaker, 1977; Svenson, 1981; Alicke, 1985), which indicates that an overconfident CEO to have an inflated belief about owning better ability, knowledge, and decision-making judgments beyond an average benchmark.

indicating that bondholders care more about the increase in asset value volatility and financial constraint than the increase in asset value due to the risk-taking behaviors conducted by a narcissistic CEO. The above implications are also empirically supported by the results of path analyses showing that the positive effect of CEO narcissism on bond yield spread is mainly through the channels of asset volatility, financial constraint, and market-to-book value ratio while the negative effect of CEO narcissism on bond yield spread is through the channel of asset value.

In addition to the above mentioned theoretical channels of structural form credit risk models, we also provide empirical evidences for the newly proposed two mechanisms related to TMT characteristics. We find that CEO narcissism boosts firm credit risk via the channels of having higher TMT shared working experience and TMT social networks. The results support the arguments that higher likelihood of other team members' passive management or collusion with CEO and higher possibility of owing large scale of social capital both increase the likelihood of a narcissistic CEO's overinvestment and risk-taking behaviors, which thus increase firm credit risk. Moreover, we also find that subordinate executives' relative power weakens the effect of CEO narcissism on firm credit risk. This is mainly because higher subordinate executives' relative power (namely internal governance, Cheng et al., 2016) provides better monitoring mechanism, which reduces the likelihood of a narcissistic CEO's overinvestment and risk-taking behavior and weaken the positive effect CEO narcissism. Moreover, we also find that bondholders are less concerned about a narcissistic CEO with better corporate governance quality. This is mainly because better corporate governance quality provides higher levels of monitors and controls for the narcissistic CEO, leading the CEO to take on less risky investments that hurt bondholders' wealth.

The endogeneity issue is considered and discussed in this study. Since CEO narcissism is closely related to an individual's innate traits and the personality traits do not change much after the age of 40 (Roberts et al., 2006; McCrae and Costa, 1982), an individual narcissistic

trait is likely to be viewed as exogenous. Thus, endogeneity issues such as reverse causality problems become less serious. To provide more convincing evidence, we also employ the difference-in-difference (DID) design to mitigate endogeneity issues of omitted variables, reverse causality, and measurement errors. The results of DID design are consistent with our main findings. In addition, our conclusions still hold when considering the bond- and year-level fixed effects and bond-level clustered issue. Therefore, our findings that CEO narcissism has a positive impact on bond yield spread are robust with respect to endogeneity issues.

The main contributions of this study include: (1) introducing the importance and implications of CEO narcissism for bondholders and debtholders; (2) proposing two new potential mechanisms for the effect of CEO narcissism on firm credit risk from the perspectives of TMT characteristics (namely TMT shared working experience and TMT social networks) in addition to those of traditional structural form credit risk models; and (3) investigating whether corporate governance quality moderate the effects of CEO narcissism on corporate credit risk and bondholders' welfare. This study thus contributes to both the bond yield spread (credit risk) literature and the CEO personality traits literature. Our findings also provide practical references for creditor banks in making credit decisions.

The remainder of this paper is organized as follows. Section 2 demonstrates the measures of CEO narcissism. Section 3 presents hypotheses developments. Section 4 summarizes other major variables used in the empirical examinations. Section 5 presents and analyzes empirical results. Finally, section 6 provides concluding remarks.

II. Main Measures

To measure CEO narcissism, this study follows Olsen et al. (2014) and employs the composite variable of the prominence of the CEO's photograph in annual reports (P_CEO), the ratio of the cash pay of the CEO to that of the executive with the second-highest compensation

(R_CH), and the ratio of the non-cash pay of the CEO to the executive with the second-highest compensation (R_NCH), denoted Nar_Def1. In addition, the study also introduces CEO photograph size and CEO signature size (Zweigenhaft, 1977; Ham et al., 2018) and develops two aggregate variables to measure CEO narcissism: a composite variable of the P_CEO variable and a CEO's photograph size in annual reports (PSIZE_CEO, measured by the square area of CEO photo image) and a composite variable of the P_CEO variable, PSIZE_CEO variable, the CEO signature size in annual reports (SSIZE_CEO, measured by the square area of CEO signature image).⁷ The detailed estimations of the Nar_Def1, Nar_Def2, and Nar_Def3 variable are given below.

For the Nar_Def1 variable, we follow Olsen et al. (2014) in defining the prominence of the CEO's photograph in annual reports. In this study, the score of the prominence of the CEO's photograph is 1 when there is no photograph of the CEO in annual reports, 2 when the CEO is photographed with other executives, 3 when the CEO's photograph is presented alone and its illustration covers less than half the page, 4 when the CEO's photograph is presented alone and its illustration covers more than half the page with some space below the photograph, and 5 when the CEO's photograph is presented alone and its illustration covers the whole page. P_CEO is defined as the average of the score of the prominence of the CEO's photograph during the second and third year of the CEO's tenure. Second, following Olsen et al. (2014), an executive's cash pay is defined as the sum of salary and bonus while non-cash pay is measured by total compensation (TDC1 in ExecuComp) less cash compensation. The R_CH (R_NCH) variable is estimated by the average of the ratio of the CEO's salary and bonus (non-cash compensation) to that of executive who is the second-highest paid during the second and

⁷ To measure CEO photograph size and CEO signature size, this study employs the square area (product of the length and the width) of the image (unit: pixel) as the measure for the CEO photograph size and CEO signature size. The method is different from that of Ham et al. (2018), in which the square area of the CEO's signature is defined as a rectangle drawn around the CEO's signature, with the rectangle in alignment with the most extreme endpoints of the signature. The average area of the CEOs' signatures is 6.3 cm, and the average area-per-letter is 0.5 cm using S&P 500 component firms (Ham et al., 2018).

third year of the CEO's tenure. After calculating the original values of P_{CEO}, R_{CH}, and R_{NCH} variables, we calculate the average of the standardized values of P_{CEO}, R_{CH}, and R_{NCH}, terming the result Nar_{Comp1}. We then define Nar_{Def1} as equaling 1 if Nar_{Comp1} is greater than its average and 0 if otherwise.

For the Nar_{Def2} (Nar_{Def3}) variable, we use a similar method to calculate the average of the standardized values of P_{CEO} and P_{SIZE}_{CEO} (P_{CEO}, P_{SIZE}_{CEO}, and S_{SIZE}_{CEO}) variables, denoted Nar_{Comp2} (Nar_{Comp3}). We then define Nar_{Def2} (Nar_{Def3}) as equaling 1 if Nar_{Comp2} (Nar_{Comp3}) is greater than its average and 0 if otherwise.

III. Hypotheses Development

In this section we develop hypotheses regarding the effects of CEO narcissism on firm credit risk. First, in seeking recognition and attention and acting out self-importance, self-admiration, and exhibitionism, CEO narcissism may lead to: (1) an increase in a firm's asset value volatility through more overinvestments (Ham et al., 2018) and more risk-taking behaviors (Campbell et al., 2004; Chatterjee and Hambrick, 2011); (2) an increase in financial constraint due to higher financial burden and more risk-taking behaviors; (3) an uncertain impact on firm asset value due to the competing perspectives of short-sighted behaviors (Vazire and Funder 2006; Giampetro-Meyer et al. 1998), better decision quality (Byrne and Worthy, 2013) and taking on more uncertain investments to pursue future growth (Ham et al., 2018) and improve the CEO's self-image (Anderson and Tirrell, 2004);⁸ and (4) an increase in the likelihood of higher future growth due to more investments in the current period.

⁸ Vazire and Funder (2006) and Giampetro-Meyer et al. (1998) demonstrate that a narcissistic individual is likely to exhibit short-sighted behaviors and neglect long-term outcomes. However, Ham et al. (2018) find that CEO narcissism is positively related to overinvestments (particularly in R&D and M&A expenditures) and is negatively related to profitability and operating cash flows.

Second, based on structural form credit risk models of Merton (1974) and Duffie and Lando (2001), asset value, asset value volatility, default threshold, and incomplete accounting information represent the four main components of firm credit risk. The latter three have a positive association with firm credit risk while the first has the opposite association.

Based on the foregoing discussion, this study concludes: (1) CEO narcissism is positively associated with corporate credit risk from the theoretical perspectives of asset value volatility, and financial constraint, while having an uncertain effect on asset value (Merton, 1974; Duffie and Lando, 2001). We thus construct Hypothesis 1.

