International Review of Financial Analysis 95 (2024) 103385

Contents lists available at ScienceDirect

International Review of Financial Analysis

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

Chief executive officer marital status and corporate credit ratings

Xiangshang Cai [a], Yang Gao [b], Zhiting Wu [c], Jiayi Yuan [d,*]

[a] Management School, University of Liverpool, Chatham St, Liverpool L69 7ZH, United Kingdom
[b] University of Exeter Business School, University of Exeter, Streatham Court, Rennes Drive, Exeter EX4 4PU, United Kingdom
[c] Institute for Financial and Accounting Studies, Xiamen University, Jiageng 2nd Building, 422 Siming South Road, Xiamen, Fujian Province 361005, China
[d] Leeds University Business School, University of Leeds, Maurice Keyworth Building, Woodhouse Lane, Leeds LS2 9JT, United Kingdom

ARTICLE INFO

JEL codes:
G24
G30
M12
M14

Keywords:
CEO marital status
Corporate credit ratings
Bankruptcy risk
Corporate social responsibility (CSR)
Business uncertainty shocks

ABSTRACT

In this study, we investigate the effects of CEO marital status on credit risk assessments. We find that firms with married CEOs receive more favorable credit ratings. We also find that firms with married CEOs have a lower bankruptcy risk, less exposure to business uncertainty shocks, and better institutional corporate social responsibility (CSR) performance, giving richer insights into potential mechanisms through which married CEOs improve credit ratings. Furthermore, we find that the positive effects of married CEOs on credit ratings are more pronounced for firms with stronger CEO risk-taking incentives provided by option compensation and firms with greater tournament incentives measured as the pay gap between the CEO and the next layer of senior executives. Overall, this study emphasizes the implications of CEO marital status for debtholder wealth.

1. Introduction

Drawing from upper echelon theory, chief executive officer (CEO) experience and attributes matter in terms of corporate decisions (Hambrick, 2007; Hambrick & Mason, 1984). Prior research finds that CEOs' characteristics, such as political preferences (Bhandari & Golden, 2021), religion (Hilary & Hui, 2009), CEOs' early-life exposure to fatal disasters (Bernile, Bhagwat, & Rau, 2017), and education (King, Srivastav, & Williams, 2016), have significant implications for business activities. As an important personal attribute, marital status often changes individuals' decisions and reshapes their investment behavior (Bertocchi, Brunetti, & Torricelli, 2011; Love, 2010). Anecdotal evidence suggests that the marital status of individuals is often associated with the probability of their experiencing personal bankruptcy, defaulting on credit cards (Agarwal, Chomsisengphet, & Liu, 2011), risk of motor vehicle driver injury (Whitlock, Norton, Clark, Jackson, & MacMahon, 2004), and even the level of car insurance premium they pay (Megna, 2021). Given the difference between married and single individuals, a growing body of literature explores the effects of CEO marital status on corporate activities, including dividend policy (Hossain, Rabarison, Ater, & Sobngwi, 2023; Nicolosi, 2013), risk-taking and investment decisions (Roussanov & Savor, 2014), earnings management (Hilary, Huang, & Xu, 2017), insider trading (Hegde, Liao, Ma, & Nguyen, 2023), cash holdings (Al Mamun, Boubaker, Ghafoor, & Suleman, 2024; Elnahas, Hossain, & Javadi, 2024), corporate innovation (Zhang, Zheng, Lam, Fu, & Li, 2022), and corporate social responsibility (CSR) (Hegde & Mishra, 2019). However, it remains an underexplored question of whether, and to what extent, firms run by married CEOs improve financial solvency and build trustworthiness in debt markets. This paper aims to extend the line of CEO marital status research to include the implications for corporate credit ratings.

Credit rating is a widely accepted criterion for capital market participants to assess corporate trustworthiness, which plays an essential role in corporate financing (Kisgen, 2006) and investment decisions (Aktas, Petmezas, Servaes, & Karampatsas, 2021; Harford & Uysal, 2014). Given the importance of credit ratings, early studies were dedicated to identifying the key determinants of corporate credit ratings, such as firm size, financial ratios, corporate governance, and information asymmetry (Ashbaugh-Skaife, Collins, & LaFond, 2006; Boardman & McEnally, 1981; Horrigan, 1966; Mei & Subramanyam, 2008). More recently, rating agencies are found to regard the direct communication between management teams and rating analysts as a key element in the process of credit rating assessments (FitchRatings, 2021; MorningStar, 2017; Standard & Poor's [S&P], 2019), which further emphasizes the

* Corresponding author.
E-mail addresses: Xiangshang.Cai@liverpool.ac.uk (X. Cai), Y.Gao4@exeter.ac.uk (Y. Gao), wuzhiting@xmu.edu.cn (Z. Wu), J.Yuan1@leeds.ac.uk (J. Yuan).

https://doi.org/10.1016/j.irfa.2024.103385
Received 18 January 2023; Received in revised form 20 January 2024; Accepted 19 February 2024
Available online 29 May 2024

essential role of top management teams in credit risk assessments. Recent studies increasingly demonstrate that credit rating agencies take management attributes, such as CEO risk-taking incentives (Kuang & Qin, 2013), managerial ability (Bonsall, Holzman, & Miller, 2017), generalist skills (Ma, Ruan, Wang, and Zhang, 2021), and the CEO's political preference (Bhandari & Golden, 2021), into account during credit risk assessments. Missing from this literature, however, is another important managerial attribute—CEO marital status. We fill this gap in the credit rating literature by investigating whether credit rating agencies take CEO marital status into account in their assessments of credit risk.

Our main prediction is that credit rating agencies have a positive perception of firms led by married CEOs, as the latter tend to improve the creditworthiness of companies through three potential mechanisms. First, married CEOs tend to have higher household consumption commitments than unmarried CEOs (Roussanov & Savor, 2014); hence, due to their household responsibilities, they are less able to afford potential dismissal.[1] It is worth mentioning that the majority of U.S. CEOs are not able to get reemployment after their company goes bankrupt (Eckbo, Thorburn, & Wang, 2016). Along these lines, we conjecture that married CEOs are more concerned about job security and, therefore, dedicated to decreasing firms' bankruptcy risk, contributing to higher credit ratings. Second, married males, on average, have a lower level of testosterone than single men (Booth & Dabbs, 1993; Burnham et al., 2003), which constrains their pursuit of power and dominant position (Carney, Cuddy, & Yap, 2010; Mazur & Booth, 1998; Mehta, Jones, & Josephs, 2008). In this vein, married male CEOs are likely to make fewer autocratic decisions compared with single male CEOs, which contributes to a reduction in the volatility of firm performance (Adams, Almeida, & Ferreira, 2005; Fahlenbrach, 2009; Liu & Jiraporn, 2010). Thus, firms managed by a married CEO could have a lower exposure to business uncertainty shocks. Third, firms run by married CEOs tend to have better CSR performance (Hegde & Mishra, 2019). Institutional CSR activities help firms hedge or diversify risks associated with adverse events (Gardberg & Fombrun, 2006; Godfrey, 2005; Godfrey, Merrill, & Hansen, 2009), which contributes to higher corporate credit ratings (Jiraporn, Jiraporn, Boeprasert, & Chang, 2014).

However, a competing argument is that the presence of a married CEO may have a negative or insignificant association with credit ratings. First, as a sort of safe asset (Bertocchi et al., 2011), marriage has been shown to enhance individuals' risk tolerance (e.g., Agnew, Balduzzi, & Sunden, 2003; Grable, 2000). To shoulder the family burden and ensure that family members live comfortably, married CEOs may desire success and high status, which increases the business risk to which their firms are exposed (Adams et al., 2005; Fahlenbrach, 2009; Liu & Jiraporn, 2010). Second, as leisure time may be more valuable to someone who has a spouse and children (Roussanov & Savor, 2014), married CEOs tend to have a higher opportunity cost of effort, which impedes their firms from implementing value-enhancing investment projects and leads to problems of underinvestment (Aggarwal & Samwick, 2006; Bertrand & Schoar, 2003; Chen, Cheng, Lo, & Wang, 2015; Hirshleifer & Thakor, 1992), thereby destroying future firm value and lowering credit ratings. Third, married CEOs may also preserve more resources for their own families at the expense of their employees (Dahl, Dezső, & Ross, 2012) and other stakeholders, which is detrimental to their relationship with stakeholders, leading to lower credit ratings (Attig, El Ghoul, Guedhami, & Suh, 2013; Jiraporn et al., 2014; Oikonomou, Brooks, & Pavelin, 2014).

Based on a sample of 12,976 firm-year observations of U.S. listed firms in the period 1992–2017, we investigate the impact of CEO marital status on corporate credit rating. Our empirical results are strongly aligned with our main prediction that firms with married CEOs receive more favorable credit ratings than comparable firms with unmarried CEOs. The results are robust in respect of alternative measures of corporate credit ratings. The documented relationship is economically meaningful: on average, a married CEO is related to a 1.62% to 4.04% increase in corporate credit rating under various credit rating measures. The magnitude of the impact is comparable with the impacts of other well-known credit rating determinants, such as firm size, leverage, and business loss (Bhandari & Golden, 2021; Cao, Kim, Zhang, & Zhang, 2019; Kuang & Qin, 2013; Ma et al., 2021).

The empirical relationship between married CEOs and corporate credit ratings may suffer from endogeneity concerns due to omitted variables unaccounted for in the baseline regression. Specifically, firms may differ in both unobservable and observable firm characteristics depending on whether they are led by a married or an unmarried CEO. Thus, the positive impact of married CEOs on corporate credit ratings may be subject to omitted variable bias. Furthermore, it is possible that married CEO candidates are more likely to join firms with higher credit ratings in the labour market, which raises potential reverse causality concerns. We adopt five identification approaches to assuage the endogeneity concerns. First, we perform difference-in-differences (DID) analysis by exploiting the variation in CEO marital status accompanied by CEO turnover events to investigate changes in corporate credit rating. To circumvent the potential concern that CEO departures are induced by endogenous factors, such as firm performance, we utilize exogenous CEO turnover events (e.g., death, health-related departures, or natural retirement) to strengthen the identification strategy, which helps isolate the effect of CEO marital status on corporate credit rating. Second, we employ a propensity score matching (PSM) approach to mitigate the concern that a significant relation between married CEOs and corporate credit ratings is driven by systematic differences in observable firm- and CEO-specific characteristics. Third, we implement a variation of the Heckman two-stage approach (Heckman, 1979), a treatment effects model, to control for the biases induced by non-random CEO selection. Fourth, we re-estimate our baseline regression and further control for unobserved time-invariant firm heterogeneity using the firm fixed effect model. Last, we augment baseline regression models by incorporating additional control variables relating to CEO attributes to further mitigate potential endogeneity concerns due to omitted variables. Our results indicate that the positive relationship between married CEOs and corporate credit ratings is still statistically significant after addressing the endogeneity issues.

We conduct additional analyses to examine why credit rating agencies would take a CEO's marital status into consideration when assessing the credit rating of a firm. We investigate the underlying mechanisms through which the presence of married CEOs has a positive effect on the creditworthiness of companies and show that firms with married CEOs have a lower likelihood of bankruptcy, less exposure to business uncertainty shocks, and better institutional CSR performance. We also perform cross-sectional analyses to investigate whether the positive impact of married CEOs on credit ratings is heterogeneous across different types of firms. We find that the positive relationship between married CEOs and credit ratings is more pronounced for firms with CEOs who are granted greater stock option compensation for risk-taking incentives and a higher pay gap between the CEO and the next layer of senior managers. Collectively, our empirical evidence highlights the relevance of CEO marital status in a firm's ability to maintain financial stability and credit trustworthiness.

This study contributes to two research streams. First, we offer novel empirical support for upper echelon theory in corporate finance. Specifically, we complement the literature on the effects of managerial attributes, especially CEO marital status, on corporate policies and practice (Al Mamun et al., 2024; Elnahas, Hossain, & Javadi, 2024; Hegde & Mishra, 2019; Hegde et al., 2023; Hossain et al., 2023; Hilary

[1] Although married CEOs do not necessarily consume more than their single peers, a married CEO who is responsible for indispensable family expenditures, such as childcare costs, has less flexibility in consumption choices. Married CEOs are, due to their household consumption commitments, less able to afford potential dismissal (Kim et al., 2022).

et al., 2017; Kim, Liao, & Liu, 2022; Liu, Tian, & Zhang, 2023; Nicolosi, 2013; Nicolosi & Yore, 2015; Roussanov & Savor, 2014; Zhang et al., 2022). Most studies emphasize the implications of CEO marital status for the cost and benefit to shareholders, whereas we focus on the impact of CEO marital status from the perspective of the debtholders. We make the first attempt to examine whether and to what extent the marital status of CEOs is considered in relation to corporate credit rating assessment. Our findings emphasize the positive contribution of married CEOs to maintaining financial stability, reducing firms' exposure to business uncertainty shocks, and enhancing their long-term sustainability, thereby being awarded more favorable credit ratings in debt markets.

Second, our study contributes to a growing body of literature examining the determinants of corporate credit ratings (Alissa, Bonsall, Koharki, & Penn, 2013; Ashbaugh-Skaife et al., 2006; Becker & Milbourn, 2011; Bhandari & Golden, 2021; Bonsall et al., 2017; Cornaggia, Krishnan, & Wang, 2017; Kuang & Qin, 2013; Ma et al., 2021; Mei & Subramanyam, 2008). Recent studies investigate the role of CEO attributes in the evaluation of a firm's creditworthiness by credit rating agencies, examining such characteristics as managerial skills (Bonsall et al., 2017; Cornaggia et al., 2017), transferable skills (Ma et al., 2021), political preferences (Bhandari & Golden, 2021), and managerial education background (Papadimitri, Pasiouras, Tasiou, & Ventouri, 2020). Our findings are consistent with the argument in the literature that credit rating agencies take CEO traits into account when assessing a firm's creditworthiness. We extend the literature by examining the influence of an important but underexplored managerial trait—the marital status of CEOs—on credit ratings.

Our paper has practical implications for financial analysts, investors, and regulators who continue to assess the role of credit rating agencies. First, whereas anecdotal evidence suggests that people's creditworthiness is typically associated with their marital status (Agarwal et al., 2011), little is known regarding whether the marital status of a CEO is relevant to the creditworthiness of companies managed by that CEO. We answer the question by uncovering a positive association between CEO marital status and corporate credit ratings. Second, following a series of accounting scandals in the early 2000s, the 2008 global financial crisis, and the market crash led by the COVID-19 pandemic, the quality of credit ratings has been the subject of mounting public scrutiny. Our study contributes to the debate by providing supportive evidence of the ability of rating agencies to incorporate an important CEO trait (i.e., CEO marital status) into credit risk assessments. Furthermore, our study provides valuable information for bond market participants in terms of their assessments of firm bankruptcy risks based on the personal traits of CEOs.

This paper is organized as follows. We discuss the hypothesis development in section 2. Section 3 describes the sample selection, definitions of the variables, and descriptive statistics. Our main results are presented in section 4. We discuss the underlying mechanisms through which married CEOs affect the creditworthiness of their companies in section 5 and present additional cross-sectional analysis in section 6. Section 7 concludes the paper.

2. Hypothesis development

Anecdotal evidence suggests that marital status, an important personal attribute, has a close association with the degree of conservatism and creditworthiness of the individual. For example, Agarwal et al. (2011) suggest that married debtholders are 32% less likely to file for personal bankruptcy and 24% less likely to default on their credit card debt than their single peers. Whitlock et al. (2004) show that married people have a substantially lower risk of driver injury than people who have never been married. With this in mind, actuaries consider marital status to be one of the most important factors when assessing an individual's risk as a driver. Based on a rate analysis by industry experts on carinsurance.com, many car insurers give people discounts when they get married, and married insureds pay 4% less than drivers who are single (Megna, 2021). According to behavior consistency theory, individuals are consistent in their behavioral dispositions across different domains, contexts, and situations (Bhandari & Golden, 2021; Elnahas & Kim, 2017).[2] Given that marriage is often associated with an individual's conservatism and creditworthiness and that the personal attributes of CEOs play an essential role in corporate decision making (e.g., Bhandari & Golden, 2021; Roussanov & Savor, 2014), CEOs' marital status may also directly influence the creditworthiness of their companies.

