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Working Paper

Married CEOs and Stock Price Crash Risk

QMS Research Paper, No. 2021/09

Provided in Cooperation with:

Queen's University Belfast, Queen's Business School

Suggested Citation: Kim, Jeong-Bon; Liao, Shushu; Liu, Yangke (2021) : Married CEOs and Stock Price Crash Risk, QMS Research Paper, No. 2021/09, Queen's University Belfast, Queen's Management School, Belfast, <https://doi.org/10.2139/ssrn.3958224>

This Version is available at:

<https://hdl.handle.net/10419/271254>

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Married CEOs and Stock Price Crash Risk

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8 November 2021

Series edited by Phillip T. Fliers and Louise Moss.
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Married CEOs and Stock Price Crash Risk*

(Forthcoming in European Financial Management)

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This version: October 2021

* We are grateful to John A. Doukas (the editor) and two anonymous referees for constructive comments and suggestions that helped us significantly improve our paper. We also appreciate helpful comments from Gareth Campbell, Viet Anh Dang, John Turner, Mark Humphery-Jenner, Dimitris Margaritis, and Nhut Nguyen Hoang, as well as participants of the faculty research seminars at Auckland University of Technology, the University of Auckland, Lancaster University, and Queen's University Belfast. All remaining errors are our own.

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Married CEOs and Stock Price Crash Risk

Abstract

This study examines whether marriage, as a social construct and cultural norm, can affect firm-level stock price crash risk. We find that firms managed by married CEOs are associated with lower future stock price crash risk, after controlling for a set of firm characteristics and CEO traits. We document that CEO marriage reduces crash risk by curbing bad news hoarding and formation activities. Moreover, the attenuating impact of CEO marriage on crash risk is more pronounced among firms with weaker corporate governance and those run by less prominent, higher-delta, and lower paid CEOs.

Keywords: Marriage; CEO; crash risk; bad news hoarding; corporate governance; compensation

JEL Classifications: G12; G30; M52; M12

1. Introduction

A large body of literature provides evidence that business management is associated with the personal attributes and experiences of a chief executive officer (CEO), such as overconfidence, trustworthiness, gender, education, religion, and military and financial backgrounds. However, little is known about the role that marriage plays in business. As a common personal trait and social conduct, a CEO's marital status may affect managerial activities, as well as operational performance. In this study, we explore whether managers' opportunistic bad news hoarding behavior and subsequent shareholder wealth differ systematically between firms headed by married and single CEOs, respectively. Specifically, our analysis focuses on the impact of CEO marital status on firm-level stock price crash risk.

Stock price crashes indicate extreme negative shocks in the equity market. Prior literature suggests that managerial reporting opportunism, such as deliberately hiding bad news from outsiders, is a major source of stock price crash risk at the firm level (Hutton, Marcus, & Tehranian, 2009; Jin & Myers, 2006; Kim, Li, & Zhang, 2011a, 2011b). The reluctance to disclose timely bad news stems from a variety of factors, including the need to maintain stock prices (Graham, Harvey, & Rajgopal, 2005), concerns over career or job security (Kothari, Shu, & Wysocki, 2009), and incentives to maintain the esteem of one's peers and firm reputation (Ball, 2009). If managers accumulate and withhold bad news for an extended period, the share price will be artificially inflated. When the amount of negative information accumulated over a period reaches a certain threshold at which the cost of withholding is greater than the associated benefit, managers are forced to release all the hidden information at once, leading to an unanticipated large-scale decline in the stock price or a stock price crash.

Studies have investigated a considerable range of factors that affect firm-specific future stock price crash risk. For example, one line of research examines corporate accounting and financial policies, including financial reporting opacity (Hutton et al., 2009; Kim & Zhang, 2014), tax avoidance (Kim et al.,