***Hypothesis 1.** A firm's CEO narcissism is associated with firm credit risk from the theoretical perspectives of structural form credit risk models.*

***Hypothesis 1a.** A firm's CEO narcissism is positively associated with firm credit risk from the theoretical perspectives of asset value volatility and financial constraint.*

***Hypothesis 1b.** A firm's CEO narcissism has an uncertain association with firm credit risk from the theoretical perspective of asset value.*

In addition to the above mentioned theoretical channels, this study proposes another new potential two mechanisms that may change the CEO narcissism effect on bondholders' wealth from the perspectives of management team characteristics, covering TMT shared working experience and TMT social networks. The two potential mechanisms of management team characteristics are discussed as follows. First, as mentioned previously, higher TMT shared working experience implies higher likelihood of other team members' passive management or collusion with the CEO (Katz, 1982; Daboub et al., 1995; Grijalva et al., 2020), which may lead a narcissistic CEO to take riskier activities and thus boost the positive effect of CEO narcissism on corporate credit risk. Second, higher TMT social network suggests higher social capital and stronger risk-sharing mechanism, which may lead a narcissistic CEO to have more

incentives to take riskier activities (Begley et al., 1996; Ferris et al., 2017) and thus boost the positive effect of CEO narcissism on corporate credit risk.

Based on the foregoing discussion, this study concludes that TMT characteristics may play the potential mechanisms for the CEO narcissism effect on firm credit risk, shown as Hypothesis 2.

Hypothesis 2. *A firm's CEO narcissism is positively associated with firm credit risk from the perspectives of TMT characteristics.*

Hypothesis 2a. *A firm's CEO narcissism is positively associated with firm credit risk via the mechanism of TMT shared working experience.*

Hypothesis 2b. *A firm's CEO narcissism is positively associated with firm credit risk via the mechanism of TMT social network.*

In addition, this study introduces internal governance issue into the effect of CEO narcissism on corporate credit risk. This study employs “subordinate executives’ relative power” as the proxy of internal governance quality (Cheng et al., 2016). Since higher subordinate executives’ relative power suggests better internal governance quality, a narcissistic CEO have less incentive to take riskier activities, which may lead to a reduction for the positive effect of CEO narcissism on corporate credit risk. We thus construct Hypothesis 3.

Hypothesis 3. *Internal governance quality moderates the positive effect of CEO narcissism on firm credit risk.*

IV. Data and Methodology

The purpose of this study is to explore whether CEO personality traits affect firm credit risk from the CEO narcissism perspective using American corporate bond yield spread data. The data required to implement the empirical analyses for the research question are collected

in the following ways. First, we follow the previous bond yield spread literature (e.g. Yu, 2005) and select straight corporate bond issues with certain features as our main sample observations. The screened features cover: (1) unsecured or unguaranteed by others, (2) fixed rate coupons, (3) issued by non-financial industry or low regulated firms, and (4) issued with no embedded options or special clauses (e.g. non-convertible or non-callable bonds). After the above screening procedures, the preliminarily qualified bond sample observations are non-secured and non-callable straight corporate bonds with fixed coupon rates. Second, to ensure bond sample observations with CEO narcissism data and other necessary CEO-, firm-, and bond-level data (as control variables), we retain bond sample observations without invalid and missing data. The final sample includes 8,397 annual bond observations during the sample period from 2008 to 2018. Approximately 91.21% are investment grade bonds since we primarily employ S&P 500 component firms to estimate our main variable, CEO narcissism. Table 1 shows the distribution of the sample observations. In addition, the sample size increases each year during the sample period.

[Insert Table 1 here]

IV.1. Data sources

For the original data of main independent variable, CEO narcissism, is gathered from ExecuComp and BoardEx databases and also hand-collected from annual report (10-K) and proxy statements (DEF 14A) for firms listed in the S&P 500 index. For the proxies of CEO narcissism, this study follows Olsen et al. (2014) and Ham et al. (2018) in collecting the needed data. For the proxies used in Olsen et al. (2014), the CEO's photograph (P_CEO) is collected from annual report in the Securities and Exchange Commission (SEC) online Edgar system. The relative cash pay of CEO (R_CH) and the relative non-cash pay of CEO (R_NCH) are estimated from ExecuComp or BoardEx. For the proxy used in Ham et al. (2018), the CEO signature size is collected from the letter to shareholders in the annual report, or from the most

recent proxy statement when the signature was unavailable in the annual report.

In addition, the data of bond issue features are taken from the Datastream database. The bond issue variables used in this study include yield spread, coupon rate, maturity, bond age, issued amount, and bond credit rating. We also control for other well-known spread determinant variables related to firm- and CEO-level characteristics in the empirical design. The data sources of these variables includes COMPUSTAT (e.g. financial data), BoardEx (e.g. governance data), Execucomp (e.g. CEO basic information), and CRSP (equity).

Using the above data sources, we remove bond observations with no information on CEO narcissism, other CEO basic information variables, firm characteristics, and bond characteristics (as control variables). The study then employs the remaining bond observations from 2008 to 2018 as the main sample for conducting the empirical analysis.

IV.2. Dependent variable

For the dependent variable, this study employs corporate bond yield spread (YS) as the proxy of firm credit risk. Following Yu (2005), we define the YS variable as the yield difference between the bond yield and the yield of an equivalent maturity Treasury bond. Thus, a higher YS value represents a higher firm credit risk. The YS data is collected from the Datastream database.

IV.3. Control variables

For the control variables of bond yield spread, this study follows the corporate bond literature (e.g. Yu, 2005; Lu et al., 2010) and employs several firm characteristics and bond issue features as control variables. The variables of firm characteristics include (1) leverage ratio (LEV, defined as the ratio of debt book value to the sum of debt book value and equity market value), (2) equity volatility (VOL, defined as the annualized standard deviation of daily equity returns over the previous year), (3) firm age (Fage, the natural logarithm of the sum of

one and the number of years since the firm appears in COMPUSTAT), (4) firm asset size (SIZE, the natural logarithm of firm asset market value), (5) return on assets (ROA, defined as the ratio of earnings before interest and tax (EBIT) to total assets), and (6) operating cash flow volatility (OCFV, measured by the standard deviation of operating cash flow per unit asset (OCF) over the previous five-year OCF data). The above firm characteristics variables are estimated using the financial and stock market data from the COMPUSTAT and CRSP databases.

The variables of bond features cover coupon rate (Coupon, defined as bond annualized coupon rate), bond maturity (LFFL, defined as the remaining years from time t to the bond maturity date), amount issued (Lnamt, measured by the logarithm of the originally issued dollar amount), bond age (Bage, measured by the time interval between the issuing date and the settlement date), and its Moody's bond credit rating (RAT, which represents the numerical score for each rating category as follows: 1 is Aaa, 2 is Aa1, 3 is Aa2, 4 is Aa3, 5 is A1, and so on). The data source of the above bond features is the Datastream database.

The variables of CEO basic information used in this study include CEO age, CEO tenure, and CEO gender. CEO_Age and CEO_TEN are defined as CEO age (unit: in years) and CEO tenure (unit: in years), respectively. CEO_GEN is a dummy variable that equals 1 if the CEO is female and 0 otherwise. The data source for the above CEO characteristics is the Execucomp database.

The summarized descriptive statistics of the above variables using the sample bond observations with CEO narcissism variables and control variables are shown in Table 2. The average bond yield spread (YS) is 188.1330 bps. In addition, the averages of the three CEO narcissism variables (Nar_Def1, Nar_Def2, Nar_Def3) are 0.6070, 0.5471, and 0.5391, respectively. These results show that over 50% of bond observations are issued by firms with narcissistic CEOs. Table 2 also shows that the average CEO age (CEO_Age) is 58.3106 years

(and the minimum is 40), the average CEO gender (CEO_GEN) is 0.0615, the average leverage ratio (LEV) is 40.22%, the average equity volatility (VOL) is 26.88%, and the average bond credit rating (RAT) is 7.7341 (between A3 and Baa1 in Moody's rating system).