Major credit rating agencies have stated that they consider CEOs' management attributes and risk tolerance when conducting credit risk assessments (FitchRatings, 2021; MorningStar, 2017; S&P, 2008). For example, MorningStar (2017) states that 'we emphasize how conservatively a management team is managing its balance sheet, its policies regarding share buybacks and dividends'. S&P (2008) claims that 'Management is assessed for its role in determining operational success and also for its risk tolerance'. Given that information on CEOs' marital status is publicly available and closely associated with their conservatism and creditworthiness, rating agencies may take this information into consideration when assessing the credit rating of companies. We expect the presence of married CEOs to affect credit rating assessments positively through three potential mechanisms.

First, firms run by married CEOs have lower default risks than those with unmarried CEOs due to the conservatism of the former. Eckbo et al. (2016) offer evidence that 66% of incumbent CEOs fail to be reemployed in the job market after their firm experiences bankruptcy. More importantly, in the case of bankruptcy, the cash flow of those CEOs' future earnings is 4.6 times lower, making it difficult for them to maintain the same living standards. A married CEO, particularly for single-income couples and couples with children, typically has higher household consumption commitments than an unmarried CEO (Roussanov & Savor, 2014). Although married CEOs' consumption is not necessarily higher than that of their single peers, a married CEO is responsible for indispensable family expenditures, such as childcare costs, and has less flexibility in consumption choices. Married CEOs are, due to their household responsibilities, less able to afford potential dismissal (Kim et al., 2022). Hence, they are more concerned about job security and dedicated to decreasing firms' bankruptcy risk, contributing to higher credit ratings.

Second, among male CEOs, who account for the absolute majority of our sample,[3] married men make fewer autocratic decisions in running their firms due to a lower level of testosterone. Research in the field of biology finds that married males, on average, have a lower level of testosterone than single men (Booth & Dabbs, 1993; Burnham et al., 2003), which limits their desire for dominance (Carney et al., 2010; Mazur & Booth, 1998; Mehta et al., 2008). The literature finds that CEOs who dominate major corporate decisions consistently undervalue the risk of potential investment projects, leading to more extreme decisions and increased volatility in firm performance (Adams et al., 2005; Fahlenbrach, 2009; Liu & Jiraporn, 2010). Therefore, among male CEOs, married CEOs are less likely to aspire to power and status and make fewer autocratic decisions, which contributes to lower exposure to business uncertainty shocks and higher credit ratings.

Third, firms run by married CEOs tend to have better CSR performance. Married individuals have been found to have better mental health and to make fewer egocentric decisions, enabling them to take other people's points of view into consideration (Stack & Eshleman, 1998; Todd, Forstmann, Burgmer, Brooks, & Galinsky, 2015). In addition, Hegde and Mishra (2019) document that, as a social construction and cultural norm, marriage serves as a powerful catalyst to foster pro-

[2] For example, Cronqvist, Makhija, and Yonker (2012) find that CEOs' leverage choices for their companies are consistent with the mortgaging of their primary residences.

[3] Male CEOs account for 97.7% of our sample, which is comparable with the findings of Li and Zeng (2019) and Kim et al. (2022).

social values and promote the pursuit of common interests. Hence, firms run by married CEOs have better CSR performance, especially institutional CSR,[4] which helps firms hedge or diversify risks associated with adverse events (Gardberg & Fombrun, 2006; Godfrey, 2005; Godfrey et al., 2009; Lins, Servaes, & Tamayo, 2017) and improve credit ratings (Jiraporn et al., 2014). Based on the above discussion, our main hypothesis is that firms managed by married CEOs are associated with higher credit ratings than those with unmarried CEOs.

However, it is possible that a CEO's marriage may have a negative or no association with credit ratings. First, a few studies outside the realm of corporate finance suggest that marriage represents a sort of safe asset (Bertocchi et al., 2011), which may increase the risk tolerance of married individuals (e.g., Agnew et al., 2003; Grable, 2000). Along these lines, in order to bear the family burden and ensure family members live comfortably, married CEOs may desire success and high status to increase their income, resulting in more aggressive and autocratic investment policies, thereby increasing the business risk of their firms (Adams et al., 2005; Fahlenbrach, 2009; Liu & Jiraporn, 2010). Second, compared with single CEOs, married CEOs are more likely to spend time and energy on their families, which may lead to job distraction and prevent them from devoting themselves entirely to their chief executive role (Roussanov & Savor, 2014). It is generally argued that corporate investments require CEOs to spend time overseeing the process of investment projects (Stein, 2002). Therefore, married CEOs tend to have a higher opportunity cost of effort (Roussanov & Savor, 2014), since leisure time may be more valuable for someone who has a spouse and children. In this vein, the higher opportunity cost of effort of married CEOs may motivate them to shirk or underinvest (Aggarwal & Samwick, 2006; Bertrand & Schoar, 2003; Chen et al., 2015; Hirshleifer & Thakor, 1992), which can increase the agency cost of free cash flow to damage long-term fundamental value. Third, married CEOs tend to husband more resources for their families at the expense of other stakeholders and pay their employees less generously (Dahl et al., 2012), which is detrimental to their relationship with stakeholders and the firm's long-term sustainability. As the social image is recognized as a fundamental factor in the assessment of creditworthiness by credit rating agencies (Attig et al., 2013; Jiraporn et al., 2014; Oikonomou et al., 2014), firms run by married CEOs may have lower credit ratings. On the other hand, as stated in the literature (Bonsall et al., 2017; Cao et al., 2019; Cornaggia et al., 2017), credit rating agencies may focus on fundamental firm-specific factors instead of manager attributes in credit risk assessments. CEO marital status may not have a material impact on credit ratings beyond the firm's fundamentals. Given these countervailing arguments, the association between CEO marital status and credit rating is, ultimately, an empirical question.

3. Sample, variables, and summary statistics

3.1. Sample selection and data sources

Our sample covers U.S. listed firms between 1992 and 2017, excluding those operating in financial (SIC codes 6000–6999) and regulated utility industries (SIC codes 4900–4999). Data on S&P credit ratings and firm-specific financial information are collected from the Compustat database. We obtain data on CEOs' characteristics, such as age, gender, tenure, and compensation, from the Execucomp database. Consistent with previous studies (Hegde & Mishra, 2019; Hilary et al., 2017), data on the marital status of CEOs of U.S. listed firms between 1992 and 2008 are obtained from Roussanov and Savor (2014), who manually gather the information from various public resources, such as '*Marquis Who's Who in Finance and Industry*, the Notable Names Database, the U.S. Securities and Exchange Commission's insider filings, and various media mention'. Following the approach in Roussanov and Savor (2014), we manually collect information on the marital status of CEOs of U.S. listed firms and extend the CEO marital status data to 2017. We retrieve data on stock returns from the Center for Research in Security Prices (CRSP) and on CSR activities from the MSCI ESG KLD database. Following Custódio, Ferreira, and Matos (2013) and Custódio and Metzger (2014), we manually create a link table between the executives identified as CEOs in Execucomp and directors in BoardEx to gather information on CEOs' education and employment background. Our final sample comprises 12,976 firm-year observations representing 1355 U.S. listed firms over the period 1992–2017. Our sample starts from 1992, as data on CEO characteristics from the Execucomp database begin in that year. The sample ends in 2017, since data on S&P credit ratings are available until 2017. Appendix A shows greater details for sample selection.

3.2. Marital status of CEOs

Our data on CEO marital status are provided by Roussanov and Savor (2014) for the period from 1992 to 2008, and we have manually extended the dataset to 2017. To extend the dataset of CEO marital status, we begin by searching the marital and family status of all CEOs of U.S. listed firms over the period 2009–2017 from different sources, such as The Complete Marquis Who's Who, NNDB (Notable Names Database), Wikipedia, the insider filings from the US Securities and Exchange Commission, and Google searches in the last instance. We then identify whether the CEO is married or single during his or her tenure. In line with the findings of Roussanov and Savor (2014), we could only find the exact marriage and divorce dates for a small group of the CEOs in our sample. Therefore, we follow Roussanov and Savor (2014) in employing an indirect approach to identifying CEOs' marital status. More specifically, for CEOs without any marital information, we assume that they are single during their tenure. Those CEOs who have been mentioned as being married but for whom we could not find specific marriage dates are classified as married throughout their tenure. Roussanov and Savor (2014) acknowledge some limitations in this collection approach caused by the lack of public information on CEOs' marital status, such as marriage date, divorce date, marriage quality (happy or unhappy), marriage-like relationship (not being formally married), spouse's health status and so forth. However, Roussanov and Savor (2014) emphasize that this method is representative and reasonable. In terms of CEO-year observations, married CEOs account for 86.9% of our extended sample over the period 2009–2017, which is comparable with the 84% reported in Roussanov and Savor (2014) during 1993–2008. Following Roussanov and Savor (2014), we construct a dummy, *MARRIED*, that equals one if a CEO is legally married, and zero otherwise.

3.3. Corporate credit rating

Similar to previous studies of corporate credit ratings (Aktas et al., 2021; Alissa et al., 2013; Alp, 2013; Becker & Milbourn, 2011; Driss, Drobetz, Ghoul, & Guedhami, 2021), we employ four measures of corporate credit rating. We follow Aktas et al. (2021) and Driss et al. (2021) to define our first credit rating measure, *RATE1*, as a numerical translation of the S&P long-term issuer letter rating using the following scale: AAA = 21; AA+ = 20; AA = 19; AA− = 18; ……; CC = 2; and C = 1. Following Alissa et al. (2013), our second measure of credit rating, *RATE2*, is computed by converting the S&P long-term issuer credit rating letters into numerical values, with the highest numerical rating of 16 (AAA) and the lowest numerical rating of 1 (B−). The third measure of credit rating, *RATE3*, is an ordinal variable taking on values from 1 (CCC) to 17 (AAA), based on Alp (2013). Finally, we follow Becker and

[4] The literature shows that engagement in institutional CSR activities, namely, moral capital, targeting secondary stakeholders or the broader society, provides risk management benefits (Gardberg & Fombrun, 2006; Godfrey, 2005; Godfrey et al., 2009). However, technical CSR engagement, namely, exchange capital aimed at firms' trading partners, is not able to achieve such benefits.

Milbourn (2011) to construct our fourth measure of credit rating, *RATE4*, by translating the S&P long-term issuer credit rating letters into numerical scores between 28 (AAA) and 4 (C). See Appendix C for more details.

3.4. Summary statistics and correlation matrix

Panel A of Table 1 reports the summary statistics for all the variables in our baseline regression. The mean value (standard deviation) of *RATE1* is 12.252 (3.287), which is comparable with that documented by Aktas et al. (2021) and Driss et al. (2021). The standard deviations of *RATE2* and *RATE3* are 3.260 and 3.277, respectively. They are consistent with the findings of Alissa et al. (2013). Consistent with those reported by Becker and Milbourn (2011), our sample firms have a mean value *RATE4* of 18.264, indicating that, on average, our sample firms have a BBB− credit rating. The average value of *MARRIED* is 0.877, indicating that almost 87.7% of the firms in our sample are run by married CEOs, which is also comparable with Roussanov and Savor (2014) and Hegde and Mishra (2019). Furthermore, 97.2% of married CEOs in our sample are male.[5] Panel B of Table 1 reports the correlation matrix of our main variables. The four measures of credit ratings, *RATE1*, *RATE2*, *RATE3*, and *RATE4*, are significantly and positively correlated with each other, as expected. The CEO marital status measure, *MARRIED*, is consistently and positively related to all the credit rating measures, which supports our prediction that firms run by married CEOs receive more favorable credit ratings than those with a single CEO in charge. In addition, *MARRIED* is significantly correlated with many CEO characteristics, such as gender (*FEMALE_CEO*), age (*CEO_AGE*), and tenure (*TENURE*), indicating the importance of controlling for these CEO characteristics in our multivariate analysis.

4. Main empirical results

4.1. Baseline regression models

We start our analysis by investigating the relationship between CEO marital status and corporate credit rating, while controlling other determinants of corporate credit rating. We estimate the ordinary least squares (OLS) regression in Eq. (1):

$$RATE_{i,t} = \alpha + \beta MARRIED_{i,t} + \gamma Controls_{i,t} + Year_{FE} + Industry_{FE} + State_{FE} + \varepsilon_{i,t}, \quad (1)$$

where we alternatively capture the dependent variable of our main interest, $RATE_{i,t}$, using $RATE1_{i,t}$, $RATE2_{i,t}$, $RATE3_{i,t}$, and $RATE4_{i,t}$, constructed by converting the S&P long-term issuer letter ratings into finer numerical scores from 1 to 21, 1 to 16, 1 to 17, and 4 to 28, respectively. Our independent variable of interest, *MARRIED*, is a dummy variable that equals one if the CEO is married, and zero otherwise. Following prior literature (e.g., Ashbaugh-Skaife et al., 2006; Autio, Sapienza, & Almeida, 2000; Bhandari & Golden, 2021; Boardman & McEnally, 1981; Bonsall et al., 2017; Cornaggia et al., 2017; Dechow, Sloan, & Sweeney, 1995; Driss et al., 2021; Harris & Raviv, 1990; Hilary et al., 2017; Horrigan, 1966; Ma et al., 2021; Nicolosi, 2013; Roussanov & Savor, 2014), we include a vector of contemporaneous values of control variables: firm size (*SIZE*), leverage ratio (*LEV*), business losses (*LOSS*), capital intensity (*CAP_INT*), interest coverage ratio (*INT_COV*), debt structure complexity (*SUBORD*), firm age (*FIRM_AGE*), earnings management (*ACCM*), idiosyncratic volatility (*IDIVOL*), and dividend policy (*PAYOUT*). We also follow another strand of literature (e.g., Datta, Doan, & Toscano, 2021; Kuang & Qin, 2013; Liu & Jiraporn, 2010; Park, Tsang, & Lee, 2022) to incorporate a set of CEO characteristics in our model, including CEO age (*CEO_AGE*), gender (*FEMALE_CEO*), tenure (*TENURE*), and compensation (*DELTA* and *VEGA*). Consistent with previous studies on corporate credit ratings (e.g., Bhandari & Golden, 2021; Bonsall et al., 2017; Cornaggia et al., 2017), we also control for year, industry,[6] and headquarter state fixed effects to control for the effects of general time trends and unobserved heterogeneity across industries and firm headquarter states. Robust standard errors are corrected by clustering residuals at the firm level to solve the potential bias arising from time-series and cross-sectional dependence of residuals (Petersen, 2009). Given the ordinal manner of credit rating (Bonsall et al., 2017), we also estimate the ordered logit regressions as robustness tests. A detailed description of the variables is provided in Appendix B.

Table 2 presents the empirical results of our baseline regression, which examines the impact of the presence of married CEOs on corporate credit ratings. Panel A shows the OLS regression results for the four credit rating measures, $RATE1_{i,t}$, $RATE2_{i,t}$, $RATE3_{i,t}$ and $RATE4_{i,t}$, after controlling for a vector of firm-specific determinants of credit rating and a set of CEO attributes. The estimated coefficients of $MARRIED_{i,t}$ are consistently positive and significant at the 1% significance level across all columns. In addition, the ordered logit regression results in Panel B also suggest that firms with married CEOs are associated with higher corporate credit ratings than those with unmarried CEOs. In terms of economic significance, the empirical results of the OLS regression in column (1) indicate that firms run by married CEOs are associated with a 2.41% (=0.2955/12.252) increase in credit rating at the mean. We can compare the effect of married CEOs with that of other important determinants of corporate credit rating. For example, leverage ratio (*LEV*) is negatively and significantly correlated with corporate credit rating. The estimated coefficient and standard deviation for $LEV_{i,t}$ are −3.0604 and 0.167, respectively, implying that a one-standard-deviation increase in $LEV_{i,t}$ decreases *RATE1* by 0.5111 (=3.0604 × 0.167), which is equivalent to 4.17% (=0.5111/12.252) of the sample mean of *RATE1*. Collectively, the positive impact of the presence of a married CEO on credit rating is economically material.