2011b), accounting conservatism (Kim & Zhang, 2016), financial statement comparability or the readability of 10-K reports (Kim, Li, Lu, & Yu, 2016; Kim, Wang, & Zhang, 2019), and debt maturity (Dang, Lee, Liu, & Zeng, 2018). Another line of research explores whether and how external corporate governance mechanisms can affect stock price crash risk. Examples of external governance and monitoring mechanisms include institutional ownership (Callen & Fang, 2013), accounting standards (DeFond, Hung, Li, & Li, 2015), short selling (Callen & Fang, 2015b; Deng, Gao & Kim, 2020), labor unionization (Kim, Zhang, & Zhong, 2021), Internal Revenue Service monitoring (Bauer, Fang, & Pittman, 2021), corporate governance attributes (Andreou, Antoniou, Horton, & Louca, 2016), the auditor–client relationship (Callen & Fang, 2017), engagement auditor office size (Callen, Fang, Xin, & Zhang, 2020), directors’ social networks (Fang, Pittman, & Zhao, 2021), stock liquidity (Chang, Chen, & Zolotoy, 2017), the control–ownership wedge (Hong, Kim & Welker, 2017), and individualistic national culture (Dang, Faff, Luong, & Nguyen, 2019). Moreover, our study is closely related to the stream of literature on stock price crash risk and executive traits, such as CEO equity incentives as reflected in the structure of executive compensation contracts (Kim et al., 2011a; Xu, Li, Yuan, & Chan, 2014), religion (Callen & Fang, 2015a), age (Andreou, Louca, & Petrou, 2017), and overconfidence (Kim, Wang, & Zhang, 2016). However, little is known about whether and how a CEO’s marital status, which is a common individual characteristic related to personal life experience, could have an impact on the extreme downside risk of shareholder wealth. We aim to fill this gap in the literature by investigating the relation between CEO marital status and stock price crash risk.

We hypothesize that CEO marriage may lead to lower stock price crash risk by reducing managerial incentives to withhold adverse information and lowering the likelihood of bad news formation. The business, finance, and social science literature suggests that CEO marital status may affect an individual’s ethical and social preferences, which, in turn, impacts executive risk preferences and corporate financial policies. The normative commitment to marriage involves espousing the lifestyle of caring for

family members and fostering the common good (e.g., Booth & Dabbs, 1993; Stack & Eshleman, 1998; Wilcox, Marquardt, Popenoe, & Whitehead, 2011).¹ Married CEOs might be more ethical and responsible for investors and other stakeholders in the form of deterring opportunistic behavior, such as delaying negative information disclosure, which leads to lower stock price crash risk. Importantly, married CEOs tend to be more risk averse and undertake less aggressive investment projects compared with single peers (Roussanov & Savor, 2014), leading to less bad news formation.

Due to the male dominance in executive positions, marriage might indirectly affect a male CEO's opportunistic behavior by changing his propensity to maintain dominance and become egocentric. From a biological point of view, married individuals have lower testosterone levels than unmarried counterparts (Booth & Dabbs, 1993; Burnham, Chapman, Gray, McIntyre, Lipson, & Ellison, 2003), while lower testosterone levels promote collaborative decision making (e.g., Wright, Bahrami, Johnson, Di Malta, Rees, Frith, & Dolan, 2012) and limit the desire to gain a high and dominant status (e.g., Mehta, Jones, & Josephs, 2008). Recent research on CEO facial masculinity suggests that more masculine-faced CEOs who may be associated with higher testosterone levels tend to increase financial leverage and engage in acquisitions and accounting manipulation (Jia, Lent, & Zeng, 2014; Kamiya, Kim, & Park, 2019). To the extent that married CEOs with lower testosterone levels have less desire to maintain dominant positions by manipulating information, firms run by married executives are less prone to crashes. From a psychological perspective, married CEOs experience more happiness, since they receive more emotional support from their spouse (Stack & Eshleman, 1998). Better mental health,² due to mutual support in marriage, leads to less egocentric choices and enables individuals to take into account the perspectives of other individuals (Todd, Forstmann,

¹ Nicolosi (2013) show that married CEOs are more likely to significantly increase their dividend payouts than single ones.

² Bupa Global, an international health insurer, revealed in October 2018 that two-thirds of business leaders have suffered from mental health problems, including anxiety, stress, and depression.

Burgmer, Brooks, & Galinsky, 2015). Thus, married CEOs, who are less subject to egocentrism, are more likely to share the feelings of others and less likely to seek personal interests by misreporting financial status or investing aggressively, which leads to a lower probability of experiencing stock price crashes (Jin & Myers, 2006).