[Insert Table 2 here]

V. Empirical Analyses

V.1. Examining the relation between CEO narcissism and bond yield spread

This study examines the above hypotheses by using panel data regressions with firm- and year-fixed effects, and firm-level clustered standard errors (Petersen, 2009) in evaluating the effectiveness of the regression coefficient estimates. The model specification to examine Hypothesis 1 is given in Eq. (1):

$$YS_{it} = \alpha + \beta_1 CEO_Nar_{it} + \sum_{j=2}^N \beta_j CV_{j,it} + \varepsilon_{it} \quad (1)$$

Where $CEO_Nar = Nar_Def1, Nar_Def2, Nar_Def3$

$CV = CEO_TEN, CEO_Age, CEO_GEN, LEV, VOL, Fage, SIZE, ROA, OCFV, Coupon, LFFL, Lnamt, Bage, RAT$

The results of column (1) to (6) in Table 3 demonstrate that a firm's $Nar_Def1, Nar_Def2,$ and Nar_Def3 are all significantly and positively related to the bond yield spread. First, the results of column (4), (5), and (6) show that the coefficients of $Nar_Def1, Nar_Def2,$ and Nar_Def3 are significantly positive (63.8331, 70.3581, 68.2754), indicating that the firm's bond yield spread increases 31.1761 bps (63.8331×0.4884), 35.0243 bps (70.3581×0.4978), and 34.0353 bps (68.2754×0.4985) per standard deviation increase in the firm's $Nar_Def1, Nar_Def2,$ and $Nar_Def3,$ respectively. These results show that the positive effects of $Nar_Def1, Nar_Def2,$ and Nar_Def3 on bond yield spread from the perspectives of increasing asset volatility (overinvestments and risk-taking behaviors) and financial constraints dominate

the possible negative effect from the perspective of increasing asset value (future firm value growth). That is, the results support: (1) the contention of Campbell et al. (2004), Chatterjee and Hambrick (2011), and Ham et al. (2018) that a narcissistic CEO conducts overinvestments and takes on riskier investments in pursuit of recognition and social praise, acts out self-importance, self-admiration and exhibitionism, and seeks attention; and (2) the argument that bondholders are more concerned about the effect of CEO narcissism on asset value volatility and financial constraint than its effects on asset value. These results support Hypothesis 1.

In addition, we provide results that replace firm- and year-fixed effects and firm-level clustered issue by bond- and year-fixed effects and bond-level clustered issue, shown in Table 4. These results show that our main findings remain unchanged.

[Insert Table 3 here]

[Insert Table 4 here]

V.2. Channel analyses for the effect of CEO narcissism and bond yield spread: The theoretical perspectives of asset value volatility, financial constraint, and asset value

To further examine whether the effect of CEO narcissism on bond yield spread is through the channels of asset value volatility, financial constraint, and asset value (Hypotheses 1a and 1b), the study employs a path analysis model, shown in Eqs. (2) and (3):

$$\text{Channel}_{it} = \alpha + \beta_1 \text{CEO_Nar}_{it} + \varepsilon_{it} \quad (2)$$

$$YS_{it} = \alpha + \beta_1 \text{CEO_Nar}_{it} + \beta_2 \text{Channel}_{it} + \sum_{j=3}^N \beta_j \text{CV}_{j,it} + \varepsilon_{it} \quad (3)$$

Where Channel= IVOL, SA, ROA, MB

In Eq. (2), we regress idiosyncratic equity risk (IVOL; Low, 2009), financial constraint (SA; Hadlock and Pierce, 2010), return on asset (ROA), and market-to-book value ratio (MB) on the measures of CEO narcissism and year- and firm-fixed effects. The IVOL variable is

measured by the standard deviation using the previous one-year data of the residuals of stock returns based on the Fama-French three factor model (Fama and French, 1993). Following Hadlock and Pierce (2010), the SA variable is estimated by $(-0.737 * \text{Size}) + (0.043 * \text{Size}^2) - (0.040 * \text{Age})$, where Size equals the log of inflation-adjusted book assets, and Age is the number of years the firm is listed with a non-missing stock price on Compustat. The higher value of SA variable represents higher financial constraint level.

The results in columns (6) to (10) in Table 5 show that Nar_Def2 significantly and positively relates to asset value volatility (IVOL), financial constraint (SA), and market-to-book value ratio (MB), all of which significantly and positively relate to bond yield spread (firm credit risk). These results show that the effect of Nar_Def2 on bond yield spread includes the direct impact (coefficient: 0.1300) and the indirect impacts through the channels of asset value volatility ($0.1583 \times 0.2017 = 0.0319$), financial constraint ($0.0015 \times 2.3451 = 0.0035$), and market-to-book value ratio ($0.6344 \times 0.0681 = 0.0432$). The path analyses imply that (1) the CEO narcissism effect is through the channels of asset volatility and financial constraint, supporting the argument of Hypothesis 1a, and (2) the CEO narcissism effect is through the market-to-book value ratio, suggesting that outside investors know that a narcissistic CEO pursues future growth by taking on more uncertain investments, which is less favorable for bondholders.

Moreover, columns (6) to (10) in Table 5 also show that Nar_Def2 significantly and positively relates to asset value (ROA), which significantly and negatively relates to bond yield spread (firm credit risk). This shows that the effect of Nar_Def2 on bond yield spread includes another indirect impact through the asset value channel ($0.1554 \times -0.1197 = -0.0186$). The path analyses imply that the CEO narcissism effect is through the asset value channel, supporting the argument of Hypothesis 1b that CEO narcissism may enhance financial performance because the CEO engages in short-sighted behaviors (Vazire and Funder 2006; Giampetro-Meyer et al. 1998) and has better decision quality (Byrne and Worthy, 2013).

Furthermore, the results of columns (1) to (5) and (11) to (15) in Table 5 also show that Nar_Def1 and Nar_Def3 both have similar results, which provides robustness evidence for Hypotheses 1a and 1b. Therefore, based on the above discussions, we conclude that (1) CEO narcissism has a positive direct effect (0.1300) and aggregate positive indirect effects (0.0600=0.0319+ 0.0035+0.0432-0.0186) on bond yield spread and (2) bondholders are more concerned about an increase in asset value volatility than the increase in asset value, which both result from risk-taking investments in pursuit of future growth.

[Insert Table 5 here]

V.3. The effect of CEO narcissism on bond yield spread: The mechanisms of management team characteristics

This section explores whether management team characteristics play the potential mechanisms for the effect of CEO narcissism on bond yield spread. Following Zhang (2019) and Chen (2019), the management team characteristics discussed in this study include management team shared working experience (Team_SE) and management team social network size (Team_SN). Team_SE is defined as the average of the pair-wise overlapped time for all listed executives when they become top managers. Team_SN is the natural logarithm of the average of management team members' social network sizes. The manager's social network size is the summation of the manager's employment ties, educational ties, social activity ties, and other activity ties. The model specifications are stated in Eq. (4):

$$YS_{it} = \alpha + \beta_1 CEO_Nar_{it} + \beta_2 MTC_{it} + \beta_3 CEO_Nar_{it} \times MTC_{it} + \sum_{j=4}^N \beta_j CV_{j,it} + \varepsilon_{it} \quad (4)$$

Where $CEO_Nar = Nar_Def1, Nar_Def2, Nar_Def3$;

$$MTC = Team_SE, Team_SN$$

The results of columns (1) to (3) in Table 6 show that the coefficients of the interaction

terms of *CEO_Nar* and *Team_SE* are all significant and positive. These results suggest that management team shared working experience significantly strengthens the positive effect of CEO narcissism on bond yield spreads. These results thus support the contention that higher management team shared working experience leads to a higher possibility of other team members' passive management or collusion with the CEO (formed by long-term shared experience; Katz, 1982; Daboub et al., 1995; Grijalva et al., 2020), increasing the likelihood of a narcissistic CEO's overinvestments and risk-taking behaviors, and enhancing the positive effect of CEO narcissism on corporate credit risk.

Similarly, the results of columns (4) to (6) in Table 6 show that the coefficients of the interaction terms of *CEO_Nar* and *Team_SN* are all significant and positive. These results suggest that management team social network size significantly enhances the positive effect of CEO narcissism on bond yield spreads. It may be that larger management team social networks generate more social capital for the narcissistic CEO, reducing CEO worries about taking on riskier investments. The above results support the arguments of Hypotheses 2, 2a, and 2b that the effect of CEO narcissism effect is via the mechanisms of TMT shared working experience and TMT social capital.