Further, the estimated coefficients of the control variables are broadly comparable with those of previous studies of credit rating (e.g., Ashbaugh-Skaife et al., 2006; Bhandari & Golden, 2021; Bonsall et al., 2017). The results show that credit ratings are higher for firms that are larger in size, have lower leverage, less likelihood of experiencing business losses, greater capital intensity, more interest coverage, a less complex debt structure, lower idiosyncratic volatility, higher dividend payout, and are older.

4.2. Endogeneity

Our empirical evidence so far suggests that firms with married CEOs receive more favorable credit ratings than those with single CEOs. However, the causal effect of CEO marital status on credit rating may be challenged by potential endogeneity concerns, in particular, in the form of self-selection and omitted variables bias. In the case of biases induced by self-selection, it is possible that firms with conservative boards demand lower credit risks and, therefore, appoint married CEOs to implement more conservative investment and financial strategies. This implies that married CEOs are not randomly appointed by firms. Moreover, unobserved heterogeneity concerns may render our estimated coefficients biased and inconsistent if the unobservable firm- or CEO-specific characteristics are correlated with married CEOs and with credit rating. In this subsection, we demonstrate how we solve potential endogeneity concerns using the following identification approaches: (1) a DID framework, (2) PSM analysis, (3) a Heckman two-stage approach, (4) a firm fixed-effects model, and (5) re-estimating baseline regression models with additional control variables.

[5] For brevity, we do not report the results, but they are available by request.

[6] Industry fixed effects are controlled for using two-digit SIC industry classifications.

Table 1
Summary statistics and correlation matrix.

Panel A: Summary statistics

Variables	Obs.	Mean	Std.	25th	Median	75th
RATE1	12,976	12.252	3.287	10.000	12.000	14.250
RATE2	12,976	7.265	3.260	5.000	7.000	9.250
RATE3	12,976	8.256	3.277	6.000	8.000	10.250
RATE4	12,976	18.264	3.320	16.000	18.000	20.250
MARRIED	12,976	0.877	0.329	1.000	1.000	1.000
SIZE	12,976	8.330	1.336	7.369	8.205	9.198
LEV	12,976	0.307	0.167	0.193	0.286	0.394
LOSS	12,976	0.158	0.365	0.000	0.000	0.000
CAP_INT	12,976	0.594	0.395	0.280	0.517	0.845
INT_COV	12,976	0.211	0.283	0.078	0.155	0.286
SUBORD	12,976	0.150	0.357	0.000	0.000	0.000
FIRM_AGE	12,976	12.425	6.852	7.000	12.000	18.000
ACCM	12,976	0.045	0.048	0.014	0.031	0.057
IDIVOL	12,976	0.322	0.167	0.207	0.279	0.387
PAYOUT	12,976	0.211	0.475	0.000	0.105	0.340
CEO_AGE	12,976	4.043	0.117	3.970	4.060	4.127
FEMALE_CEO	12,976	0.023	0.149	0.000	0.000	0.000
TENURE	12,976	1.380	0.792	0.693	1.386	1.946
DELTA	12,976	5.733	1.441	4.821	5.708	6.607
VEGA	12,976	4.132	1.839	3.265	4.443	5.428

Panel B: Correlation matrix

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)
(1) RATE1	1.00																			
(2) RATE2	**1.00**	1.00																		
(3) RATE3	**1.00**	**1.00**	1.00																	
(4) RATE4	**1.00**	**1.00**	**1.00**	1.00																
(5) MARRIED	**0.20**	**0.20**	**0.20**	**0.20**	1.00															
(6) SIZE	**0.51**	**0.52**	**0.52**	**0.52**	**0.16**	1.00														
(7) LEV	**−0.37**	**−0.37**	**−0.37**	**−0.37**	**−0.10**	**−0.12**	1.00													
(8) LOSS	**−0.33**	**−0.32**	**−0.33**	**−0.33**	**−0.07**	**−0.13**	**0.22**	1.00												
(9) CAP_INT	0.00	0.01	0.00	0.00	0.02	−0.01	**0.11**	**0.08**	1.00											
(10) INT_COV	**−0.28**	**−0.28**	**−0.28**	**−0.28**	**−0.06**	**−0.09**	**0.35**	**0.20**	**0.10**	1.00										
(11) SUBORD	**−0.22**	**−0.22**	**−0.22**	**−0.22**	**−0.06**	**−0.12**	**0.25**	**0.09**	0.01	**0.19**	1.00									
(12) FIRM_AGE	**−0.04**	**−0.04**	**−0.04**	**−0.05**	**−0.02**	**0.34**	−0.01	**−0.04**	**−0.08**	**−0.06**	**−0.12**	1.00								
(13) ACCM	**−0.20**	**−0.20**	**−0.20**	**−0.20**	**−0.07**	**−0.15**	**0.10**	**0.29**	**−0.03**	−0.01	**0.03**	**−0.08**	1.00							
(14) IDIVOL	**−0.52**	**−0.52**	**−0.52**	**−0.52**	**−0.11**	**−0.38**	**0.23**	**0.43**	**0.04**	**0.16**	**0.17**	**−0.23**	**0.31**	1.00						
(15) PAYOUT	**0.26**	**0.26**	**0.26**	**0.26**	**0.06**	**0.16**	−0.01	**−0.32**	**0.07**	**−0.04**	**−0.11**	**0.04**	**−0.11**	**−0.23**	1.00					
(16) CEO_AGE	**0.11**	**0.11**	**0.11**	**0.11**	**0.11**	**0.11**	**−0.02**	**−0.07**	**0.05**	0.00	**−0.03**	**0.06**	**−0.09**	**−0.12**	**0.06**	1.00				
(17) FEMALE_CEO	**−0.02**	**−0.02**	**−0.02**	**−0.02**	**0.03**	**0.04**	0.01	−0.01	**−0.03**	0.00	**−0.04**	**0.07**	0.00	**−0.02**	**0.03**	**−0.03**	1.00			
(18) TENURE	−0.01	−0.01	−0.01	−0.01	**−0.02**	**0.14**	**−0.02**	**−0.06**	**−0.04**	**−0.05**	**−0.06**	**0.36**	**−0.06**	**−0.10**	0.01	**0.30**	**−0.05**	1.00		
(19) DELTA	**0.33**	**0.32**	**0.33**	**0.33**	**0.11**	**0.44**	**−0.17**	**−0.26**	**−0.19**	**−0.20**	**−0.05**	**0.10**	**−0.08**	**−0.30**	**0.03**	**0.14**	**−0.04**	**0.35**	1.00	
(20) VEGA	**0.32**	**0.32**	**0.32**	**0.32**	**0.09**	**0.37**	**−0.15**	**−0.14**	**−0.11**	**−0.12**	**−0.06**	**0.06**	**−0.09**	**−0.24**	**0.06**	0.01	**−0.03**	**0.14**	**0.50**	1.00

This table shows the summary statistics and correlation matrix for the key variables used in our baseline regression models. Our sample consists of 12,976 firm-year observations over the period 1992–2017, with available information on CEO marital status and other variables. Panel A presents the summary statistics. The number of observations, mean, standard deviation, 25th percentile, median, and 75th percentile are reported for each variable. Panel B presents the correlation matrix. Figures in bold indicate significance at least at the 5% level. Detailed definitions of all variables are provided in Appendix B.

Table 2
CEO marital status and credit rating.

Panel A: OLS model				
Dependent variable=	RATE1	RATE2	RATE3	RATE4
	(1)	(2)	(3)	(4)
MARRIED	0.2955***	0.2938***	0.2916***	0.2963***
	(0.0988)	(0.0986)	(0.0985)	(0.0992)
SIZE	1.0740***	1.0792***	1.0765***	1.0920***
	(0.0493)	(0.0492)	(0.0492)	(0.0514)
LEV	−3.0604***	−2.9695***	−3.0270***	−3.0952***
	(0.2825)	(0.2815)	(0.2824)	(0.2864)
LOSS	−0.3840***	−0.3860***	−0.3854***	−0.3825***
	(0.0735)	(0.0731)	(0.0736)	(0.0738)
CAP_INT	0.5796***	0.5985***	0.5880***	0.5892***
	(0.1656)	(0.1658)	(0.1656)	(0.1695)
INT_COV	−1.2819***	−1.3197***	−1.3012***	−1.2887***
	(0.1171)	(0.1152)	(0.1165)	(0.1178)
SUBORD	−0.6188***	−0.6319***	−0.6240***	−0.6140***
	(0.0947)	(0.0940)	(0.0942)	(0.0956)
FIRM_AGE	0.0309***	0.0325***	0.0313***	0.0303***
	(0.0096)	(0.0096)	(0.0096)	(0.0097)
ACCM	−0.4755	−0.4163	−0.4471	−0.4571
	(0.4778)	(0.4640)	(0.4687)	(0.4884)
IDIVOL	−6.9592***	−6.6700***	−6.8503***	−6.9729***
	(0.2743)	(0.2715)	(0.2716)	(0.2762)
PAYOUT	0.3176***	0.3209***	0.3189***	0.3235***
	(0.0564)	(0.0565)	(0.0564)	(0.0572)
CEO_AGE	0.1580	0.1921	0.1799	0.1571
	(0.3051)	(0.3043)	(0.3048)	(0.3087)
FEMALE_CEO	−0.1950	−0.2040	−0.1999	−0.2031
	(0.2452)	(0.2453)	(0.2452)	(0.2466)
TENURE	0.0290	0.0284	0.0286	0.0307
	(0.0410)	(0.0409)	(0.0409)	(0.0412)
DELTA	−0.0069	−0.0106	−0.0084	−0.0073
	(0.0326)	(0.0326)	(0.0326)	(0.0327)
VEGA	0.0428*	0.0420*	0.0427*	0.0401*
	(0.0225)	(0.0226)	(0.0225)	(0.0229)
Constant	7.1081***	1.8584	2.9754**	13.0098***
	(1.5052)	(1.5008)	(1.5024)	(1.5141)
Year FE	YES	YES	YES	YES
Industry FE	YES	YES	YES	YES
State FE	YES	YES	YES	YES
Observations	12,976	12,976	12,976	12,976
R-squared	0.7071	0.7039	0.7061	0.7059
Panel B: Ordered logit model				
Dependent variable=	RATE1	RATE2	RATE3	RATE4
	(1)	(2)	(3)	(4)
MARRIED	0.2841***	0.2968***	0.2864***	0.2838***
	(0.1042)	(0.1046)	(0.1041)	(0.1042)
SIZE	1.0547***	1.0605***	1.0540***	1.0547***
	(0.0557)	(0.0555)	(0.0556)	(0.0557)
LEV	−3.2844***	−3.2537***	−3.2716***	−3.2840***
	(0.3069)	(0.3085)	(0.3061)	(0.3070)
LOSS	−0.3821***	−0.3877***	−0.3801***	−0.3814***
	(0.0756)	(0.0766)	(0.0759)	(0.0756)
CAP_INT	0.5416***	0.5501***	0.5471***	0.5412***
	(0.1665)	(0.1682)	(0.1664)	(0.1665)
INT_COV	−1.4765***	−1.5360***	−1.5029***	−1.4779***
	(0.1471)	(0.1493)	(0.1470)	(0.1471)
SUBORD	−0.5537***	−0.5572***	−0.5518***	−0.5535***
	(0.1010)	(0.1008)	(0.1010)	(0.1010)
FIRM_AGE	0.0300***	0.0301***	0.0299***	0.0300***
	(0.0100)	(0.0101)	(0.0100)	(0.0100)
ACCM	−0.7455	−0.6913	−0.7520	−0.7506
	(0.5095)	(0.5126)	(0.5085)	(0.5092)
IDIVOL	−8.0092***	−7.9554***	−8.0137***	−8.0120***
	(0.2805)	(0.2824)	(0.2801)	(0.2807)
PAYOUT	0.2740***	0.2739***	0.2739***	0.2742***
	(0.0554)	(0.0554)	(0.0553)	(0.0554)
CEO_AGE	0.2445	0.2476	0.2414	0.2439
	(0.3129)	(0.3134)	(0.3129)	(0.3129)
FEMALE_CEO	−0.1791	−0.1853	−0.1838	−0.1789
	(0.2516)	(0.2536)	(0.2522)	(0.2516)
TENURE	0.0145	0.0139	0.0132	0.0146
	(0.0428)	(0.0429)	(0.0428)	(0.0428)
DELTA	−0.0085	−0.0104	−0.0077	−0.0085
	(0.0332)	(0.0334)	(0.0332)	(0.0332)
VEGA	0.0540**	0.0529**	0.0544**	0.0540**
	(0.0224)	(0.0225)	(0.0224)	(0.0224)
Year FE	YES	YES	YES	YES
Industry FE	YES	YES	YES	YES
State FE	YES	YES	YES	YES
Observations	12,976	12,976	12,976	12,976
Pseudo R-squared	0.1782	0.1795	0.1787	0.1782

This table shows the panel regression results for the impact of CEO marital status on corporate credit rating. The sample covers 12,976 firm-year observations with non-missing values for all key variables in our baseline regression models over the period 1992–2017. Panel A shows the OLS regression results and Panel B presents the ordered logit model results. The dependent variable for corporate credit rating is proxied by four measures: (1) *RATE1*, constructed by converting letter ratings into finer numerical scores, with the highest numerical rating of 21 being assigned to the AAA letter rating and the lowest numerical rating of 1 being assigned to the C letter rating; (2) *RATE2*, constructed by converting letter ratings into finer numerical scores, with the highest numerical rating of 16 being assigned to the AAA letter rating and the lowest numerical rating of 1 being assigned to the B− letter rating; (3) *RATE3*, constructed by converting letter ratings into finer numerical scores, with the highest numerical rating of 17 being assigned to the AAA letter rating and the lowest numerical rating of 1 being assigned to the CCC letter rating; and (4) *RATE4*, constructed by converting letter ratings into finer numerical scores, with the highest numerical rating of 28 being assigned to the AAA letter rating and the lowest numerical rating of 4 being assigned to the C letter rating. The independent variable of interest is CEO marital status: *MARRIED*. The coefficients of the industry, year, and headquarter state fixed effects are suppressed for brevity in the respective columns. Standard errors are clustered by firm in all columns. Detailed definitions of all variables are provided in Appendix B. ***, **, and * denote statistical significance at the 1%, 5%, and 10% level, respectively.

4.2.1. *Difference-in-Differences (DID)*

Following Huang and Kisgen (2013), we implement the DID analysis by exploiting the CEO marital status transition around CEO turnover events to verify a causal effect of married CEOs on corporate credit rating. We identify firms that transitioned from having a married CEO to an unmarried CEO as the treatment group and firms experiencing married-to-married CEO transitions as the control group.[7] Therefore, any differences in changes in credit rating around the CEO marital status transitions between the treatment group and the control group are likely to be attributable to the impact of variations in CEO marital status, rather than differences in other firm- or CEO-specific characteristics between the two groups before the CEO turnover events. Our DID sample covers firm-year observations three years before and three years after a CEO turnover event, excluding the transition year. We further require a new CEO to stay in the position for at least two consecutive years and firms to have non-missing financial data in Compustat for at least two years before and after the transition year.