Further, married CEOs, with greater household responsibilities and family consumption commitment than single CEOs, are relatively unable to afford potential dismissal due to ethical issues. They may therefore be reluctant to engage in managerial opportunism, such as deliberately hiding negative information that leads to heightened litigation risk and reduced career stability (Cao & Narayanamoorthy, 2011; Kothari et al., 2009; Skinner, 1994, 1997). Married CEOs are more inclined than unmarried CEOs to choose a conservative reporting policy and voluntarily disclose bad news, which helps to maintain their stable employment status and avoid extreme negative events, such as litigation. Overall, marriage could effectively restrict executives' bad news hoarding behavior. We therefore predict that firms run by married CEOs are less likely to hide bad news and have lower stock price crash risk, compared to their unmarried counterparts.

To test this conjecture, we examine the relation between CEO marital status and stock price crash risk. We employ two measures for firm-specific crash risk: 1) the likelihood of future negative, extreme firm-specific weekly returns and 2) the negative conditional skewness of firm-specific weekly returns. Our dataset for CEO marital status is drawn from work by Roussanov and Savor (2014). Using a sample of US public corporations during the period 1993–2008, we find that firms managed by married CEOs are associated with lower stock price crash risk. This finding is robust after controlling for a wide range of CEO individual characteristics, such as the CEO's age, gender, tenure, option holdings, and total holdings, which are related to the CEO's risk-taking behavior (Bebchuk, 2009).

Identifying a causative link between CEO marital status and crash risk is a daunting task due to potential endogeneity in our empirical analyses. Given that CEO's personal traits may be matched with firm characteristics and both could affect extreme outcomes in the equity market, the difference in crash risk across firms could capture the effects from unobservable heterogeneity across firms. To alleviate potential endogeneity concerns, we employ various identification strategies, namely 1) focusing on marital transitions and investigating the impact of changes in the CEO's marital status on crash risk, 2) incorporating firm fixed effects and a set of additional controls, and 3) adopting a propensity score matching (PSM) approach to identify control groups with married CEOs who have indistinguishable covariate differences from our treatment groups with single CEOs. The identification tests show that the negative relation between married CEOs and crash risk remains statistically significant after addressing potential endogeneity concerns. Our baseline findings are also robust to alternative measurements of firm-level crash risk.

Next, we provide more direct evidence on the possible channels driving our main findings, that is, CEO marriages reducing stock price crash risk by curbing bad news hoarding behavior and reducing the likelihood of bad news formation. Kim and Zhang (2016) discover that accounting conservatism brings forth the disclosure of unfavorable news, and firms with conservative accounting are less likely to experience stock price crashes. Recent research documents that overinvestment in projects with negative net present value (NPV) leads to the accumulation of poor performance, which, once materialized, results in a market crash in stock prices (Chang et al., 2017; Deng et al., 2020; Kim, Wang, et al., 2016). Thus, we proxy for bad news hoarding and bad news formation using firm-level conditional conservatism in financial reporting and corporate overinvestment, respectively. Our empirical evidence shows that married CEOs tend to adopt more conservative accounting policies and engage in overinvestment projects to a lesser

extent, consistent with the notion that CEO marital status reduces crash risk by constraining both corporate bad news hoarding and bad news formation.

We further investigate whether the impact of CEO marriages on stock price crash risk is affected by firm corporate governance and executive characteristics. If CEO marriage indeed reduces stock price crash risk by restricting managerial opportunistic behavior, we would expect such an effect to be stronger when firms are more susceptible to agency issues. In addition, executives are more motivated to extract personal rents from inflated stock prices if they have compensation or reputation concerns (Al Mamun, Balachandran, & Duong, 2020; Malmendier & Tate, 2009). Consistent with this conjecture, we find that the inverse relation between married CEO and crash risk is stronger for firms with poor corporate governance mechanisms or firms run by CEOs with lower compensation, a higher delta, and less prominence.