[Insert Table 6 here]

V.4. Endogeneity and the relationship between CEO narcissism and bond yield spread

To mitigate the endogeneity concerns of omitted variables and reverse causality, this study considers the firm-fixed effect (or bond-fixed effect) in the model setting to eliminate the endogeneity issue of time-invariant omitted firm (or bond) characteristics. Since CEO narcissism is closely related to an individual's innate traits, and personality traits do not change much after the age of 40 (Roberts et al., 2006; McCrae and Costa, 1982), this study can reasonably view an individual narcissistic trait as exogenous and thus the endogeneity issues such as time-variant omitted variables and reverse causality problems become less serious. In

this study, the minimum CEO age in our bond sample observations is 40 (years old), while the average of the CEO_Age variable is 58.3106 (years old). This shows that the personality trait of CEO narcissism is stable and does not change much with other observed and unobserved variables. Therefore, there is less concern that endogeneity in the form of reverse causality is an issue in our findings.

To provide more convincing evidence for the effects of CEO narcissism on corporate bond yield spread, we use a difference-in-difference model design to mitigate the endogeneity concerns about omitted variables, reverse causality, and measurement errors. As mentioned previously, CEOs may have discretionary power over decisions of corporate operations, investment, and financing policies, which affect a firm's credit risk and its bond yield spread. Hence, CEO turnover seems to be an appropriate event for an experiment exploring the impacts of CEO narcissism on bond yield spread. We follow Lin et al. (2020) and select subsample observations using the following criteria: (1) the firm is in the sample; (2) CEO turnover occurred during the sample period; and (3) the firm has a low level of CEO narcissism before the CEO turnover occurs.⁹ We employ this subsample to implement the difference-in-difference analysis.

This study defines the treatment group as comprising firms with CEO turnover that change from a low level of CEO narcissism to a high level. The control group is thus composed of firms with CEO turnover events that change from a low level of CEO narcissism to another low level. This research defines a dummy variable, *NewNar_D* (*NewNar_Def1*, *NewNar_Def2*, *NewNar_Def3*), that equals 1 if the new CEO moves the firm from a low level of CEO narcissism to a high level, and 0 otherwise.⁵ *Post* is a dummy variable that equals 1 if the year of observation is after the occurrence of CEO turnover, and 0 otherwise.

⁹ A low (high) level of CEO narcissism is defined as values for CEO narcissism variables being lower (higher) than their 50th percentile.

To provide additional robustness evidence for Hypotheses 1, we replace *CEO_Nar* with the *NewNar_D×Post* and *Post* variables in Eq. (1) and then employ *NewNar_D×Post* to capture the treatment effect of a firm shifting from a low level of CEO narcissism to a high level on the bond yield spread. Columns (1) to (3) of Table 7 show that the coefficients of *NewNar_Def1×Post*, *NewNar_Def2×Post*, and *NewNar_Def3×Post* are positive and significant (65.2477, 56.6019, 54.8423), indicating that firms that change from a low level of CEO narcissism to a high level have higher bond yield spreads than those that change from a low level of CEO narcissism to another low level. This result is consistent with our main findings in Table 4. In addition, these results remain unchanged when replacing firm-fixed effects by bond-fixed effects (shown in columns (4) to (6) of Table 7) or employing another control group composed of firms with a low level of CEO narcissism throughout the sample period. Therefore, our finding that CEO narcissism has a positive impact on bond yield spread is robust to endogeneity issues.

[Insert Table 7 here]

V.5. Moderators of the effect of CEO narcissism on bond yield spread: Corporate governance

This section explores whether corporate governance changes the effect of CEO narcissism on bond yield spread. To measure a firm's corporate governance quality, this study employs outside director ratio (ODIR) and internal governance quality (IG, Cheng et al., 2016) as proxies for external governance and internal governance, respectively. The ODIR variable is defined as the percentage of outside directors on the board. This study follows Cheng et al. (2016) and defines the IG variable as the sum of standardized values of *Exec_Horizon* and *Exec_PayRatio*. *Exec_Horizon* represents the average of the number of years until the age of retirement (assumed 65 years old) for key subordinate executives. *Exec_PayRatio* is defined as the ratio of average annual compensation of key subordinate executives to the CEO's annual compensation, which represents the key subordinate executives' ability to monitor the CEO.

The model specifications are stated in Eq. (5):

$$YS_{it} = \alpha + \beta_1 CEO_Nar_{it} + \beta_2 CGOV_{it} + \beta_3 CEO_Nar_{it} \times CGOV_{it} + \sum_{j=4}^N \beta_j CV_{j,it} + \varepsilon_{it} \quad (5)$$

Where $CEO_Nar = Nar_Def1, Nar_Def2, Nar_Def3$; $CGOV = ODIR, IG$

The results of columns (1), (2), and (3) in Table 8 show that the coefficients of the interaction terms of CEO_Nar and IG are all significant and negative. Similarly, the results of columns (4), (5), and (6) in Table 8 demonstrate that the interaction terms of CEO_Nar and $ODIR$ are almost all negatively related to bond yield spread. These results reveal that corporate governance (internal governance and external governance) significantly weakens the effect of CEO narcissism on bond yield spreads. These results support the contention that better monitoring mechanisms reduce the likelihood of overinvestments and risk-taking behaviors by narcissistic CEOs, weakening the positive effect of CEO narcissism on corporate credit risk. Hence, the argument of Hypotheses 3 is empirically supported.

[Insert Table 8 here]

VI. Concluding Remarks

This study is the first to investigate the effects of CEO narcissism on corporate credit risk by employing American corporate bond data. Unlike CEO overconfidence, CEO narcissism describes a CEO's psychiatric and psychological characteristics, covering a sense of arrogance, exhibitionism, exploitativeness, entitlement, vanity, self-absorption, self-admiration, self-importance and uniqueness. Further, narcissistic CEOs have strong incentives to pursue others' attention and recognition and believe in their future even when they experience failure. This attitude differs from that of overconfident CEOs, whose overconfidence is the result of previous successful experiences. The findings of this study may be summarized as follows: (1) CEO narcissism is significantly and positively related to firm credit risk; (2) the positive indirect

effects of CEO narcissism on firm credit risk occur through the theoretical channels of asset volatility, financial constraint, and market-to-book value ratio (namely structural form credit risk models); (3) the positive indirect effects dominate the negative indirect effect of CEO narcissism through the channel of asset value; (4) the positive effect of CEO narcissism on firm credit risk is also via the new mechanisms of TMT shared working experience and TMT social networks; (5) the positive effect of CEO narcissism becomes weaker for firms with better corporate governance quality (including external governance and internal governance). In sum, we conclude that CEO narcissism plays a critical role in shaping firm credit risk and bondholders' welfare. This helps traditional structural form credit risk models explain corporate credit risk (and bond yield spreads). This work thus provides new insights for the credit risk literature based on a new understanding of the effects of CEO narcissism, one of the firm's most important idiosyncratic risks. Furthermore, our findings provide practical guidance for creditor banks in conducting credit decisions.

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Table 1. Sample Distribution

The sample period is yearly between 2008 and 2018. Table 1 shows the sample distribution. There are totally 8,397 annual bond observations with available data of CEO narcissism variables, other CEO characteristics, firm characteristics, and bond features. Table 1 reports the numbers of pooled observations for firms in the given years and credit ratings. The rating subsamples are sorted by Moody's credit ratings.

Year/Rating	Above Aa3	A	Baa	Below Ba1	Total
2008	27	243	243	89	602
2009	25	191	221	27	464
2010	16	195	238	36	485
2011	24	205	228	32	489
2012	15	174	211	42	442
2013	24	195	212	40	471
2014	8	201	184	35	428
2015	60	289	494	82	925
2016	83	322	619	102	1126
2017	121	338	737	132	1328
2018	151	445	920	121	1637
Total	554	2798	4307	738	8397