It is possible that CEO turnover events may be induced for reasons related to firm performance and management practice, which could affect corporate credit rating. In this case, a post-turnover variation in credit rating may not have a plausible direct connection to the transition

[7] We have only a small number of single-to-single transitions and single-to-married transitions in our sample. Hence, we are not able to investigate the effect of a single-to-married transition on credit rating.

of CEO marital status, but rather the underlying factors that led to the CEO turnover event. Therefore, we conduct the DID analysis by focusing on exogenous CEO turnover events to circumvent potential biases induced by endogenous CEO departures. We manually search for information on reasons for CEO departures from the following sources: The Complete Marquis Who's Who, insider filings from the U.S. Securities and Exchange Commission, and newspaper articles from Google search. Consistent with previous studies (Fee, Hadlock, & Pierce, 2013; Pan, Wang, & Weisbach, 2015, 2018), CEO departures due to death, health issues, or natural retirement are classified as exogenous turnover events. Finally, our sample of exogenous CEO turnovers covering 19 married-to-single and 141 married-to-married transitions retains 160 CEO departures related to death, illness, and natural retirement. We also construct a balanced sample for the DID analysis, in which both the treatment group and the control group are of comparable sample size, to further enhance our identification strategy and strengthen our overall findings. Specifically, in constructing the balanced sample for this analysis, we matched each treatment firm (married-to-single transition) with a control firm (married-to-married transition) of a similar firm size. The balanced sample retains 36 exogenous CEO turnovers, covering 19 married-to-single and 17 married-to-married transitions. We implement the following DID analysis to examine the effects of turnover-induced variation in CEO marital status on corporate credit rating:

$$RATE_{i,t} = \alpha + \beta_1 Transition_i \times Post_{i,t} + \beta_2 Transition_i + \beta_3 Post_{i,t} + \gamma Controls_{i,t} + Year_{FE} + Industry_{FE} + State_{FE} + \varepsilon_{i,t}, \quad (2)$$

where $Transition_i$ is a dummy variable that equals one if a firm experiences a married-to-unmarried CEO transition, and zero if a firm experiences a married-to-married CEO transition; $Post_{i,t}$ is a dummy variable that equals one for the years after the CEO turnover event, and zero for the years before the CEO turnover. We incorporate all the control variables from our baseline regression model in Eq. (1) and control for year, industry, and headquarter fixed effects.

Table 3 presents the results of the DID regression analysis. The estimated coefficients of interacted terms ($Transition_i \times Post_{i,t}$) are negative and statistically significant at the 5% level for the sample of exogenous CEO departures, which suggests that firms replacing an outgoing married CEO with an unmarried one are likely to experience a decrease in their corporate credit rating following the exogenous CEO turnover event. Collectively, we can conclude that a positive effect of married CEOs on corporate credit rating is robust to endogeneity concerns induced by omitted variables.

4.2.2. Propensity score matching (PSM)

To mitigate endogenous matching issues and ensure that the positive relationship between married CEOs and credit ratings is not attributable to systematic differences in observable firm characteristics or CEO attributes, we adopt the widely accepted PSM approach to estimate the treatment effect of CEOs' marital status on credit ratings (Rosenbaum & Rubin, 1983). We identify firms run by single CEOs as the treatment group because married CEOs make up the majority of our sample. We match the treatment group with a control group of firms led by married CEOs that exhibit analogous firm characteristics and CEO attributes to ensure that CEO marital status is the only distinguishable characteristic between the treatment group and the control group. We first employ a logit model to estimate the likelihood (i.e., the propensity score) that a firm is managed by a single CEO, while controlling all observable firm characteristics and CEO attributes included in the baseline regression model in Eq. (1). We use the propensity scores estimated in the logit model to implement a one-to-one, nearest neighbour matching approach without replacement. Specifically, we require the absolute value of the maximum difference between the propensity score of the treatment group and the control group to be less than 0.1%.

Table 4 presents the results of the PSM. We conduct mean-difference tests to examine whether the PSM approach eliminates the difference in observable characteristics between the treatment and the control groups. Panel A indicates that there is no significant difference in covariates between the treated firms and the control firms. In addition, we compare the four credit rating measures (*RATE1*, *RATE2*, *RATE3*, and *RATE4*) between the treatment group and the control group and estimate the average treatment effect. Panel B suggests that the average treatment effect is significant, and firms with married CEOs receive higher credit ratings than those with single CEOs. Finally, we re-estimate the baseline regression model in Eq. (1) based on the propensity score matched sample and present the results in Panel C of Table 4. The estimated coefficients of $MARRIED_{i,t}$ are positive at the 1% significance level in columns (1)–(4). Consistent with our expectation, the significant and positive relationship between married CEOs and corporate credit rating is not likely to be driven by observable differences in firm characteristics and CEO attributes, which further supports the causal effect of

Table 3
CEO marital status and credit rating: Difference-in-Difference analysis (Exogenous CEO transitions)

Panel A: DID analysis based on 160 Exogenous CEO transitions

Dependent variable=	RATE1	RATE2	RATE3	RATE4
	(1)	(2)	(3)	(4)
Transition×Post	−0.6575**	−0.6629**	−0.6576**	−0.7254**
	(0.3156)	(0.3153)	(0.3156)	(0.3255)
Transition	0.8631***	0.8676***	0.8632***	0.8552***
	(0.3128)	(0.3126)	(0.3128)	(0.3202)
Post	0.2477	0.2485	0.2479	0.2724
	(0.1712)	(0.1709)	(0.1713)	(0.1738)
Controls	YES	YES	YES	YES
Year FE	YES	YES	YES	YES
Industry FE	YES	YES	YES	YES
State FE	YES	YES	YES	YES
Observations	1012	1012	1012	1012
R-squared	0.7895	0.7889	0.7894	0.7877

Panel B: DID analysis based on 36 Exogenous CEO transitions in a matched sample

Dependent variable=	RATE1	RATE2	RATE3	RATE4
	(1)	(2)	(3)	(4)
Transition×Post	−0.5608**	−0.5608**	−0.5608**	−0.5728**
	(0.2496)	(0.2496)	(0.2496)	(0.2695)
Transition	0.4833*	0.4833*	0.4833*	0.3362
	(0.2791)	(0.2791)	(0.2791)	(0.3066)
Post	−0.2357	−0.2357	−0.2357	−0.3395
	(0.2926)	(0.2926)	(0.2926)	(0.3086)
Controls	YES	YES	YES	YES
Year FE	YES	YES	YES	YES
Industry FE	YES	YES	YES	YES
State FE	YES	YES	YES	YES
Observations	229	229	229	229
R-squared	0.9585	0.9585	0.9585	0.9561

This table shows the difference-in-difference regression results for the impact of CEO marital status on corporate credit rating. The sample covers firm-year observations three years before and three years after an exogenous CEO transition. Following Huang and Kisgen (2013) and Li and Zeng (2019), we require firms to have at least two years of non-missing data for all variables before and after the CEOs' transition. The independent variable of interest is *Transition*×*Post*. *Transition* is an indicator set to one for firms following married-to-single CEO transitions, and zero for firms following married-to-married CEO transitions. *Post* is an indicator set to one for the transition year and the years after the transition year, and zero otherwise. Panel A of this table considers 160 exogenous CEO turnovers, namely, 19 married-to-single and 141 married-to-married transitions. Panel B of this table considers 36 exogenous CEO turnovers, namely, 19 married-to-single and 17 married-to-married transitions in a matched sample. The coefficients of the industry, year, and headquarter state fixed effects are suppressed for brevity in the respective columns. Standard errors are clustered by firm in all columns. Detailed definitions of all variables are provided in Appendix B. ***, **, and * denote statistical significance at the 1%, 5%, and 10% level, respectively.

Table 4
CEO marital status and credit rating: Propensity score matching estimators.

Panel A: Diagnostic statistics of difference in means of variables

Variable	Treated	Control	*t*-stat.	*p*-value
SIZE	7.845	7.821	0.560	0.579
LEV	0.343	0.348	−0.840	0.402
CAP_INT	0.582	0.573	0.610	0.540
INT_COV	0.249	0.258	−0.700	0.481
SUBORD	0.187	0.198	−0.740	0.462
FIRM_AGE	12.595	12.637	−0.180	0.856
ACCM	0.053	0.055	−0.920	0.358
IDIVOL	0.364	0.372	−1.110	0.265
PAYOUT	0.150	0.137	0.830	0.405
CEO_AGE	4.018	4.012	1.270	0.203
TENURE	1.394	1.427	−1.120	0.264
DELTA	5.357	5.357	0.020	0.987
VEGA	3.730	3.822	−1.390	0.164

Panel B: Average treatment effects

	Single CEO (N = 1350)	Married CEO (N = 1277)	Difference	*t*-stat.
RATE1	10.708	11.096	−0.388***	−3.38
RATE2	5.728	6.117	−0.389***	−3.43
RATE3	6.716	7.103	−0.387***	−3.38
RATE4	16.707	17.100	−0.392***	−3.40

Panel C: Regressions with the propensity score-matched sample

Dependent variable=	RATE1	RATE2	RATE3	RATE4
	(1)	(2)	(3)	(4)
MARRIED	0.4031***	0.4042***	0.4010***	0.4071***
	(0.1030)	(0.1027)	(0.1029)	(0.1032)
Controls	YES	YES	YES	YES
Year FE	YES	YES	YES	YES
Industry FE	YES	YES	YES	YES
State FE	YES	YES	YES	YES
Observations	2627	2627	2627	2627
R-squared	0.7010	0.6961	0.6997	0.7011

This table shows the results of the propensity score matching approach. Panel A tabulates the diagnostic statistics of difference in observable firm- and CEO-level characteristics between the treatment and control groups. Panel B reports the average treatment effects of our dependent variables. Panel C presents the regression results based on the propensity score-matched sample. The coefficients of the industry, year, and headquarter state fixed effects are suppressed for brevity in the respective columns. Standard errors are clustered by firm in all columns. Detailed definitions of all variables are provided in Appendix B. ***, **, and * denote statistical significance at the 1%, 5%, and 10% level, respectively.

CEO marital status on corporate credit ratings.

4.2.3. Heckman selection model

Following Faccio, Marchica, and Mura (2016) and Datta et al. (2021), we adopt a variation of the Heckman two-stage approach (Heckman, 1979), a treatment effects model, to further deal with the potential self-selection bias in our setting. In the first stage, we estimate the pooled probit regression in Eq. (3) below after adding an identification restriction in the form of an industry-level peer effect in the CEO appointment (*AVE_MARRIED*). *AVE_MARRIED* is the average value of married CEOs among peer firms in the same primary industry (one-digit SIC code). The rationale behind the industry-level peer effect in the CEO appointment serving as a valid identification restriction for the likelihood of selecting married CEOs is that firms operating in the same industry are likely to share similar preferences in their hiring of CEOs. However, the average level of married CEOs among peer firms operating in the same industry as the focus firm has no plausible direct link to the credit rating of an individual firm. In the second stage, we further control for the inverse Mills ratio derived from the first stage and re-estimate the baseline regression in Eq. (4) to account for unobservable factors that determine the selection of married CEOs. Specifically, we estimate the following Heckman two-stage regression.

First stage:

$$MARRIED_{i,t} = \alpha + \beta Ave\_Married_{i,t} + \gamma Controls_{i,t} + Year_{FE} + Industry_{FE} + State_{FE} + \varepsilon_{i,t}, \quad (3)$$

Second stage:

$$RATE_{i,t} = \alpha + \beta MARRIED_{i,t} + \gamma Controls_{i,t} + \theta Inverse\ Mills\ Ratio + Year_{FE} + Industry_{FE} + State_{FE} + \varepsilon_{i,t}, \quad (4)$$

Column (1) of Table 5 presents the first-stage results. The first-stage results show that the industry-level peer preference in selecting married CEOs is significantly and positively related to the probability of firms hiring married CEOs. Columns (2)–(5) present the second-stage results. The coefficients for $MARRIED_{i,t}$ remain positive and significant at the 1% significance level, suggesting that our early finding that firms with married CEOs receive more favorable credit ratings than those with single CEOs is unlikely to be a spurious result induced by unobservable factors that affect the endogenous selection of married CEOs.

4.2.4. Firm fixed-effects model

Although the PSM approach can alleviate potential endogeneity concerns arising from observed heterogeneity across firms, the causal relationship between married CEOs and credit ratings could be influenced by unobservable firm characteristics. Following Gormley and Matsa (2014), we adopt a firm fixed-effects model to deal with potential biases induced by time-invariant and unobservable firm-specific factors. We do not control for CEO fixed effects in our model, as CEO marital status has very limited changes in our sample. We re-estimate our baseline regression and control firm and year fixed effects in Eq. (5):

$$RATE_{i,t} = \alpha + \beta MARRIED_{i,t} + \gamma Controls_{i,t} + Firm_{FE} + Year_{FE} + \varepsilon_{i,t}, \quad (5)$$

Table 6 presents the results after controlling for firm and year fixed effects. Consistent with our baseline regression results in Table 2, the estimated coefficients of $MARRIED_{i,t}$ remain positive and significant across all the columns. Our results continue to show that firms with married CEOs receive more favorable credit ratings than those with single CEOs after controlling for firm-level time-invariant unobserved heterogeneity.

4.2.5. Additional controls

To further mitigate the potential endogeneity concerns induced by omitted variables and assess the robustness of our baseline regression results, we re-estimate the baseline regressions by controlling for additional control variables that are related to CEO attributes, including CEO power (*CEO_FOUNDER*), CEO overconfidence (*OVERCONF*), CEO tournament incentives (*PAY_GAP*), CEO education background (*CEO_Ivy_Degree*, *CEO_MBA_Degree*, and *CEO_PhD_Degree*), and managerial ability (*MA_Rank*). Liu and Jiraporn (2010) find that firms with powerful CEOs have lower credit ratings and higher yield spreads. Firms with overconfident CEOs are more likely to default on debt obligations (Lartey & Danso, 2022). Furthermore, Kini and Williams (2012) suggest that a higher pay gap between CEOs and top management teams motivates senior managers to participate in higher risk-taking activities, thereby increasing the likelihood of being promoted to the position of CEO. In addition, Papadimitri et al. (2020) argue that credit rating assessment is positively related to managerial education level. Finally, firms with skilled CEOs are associated with lower default risk and higher credit ratings (Bonsall et al., 2017; Cornaggia et al., 2017). Therefore, we control for the effect of managerial past-experience-based skills on credit ratings (Demerjian, Lev, & McVay, 2012).

Table 7 reports the empirical results. The positive effect of married CEOs on credit rating is significant at the 1% significance level in all

Table 5
CEO marital status and credit rating: Treatment effects model.

	First stage	Second stage			
Dependent variable=	MARRIED	RATE1	RATE2	RATE3	RATE4
	(1)	(2)	(3)	(4)	(5)
AVE_MARRIED	4.6836**				
	(1.8747)				
MARRIED		0.3509***	0.3511***	0.3472***	0.3551***
		(0.0960)	(0.0956)	(0.0956)	(0.0961)
SIZE	0.1971***	1.2229***	1.2368***	1.2274***	1.2515***
	(0.0362)	(0.0649)	(0.0649)	(0.0648)	(0.0692)
LEV	−0.5172**	−3.5064***	−3.4517***	−3.4854***	−3.5769***
	(0.2206)	(0.3191)	(0.3177)	(0.3189)	(0.3267)
LOSS	0.0742	−0.3433***	−0.3413***	−0.3441***	−0.3382***
	(0.0603)	(0.0754)	(0.0748)	(0.0755)	(0.0758)
CAP_INT	0.0317	0.6186***	0.6376***	0.6275***	0.6301***
	(0.1150)	(0.1654)	(0.1654)	(0.1653)	(0.1690)
INT_COV	−0.1016	−1.3837***	−1.4254***	−1.4023***	−1.3979***
	(0.0768)	(0.1209)	(0.1185)	(0.1202)	(0.1220)
SUBORD	−0.0804	−0.7034***	−0.7196***	−0.7084***	−0.7031***
	(0.0957)	(0.0958)	(0.0954)	(0.0955)	(0.0967)
FIRM_AGE	−0.0017	0.0306***	0.0320***	0.0309***	0.0299***
	(0.0094)	(0.0097)	(0.0097)	(0.0097)	(0.0098)
ACCM	−0.7429*	−1.2925***	−1.2661***	−1.2691***	−1.3269***
	(0.4484)	(0.4992)	(0.4847)	(0.4889)	(0.5057)
IDIVOL	−0.2143	−7.1986***	−6.9549***	−7.1082***	−7.2338***
	(0.2079)	(0.2818)	(0.2783)	(0.2794)	(0.2843)
PAYOUT	0.0566	0.3537***	0.3588***	0.3553***	0.3626***
	(0.0527)	(0.0576)	(0.0576)	(0.0576)	(0.0585)
CEO_AGE	1.3861***	1.2250***	1.3283***	1.2651***	1.3065***
	(0.3345)	(0.4327)	(0.4322)	(0.4325)	(0.4482)
FEMALE_CEO	0.3992	0.0921	0.1020	0.0925	0.1047
	(0.2702)	(0.2599)	(0.2595)	(0.2596)	(0.2619)
TENURE	−0.1056**	−0.0573	−0.0638	−0.0595	−0.0623
	(0.0451)	(0.0485)	(0.0485)	(0.0485)	(0.0493)
DELTA	0.0487	0.0291	0.0280	0.0286	0.0311
	(0.0330)	(0.0347)	(0.0347)	(0.0347)	(0.0350)
VEGA	0.0297	0.0660***	0.0674***	0.0666***	0.0654***
	(0.0235)	(0.0232)	(0.0233)	(0.0232)	(0.0235)
Inverse Mills ratio		2.7756***	2.9595***	2.8263***	2.9817***
		(0.7476)	(0.7418)	(0.7448)	(0.7869)
Constant	−8.8049***	1.6227	−3.9669*	−2.5909	7.1170***
	(2.0864)	(2.1723)	(2.1723)	(2.1724)	(2.2513)
Year FE	YES	YES	YES	YES	YES
Industry FE	YES	YES	YES	YES	YES
State FE	YES	YES	YES	YES	YES
Observations	12,759	12,759	12,759	12,759	12,759
R-squared	0.1239	0.7064	0.7037	0.7055	0.7055

This table presents the regression results of the treatment effects model for the relationship between CEO marital status and corporate credit rating after controlling for the self-selection bias in CEO selection. In the first stage, we implement the pooled probit regression for the likelihood that a firm employs a married CEO. We use *AVE_MARRIED* as an identification restriction. In the second stage, we examine the effects of married CEOs (*MARRIED*) on corporate credit rating (*RATE1*, *RATE2*, *RATE3*, and *RATE4*) including the I*nverse Mills ratio* (derived from the first stage). The coefficients of the industry, year, and headquarter state fixed effects are suppressed for brevity in the respective columns. Standard errors are clustered by firm in all columns. Detailed definitions of all variables are described in Appendix B. ***, **, and * denote statistical significance at the 1%, 5%, and 10% level, respectively.

columns. These findings further alleviate endogeneity concerns about omitted variables and confirm the robustness of our baseline regression results that firms with married CEOs receive higher credit ratings than those with unmarried CEOs.