This study adds to the literature in the following ways. First, it contributes to the growing literature on managerial attributes, for example, prior literature on CEO marital status, and its impact on business ethics and risk. This literature shows that heterogeneity in an individual's personal characteristics has an influence on CEO financial reporting behavior (Schrand & Zechman, 2012) and CEOs' perceptions of risk and return (e.g., Hackbarth, 2008; Malmendier & Tate, 2005, 2008). However, many of these studies focus on inherent and fixed managerial traits, such as CEO overconfidence and optimistic bias. Our goal is to examine CEO marital status, which can change over time. Hilary, Huang, and Xu (2017) find that firms managed by a single CEO tend to display a higher degree of earnings management. However, our analyses extend beyond earnings manipulation behavior and show that CEO marital status has an incremental explanatory power for crash risk. Hegde and Mishra (2019) link a CEO's marital status to corporate social responsibility (CSR) performance. Roussanov and Savor (2014) find that firms with married CEOs have lower stock return volatility and less investment aggressiveness. Nicolosi and Yore (2015) find that married

executives are more willing to initiate bold strategic changes. Our study extends these studies by examining the impact of CEO marital status on managerial bad news hoarding behavior and future stock price crash risk. Stock price crash risk refers to the likelihood of unanticipated large-scale declines in stock price and focuses on downside tail risk. Therefore, crash risk differs by its nature from stock return volatility, which is related to both downside risk and upside potential.

Our study also contributes to a growing body of research on stock price crash risk. Over the last two decades, the topic of stock price crashes has attracted considerable attention from both academics and practitioners. Recent research has documented various factors linked to stock price crash risk, including institutional ownership (Callen & Fang, 2013), religion (Callen & Fang, 2015a), short selling (Callen & Fang, 2015b), auditor tenure (Callen & Fang, 2017), corporate debt maturity (Dang et al., 2018), an individualistic national culture (Dang et al., 2019), and commercial banker-directors (Kang, Kim, & Liao, 2020). To the best of our knowledge, this study is the first to examine the implications of CEO marriage, an executive attribute and social conduct, on firm-level stock price crash risk. Extending the crash risk literature, we provide novel evidence that married CEOs are less prone to engage in bad news hoarding that leads to stock price crashes.

The paper proceeds as follows. Section 2 briefly reviews the literature and empirical predictions. We describe the data and the construction of key variables in Section 3. Our main regression results are presented in Section 4. Section 5 addresses identification and robustness issues. We explore the underlying mechanisms in Section 6. We conduct our cross-sectional analyses in Section 7. Section 8 concludes the paper.

2. Related literature and hypothesis development

Conventional economic theory tends to model managers as homogeneous individuals who make identical and optimal decisions in response to the same information set. However, behavioral finance theory suggests

that managerial interpretations of information and decision making are associated with a set of individual characteristics, such as personality, education, wealth, and risk tolerance (e.g., Bajo, Jankensgård, & Marinelli, 2021; Cen & Doukas, 2017; Chatterjee & Hambrick, 2007; Schrand & Zechman, 2012; Urquhart & Zhang, 2021). Marital status, one of the most scarcely examined attributes, exerts an impact on corporate activities such as CSR (Hegde & Mishra, 2019), stock return volatility (Roussanov & Savor, 2014), and earnings management (Hilary et al., 2017). Based on these studies, we aim to examine whether CEO marriage might influence managerial opportunistic behavior and the likelihood of a future collapse in shareholder value.

Prior research suggests that managerial bad news hoarding is a major cause of future stock price crashes (Hutton et al., 2009; Jin & Myers, 2006; Kim et al., 2011a, 2011b). For instance, Hutton et al. (2009) argue that the opacity of financial statements is positively related to stock price crashes, since opaque firms are prone to hoarding firm-specific negative information during an extended period. Callen and Fang (2015a) find that firms headquartered in counties with higher levels of religiosity tend to have lower crash risk, which supports the view that religion, as a social norm, can curb managerial bad news hoarding behavior. Callen and Fang (2017) suggest that auditor tenure is negatively related to future stock price crash risk, since the auditor–client relationship allows auditors to better detect and restrict their clients’ negative information-withholding activities. Dang et al. (2018) contend that firms with more short-maturity debt are less prone to stock price crashes, given that short-term debt lenders can effectively monitor managers and curb bad news hoarding. Using a cross-country sample, Dang et al. (2019) find that firms in more individualistic cultural settings tend to have higher crash risk, consistent with the view that individualism incentivizes managers to withhold bad news and engage in excessive risk taking. Kang et al. (2020) document that commercial banker directors are more capable of utilizing their financial expertise to detect bad news hoarding and improve financial disclosure, leading to reduced stock price crash risk.