Table 2. Summary Statistics of Major Variables

This table presents the mean, standard deviation (S.D.), minimum, and maximum of major variables used in empirical analyses. Panel A, B, C, D, and E presents the summary statistics of bond yield spread, CEO narcissism variables, firm characteristic variables, bond feature variables, and moderating role variables, respectively. In Panel A, Yield spread (YS) is the difference in yield to maturity between a corporate bond and a U.S. Treasury bond with the same maturity. In Panel B, Nar_Def1 is the composite variable of the prominence of a CEO's photograph in annual reports (P_CEO), the relative cash pay of CEO to the executive that has second-highest compensation (R_CH), and the relative non-cash pay of CEO to the executive that has second-highest compensation (R_NCH). We first calculate the average of the standardized values of P_CEO, R_CH, and R_NCH, called as Nar_Comp1. Then we define Nar_Def1 equals 1 if Nar_Comp1 is larger than its average and 0 if otherwise. Nar_Def2 is the composite variable of P_CEO and the CEO photo size (PSIZE_CEO, measured by the area of CEO photo image). Nar_Def3 is the composite variable of P_CEO, PSIZE_CEO, and the CEO signature size (SSIZE_CEO, measured by the area of CEO signature image). In Panel C, CEO_TEN, CEO_Age, and CEO_GEN represent CEO tenure (unit: in years), CEO age (unit: in years), and CEO gender (1: female; 0: male), respectively. LEV refers to firm leverage ratio. The equity volatility (VOL) measures the annualized volatility of previous one-year stock returns. Firm size (SIZE) is the natural log of the market value of a firm's assets at the end of a fiscal year. Firm age (Fage) is the number of years a firm has appeared on Compustat. ROA is the return on assets, defined as the ratio of net income to total assets. Operating cash flow volatility (OCFV) is defined as the standard deviation of previous five-year data of operating cash flow per unit asset. In Panel D, LFFL, Coupon, and Lnamt stand for the time to maturity, annual coupon rate, and natural log of amount issued, respectively. Bond age (Bage) is defined as the difference between the settlement date and the issuing date. Bond rating (RAT) is the numerical scores of bond rating, where Aaa is 1, Aa1 is 2, Aa2 is 3, etc. In Panel E, IG and ODIR represent internal governance variable (IG, Cheng et al., 2016) and outside director ratio, respectively. Team_SE and Team_SN are variables of management team shared experience and social network size, respectively.

Variable	Obs	Mean	Std. Dev.	Min	Max
Panel A. Dependent Variable: Yield Spread					
YS	8,397	188.1330	179.5866	24.1000	1475.6000
Panel B. CEO Narcissism Variables					
Nar_Def1	8,397	0.6070	0.4884	0.0000	1.0000
Nar_Def2	8,397	0.5471	0.4978	0.0000	1.0000
Nar_Def3	8,397	0.5391	0.4985	0.0000	1.0000
Panel C. Control Variables: CEO characteristics and Firm Characteristics					
CEO_TEN	8,397	7.1629	2.8809	4.0000	14.0000
CEO_Age	8,397	58.3106	5.2155	40.0000	81.0000
CEO_GEN	8,397	0.0615	0.2402	0.0000	1.0000
LEV	8,397	0.4022	0.1691	0.0311	1.0000
VOL	8,397	0.2688	0.1488	0.0961	1.3906
SIZE	8,397	10.8445	1.1459	7.1074	13.9877
Fage	8,397	47.7963	17.0519	5.0027	68.5507
ROA	8,397	0.1048	0.0681	-0.2867	0.5608
OCFV	8,397	0.0240	0.0187	0.0017	0.2103
Panel D. Control Variables: Bond Feature					
Coupon	8,397	5.2464	1.8432	1.1000	13.0000
Bage	8,397	7.3119	5.6739	0.0438	29.7150
LFFL	8,397	13.0371	12.1662	0.0167	95.1944
Lnamt	8,397	16.6984	4.8804	2.6721	23.4313
RAT	8,397	7.7341	2.4264	1.0000	18.0000
Panel E. Moderating Variables					
Team_SE	7,210	6.6988	3.6233	0.0000	26.1667
Team_SN	6,458	10.1961	0.5194	7.4116	11.1506
IG	8,390	-0.5205	1.1781	-3.8044	5.8899
ODIR	6,458	0.8916	0.0779	0.4444	1.0000

Table 3. The Effect of CEO Narcissism on Corporate Bond Yield Spread: Firm-Fixed Effect

This table shows the results regarding the relationship between CEO narcissism variables (Nar_Def1, Nar_Def2, Nar_Def3) and corporate bond yield spread (YS). Nar_Def1, Nar_Def2, and Nar_Def3 are the composite variable of P_CEO, R_CH, and R_NCH, the composite variable of P_CEO and PSIZE_CEO, and the composite variable of P_CEO, PSIZE_CEO, and SSIZE_CEO, respectively. Control variables include CEO tenure (CEO_TEN), CEO age (CEO_Age), CEO gender (CEO_GEN), leverage ratio (LEV), equity volatility (VOL), the natural logarithm of firm asset value (SIZE), firm age (Fage), return on assets (ROA), operating cash flow volatility (OCFV), annualized coupon rate (Coupon), bond age (Bage), time to maturity (LFFL), the natural log of amount issued (Lnamt), and bond credit rating (RAT). The fixed effects (firm and year) and cluster issues are considered in these results. This table presents the regression coefficients and adjusted R-squared. The t-statistics calculated by firm-level clustered standard errors (Petersen, 2009) for each coefficient appears immediately underneath. The signs of “*, **, ***” represent the significance of 10%, 5%, and 1%, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)
	YS	YS	YS	YS	YS	YS
Nar_Def1	50.4958** (2.49)			63.8331*** (2.85)		
Nar_Def2		60.4799*** (3.38)			70.3581*** (3.41)	
Nar_Def3			60.5153*** (4.49)			68.2754*** (4.70)
LEV	218.8095*** (3.33)	222.4882*** (3.40)	224.0714*** (3.45)	214.7466*** (3.19)	218.9066*** (3.29)	220.1012*** (3.34)
VOL	391.0455*** (5.88)	391.9377*** (5.92)	389.1919*** (5.96)	383.3466*** (5.83)	384.4110*** (5.88)	381.8401*** (5.95)
SIZE	-7.0611 (-0.43)	-6.0400 (-0.36)	-5.4387 (-0.33)	-8.4880 (-0.52)	-7.3652 (-0.45)	-6.6086 (-0.41)
Fage	130.3715*** (2.97)	131.3642*** (3.03)	130.9118*** (3.03)	133.5094** (2.42)	142.6397*** (2.63)	136.1238** (2.55)
ROA	-312.3126*** (-3.18)	-295.0259*** (-3.17)	-298.0995*** (-3.20)	-338.8255*** (-3.32)	-313.0091*** (-3.28)	-317.1517*** (-3.33)
OCFV	345.7725 (0.93)	330.1958 (0.90)	305.3106 (0.84)	369.0809 (1.05)	346.8448 (0.99)	314.9630 (0.91)
Coupon	12.5572*** (6.63)	12.6860*** (6.69)	12.7854*** (6.76)	12.7201*** (6.68)	12.8691*** (6.78)	12.9768*** (6.86)
Bage	0.6939 (1.48)	0.6931 (1.49)	0.6742 (1.45)	0.6973 (1.50)	0.6996 (1.51)	0.6758 (1.46)
LFFL	1.9815*** (12.59)	1.9662*** (12.61)	1.9574*** (12.61)	1.9740*** (12.56)	1.9581*** (12.61)	1.9472*** (12.59)
Lnamt	-7.7046** (-2.47)	-7.7298** (-2.49)	-7.8686** (-2.53)	-7.5136** (-2.40)	-7.5473** (-2.42)	-7.7373** (-2.45)
RAT	28.3109*** (4.35)	28.7532*** (4.51)	29.0790*** (4.59)	26.8963*** (4.09)	27.6534*** (4.29)	28.0726*** (4.36)
CEO_TEN				-3.7012 (-1.17)	-2.8353 (-0.89)	-3.3466 (-1.07)
CEO_Age				3.3445* (1.70)	2.8711 (1.51)	3.1143* (1.70)
CEO_GEN				9.6415 (0.36)	17.8695 (0.72)	12.3401 (0.49)
Constant	-6852.4834*** (-2.95)	-6924.2353*** (-3.02)	-6906.0333*** (-3.02)	-7160.8174** (-2.50)	-7632.8510*** (-2.71)	-7311.9495*** (-2.63)
Observations	8397	8397	8397	8397	8397	8397
Adjusted R ²	0.7202	0.7211	0.7223	0.7216	0.7223	0.7236

Table 4. The Effect of CEO Narcissism on Corporate Bond Yield Spread: Bond-Fixed Effect