4.3. Robustness check

It could be argued that the consequences of corporate policy implemented by married CEOs might take a few years to emerge. Therefore, the marital status of CEOs could influence companies'creditworthiness a few years later. As a robustness check of the main results in Table 2, we examine how a married CEO affects credit ratings in the long term. We regress the corporate credit rating at time $t+1$, $t+2$, and $t+3$ on CEO marital status at time t. Table 8 presents the results and indicates that firms run by married CEOs receive more favorable credit ratings in the long run.

5. Economic mechanisms

Our empirical analysis so far suggests that firms with married CEOs receive more favorable credit ratings than those run by unmarried CEOs. A natural question arising from this is why credit rating agencies have a positive perception of the presence of a married CEO. As discussed in the hypothesis development section, married CEOs improve the creditworthiness of companies by mitigating bankruptcy risk, reducing their firms' exposure to business uncertainty shocks, and improving institutional CSR (moral capital) commitment. To validate these economic mechanisms, in this section, we investigate the effects of CEO marital status on firms' bankruptcy risk, exposure to business uncertainty shocks, and institutional CSR performance.

5.1. Bankruptcy risk

We first examine the impact of CEO marital status on firms'

Table 6
CEO marital status and credit rating: Firm fixed-effects models.

Dependent variable=	RATE1	RATE2	RATE3	RATE4
	(1)	(2)	(3)	(4)
MARRIED	0.1036**	0.0922*	0.0915*	0.1123**
	(0.0500)	(0.0493)	(0.0496)	(0.0504)
SIZE	1.2146***	1.2031***	1.2128***	1.2202***
	(0.0271)	(0.0267)	(0.0269)	(0.0273)
LEV	−2.6551***	−2.5447***	−2.6060***	−2.6808***
	(0.1083)	(0.1068)	(0.1075)	(0.1092)
LOSS	−0.0606*	−0.0638*	−0.0598*	−0.0598*
	(0.0360)	(0.0355)	(0.0357)	(0.0363)
CAP_INT	1.3944***	1.4166***	1.4038***	1.4144***
	(0.0788)	(0.0777)	(0.0783)	(0.0795)
INT_COV	−0.6420***	−0.6652***	−0.6573***	−0.6422***
	(0.0441)	(0.0435)	(0.0438)	(0.0445)
SUBORD	−0.2932***	−0.3150***	−0.3054***	−0.2984***
	(0.0429)	(0.0423)	(0.0426)	(0.0433)
FIRM_AGE	0.6245*	0.6055*	0.6588*	0.6135*
	(0.3433)	(0.3387)	(0.3410)	(0.3462)
ACCM	0.5151**	0.5584**	0.5557**	0.4992**
	(0.2429)	(0.2396)	(0.2413)	(0.2450)
IDIVOL	−3.3236***	−3.0485***	−3.2199***	−3.3300***
	(0.1081)	(0.1066)	(0.1074)	(0.1090)
PAYOUT	0.0761***	0.0761***	0.0763***	0.0738***
	(0.0245)	(0.0242)	(0.0244)	(0.0248)
CEO_AGE	−0.5294***	−0.4659***	−0.4824***	−0.5430***
	(0.1365)	(0.1347)	(0.1356)	(0.1377)
FEMALE_CEO	0.0796	0.0772	0.0774	0.0892
	(0.0922)	(0.0909)	(0.0916)	(0.0930)
TENURE	0.0426**	0.0431**	0.0406**	0.0446**
	(0.0190)	(0.0187)	(0.0188)	(0.0191)
DELTA	0.0456***	0.0405***	0.0445***	0.0458***
	(0.0140)	(0.0138)	(0.0139)	(0.0141)
VEGA	0.0049	0.0039	0.0050	0.0057
	(0.0092)	(0.0091)	(0.0091)	(0.0093)
Constant	8.0485***	2.7847***	3.8601***	14.0624***
	(0.6979)	(0.6885)	(0.6932)	(0.7038)
Year FE	YES	YES	YES	YES
Firm FE	YES	YES	YES	YES
Observations	12,976	12,976	12,976	12,976
R-squared	0.4194	0.4129	0.4180	0.4189

This table shows the regression results for the impact of CEO marital status on corporate credit rating after controlling for firm and year fixed effects. The dependent variable of corporate credit rating is proxied by *RATE1*, *RATE2*, *RATE3*, and *RATE4*. The independent variable of interest is CEO marital status: *MARRIED*. The coefficients of the firm and year fixed effects are suppressed for brevity in the respective columns. Standard errors are clustered by firm in all columns. Detailed definitions of all variables are provided in Appendix B. ***, **, and * denote statistical significance at the 1%, 5%, and 10% level, respectively.

bankruptcy risk by constructing three bankruptcy risk measures: Altman's (1968) $Z\_Score_{i,t}$, MacKie-Mason's (1990) *Modified* $Z\_Score_{i,t}$, and Ohlson's (1980) $O\_Score_{i,t}$. A lower (higher) value of $Z\_Score_{i,t}$ ($O\_Score_{i,t}$) implies that firms suffer from higher bankruptcy risks. Consistent with previous studies on the determinants of bankruptcy risk (Baghdadi, Nguyen, & Podolski, 2020; Brogaard, Li, & Xia, 2017), we utilize a set of control variables, which include firm size (*SIZE*), market-to-book ratio (*MTB*), annualized monthly stock return (*RET*), tangibility (*TANG*), dividend payments (*PAYOUT*), research and development expenditure (*RDEXP*), CEO age (*CEO_AGE*), CEO gender (*FEMALE_CEO*), *TENURE*, *DELTA*, and *VEGA*. Detailed definitions of these variables can be found in Appendix B. We estimate the following OLS regression model with year, industry, and headquarter state fixed effects, as in our baseline regression model:

$$Bankruptcy\ risk_{i,t+1} = \alpha + \beta MARRIED_{i,t} + \gamma Controls_{i,t} + Year_{FE} + Industry_{FE} + State_{FE} + \varepsilon_{i,t+1} \quad (6)$$

The results presented in Panel A of Table 9 below show that the estimated coefficients for $MARRIED_{i,t}$ are positive and significant, at

Table 7
CEO marital status and credit rating: Additional controls.

Dependent variable=	RATE1	RATE2	RATE3	RATE4
	(1)	(2)	(3)	(4)
MARRIED	0.3524***	0.3518***	0.3493***	0.3537***
	(0.0996)	(0.0995)	(0.0994)	(0.1001)
SIZE	1.0571***	1.0613***	1.0589***	1.0736***
	(0.0524)	(0.0524)	(0.0524)	(0.0541)
LEV	−3.2225***	−3.1342***	−3.1855***	−3.2601***
	(0.2940)	(0.2927)	(0.2939)	(0.2978)
LOSS	−0.3266***	−0.3258***	−0.3262***	−0.3229***
	(0.0772)	(0.0770)	(0.0773)	(0.0775)
CAP_INT	0.5370***	0.5531***	0.5454***	0.5458***
	(0.1734)	(0.1735)	(0.1734)	(0.1767)
INT_COV	−1.2745***	−1.3160***	−1.2973***	−1.2806***
	(0.1243)	(0.1219)	(0.1236)	(0.1248)
SUBORD	−0.6005***	−0.6139***	−0.6057***	−0.5947***
	(0.0964)	(0.0959)	(0.0960)	(0.0971)
FIRM_AGE	0.0245**	0.0257**	0.0248**	0.0238**
	(0.0104)	(0.0104)	(0.0104)	(0.0105)
ACCM	−0.2717	−0.2381	−0.2480	−0.2703
	(0.4842)	(0.4747)	(0.4784)	(0.4904)
IDIVOL	−6.7343***	−6.4614***	−6.6282***	−6.7473***
	(0.2759)	(0.2728)	(0.2730)	(0.2785)
PAYOUT	0.3148***	0.3185***	0.3164***	0.3199***
	(0.0578)	(0.0580)	(0.0579)	(0.0587)
CEO_AGE	0.2503	0.2833	0.2711	0.2517
	(0.3267)	(0.3261)	(0.3264)	(0.3309)
FEMALE_CEO	−0.2299	−0.2352	−0.2346	−0.2354
	(0.2437)	(0.2442)	(0.2440)	(0.2451)
TENURE	0.0041	0.0051	0.0046	0.0065
	(0.0432)	(0.0431)	(0.0432)	(0.0435)
DELTA	0.0436	0.0426	0.0433	0.0437
	(0.0387)	(0.0389)	(0.0388)	(0.0393)
VEGA	0.0788**	0.0754**	0.0777**	0.0759**
	(0.0310)	(0.0310)	(0.0310)	(0.0316)
OVERCONF	−0.1082***	−0.1100***	−0.1083***	−0.1082***
	(0.0270)	(0.0271)	(0.0270)	(0.0274)
PAY_GAP	−0.1285***	−0.1298***	−0.1294***	−0.1303***
	(0.0341)	(0.0340)	(0.0341)	(0.0346)
CEO_FOUNDER	−0.3244**	−0.3485**	−0.3364**	−0.3251**
	(0.1406)	(0.1404)	(0.1404)	(0.1411)
CEO_Ivy_Degree	−0.1285	−0.1214	−0.1240	−0.1411
	(0.1314)	(0.1314)	(0.1313)	(0.1328)
CEO_MBA_Degree	0.1131	0.1110	0.1114	0.1122
	(0.0879)	(0.0882)	(0.0880)	(0.0886)
CEO_PhD_Degree	−0.1153	−0.1154	−0.1144	−0.0917
	(0.1765)	(0.1765)	(0.1767)	(0.1808)
MA_Rank	0.6758***	0.6799***	0.6753***	0.6981***
	(0.1117)	(0.1114)	(0.1116)	(0.1134)
Constant	7.2039***	1.9704	3.0744*	13.0998***
	(1.6041)	(1.5990)	(1.6012)	(1.6136)
Year FE	YES	YES	YES	YES
Industry FE	YES	YES	YES	YES
State FE	YES	YES	YES	YES
Observations	11,199	11,199	11,199	11,199
R-squared	0.7163	0.7138	0.7155	0.7151

This table shows the regression results for the relationship between CEO marital status and corporate credit rating after including a set of additional control variables. We re-estimate our baseline regressions by controlling for additional CEO characteristics: CEO compensation (*OVERCONF* and *PAY_GAP*), CEO power (*CEO_FOUNDER*), CEO education background (*CEO_Ivy_Degree*, *CEO_MBA_Degree,* and *CEO_PhD_Degree*), and managerial skills (*MA_Rank*). The dependent variable of corporate credit rating is proxied by *RATE1, RATE2, RATE3*, and *RATE4*. The independent variable of interest is CEO marital status: *MARRIED*. The coefficients of the industry, year, and headquarter state fixed effects are suppressed for brevity in the respective columns. Standard errors are clustered by firm in all columns. Detailed definitions of all variables are provided in Appendix B. ***, **, and * denote statistical significance at the 1%, 5%, and 10% level, respectively.

Table 8
Robustness check: Long-term impact of married CEOs on credit ratings.

Panel A: Credit rating at time $t+1$				
Dependent variable=	$RATE1_{t+1}$	$RATE2_{t+1}$	$RATE3_{t+1}$	$RATE4_{t+1}$
	(1)	(2)	(3)	(4)
MARRIED	0.3068***	0.3080***	0.3064***	0.3083***
	(0.1053)	(0.1051)	(0.1051)	(0.1059)
Controls	YES	YES	YES	YES
Year FE	YES	YES	YES	YES
Industry FE	YES	YES	YES	YES
State FE	YES	YES	YES	YES
Observations	10,827	10,827	10,827	10,827
R-squared	0.7296	0.7264	0.7286	0.7281

Panel B: Credit rating at time $t+2$				
Dependent variable=	$RATE1_{t+2}$	$RATE2_{t+2}$	$RATE3_{t+2}$	$RATE4_{t+2}$
	(1)	(2)	(3)	(4)
MARRIED	0.3015***	0.3011***	0.3013***	0.3027***
	(0.1114)	(0.1105)	(0.1110)	(0.1121)
Controls	YES	YES	YES	YES
Year FE	YES	YES	YES	YES
Industry FE	YES	YES	YES	YES
State FE	YES	YES	YES	YES
Observations	9638	9638	9638	9638
R-squared	0.7133	0.7134	0.7136	0.7118

Panel C: Credit rating at time $t+3$				
Dependent variable=	$RATE1_{t+3}$	$RATE2_{t+3}$	$RATE3_{t+3}$	$RATE4_{t+3}$
	(1)	(2)	(3)	(4)
MARRIED	0.3413***	0.3439***	0.3427***	0.3414***
	(0.1241)	(0.1224)	(0.1234)	(0.1247)
Controls	YES	YES	YES	YES
Year FE	YES	YES	YES	YES
Industry FE	YES	YES	YES	YES
State FE	YES	YES	YES	YES
Observations	8575	8575	8575	8575
R-squared	0.6810	0.6827	0.6818	0.6799

This table shows the results of the robustness check that examines how a married CEO affects corporate credit ratings in the long term. The dependent variables in Panels A, B, and C are corporate credit ratings at time t + 1, $t+2$, and $t+3$, respectively. *Controls* include the same firm- and CEO-level characteristics as the baseline regressions in Table 2. The coefficients of the industry, year, and headquarter state fixed effects are suppressed for brevity in the respective columns. Standard errors are clustered by firm in all columns. Detailed definitions of all variables are provided in Appendix B. ***, **, and * denote statistical significance at the 1%, 5%, and 10% level, respectively.

least at the 1% level in columns (1) and (2), and negative at the 5% significance level in column (3), which is in line with our prediction that firms with married CEOs have a lower likelihood of experiencing bankruptcy than those with unmarried CEOs.