In addition, stock price crash risk depends on the likelihood of bad news formation, as in poor choices of investment projects. Kim, Wang, et al. (2016) argue that overconfident CEOs tend to overvalue the performance of a bad project and thus keep a negative-NPV project alive for an extended period, which results in a stock price crash once the project's poor performance is realized. In a similar vein, Chang et al. (2017) argue that effective monitoring reduces the likelihood of bad news formation due to inefficient investment decisions, which leads to lower crash risk. Deng et al. (2020) also document that the lifting of short-sale constraints reduces crash risk through the channel of easing corporate overinvestment problems.

We conjecture that firms run by married CEOs are less prone to crashes due to reduced bad news hoarding and formation. First, married CEOs may act more ethically and responsibly than single ones, leading to less risk-taking behavior. When managers exert organization effort, they exercise considerable discretion and may act on the basis of their personal values (Cai, Kim, Li, & Pan, 2019; Chatterjee & Hambrick, 2007; Hambrick & Mason, 1984). Heterogeneity in corporate practices to disclose information can manifest executives' personal preferences, such as a CEO's preference for common goodness. A normative commitment to marriage can foster the pursuit of the common good and promote the goal of caring for each other. Hegde and Mishra (2019) suggest that firms led by married CEOs are more committed to CSR. High-CSR firms tend to engage less in bad news hoarding than low-CSR firms, since the former are more likely to consider increased information disclosure a form of social responsibility and maintain higher ethical standards in financial reporting, compared to the latter (Kim, Li, & Li, 2014). Similarly, Hilary et al. (2017) provide evidence that firms managed by a married CEO engage less in earnings management. Thus, married CEOs are less inclined to withhold negative information due to personal interests, leading to a lower likelihood of stock price crash. Married CEOs may also be associated with a lower likelihood of bad news formation, since the positive effect of marital status on managers' risk aversion can translate to less aggressive investment policies (Roussanov & Savor, 2014). According to

Kim, Wang, et al. (2016), overinvestment in negative-NPV projects and excessive risk taking might bring about adverse performance and hence potentially escalate bad news formation.

Second, given the current dominance of male executives, we argue that marriage might alter a male CEO's egocentrism and restrict him from engaging in opportunistic activities. A broad range of the biology, social psychology, and sociology literature suggests that marriage can effectively impact personality attributes such as the tendency to become dominant and egocentric. Booth and Dabbs (1993) find that married men have lower testosterone levels. The biological and social psychology literature shows that lower testosterone levels can foster collaborative decision making (Wright et al., 2012), restrict the motivation to gain prestige (Carney, Cuddy, & Yap, 2010; Mehta et al., 2008), and lead to less aggression and dominance (Apicella, Dreber, Campbell, Gray, Hoffman, & Little, 2008; Mazur & Booth, 1998). Kamiya et al. (2019) find that CEO facial masculinity, which may be positively affected by testosterone, can be an important driver of risky decision making, such as high financial leverage and more acquisitions. Jia et al. (2014) show that CEO facial masculinity is positively related to financial misreporting. Roussanov and Savor (2014) suggest that married CEOs, who are less subject to egocentrism, are less inclined toward empire building to benefit themselves at the expense of others or engaging in excessive high-risk investments.

Further, a rich psychology literature documents the positive impact of marriage on mental health as reflected in greater happiness and less depression (e.g., Stack & Eshleman, 1998; Wilcox et al., 2011). Psychological research suggests that anxiety and depressive disorders are strongly linked to egocentric thoughts and empathy deficits (Hoffmann, Banzhaf, Kanske, Gärtner, Bermpohl, & Singer, 2016; Schreiter, Pijnenborg, & Aan Het Rot, 2013; Todd et al., 2015). Married CEOs, who receive more emotional support from their spouses, experience less depression, are less subject to egocentrism, and are more capable of empathizing with the perspectives and feelings of others. Hence, due to the low tendency to seek high status

and the possibility of bearing high emotional costs from cheating, CEO marital status may constrain opportunistic bad news hoarding and bad news formation activities, thus reducing stock price crash risk.