This table shows the results regarding the relationship between CEO narcissism variables (Nar_Def1, Nar_Def2, Nar_Def3) and corporate bond yield spread (YS). Nar_Def1, Nar_Def2, and Nar_Def3 are the composite variable of P_CEO, R_CH, and R_NCH, the composite variable of P_CEO and PSIZE_CEO, and the composite variable of P_CEO, PSIZE_CEO, and SSIZE_CEO, respectively. Control variables include CEO tenure (CEO_TEN), CEO age (CEO_Age), CEO gender (CEO_GEN), leverage ratio (LEV), equity volatility (VOL), the natural logarithm of firm asset value (SIZE), firm age (Fage), return on assets (ROA), operating cash flow volatility (OCFV), annualized coupon rate (Coupon), bond age (Bage), time to maturity (LFFL), the natural log of amount issued (Lnamt), and bond credit rating (RAT). The fixed effects (bond and year) and cluster issues are considered in these results. This table presents the regression coefficients and adjusted R-squared. The t-statistics calculated by bond-level clustered standard errors (Petersen, 2009) for each coefficient appears immediately underneath. The signs of “*”, “**”, “***” represent the significance of 10%, 5%, and 1%, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)
	YS	YS	YS	YS	YS	YS
Nar_Def1	40.7938*** (4.06)			58.6274*** (4.30)		
Nar_Def2		53.7678*** (5.95)			61.0919*** (5.84)	
Nar_Def3			49.6889*** (6.19)			54.8813*** (6.44)
LEV	238.4845*** (8.13)	239.7224*** (8.20)	242.2947*** (8.29)	232.6490*** (7.75)	234.2328*** (7.85)	237.2596*** (7.97)
VOL	298.6347*** (6.20)	298.3688*** (6.19)	297.5351*** (6.18)	289.6804*** (6.36)	290.9393*** (6.35)	290.2984*** (6.35)
SIZE	-3.9501 (-0.52)	-3.1907 (-0.42)	-2.7328 (-0.36)	-8.8332 (-1.24)	-7.2472 (-1.02)	-6.6247 (-0.93)
Fage	66.1845*** (3.66)	66.0034*** (3.64)	65.6675*** (3.63)	49.4091*** (2.66)	50.5704*** (2.67)	46.8525** (2.48)
ROA	-304.5926*** (-5.01)	-293.7283*** (-4.89)	-292.1664*** (-4.87)	-335.3241*** (-5.35)	-315.1629*** (-5.18)	-312.9247*** (-5.16)
OCFV	359.2789** (2.17)	334.3759** (2.06)	322.7185** (1.99)	335.9284** (2.00)	299.3446* (1.79)	285.9617* (1.71)
Coupon	209.3027 (0.42)	210.2839 (0.42)	207.8633 (0.41)	214.9090 (0.42)	214.1158 (0.42)	211.3191 (0.42)
Bage	-148.9397* (-1.84)	-142.8215* (-1.74)	-143.6118* (-1.76)	-143.0397* (-1.91)	-139.6366* (-1.83)	-140.3327* (-1.85)
LFFL	82.0485*** (6.21)	82.0679*** (6.20)	82.1109*** (6.28)	83.6102*** (7.19)	83.4381*** (7.08)	83.5432*** (7.24)
Lnamt	56.5335*** (2.75)	56.2671*** (2.74)	55.7174*** (2.71)	57.8864*** (2.78)	57.4956*** (2.76)	56.8292*** (2.73)
RAT	25.4507*** (4.78)	25.1016*** (4.73)	25.4666*** (4.81)	23.3159*** (4.46)	23.5252*** (4.50)	23.9692*** (4.59)
CEO_TEN				-5.8113** (-2.10)	-4.7141* (-1.75)	-5.1021* (-1.87)
CEO_Age				5.3490** (2.19)	4.4836** (1.97)	4.5093** (1.99)
CEO_GEN				-15.9393 (-1.12)	-13.8697 (-0.96)	-18.8367 (-1.27)
Constant	-5053.1887* (-1.71)	-5118.1882* (-1.74)	-5075.2581* (-1.72)	-4519.1944 (-1.52)	-4577.4849 (-1.54)	-4356.9121 (-1.47)
Observations	8397	8397	8397	8397	8397	8397
Adjusted R ²	0.6899	0.6910	0.6912	0.6925	0.6929	0.6932

Table 5. Path Analyses for the Effects of the CEO Narcissism Variables on Bond Yield Spread: Structural Credit Model Perspectives

This table shows the results of path analyses model for exploring whether the effect of CEO narcissism (Nar_Def1, Nar_Def2, and Nar_Def3) on bond yield spread (YS; the proxy of firm credit risk) through the channels of asset volatility, asset value, and financial leverage, which are three of main components of structural credit models. Nar_Def1, Nar_Def2, and Nar_Def3 are the composite variable of P_CEO, R_CH, and R_NCH, the composite variable of P_CEO and PSIZE_CEO, and the composite variable of P_CEO, PSIZE_CEO, and SSIZE_CEO, respectively. The mediating variables, including the proxies of asset volatility, asset value, and financial threshold, used in this study are idiosyncratic equity risk (IVOL; Low, 2009), return on asset (ROA), market-to-book value ratio (MB), and financial constraint (SA; Hadlock and Pierce, 2010). The higher value of SA variable represents higher financial constraint level. Following Hadlock and Pierce (2010), the SA variable is estimated by $(-0.737 * \text{Size}) + (0.043 * \text{Size}^2) - (0.040 * \text{Age})$, where Size equals the log of inflation-adjusted book assets, and Age is the number of years the firm is listed with a non-missing stock price on Compustat. Control variables include CEO tenure (CEO_TEN), CEO age (CEO_Age), CEO gender (CEO_GEN), leverage ratio (LEV), equity volatility (VOL), the natural logarithm of firm asset value (SIZE), firm age (Fage), return on assets (ROA), operating cash flow volatility (OCFV), annualized coupon rate (Coupon), bond age (Bage), time to maturity (LFFL), the natural log of amount issued (Lnamt), and bond credit rating (RAT). The fixed effects (firm and year) are considered in these results. This table presents the model coefficients and R-squared. The coefficients represent the standardized regression coefficients (path coefficients). The t-statistics for each coefficient appears immediately underneath. The signs of “*”, “**”, “***” represent the significance of 10%, 5%, and 1%, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
	IVOL	ROA	SA	MB	YS	IVOL	ROA	SA	MB	YS	IVOL	ROA	SA	MB	YS
Nar_Def1	0.1565*** (7.71)	0.3128*** (15.34)	0.0014*** (3.31)	0.5499*** (22.02)	0.0969*** (4.98)										
Nar_Def2						0.1583*** (7.39)	0.1554*** (7.14)	0.0015*** (3.41)	0.6344*** (24.23)	0.1300*** (6.55)					
Nar_Def3											0.1325*** (7.23)	0.1290*** (6.93)	0.0025*** (6.71)	0.4605*** (20.34)	0.1467*** (8.96)
CEO_TEN					-0.0581*** (-4.03)					-0.0497*** (-3.45)					-0.0553*** (-3.85)
CEO_Age					0.0896*** (5.74)					0.0846*** (5.59)					0.0933*** (6.15)
CEO_GEN					0.0129 (1.08)					0.0229* (1.90)					0.0185 (1.55)
LEV					0.2770*** (16.63)					0.2793*** (16.79)					0.2800*** (16.87)
IVOL					0.2019*** (20.20)					0.2017*** (20.25)					0.1999*** (20.13)
SIZE					0.0409 (1.40)					0.0475 (1.64)					0.0481* (1.66)
Fage					13.1736***					13.9312***					13.6211***

					(3.88)					(4.10)					(4.03)
ROA					-0.1250***					-0.1197***					-0.1215***
					(-12.04)					(-11.74)					(-11.95)
OCFV					0.0331***					0.0323***					0.0305***
					(3.63)					(3.56)					(3.38)
Coupon					0.1353***					0.1359***					0.1371***
					(13.93)					(14.02)					(14.17)
Bage					0.0246***					0.0246***					0.0238***
					(2.99)					(2.99)					(2.91)
LFFL					0.1353***					0.1347***					0.1339***
					(25.56)					(25.47)					(25.39)
Lnamt					-0.1807***					-0.1817***					-0.1853***
					(-4.89)					(-4.93)					(-5.04)
RAT					0.4344***					0.4373***					0.4390***
					(20.72)					(21.12)					(21.36)
SA					2.3658***					2.3451***					2.1390***
					(5.09)					(5.05)					(4.61)
MB					0.0735***					0.0681***					0.0670***
					(9.23)					(8.46)					(8.44)
Observations	8169	8169	8169	8169	8169	8169	8169	8169	8169	8169	8169	8169	8169	8169	8169
Adjusted R ²	0.7685	0.7662	0.9999	0.6493	0.8374	0.7683	0.7608	0.9999	0.6536	0.8378	0.7682	0.7607	0.9999	0.6463	0.8386