5.2. Business uncertainty shocks

Second, we investigate whether and to what extent married CEOs are able to reduce their firms' exposure to business uncertainty shocks. Following Alfaro, Bloom, and Lin (2024), we use realized annual stock return volatility and OptionMetrics' 365-day implied volatility of at-the-money-forward call options to measure firm-level uncertainty shocks. We test the effect of the presence of married CEOs on firms' exposure to business uncertainty shocks by estimating the following OLS regression:

$$Uncertainty_{i,t+1} = \alpha + \beta MARRIED_{i,t} + \gamma Controls_{i,t} + Year_{FE} + Industry_{FE} + State_{FE} + \varepsilon_{i,t+1} \quad (7)$$

where $Uncertainty_{i,t+1}$ is measured using realized volatility ($REAL\_VOL_i$,

Table 9
CEO marital status, bankruptcy risk, business uncertainty shocks, and moral and exchange capital.

Panel A: Bankruptcy risk			
Dependent variable=	Z_Score_{t+1}	$Modified\ Z\_Score_{t+1}$	O_Score_{t+1}
	(1)	(2)	(3)
MARRIED	0.3023***	0.2187***	−0.2180**
	(0.0908)	(0.0594)	(0.0903)
Controls	YES	YES	YES
Year FE	YES	YES	YES
Industry FE	YES	YES	YES
State FE	YES	YES	YES
Observations	11,992	11,992	11,991
R-squared	0.5553	0.5032	0.3037

Panel B: Business uncertainty shocks		
Dependent variable=	$REAL\_VOL_{t+1}$	IMP_VOL_{t+1}
	(1)	(2)
MARRIED	−0.0178**	−0.0176**
	(0.0091)	(0.0069)
Controls	YES	YES
Year FE	YES	YES
Industry FE	YES	YES
State FE	YES	YES
Observations	9470	8894
R-squared	0.5183	0.5365

Panel C: Moral capital and exchange capital				
Dependent variable=	MC_RAW_{t+1}	MC_ADJ_{t+1}	EC_RAW_{t+1}	EC_ADJ_{t+1}
	(1)	(2)	(3)	(4)
MARRIED	0.3390***	0.0580***	0.0829	0.0062
	(0.1078)	(0.0178)	(0.0799)	(0.0120)
Controls	YES	YES	YES	YES
Year FE	YES	YES	YES	YES
Industry FE	YES	YES	YES	YES
State FE	YES	YES	YES	YES
Observations	7619	7619	7619	7619
R-squared	0.2891	0.2302	0.2685	0.2617

Panels A, B, and C in this table report the regression results for the impact of CEO marital status on bankruptcy risk, business uncertainty shocks, and moral and exchange capital, respectively, for U.S. listed firms over the period 1992–2017. The dependent variables in Panel A are three bankruptcy risk measures: *Z_Score*, *Modified Z_Score*, and *O_Score*. A lower (higher) value of *Z_Score* (*O_Score*) implies that firms suffer from higher bankruptcy risks. In Panel B, the dependent variables are two measures of business uncertainty shocks: *REAL_VOL* and *IMP_VOL*. *REAL_VOL* is measured by the standard deviation of daily cum-dividend stock returns over the course of each firm's fiscal year (which typically spans approximately 252 trading days). *IMP_VOL* is calculated by the standard deviation of daily implied volatility values from OptionMetrics (which typically spans approximately 252 trading days). In Panel C, the dependent variables are raw and adjusted moral capital in columns (1) and (2): *MC_RAW* and *MC_ADJ*, respectively, which cover four dimensions: Community, Workforce diversity, Environment impact, and Human rights. In columns (3) and (4), the dependent variables are raw and adjusted exchange capital: *EC_RAW* and *EC_ADJ*, which include three dimensions: Corporate governance, Employee relations, and Product quality. We measure the *RAW* variables as the difference between the total number of strengths and the total number of concerns for each firm-year. We measure the *ADJ* variable as the difference between the scaled strengths and the scaled concerns. Specifically, the scaled strengths (concerns) are calculated by taking the total number of strengths (concerns) for each firm-year across all dimensions over the maximum possible number of strengths (concerns) in all dimensions for each firm-year. The coefficients of the industry, year, and headquarter state fixed effects are suppressed for brevity in the respective columns. Standard errors are clustered by firm in all columns. Detailed definitions of all variables are provided in Appendix B. ***, **, and * denote statistical significance at the 1%, 5%, and 10% level, respectively.

$_{t+1}$) and implied volatility ($IMP\_VOL_{i,t+1}$). We include a vector of control variables, such as firm size (*SIZE*), market-to-book ratio (*MTB*), return on assets (*ROA*), business loss (*LOSS*), tangibility (*TANG*), firm age (*FIRM_AGE*), research and development expenditure (*RDEXP*), CEO age (*CEO_AGE*), CEO gender (*FEMALE_CEO*), CEO tenure (*TENURE*), CEO pay-for-performance incentives (*DELTA*), and CEO risk-taking incentives (*VEGA*), as well as year, industry and headquarter state fixed effects. Detailed definitions of these variables can be found in Appendix B.

Panel B of Table 9 presents the results. The estimated coefficients of $MARRIED_{i,t}$ are negative and significant at the 5% significance level in columns (1) and (2), suggesting that married CEOs reduce their firms' vulnerability to business uncertainty shocks.

5.3. Moral and exchange capital commitment

Previous studies document that engagement in institutional CSR activities, namely, moral capital targeting secondary stakeholders or the broader society, provides risk management benefits (Gardberg & Fombrun, 2006; Godfrey, 2005; Godfrey et al., 2009). However, technical CSR engagement, namely, exchange capital aimed at firms' trading partners, cannot achieve such benefits. We argue that married CEOs are able to build a long-term sustainable image by accumulating moral capital commitment.

To test the association between CEO marital status and moral or exchange capital, we follow Godfrey (2005) and Godfrey et al. (2009) and decompose CSR into institutional CSR (moral capital) and technical CSR (exchange capital). We investigate the impact of CEO marital status on moral capital and exchange capital in the following regression models:

$$MC_{i,t+1} = \alpha + \beta MARRIED_{i,t} + \gamma Controls_{i,t} + Year_{FE} + Industry_{FE} + State_{FE} + \varepsilon_{i,t+1}, \quad (8)$$

$$EC_{i,t+1} = \alpha + \beta MARRIED_{i,t} + \gamma Controls_{i,t} + Year_{FE} + Industry_{FE} + State_{FE} + \varepsilon_{i,t+1}, \quad (9)$$

where $MC_{i,t+1}$ is institutional CSR, and includes dimensions of Community, Diversity, Environment impact, and Human rights. We use two proxies of $MC_{i,t+1}$: $MC\_RAW_{i,t+1}$ and $MC\_ADJ_{i,t+1}$. $MC\_RAW_{i,t+1}$ is constructed as the difference between the total number of strengths and the total number of concerns in respect of the four dimensions (Community, Diversity, Environment impact, and Human rights). $MC\_ADJ_{i,t+1}$ is constructed by scaling the raw strength and concern scores of each dimension over the maximum number of strength and concern items for the dimension for each year, and then taking the net difference between the adjusted strength and concern scores for the dimension. $EC_{i,t+1}$ is technical CSR, including dimensions of Corporate governance, Employee relations, and Product quality. $EC_{i,t+1}$ has the following two measures: $EC\_RAW_{i,t+1}$ is constructed as the difference between the total number of strengths and the total number of concerns in the three dimensions (Corporate governance, Employee relations, and Product quality); and $EC\_ADJ_{i,t+1}$ is constructed by scaling the raw strength and concern scores of each dimension over the maximum number of strength and concern items for the dimension for each year, and then taking the net difference between the adjusted strength and concern scores for the dimension. Consistent with previous CSR studies (e.g., Hegde & Mishra, 2019), we include control variables, such as firm size (*SIZE*), market-to-book ratio (*MTB*), return on assets (*ROA*), leverage (*LEV*), tangibility (*TANG*), firm age (*FIRM_AGE*), research and development expenditure (*RDEXP*), CEO power (*CEO_FOUNDER*), CEO gender (*FEMALE_CEO*), CEO tenure (*TENURE*), and CEO age (*CEO_AGE*). We further control year, industry, and state fixed effects in the regression models. Appendix B presents the detailed variable definitions.

Panel C of Table 9 presents the relationship between CEO marital status and moral or exchange capital commitment. The results in columns (1) and (2) suggest that the estimated coefficients of $MARRIED_{i,t}$ for $MC\_RAW_{i,t+1}$ and $MC\_ADJ_{i,t+1}$ are positive and significant at the 1% significance level, suggesting that married CEOs are actively involved in moral capital investment to build a long-term sustainable image. However, in columns (3) and (4), the insignificant coefficients of $MARRIED_{i,t}$ imply the impact of CEO marital status on exchange capital engagement is not evident. Collectively, we can conclude that compared with unmarried CEOs, married CEOs are more likely to invest in moral capital that provides insurance-like benefits against negative events. The impact of CEO marital status on exchange capital, which does not provide risk management benefits, is not material.

6. Cross-sectional analysis

Our baseline regression results indicate that credit rating agencies offer more favorable credit ratings to firms led by married CEOs. In this section, we examine whether the positive relationship between married CEOs and credit ratings is augmented for firms with CEOs who are granted greater option compensation for risk-taking incentives, and for firms with greater tournament incentives. It is generally recognized that debtholders have to bear significant downside risk with limited payoff, which is associated with more emphasis on risk-averse investment and financing policies. However, shareholders have greater risk-taking incentives, even if this is at the expense of debtholders' interests, due to limited liabilities and asymmetric payoffs (Jensen & Meckling, 1976; Smith & Warner, 1979). The extant literature proposes that the use of stock options may exacerbate conflicts of managerial risk-taking preference between shareholders and debtholders, which is associated with higher incentives for risk-taking (Amihud & Lev, 1981; Chava & Purnanandam, 2010; Coles, Daniel, & Naveen, 2006; Guay, 1999; Hayes, Lemmon, & Qiu, 2012; Smith & Stulz, 1985). In addition, a higher pay gap between the CEO and the top executives stimulates senior managers' risk-taking incentives and leads to riskier financing and investment policies, which are negatively correlated with debtholder wealth (e.g., Kini & Williams, 2012; Shen & Zhang, 2018). Single CEOs are likely to take additional risks in companies with greater compensation for risk-taking incentives than married CEOs. In this vein, we examine whether the impact of married CEOs on corporate credit rating is more pronounced among firms with CEOs who are granted greater option compensation for risk-taking incentives and for firms with higher tournament incentives.

In this section, we examine whether the positive relationship between married CEOs and corporate credit ratings is heterogenous across different degrees of sensitivity of managerial wealth to stock return volatility (*VEGA*) and tournament incentives (*Pay_Gap*) by estimating the following OLS regressions:

$$RATE_{i,t} = \alpha + \beta_1 MARRIED_{i,t} + \beta_2 High\_Vega_{i,t} + \beta_3 MARRIED_{i,t} \times High\_Vega_{i,t} + \gamma Controls_{i,t} + Year_{FE} + Industry_{FE} + State_{FE} + \varepsilon_{i,t}, \quad (10)$$

$$RATE_{i,t} = \alpha + \beta_1 MARRIED_{i,t} + \beta_2 High\_Pay\_GAP_{i,t} + \beta_3 MARRIED_{i,t} \times High\_Pay\_GAP_{i,t} + \gamma Controls_{i,t} + Year_{FE} + Industry_{FE} + State_{FE} + \varepsilon_{i,t}, \quad (11)$$

where we follow Core and Guay (2002) and Coles et al. (2006) to define the sensitivity of managerial wealth to stock return volatility (*VEGA*) as the natural logarithm of a dollar change in the CEO's wealth associated with a 1% change in the standard deviation of the firm's returns. A higher *VEGA* value denotes greater risk-taking incentives for CEOs. We construct a dummy variable, *High_Vega*, which equals one if a firm's sensitivity of managerial wealth to stock return volatility (*VEGA*) is above the sample median in a given year, and zero otherwise.

In addition, consistent with previous studies on tournament incentives (e.g., Kini & Williams, 2012; Shen & Zhang, 2018), we define tournament incentives (*PAY_GAP*) as the natural logarithm of the gap between CEOs' total compensation and the median value of total compensation among the top management teams. A higher value of *PAY_GAP* is a proxy for a greater difference in salary between the CEO and the other top executives. We construct a dummy variable, *High_PAY_GAP*, which equals one if a firm's tournament incentives (*PAY_GAP*) are above the sample median in a given year, and zero otherwise. We also include all the control variables in Eq. (1) and control for year, industry, and state fixed effects.

Panel A of Table 10 shows that the estimated coefficients of the interaction term $MARRIED_{i,t} \times High\_Vega_{i,t}$, are positive and significant at the 5% significance level, suggesting that the positive effect of married CEOs on corporate credit ratings is more pronounced for firms with CEOs who are granted greater compensation for risk-taking incentives (*VEGA*). Furthermore, Panel B shows that the estimated coefficients of the interaction term $MARRIED_{i,t} \times High\_PAY\_GAP_{i,t}$ are also positive and significant at the 1% significance level, suggesting that the positive effects of married CEOs on corporate credit ratings are attenuated when firms have greater tournament incentives. Collectively, these results suggest that the positive effect of married CEOs on credit ratings is more pronounced for firms led by CEOs with greater compensation for risk-taking incentives and for those with greater tournament incentives.

7. Conclusion

We provide robust evidence to suggest that credit rating agencies take CEO marital status into account in their assessments of credit risk and that firms with married CEOs receive more favorable credit ratings than those with unmarried CEOs. Our results hold when solving endogeneity concerns using DID analysis based on exogenous CEO turnover events, PSM, the Heckman treatment effect model, a firm fixed-effects model, and when controlling additional CEO characteristics.

We identify potential mechanisms through which married CEOs improve the creditworthiness of their companies. We find that firms with married CEOs have a lower likelihood of bankruptcy and decreased exposure to business uncertainty shocks than those with unmarried CEOs. In addition, we show that married CEOs actively committed to institutional CSR (moral capital) provide risk management benefits. Finally, our cross-sectional analysis indicates that the positive relationship between married CEOs and credit ratings is more pronounced for firms with higher CEO risk-taking incentives provided by option compensation and greater tournament incentives. Collectively, our empirical evidence highlights the relevance of CEO marital status in maintaining financial stability and credit trustworthiness, giving richer insights into potential reasons why credit rating agencies positively perceive firms managed by married CEOs.

In this study, we are the first to investigate how the marital status of CEOs is perceived in the debt market. Our study contributes to empirical studies investigating the implications of CEO marital status for corporate outcomes. Although substantial evidence shows that the marital status of CEOs is closely associated with firm performance and shareholder wealth (e.g., Hegde & Mishra, 2019; Kim et al., 2022; Roussanov & Savor, 2014), little is known regarding whether and how the marital status of CEOs is perceived in the debt market. We contribute to the literature by showing that firms managed by married CEOs are more capable of maintaining financial stability and building creditworthiness

Table 10
Cross-sectional analysis: CEO compensation structure.