Table 6. The Effect of CEO Narcissism on Corporate Bond Yield Spread: The Potential Mechanisms of Management Team Characteristics

This table shows the results of the mechanisms of management team characteristics for the relation between CEO narcissism variables (Nar_Def1, Nar_Def2, Nar_Def3) and corporate bond yield spread (YS). Following Zhang (2019) and Chen (2019), the proxies of management team characteristics used in this study include management team shared working experience (Team_SE) and management team social network size (Team_SN). Team_SE is defined as the average of the pair-wise overlapped time for all listed executives when they become top managers. Team_SN is the natural logarithm of the average of management team members' social network sizes. The manager's social network size (M_SN) is the summation of the manager's employment ties, educational ties, social activity ties, other activity ties. Control variables include CEO tenure (CEO_TEN), CEO age (CEO_Age), CEO gender (CEO_GEN), leverage ratio (LEV), equity volatility (VOL), the natural logarithm of firm asset value (SIZE), firm age (Fage), return on assets (ROA), operating cash flow volatility (OCFV), annualized coupon rate (Coupon), bond age (Bage), time to maturity (LFFL), the natural log of amount issued (Lnamt), and bond credit rating (RAT). The fixed effects (firm and year) and cluster issues are considered in these results. This table presents the regression coefficients and adjusted R-squared. The t-statistics calculated by firm-level clustered standard errors (Petersen, 2009) for each coefficient appears immediately underneath. The signs of “*”, “**”, “***” represent the significance of 10%, 5%, and 1%, respectively.

	(1) YS	(2) YS	(3) YS	(4) YS	(5) YS	(6) YS
Nar_Def1	17.2288 (0.56)			-62.9103 (-1.45)		
Nar_Def2		26.2354 (0.94)			-43.3693 (-0.95)	
Nar_Def3			30.1298 (1.25)			-8.3626 (-0.29)
Team_SE	-3.6574* (-1.70)	-3.5375* (-1.82)	-3.1714 (-1.65)			
Nar_Def1*Team_SE	5.0006* (1.72)					
Nar_Def2*Team_SE		5.6744* (1.92)				
Nar_Def3*Team_SE			4.8472* (1.67)			
Team_SN				-0.0019*** (-2.83)	-0.0015** (-2.13)	-0.0011* (-1.66)
Nar_Def1*Team_SN				0.0032*** (3.67)		
Nar_Def2*Team_SN					0.0029*** (3.10)	
Nar_Def3*Team_SN						0.0022*** (2.84)
CEO_TEN	-4.5875 (-1.40)	-4.4243 (-1.36)	-4.4550 (-1.38)	-2.5721 (-0.72)	-2.6496 (-0.75)	-2.4510 (-0.70)
CEO_Age	3.5748 (1.57)	3.5286 (1.64)	3.2539 (1.54)	2.3300 (0.96)	2.6864 (1.15)	2.5902 (1.14)
CEO_GEN	14.2066 (0.59)	19.1388 (0.83)	14.2806 (0.62)	-0.0924 (-0.00)	3.8292 (0.17)	2.5402 (0.11)
LEV	222.2200*** (3.11)	226.4853*** (3.18)	229.3420*** (3.23)	248.5341*** (3.23)	248.6410*** (3.21)	245.1652*** (3.19)
VOL	343.4686*** (4.92)	344.1391*** (5.01)	346.3269*** (5.03)	336.1214*** (4.76)	343.5513*** (4.87)	344.6047*** (4.89)
SIZE	-2.5052 (-0.14)	-1.0750 (-0.06)	-0.8801 (-0.05)	-11.2359 (-0.65)	-11.7352 (-0.68)	-12.0786 (-0.70)
Fage	96.6724*** (3.29)	104.8499*** (3.69)	99.2492*** (3.55)	124.1682** (2.21)	129.8512** (2.29)	128.0845** (2.28)
ROA	-320.6484*** (-2.87)	-318.5142*** (-3.11)	-315.0209*** (-3.10)	-358.2384*** (-3.04)	-336.6244*** (-2.97)	-343.1089*** (-3.03)
OCFV	359.0755 (1.11)	342.9564 (1.08)	334.1848 (1.06)	-12.5910 (-0.04)	41.6892 (0.12)	27.1839 (0.08)
Coupon	13.0529*** (7.05)	13.1602*** (7.21)	13.3048*** (7.31)	10.9624*** (5.24)	10.8710*** (5.21)	10.8840*** (5.26)
Bage	0.5138 (1.18)	0.5232 (1.23)	0.4917 (1.16)	0.8409 (1.52)	0.8674 (1.57)	0.8519 (1.54)
LFFL	1.9005*** (12.66)	1.8883*** (12.76)	1.8827*** (12.75)	1.9514*** (10.56)	1.9484*** (10.56)	1.9438*** (10.56)
Lnamt	-6.4197** (-2.50)	-6.2704** (-2.45)	-6.3667** (-2.48)	-7.1901* (-1.93)	-7.2175* (-1.92)	-7.5483** (-2.01)
RAT	23.8975*** (3.67)	24.3405*** (3.88)	24.2402*** (3.85)	26.6657*** (3.86)	26.9727*** (3.98)	27.1514*** (3.99)
Constant	-5368.3137*** (-3.42)	-5824.4872*** (-3.84)	-5517.1743*** (-3.69)	-6560.0424** (-2.23)	-6892.8499** (-2.31)	-6802.4159** (-2.31)
Observations	7210	7210	7210	6458	6458	6458
Adjusted R ²	0.7269	0.7286	0.7288	0.7290	0.7289	0.7287

Table 7. Endogeneity Discussions on the Relation between CEO Narcissism and Corporate Bond Yield Spread: Difference-in-Difference Design

This table shows the results of difference-in-difference model design for the effect of CEO narcissism on bond yield spread (YS; the proxy of firm credit risk). This study employs CEO turnover as an event to form a quasi-natural experiment and then discusses the impacts of CEO narcissism on bond yield spread. This study defines the treatment group as the firms with CEO turnover that change from a low level of CEO narcissism to a high level. The control group is defined as the firms with CEO turnover event that change from a low level of CEO narcissism to another low level. Besides, this research defines a dummy variable, *NewNar_D* (*NewNar_Def1*, *NewNar_Def2*, *NewNar_Def3*), that equals 1 if the joining of the new CEO moves from a low level of CEO narcissism to a high level and 0 otherwise. *Post* is a dummy variable that equals 1 if the year of observation is after the occurrence of CEO turnover and 0 otherwise. We employ *NewNar_D* × *Post* to capture the treatment effect of a firm from a low level of CEO narcissism to a high level on bond yield spread. Control variables include CEO tenure (CEO_TEN), CEO age (CEO_Age), CEO gender (CEO_GEN), leverage ratio (LEV), equity volatility (VOL), the natural logarithm of firm asset value (SIZE), firm age (Fage), return on assets (ROA), operating cash flow volatility (OCFV), annualized coupon rate (Coupon), bond age (Bage), time to maturity (LFFL), the natural log of amount issued (Lnamt), and bond credit rating (RAT). The fixed effects (firm/bond and year) and cluster issues are considered in these results. This table presents the regression coefficients and adjusted R-squared. The t-statistics calculated by firm/bond-level clustered standard errors (Petersen, 2009) for each coefficient appears immediately underneath. The signs of “*, **, ***” represent the significance of 10%, 5%, and 1%, respectively.