Dependent variable=	RATE1	RATE2	RATE3	RATE4
	(1)	(2)	(3)	(4)
Panel A: Risk-taking incentives (*VEGA*)				
MARRIED	0.1584	0.1500	0.1513	0.1530
	(0.1112)	(0.1105)	(0.1105)	(0.1118)
High_Vega	−0.0590	−0.0557	−0.0611	−0.0847
	(0.1590)	(0.1586)	(0.1585)	(0.1612)
MARRIED×High_Vega	0.3665**	0.3838**	0.3752**	0.3847**
	(0.1689)	(0.1687)	(0.1686)	(0.1704)
Controls	YES	YES	YES	YES
Year FE	YES	YES	YES	YES
Industry FE	YES	YES	YES	YES
State FE	YES	YES	YES	YES
Observations	12,976	12,976	12,976	12,976
R-squared	0.7080	0.7049	0.7071	0.7068
Panel B: Tournament incentives (*PAY_GAP*)				
MARRIED	0.1692	0.1651	0.1650	0.1645
	(0.1051)	(0.1055)	(0.1051)	(0.1060)
High_PAY_GAP	−0.4934***	−0.5002***	−0.4954***	−0.5122***
	(0.1268)	(0.1269)	(0.1267)	(0.1273)
MARRIED×High_PAY_GAP	0.4406***	0.4474***	0.4416***	0.4548***
	(0.1437)	(0.1436)	(0.1434)	(0.1440)
Controls	YES	YES	YES	YES
Year FE	YES	YES	YES	YES
Industry FE	YES	YES	YES	YES
State FE	YES	YES	YES	YES
Observations	12,578	12,578	12,578	12,578
R-squared	0.7072	0.7041	0.7063	0.7061

This table shows how CEO compensation structure affects the relationship between CEO marital status and corporate credit rating. The dependent variable of corporate credit rating is proxied by *RATE1*, *RATE2*, *RATE3*, and *RATE4*. The independent variables of interest are interaction terms: *MARRIED×High_Vega* and *MARRIED×High_PAY_GAP*. *High_Vega* is a dummy variable that equals one if the CEO's *Vega* is above the median value of the sample in a given year, and zero otherwise. *High_PAY_GAP* is a dummy variable that equals one if the pay gap between the CEO and the senior management teams (*PAY_GAP*) is above the median value of the sample in a given year, and zero otherwise. *Controls* include the same firm- and CEO-level characteristics as those in the baseline regressions in Table 2. The coefficients of the industry, year, and headquarter state fixed effects are suppressed for brevity in the respective columns. Standard errors are clustered by firm in all columns. Detailed definitions of all variables are provided in Appendix B. ***, **, and * denote statistical significance at the 1%, 5%, and 10% level, respectively.

in debt markets.

Data availability

The authors do not have permission to share data.

Acknowledgments

We are grateful to Han Yan, Bowen Cheng, and Aiyang Li for the manual collection of CEO marital status for U.S. listed firms from 2009 to 2017.

Appendix A. Sample selection

Panel A: Sampling process

	No. of firm-years	No. of CEOs
Sample period 1992–2017		
Execucomp database (1992–2017) with CEOann = "CEO" without financial and utility firms	36,283	6405
(1) After deleting observations missing information on information on basic CEO characteristics, including age, gender and tenure	33,746	6077
(2) After deleting observations missing information on CEO marital status	30,828	5326
(3) After deleting observations missing information on credit rating	15,220	2894
(4) After deleting observations missing information on control variables from the Compustat database	14,216	2800
(5) After deleting observations missing information on control variables from the Center for Research in Security Prices (CRSP) database	13,814	2737
(6) After deleting observations missing information on *Vega* and *Delta*	12,976	2611
Final sample	12,976	2611

Panel B: Sample distribution by year

Year	Frequency	Percentage	Married CEOs	Single CEOs
1992	12	0.09	11	1
1993	387	2.98	364	23
1994	437	3.37	402	35
1995	485	3.74	444	41
1996	508	3.91	466	42
1997	520	4.01	479	41
1998	550	4.24	496	54
1999	546	4.21	494	52
2000	531	4.09	469	62
2001	525	4.05	468	57
2002	548	4.22	486	62
2003	562	4.33	491	71
2004	577	4.45	501	76
2005	568	4.38	478	90
2006	567	4.37	470	97
2007	610	4.70	506	104
2008	573	4.42	468	105
2009	538	4.15	451	87
2010	508	3.91	427	81
2011	528	4.07	447	81
2012	507	3.91	430	77
2013	508	3.91	440	68
2014	520	4.01	460	60
2015	512	3.95	457	55
2016	474	3.65	430	44
2017	375	2.89	342	33
Total	12,976	100	11,377	1599

This table shows the sample selection. Panel A presents the sampling process and Panel B reports the yearly sample distribution.

Appendix B. Description of the variables

Variable	Definition
RATE1	RATE1 is constructed by converting letter ratings into finer numerical scores, with the highest numerical rating of 21 being assigned to the AAA letter rating and the lowest numerical rating of 1 being assigned to the C letter rating. Source: Compustat.
RATE2	RATE2 is constructed by converting letter ratings into finer numerical scores, with the highest numerical rating of 16 being assigned to the AAA letter rating and the lowest numerical rating of 1 being assigned to the B− letter rating. Source: Compustat.
RATE3	RATE3 is constructed by converting letter ratings into finer numerical scores, with the highest numerical rating of 17 being assigned to the AAA letter rating and the lowest numerical rating of 1 being assigned to the CCC letter rating. Source: Compustat.
RATE4	RATE4 is constructed by converting letter ratings into finer numerical scores, with the highest numerical rating of 28 being assigned to the AAA letter rating and the lowest numerical rating of 4 being assigned to the C letter rating. Source: Compustat.
MARRIED	Dummy variable, set to one if a firm's CEO is married, and zero otherwise. Source: (Roussanov, & Savor, 2014) and manual collection from various public resources, such as *Marquis Who's Who in Finance and Industry*, the Notable Names Database, the U.S. Securities and Exchange Commission's insider filings, and various media mention.
SIZE	The natural logarithm of total assets (AT). Source: Compustat.

(*continued on next page*)

(*continued*)

Variable	Definition
LEV	Total debt divided by total assets ((DLTT+DLC)/AT). Source: Compustat.
LOSS	Dummy variable, set to one if a firm's income before extraordinary items is negative in the current or previous fiscal year, and zero otherwise (IB). Source: Compustat.
CAP_INT	Gross property, plant, and equipment divided by total assets (PPEGT/AT). Source: Compustat.
INT_COV	Logarithmic transformation of the pre-tax interest coverage ratio, log(1 + (XINT/EBIT)). Source: Compustat.
SUBORD	Dummy variable, set to one if a firm has subordinated debt, and zero otherwise (DS). Source: Compustat.
FIRM_AGE	Number of years since the firm was incorporated in the Compustat database. Source: Compustat.
ACCM	The absolute value of discretionary accruals that are estimated using the modified Jones model (Dechow et al., 1995). Source: Compustat.
IDIVOL	The standard deviation of residuals from a firm-specific Fama and French (1993) three-factor model estimated using daily stock returns during the year. Source: Center for Research in Security Prices (CRSP).
PAYOUT	Cash dividends declared on common shares divided by net income before extraordinary items (DVC/IB). Source: Compustat.
CEO_AGE	The natural logarithm of one plus CEO age. Source: Execucomp.
TENURE	The natural logarithm of one plus the number of years since the CEO joined the company. Source: Execucomp.
FEMALE_CEO	Dummy variable, set to one for a female CEO, and zero otherwise. Source: Execucomp.
DELTA	The natural logarithm of a dollar change in the CEO's wealth associated with a 1% change in the firm's stock price. Source: data are downloaded from https://sites.temple.edu/lnaveen/data/
VEGA	The natural logarithm of a dollar change in the CEO's wealth associated with a 1% change in the standard deviation of the firm's returns. Source: data are downloaded from https://sites.temple.edu/lnaveen/data/
OVERCONF	The ratio of the mean value of the CEO's vested but unexercised options over the difference between the firm's stock price and the numerator (Banerjee, Humphery-Jenner, & Nanda, 2015). Source: Execucomp.
PAY_GAP	The difference between CEO pay and the median pay of other senior executives. Source: Execucomp.
CEO_FOUNDER	Dummy variable, set to one if a CEO was the CEO five years before the initial public offering date reported by Compustat or the first date reported by CRSP. Source: **Compustat**, Execucomp and Center for Research in Security Prices (CRSP).
CEO_Ivy_Degree	Dummy variable, set to one if the CEO received a degree from an Ivy League university, and zero otherwise. Source: Execucomp and Boardex.
CEO_MBA_Degree	Dummy variable, set to one if the CEO received an MBA degree, and zero otherwise. Source: Execucomp and Boardex.
CEO_PhD_Degree	Dummy variable, set to one if the CEO received a PhD degree, and zero otherwise. Source: Execucomp and Boardex.
MA_Rank	The decile rank by industry-year of the managerial ability score from Demerjian et al. (2012). Source: https://peterdemerjian.weebly.com/managerialability.html.
Z_Score	Altman's (1968) *Z*-score = 1.2 × WC/AT +1.4 × RE/AT +3.3 × EBIT/AT +0.6 × MV/LT + 0.999 × SALES/AT; where WC is a proxy for working capital; AT is a proxy for total assets; RE is retained earnings; EBIT is a proxy for earnings before interest and taxes; MV is a proxy for market value of equity; LT is a proxy for total liabilities; and SALES is a proxy for turnover. Source: Compustat.
Modified Z_Score	Modified Altman's (1968) Z-score from MacKie-Mason (1990). Source: Compustat.
O_Score	Ohlson's (1980) O-score: O-score = $-1.32 - 0.407 \times \text{logAT} + 6.03 \times \text{LT/AT} - 1.43 \times \text{WC/AT} + 0.076 \times \text{CL/CA} - 1.72 \times \text{LTdummy} - 2.37 \times \text{NI/AT} - 1.83 \times \text{FFO/LT} + 0.285 \times \text{NLdummy} - 0.521 \times (\text{NI}_t - \text{NI}_{t-1})/(\lvert\text{NI}_t\rvert + \lvert\text{NI}_{t-1}\rvert)$; where AT is a proxy for total assets; LT is a proxy for total liabilities; WC is a proxy for working capital; CL is a proxy for current liabilities; CA is a proxy for current assets; LTdummy is a dummy variable that equals one if LT is higher than AT, and zero otherwise; NI is a proxy for net income; FFO is a proxy for funds from operations; and NLdummy is a dummy variable that equals one if the firm had a net loss in the previous two years, and zero otherwise. Source: Compustat.
ROA	Net income before extraordinary items divided by total assets (IB/AT). Source: Compustat.
MTB	Market-to-book ratio: the market value of equity divided by the book value of equity: (CSHO×PRCC_F)/CEQ. Source: Compustat.
STD_RET	The standard deviation of the monthly stock return during the year. Source: Center for Research in Security Prices (CRSP).
RET	Annual return is the annualized monthly stock returns. Source: Center for Research in Security Prices (CRSP).
TANG	Tangibility is tangible assets scaled by total assets (PPEGT/AT). Source: Compustat.
RDEXP	Research and development expenditure (XRD), missing values are replaced as zero. Source: Compustat.
REAL_VOL	Realized volatility is the standard deviation of daily cum-dividend stock returns over the course of each firm's fiscal year (which typically spans approximately 252 trading days). Source: www.policyuncertainty.com.
IMP_VOL	Implied volatility is the standard deviation of daily implied volatility values from OptionMetrics (which typically spans approximately 252 trading days). Daily implied volatility data correspond to at-the-money 365-day forward call options. Source: www.policyuncertainty.com.
MC_RAW	Raw moral capital is the difference between the total number of strengths and the total number of concerns in four dimensions: Community, Diversity, Environment impact, and Human rights. Source: MSCI ESG KLD STATS.
MC_ADJ	Adjusted moral capital is constructed by scaling the raw strength and concern scores of each dimension over the maximum number of strength and concern items for the dimension for each year, and then taking the net difference between the adjusted strength and concern scores for the dimension. Source: MSCI ESG KLD STATS.
EC_RAW	Raw exchange capital is the difference between the total number of strengths and the total number of concerns in three dimensions: Corporate governance, Employee relations, and Product quality. Source: MSCI ESG KLD STATS.
EC_ADJ	Adjusted exchange capital is constructed by scaling the raw strength and concern scores of each dimension over the maximum number of strength and concern items for the dimension for each year, and then taking the net difference between the adjusted strength and concern scores for the dimension. Source: MSCI ESG KLD STATS.
High_Vega	Dummy variable, set to one if the CEO's stock option compensation (*VEGA*) is above the 50th percentile of the sample in a given year, and zero otherwise. Source: data are downloaded from https://sites.temple.edu/lnaveen/data/.
High_PAY_GAP	Dummy variable, set to one if the difference between CEO pay and the median pay of other senior executives in the same company is above the 50th percentile of the sample in a given year, and zero otherwise. Source: Execucomp.
AVE_MARRIED	Average value of married CEOs among peer firms in the same primary industry (one-digit SIC code). Source: (Roussanov, & Savor, 2014) and manual collection from various public resources, such as *Marquis Who's Who in Finance and Industry*, the Notable Names Database, the U.S. Securities and Exchange Commission's insider filings, and various media mention, and Compustat.

Appendix C. Credit ratings

S&P's long-term issuer letter rating	RATE1 (Numeric coding)	RATE2 (Numeric coding)	RATE3 (Numeric coding)	RATE4 (Numeric coding)
AAA	21	16	17	28
AA+	20	15	16	26

(*continued on next page*)

(*continued*)

S&P's long-term issuer letter rating	RATE1 (Numeric coding)	RATE2 (Numeric coding)	RATE3 (Numeric coding)	RATE4 (Numeric coding)
AA	19	14	15	25
AA−	18	13	14	24
A+	17	12	13	23
A	16	11	12	22
A−	15	10	11	21
BBB+	14	9	10	20
BBB	13	8	9	19
BBB−	12	7	8	18
BB+	11	6	7	17
BB	10	5	6	16
BB−	9	4	5	15
B+	8	3	4	14
B	7	2	3	13
B−	6	1	2	12
CCC+	5		1	11
CCC	4			10
CCC−	3			9
CC	2			7
C	1			4

References

Adams, R. B., Almeida, H., & Ferreira, D. (2005). Powerful CEOs and their impact on corporate performance. *Review of Financial Studies, 18*(4), 1403–1432.

Agarwal, S., Chomsisengphet, S., & Liu, C. (2011). Consumer bankruptcy and default: The role of individual social capital. *Journal of Economic Psychology, 32*(4), 632–650.

Aggarwal, R. K., & Samwick, A. A. (2006). Empire-builders and shirkers: Investment, firm performance, and managerial incentives. *Journal of Corporate Finance, 12*(3), 489–515.

Agnew, J., Balduzzi, P., & Sunden, A. (2003). Portfolio choice and trading in a large 401 (k) plan. *American Economic Review, 93*(1), 193–215.

Aktas, N., Petmezas, D., Servaes, H., & Karampatsas, N. (2021). Credit ratings and acquisitions. *Journal of Corporate Finance, 69*, Article 101986.

Al Mamun, M., Boubaker, S., Ghafoor, A., & Suleman, M. T. (2024). Is marriage a turning point? Evidence from cash holdings behaviour. *British Journal of Management, 35*(2), 775–798.

Alfaro, I., Bloom, N., & Lin, X. (2024). The finance uncertainty multiplier. *Journal of Political Economy, 132*(2), 577–615.

Alissa, W., Bonsall, S. B., Koharki, K., & Penn, M. W. (2013). Firms' use of accounting discretion to influence their credit ratings. *Journal of Accounting and Economics, 55*(2–3), 909–924.

Alp, A. (2013). Structural shifts in credit rating standards. *Journal of Finance, 68*(6), 2435–2470.

Altman, E. I. (1968). Financial ratios, discriminant analysis and the prediction of corporate bankruptcy. *Journal of Finance, 23*(4), 589–609.

Amihud, Y., & Lev, B. (1981). Risk reduction as a managerial motive for conglomerate mergers. *The Bell Journal of Economics, 12*(2), 605–617.

Ashbaugh-Skaife, H., Collins, D. W., & LaFond, R. (2006). The effects of corporate governance on firms' credit ratings. *Journal of Accounting and Economics, 42*(1–2), 203–243.

Attig, N., El Ghoul, S., Guedhami, O., & Suh, J. (2013). Corporate social responsibility and credit ratings. *Journal of Business Ethics, 117*(4), 679–694.

Autio, E., Sapienza, H. J., & Almeida, J. G. (2000). Effects of age at entry, knowledge intensity, and imitability on international growth. *Academy of Management Journal, 43*(5), 129–147.

Baghdadi, G. A., Nguyen, L. H., & Podolski, E. J. (2020). Board co-option and default risk. *Journal of Corporate Finance, 64*, Article 101703.

Banerjee, S., Humphery-Jenner, M., & Nanda, V. (2015). Restraining overconfident CEOs through improved governance: Evidence from the Sarbanes–Oxley Act. *Review of Financial Studies, 28*(10), 2812–2858.