	(1) YS	(2) YS	(3) YS	(4) YS	(5) YS	(6) YS
Post	-52.7814 (-0.97)	-43.3624 (-0.80)	-25.5306 (-0.59)	-27.9182 (-0.81)	-20.8750 (-0.58)	-43.6923 (-1.38)
NewNar_Def1*Post	65.2477* (1.96)			83.9189*** (2.98)		
NewNar_Def2*Post		56.6019** (2.11)			61.6443*** (2.73)	
NewNar_Def3*Post			54.8423*** (2.77)			59.3196*** (2.66)
CEO_TEN	-15.9201** (-2.04)	-16.0205** (-2.15)	-11.6168* (-1.85)	-11.7851* (-1.78)	-10.1256 (-1.58)	-12.0540* (-1.79)
CEO_Age	1.7833 (0.59)	2.4019 (0.92)	0.4755 (0.20)	7.1609* (1.71)	5.7395 (1.53)	5.0117 (1.28)
CEO_GEN	-105.1228*** (-2.83)	-20.4622 (-0.51)	-58.9682* (-1.77)	-35.0802 (-1.55)	-27.0439 (-0.97)	-45.4101** (-2.16)
LEV	328.6734** (2.26)	257.4513* (1.88)	260.8870* (1.91)	205.6460*** (3.60)	180.0392*** (3.43)	172.0506*** (3.59)
VOL	390.3891*** (3.38)	373.5048*** (3.39)	406.9449*** (3.87)	392.1327*** (4.68)	369.4944*** (4.46)	374.5658*** (4.59)
SIZE	45.8294 (1.46)	42.4544 (1.41)	31.8590 (1.18)	-6.6062 (-0.40)	-3.2415 (-0.20)	-9.0848 (-0.66)
Fage	85.7291 (1.65)	135.8955** (2.42)	115.8970** (2.31)	77.3046*** (2.64)	61.5190** (2.00)	52.7543* (1.79)
ROA	-150.9612 (-0.99)	-189.8712 (-1.25)	-164.0235 (-1.07)	-211.0640* (-1.77)	-177.5046 (-1.60)	-176.7126 (-1.57)
OCFV	171.5256 (0.20)	233.1901 (0.29)	277.3660 (0.35)	875.3978** (2.00)	685.4153 (1.60)	829.7107* (1.93)
Coupon	17.1801*** (4.71)	17.3435*** (4.95)	16.2880*** (5.02)	-960.3046*** (-3.16)	-1021.3637*** (-3.41)	-1068.3926*** (-3.56)
Bage	0.3755 (0.41)	0.2196 (0.25)	0.5965 (0.69)	-119.2996 (-1.61)	-110.8050 (-1.47)	-127.0366 (-1.48)
LFFL	1.4860*** (8.13)	1.5179*** (7.67)	1.5165*** (7.69)	4.8769 (0.18)	11.8441 (0.48)	89.9630*** (8.51)
Lnamt	-0.3867 (-0.06)	-0.5013 (-0.08)	-1.5868 (-0.26)	113.8498*** (2.86)	111.4591*** (2.99)	110.6299*** (3.02)
RAT	37.8912*** (4.31)	43.3286*** (5.19)	44.5587*** (5.67)	49.9989*** (4.78)	53.2008*** (5.19)	54.1383*** (5.72)
Constant	-5331.0764* (-1.93)	-7918.6227*** (-2.70)	-6761.6261** (-2.50)	-86.7273 (-0.03)	914.5924 (0.37)	1231.1685 (0.50)
NewNar_D	YES	YES	YES	YES	YES	YES
Year Dummies	YES	YES	YES	YES	YES	YES
Firm Dummies	YES	YES	YES	NO	NO	NO
Bond Dummies	NO	NO	NO	YES	YES	YES
Cluster	Firm	Firm	Firm	Bond	Bond	Bond
Observations	1829	1975	2054	1829	1975	2054
Adjusted R ²	0.7240	0.7270	0.7183	0.7167	0.7106	0.7110

**Table 8. The Effect of CEO Narcissism on Corporate Bond Yield Spread:
The Moderating Role of Corporate Governance**

This table shows the results of the moderating effects of corporate governance for the relation between CEO narcissism variables (Nar_Def1, Nar_Def2, Nar_Def3) and corporate bond yield spread (YS). The proxies of corporate governance used in this study include internal governance variable (IG; Cheng et al., 2016) and external governance variable (ODIR). Following Cheng et al. (2016), the IG variable is defined as the sum of standardized values of Exec_Horizon and Exec_PayRatio. Exec_Horizon stands for the number of years until the age of retirement and Exec_PayRatio presents the key subordinate executives' ability to monitor the CEO. For the proxy of external governance, the ODIR variable is defined as the percentage of outside directors on the board. Control variables include CEO tenure (CEO_TEN), CEO age (CEO_Age), CEO gender (CEO_GEN), leverage ratio (LEV), equity volatility (VOL), the natural logarithm of firm asset value (SIZE), firm age (Fage), return on assets (ROA), operating cash flow volatility (OCFV), annualized coupon rate (Coupon), bond age (Bage), time to maturity (LFFL), the natural log of amount issued (Lnamt), and bond credit rating (RAT). The fixed effects (firm and year) and cluster issues are considered in these results. This table presents the regression coefficients and adjusted R-squared. The t-statistics calculated by firm-level clustered standard errors (Petersen, 2009) for each coefficient appears immediately underneath. The signs of **, *, *** represent the significance of 10%, 5%, and 1%, respectively.

	(1) YS	(2) YS	(3) YS	(4) YS	(5) YS	(6) YS
Nar_Def1	46.6598** (2.07)			-4.9019 (-0.08)		
Nar_Def2		54.3553*** (2.60)			974.4789*** (2.89)	
Nar_Def3			60.1956*** (3.79)			1003.5612*** (2.97)
IG	11.6535** (2.29)	11.5046** (2.54)	9.2031** (2.12)			
Nar_Def1*IG	-15.9246** (-2.19)					
Nar_Def2*IG		-17.5071** (-2.55)				
Nar_Def3*IG			-11.7408* (-1.82)			
ODIR				-14.3821 (-0.06)	356.3354 (1.48)	344.0582 (1.40)
Nar_Def1*ODIR				68.9962 (1.06)		
Nar_Def2*ODIR					-911.6172*** (-2.67)	
Nar_Def3*ODIR						-947.3477*** (-2.78)
CEO_TEN	-3.1769 (-0.99)	-2.4033 (-0.74)	-2.7796 (-0.88)	-2.9758 (-0.82)	-1.4821 (-0.42)	-1.4938 (-0.42)
CEO_Age	3.0901 (1.51)	2.5986 (1.31)	2.6549 (1.37)	2.5653 (1.06)	1.3739 (0.61)	0.9743 (0.45)
CEO_GEN	13.1064 (0.50)	20.7457 (0.86)	13.8165 (0.55)	5.1290 (0.23)	7.6758 (0.33)	-9.6702 (-0.41)
LEV	210.4663*** (3.19)	211.1303*** (3.24)	215.0722*** (3.30)	224.5435*** (2.92)	243.2975*** (3.28)	245.5570*** (3.36)
VOL	380.2294*** (5.95)	381.0510*** (5.98)	384.4856*** (6.03)	338.8188*** (4.73)	347.4457*** (4.88)	351.2973*** (4.94)
SIZE	-8.4578 (-0.52)	-7.9269 (-0.49)	-7.4665 (-0.46)	-10.3102 (-0.58)	-8.4186 (-0.52)	-8.8496 (-0.54)
Fage	110.2538** (2.01)	117.7624** (2.19)	116.9439** (2.21)	119.7378** (2.11)	133.8185** (2.36)	117.0075** (2.11)
ROA	-340.2978*** (-3.40)	-318.9921*** (-3.38)	-319.2637*** (-3.39)	-365.6027*** (-2.96)	-314.6354*** (-2.71)	-316.4179*** (-2.74)
OCFV	395.5457 (1.12)	348.4933 (0.99)	330.6988 (0.96)	-57.7950 (-0.15)	69.2250 (0.19)	30.8930 (0.09)
Coupon	12.7230*** (6.75)	12.9191*** (6.87)	13.0511*** (6.95)	10.9400*** (5.30)	10.3002*** (4.89)	10.6542*** (5.10)
Bage	0.6728 (1.47)	0.6709 (1.47)	0.6571 (1.44)	0.7529 (1.35)	0.7854 (1.42)	0.7012 (1.27)
LFFL	1.9693*** (12.52)	1.9526*** (12.59)	1.9439*** (12.57)	1.9448*** (10.55)	1.9697*** (10.42)	1.9489*** (10.52)
Lnamt	-7.8634** (-2.51)	-7.8500** (-2.52)	-7.8196** (-2.49)	-8.0215** (-2.13)	-8.9293** (-2.39)	-9.1539** (-2.44)
RAT	26.8134*** (4.11)	27.3198*** (4.28)	27.5807*** (4.33)	27.3449*** (3.85)	29.2310*** (4.41)	29.8460*** (4.50)
Constant	-5937.6376** (-2.09)	-6316.0722** (-2.27)	-6285.3587** (-2.29)	-6380.2380** (-2.13)	-7461.7762** (-2.48)	-6548.4174** (-2.25)
Observations	8390	8390	8390	6458	6458	6458
Adjusted R ²	0.7215	0.7226	0.7228	0.7259	0.7295	0.7303