Becker, B., & Milbourn, T. (2011). How did increased competition affect credit ratings? *Journal of Financial Economics, 101*(3), 493–514.

Bernile, G., Bhagwat, V., & Rau, P. R. (2017). What doesn't kill you will only make you more risk-loving: Early-life disasters and CEO behavior. *The Journal of Finance, 72*(1), 167–206.

Bertocchi, G., Brunetti, M., & Torricelli, C. (2011). Marriage and other risky assets: A portfolio approach. *Journal of Banking and Finance, 35*(11), 2902–2915.

Bertrand, M., & Schoar, A. (2003). Managing with style: The effect of managers on firm policies. *Quarterly Journal of Economics, 118*(4), 1169–1208.

Bhandari, A., & Golden, J. (2021). CEO political preference and credit ratings. *Journal of Corporate Finance, 68*, Article 101909.

Boardman, C. M., & McEnally, R. W. (1981). Factors affecting seasoned corporate bond prices. *Journal of Financial and Quantitative Analysis, 16*(2), 207–226.

Bonsall, S. B., Holzman, E. R., & Miller, B. P. (2017). Managerial ability and credit risk assessment. *Management Science, 63*(5), 1425–1449.

Booth, A., & Dabbs, J. M. (1993). Testosterone and men's marriages. *Social Forces, 72*(2), 463–477.

Brogaard, J., Li, D., & Xia, Y. (2017). Stock liquidity and default risk. *Journal of Financial Economics, 124*(3), 486–502.

Burnham, T. C., Chapman, J. F., Gray, P. B., McIntyre, M. H., Lipson, S. F., & Ellison, P. T. (2003). Men in committed, romantic relationships have lower testosterone. *Hormones and Behavior, 44*(2), 119–122.

Cao, Z., Kim, J.-B., Zhang, E. X., & Zhang, R. (2019). *Managerial risk tolerance and corporate credit ratings*.

Carney, D. R., Cuddy, A. J. C., & Yap, A. J. (2010). Power posing: Brief nonverbal displays affect neuroendocrine levels and risk tolerance. *Psychological Science, 21*(10), 1363–1368.

Chava, S., & Purnanandam, A. (2010). CEOs versus CFOs: Incentives and corporate policies. *Journal of Financial Economics, 97*(2), 263–278.

Chen, X., Cheng, Q., Lo, A. K., & Wang, X. (2015). CEO contractual protection and managerial short-termism. *Accounting Review, 90*(5), 1871–1906.

Coles, J. L., Daniel, N. D., & Naveen, L. (2006). Managerial incentives and risk-taking. *Journal of Financial Economics, 79*(2), 431–468.

Core, J., & Guay, W. (2002). Estimating the value of employee stock option portfolios and their sensitivities to price and volatility. *Journal of Accounting Research, 40*(3), 613–630.

Cornaggia, K. J., Krishnan, G. V., & Wang, C. (2017). Managerial ability and credit ratings. *Contemporary Accounting Research, 34*(4), 2094–2122.

Cronqvist, H., Makhija, A. K., & Yonker, S. E. (2012). Behavioral consistency in corporate finance: CEO personal and corporate leverage. *Journal of Financial Economics, 103*(1), 20–40.

Custódio, C., Ferreira, M. A., & Matos, P. (2013). Generalists versus specialists: Lifetime work experience and chief executive officer pay. *Journal of Financial Economics, 108*(2), 471–492.

Custódio, C., & Metzger, D. (2014). Financial expert CEOs: CEO's work experience and firm's financial policies. *Journal of Financial Economics, 114*, 125–154.

Dahl, M. S., Dezsö, C. L., & Ross, D. G. (2012). Fatherhood and managerial style: How a male CEO's children affect the wages of his employees. *Administrative Science Quarterly, 57*(4), 669–693.

Datta, S., Doan, T., & Toscano, F. (2021). Top executive gender, board gender diversity, and financing decisions: Evidence from debt structure choice. *Journal of Banking and Finance, 125*, Article 106070.

Dechow, P. M., Sloan, R. G., & Sweeney, A. P. (1995). Detecting earnings management. *The Accounting Review, 70*(2), 193–225.

Demerjian, P., Lev, B., & McVay, S. (2012). Quantifying managerial ability: A new measure and validity tests. *Management Science, 58*(7), 1229–1248.

Driss, H., Drobetz, W., Ghoul, S. E., & Guedhami, O. (2021). Institutional investment horizons, corporate governance, and credit ratings: International evidence. *Journal of Corporate Finance, 67*, Article 101874.

Eckbo, B. E., Thorburn, K. S., & Wang, W. (2016). How costly is corporate bankruptcy for the CEO? *Journal of Financial Economics, 121*(1), 210–229.

Elnahas, A. M., Hossain, M. N., & Javadi, S. (2024). CEO marital status and corporate cash holdings. *European Financial Management, 30*(1), 187–229.

Elnahas, A. M., & Kim, D. (2017). CEO political ideology and mergers and acquisitions decisions. *Journal of Corporate Finance, 45*, 162–175.

Faccio, M., Marchica, M. T., & Mura, R. (2016). CEO gender, corporate risk-taking, and the efficiency of capital allocation. *Journal of Corporate Finance, 39*, 193–209.

Fahlenbrach, R. (2009). Founder-CEOs, investment decisions, and stock market performance. *Journal of Financial and Quantitative Analysis, 44*(2), 439–466.

Fama, E. F., & French, K. R. (1993). Common risk factors in the returns on stocks and bonds. *Journal of Financial Economics, 33*(1), 3–56.

Fee, C. E., Hadlock, C. J., & Pierce, J. R. (2013). Managers with and without style: Evidence using exogenous variation. *Review of Financial Studies, 26*(3), 567–601.
FitchRatings. (2021). Corporate rating criteria. Retrieved from https://www.fitchratings.com/research/corporate-finance/corporate-rating-criteria-15-10-2021.
Gardberg, N. A., & Fombrun, C. J. (2006). Corporate citizenship: Creating intangible assets across institutional environments. *Academy of Management Review, 31*(2), 329–346.
Godfrey, P. C. (2005). The relationship between corporate philanthropy and shareholder wealth: A risk management perspective. *Academy of Management Review, 30*(4), 777–798.
Godfrey, P. C., Merrill, C. B., & Hansen, J. M. (2009). The relationship between corporate social responsibility and shareholder value: An empirical test of the risk management hypothesis. *Strategic Management Journal, 30*(4), 425–445.
Gormley, T. A., & Matsa, D. A. (2014). Common errors: How to (and not to) control for unobserved heterogeneity. *Review of Financial Studies, 27*(2), 617–661.
Grable, J. E. (2000). Financial risk tolerance and additional factors that affect risk taking in everyday money matters. *Journal of Business and Psychology, 14*(4), 625–630.
Guay, W. R. (1999). The sensitivity of CEO wealth to equity risk: An analysis of the magnitude and determinants. *Journal of Financial Economics, 53*(1), 43–71.
Hambrick, D. C. (2007). Upper echelons theory: An update. *Academy of Management Review, 32*(2), 334–343.
Hambrick, D. C., & Mason, P. (1984). Upper echelons: The organization as a reflection of its top managers. *Academy of Management Review, 9*(2), 193–206.
Harford, J., & Uysal, V. B. (2014). Bond market access and investment. *Journal of Financial Economics, 112*(2), 147–163.
Harris, M., & Raviv, A. (1990). Capital structure and the informational role of debt. *Journal of Finance, 45*(2), 321–349.
Hayes, R. M., Lemmon, M., & Qiu, M. (2012). Stock options and managerial incentives for risk taking: Evidence from FAS 123R. *Journal of Financial Economics, 105*(1), 174–190.
Heckman, J. J. (1979). Sample selection bias as a specification error. *Econometrica, 47*(1), 153–161.
Hegde, P., Liao, S., Ma, R., & Nguyen, N. H. (2023). CEO marital status and insider trading. *British Journal of Management, 34*(4), 1974–1991.
Hegde, S. P., & Mishra, D. R. (2019). Married CEOs and corporate social responsibility. *Journal of Corporate Finance, 58*, 226–246.
Hilary, G., Huang, S., & Xu, Y. (2017). Marital status and earnings management. *The European Accounting Review, 26*(1), 153–158.
Hilary, G., & Hui, K. W. (2009). Does religion matter in corporate decision making in America? *Journal of Financial Economics, 93*(3), 455–473.
Hirshleifer, D., & Thakor, A. V. (1992). Managerial conservatism, project choice, and debt. *Review of Financial Studies, 5*(3), 437–470.
Horrigan, J. O. (1966). The determination of long-term credit standing with financial ratios. *Journal of Accounting Research, 4*, 44–62.
Hossain, M. N., Rabarison, M. K., Ater, B., & Sobngwi, C. K. (2023). CEO marital status and dividend policy. *Journal of Corporate Finance, 78*, Article 102342.
Huang, J., & Kisgen, D. J. (2013). Gender and corporate finance: Are male executives overconfident relative to female executives? *Journal of Financial Economics, 108*(3), 822–839.
Jensen, M. C., & Meckling, W. H. (1976). Theory of the firm: Managerial behavior, agency costs and ownership structure. *Journal of Financial Economics, 3*(4), 305–360.
Jiraporn, P., Jiraporn, N., Boeprasert, A., & Chang, K. (2014). Does corporate social responsibility (CSR) improve credit ratings? Evidence from geographic identification. *Financial Management, 43*(3), 505–531.
Kim, J.-B., Liao, S., & Liu, Y. (2022). Married CEOs and stock price crash risk. *European Financial Management, 28*(5), 1376–1412.
King, T., Srivastav, A., & Williams, J. (2016). What's in an education? Implications of CEO education for bank performance. *Journal of Corporate Finance, 37*, 287–308.
Kini, O., & Williams, R. (2012). Tournament incentives, firm risk, and corporate policies. *Journal of Financial Economics, 103*(2), 350–376.
Kisgen, D. J. (2006). Credit ratings and capital structure. *Journal of Finance, 61*(3), 1035–1072.
Kuang, Y. F., & Qin, B. (2013). Credit ratings and CEO risk-taking incentives. *Contemporary Accounting Research, 30*(4), 1524–1559.
Lartey, T., & Danso, A. (2022). CEO overconfidence and debt covenant violations. *Journal of Financial Research, 45*(1), 162–199.
Li, Y., & Zeng, Y. (2019). The impact of top executive gender on asset prices: Evidence from stock price crash risk. *Journal of Corporate Finance, 58*, 528–550.
Lins, K. V., Servaes, H., & Tamayo, A. (2017). Social capital, trust, and firm performance: The value of corporate social responsibility during the financial crisis. *Journal of Finance, 72*(4), 1785–1824.
Liu, M. H., Tian, S., & Zhang, Y. (2023). CEO marital status and corporate tax planning behavior. *Review of Quantitative Finance and Accounting*, 1–36.
Liu, Y., & Jiraporn, P. (2010). The effect of CEO power on bond ratings and yields. *Journal of Empirical Finance, 17*(4), 744–762.
Love, D. (2010). The effects of marital status and children on savings and portfolio choice. *Review of Financial Studies, 23*(1), 385–432.
Ma, Z., Ruan, L., Wang, D., & Zhang, H. (2021). Generalist CEOs and credit ratings. *Contemporary Accounting Research, 38*(2), 1009–1036.
MacKie-Mason, J. K. (1990). Do taxes affect corporate financing decisions? *Journal of Finance, 45*(5), 1471–1493.
Mazur, A., & Booth, A. (1998). Testosterone and dominance in men. *Behavioral and Brain Sciences, 21*(3), 353–397.
Megna, M. (2021). What are the factors that affect car insurance rates. Retrieved from https://www.carinsurance.com/Articles/10-factors-that-affect-your-car-insurance-rates.aspx.
Mehta, P. H., Jones, A. C., & Josephs, R. A. (2008). The social endocrinology of dominance: Basal testosterone predicts cortisol changes and behavior following victory and defeat. *Journal of Personality and Social Psychology, 94*(6), 1078–1093.
Mei, C., & Subramanyam, K. R. (2008). Analyst following and credit ratings. *Contemporary Accounting Research, 25*(4), 1007–1044.
MorningStar. (2017). Corporate credit rating methodology. Retrieved from https://ratingagency.morningstar.com/PublicDocDisplay.aspx?i=rptC7ZVHtAo%3D&m=i0Pyc%2Bx7qZZ4%2BsXnymazBA%3D%3D&s=LviRtUKXqs8kml5dHt7FTeE2SZmY0Fvqd4iX49Mk%2F9UapyiFTEO6TA%3D%3D.
Nicolosi, G. (2013). Demographics of dividends. *Journal of Corporate Finance, 23*, 54–70.
Nicolosi, G., & Yore, A. S. (2015). 'I do': Does marital status affect how much CEOs 'do'? *Financial Review, 50*(1), 57–88.
Ohlson, J. A. (1980). Financial ratios and the probabilistic prediction of bankruptcy. *Journal of Accounting Research, 18*(1), 109–131.
Oikonomou, I., Brooks, C., & Pavelin, S. (2014). The effects of corporate social performance on the cost of corporate debt and credit ratings. *Financial Review, 49*(1), 49–75.
Pan, Y., Wang, T. Y., & Weisbach, M. S. (2015). Learning about CEO ability and stock return volatility. *Review of Financial Studies, 28*(6), 1623–1666.
Pan, Y., Wang, T. Y., & Weisbach, M. S. (2018). How management risk affects corporate debt. *Review of Financial Studies, 31*(9), 3491–3531.
Papadimitri, P., Pasiouras, F., Tasiou, M., & Ventouri, A. (2020). The effects of board of directors' education on firms' credit ratings. *Journal of Business Research, 116*, 294–313.
Park, J. W., Tsang, A., & Lee, Y. (2022). Firstborn CEOs and credit ratings. *The British Accounting Review, 54*(4), Article 101083.
Petersen, M. A. (2009). Estimating standard errors in finance panel data sets: Comparing approaches. *Review of Financial Studies, 22*(1), 435–480.
Rosenbaum, P. R., & Rubin, D. B. (1983). The central role of the propensity score in observational studies for causal effects. *Biometrika, 70*(1), 41–55.
Roussanov, N., & Savor, P. (2014). Marriage and managers' attitudes to risk. *Management Science, 60*(10), 2496–2508.
Shen, C. H. H., & Zhang, H. (2018). Tournament incentives and firm innovation. *Review of Finance, 22*(4), 1515–1548.
Smith, C. W., & Stulz, R. M. (1985). The determinants of firms' hedging policies. *Journal of Financial and Quantitative Analysis, 20*(4), 391–405.
Smith, C. W., & Warner, J. B. (1979). On financial contracting: An analysis of bond covenants. *Journal of Financial Economics, 7*(2), 117–161.
Stack, S., & Eshleman, J. R. (1998). Marital status and happiness: A 17-nation study. *Journal of Marriage and the Family, 60*(2), 527–536.
Standard & Poor''s. (2008). Corporate criteria: Analytical methodology. Retrieved from https://disclosure.spglobal.com/ratings/en/regulatory/article/-/view/sourceId/5446217.
Standard & Poor''s. (2019). Guide to credit rating essentials. Retrieved from https://www.spglobal.com/ratings/_division-assets/pdfs/guide_to_credit_rating_essentials_digital.pdf.
Stein, J. C. (2002). Information production and capital allocation: Decentralized versus hierarchical firms. *Journal of Finance, 57*(5), 1891–1921.
Todd, A. R., Forstmann, M., Burgmer, P., Brooks, A. W., & Galinsky, A. D. (2015). Anxious and egocentric: How specific emotions influence perspective taking. *Journal of Experimental Psychology: General, 144*(2), 374–391.
Whitlock, G., Norton, R., Clark, T., Jackson, R., & MacMahon, S. (2004). Motor vehicle driver injury and marital status: A cohort study with prospective and retrospective driver injuries. *Injury Prevention, 10*(1), 33–36.
Zhang, Y., Zheng, H., Lam, D., Fu, X. M., & Li, M. (2022). CEOs' marital status and corporate innovation. *Journal of Product Innovation Management, 39*(5), 686–716.