Lastly, married CEOs are less prone to hoarding bad news due to employment stability concerns. Married managers, especially among single-career couples and parents, may have stronger family consumption commitments and greater financial burdens than single managers (e.g., Roussanov & Savor, 2014). Facing high costs of unemployment, such managers are more likely to avoid opportunistic behavior that could eventually cause extreme negative outcomes, such as lawsuits. Skinner (1994) argues that timely disclosure lowers the probability of lawsuits, and Skinner (1997) finds that disclosing adverse earnings news in a timely manner reduces litigation costs. Cao and Narayanamoorthy (2011) find that managers are more likely to issue a bad news warning when they face high litigation risks. Therefore, married CEOs, with greater household responsibilities and stronger family consumption commitments than single CEOs, may choose to voluntarily disclose bad news in a timelier manner to maintain their employment stability, which, in turn, lowers stock price crash risk. Overall, we predict that firms run by married CEOs have lower stock price crash risk than those run by single CEOs.

3. Data and variables

3.1. Sample and data

Our sample covers publicly listed US firms for the period from 1993 to 2008.³ Accounting data and daily stock returns are extracted from Compustat and the Center for Research in Security Prices (CRSP). We collect information about CEO income, age, tenure, and gender from Compustat's ExecuComp database. Our proxy for marital status relies on the dataset used by Roussanov and Savor (2014). Following prior research (e.g., Hutton et al., 2009; Kim et al., 2011a, 2011b), we exclude firms with a year-end share price

³ To see if the 2008 crisis affected executives' risk-taking behavior such as bad news hoarding, we drop observations in 2008, when the financial crisis occurred, and re-estimate the baseline model using this reduced sample. Untabulated results reveal that the omission of observations in 2008 does not alter our main findings.

lower than \$1. We also exclude observations missing values for the independent variables in our main multivariate regression analyses. Our final sample consists of 16,042 firm-year observations.

3.2. Measuring CEO marital status

Established comprehensive databases such as ExecuComp and BoardEx disclose scant information about CEO marital status. Hence, we refer to the dataset of Roussanov and Savor (2014), which relies on a variety of public resources, including Marquis Who's Who in Finance and Industry, the Notable Names Database, the US Securities and Exchange Commission's insider filings, and various media reports (Roussanov & Savor, 2014). The authors acknowledge certain limitations in their dataset, such as data on divorce, but they confirm that the data is representative and reasonable. Following Roussanov and Savor, we define CEO marital status, denoted by *MARRIED*, as an indicator variable that equals one if the CEO is legally married, and zero otherwise.

3.3. Measuring firm-specific stock price crash risk

We mainly employ two measures of crash risk. Following Hutton et al. (2009), we first define the firm-specific weekly return ($W_{j,\tau}$) as the natural logarithm of one plus the residual, where the residual is estimated from the following expanded market model regression:

$$r_{j,\tau} = \alpha_j + \beta_{1,j}r_{m,\tau-1} + \beta_{2,j}r_{i,\tau-1} + \beta_{3,j}r_{m,\tau} + \beta_{4,j}r_{i,\tau} + \beta_{5,j}r_{m,\tau+1} + \beta_{6,j}r_{i,\tau-1} + \varepsilon_{j,\tau}, \quad (1)$$

where $r_{j,\tau}$ is the return on stock j in week τ , $r_{m,\tau}$ is the return on the CRSP value-weighted market index, and $r_{i,\tau}$ is the Fama–French value-weighted industry index i in week τ . We include the lead and lag terms for the market index and the industry index to allow for nonsynchronous trading (Dimson, 1979). The firm-specific weekly return for firm j in week τ is then defined as the logarithmic value of one plus the residual return from Eq. (1).

Following Hutton et al. (2009) and Kim et al. (2011b), we define our first measure of crash risk as *CRASH*, which is an indicator variable that equals one when a firm experiences at least one crash week during the fiscal year, and zero otherwise. Crash weeks are considered as those weeks during which the firm-specific weekly returns are 3.09 standard deviations below the mean firm-specific weekly returns over the fiscal year, with 3.09 chosen to generate a frequency of 0.1% in the normal distribution.

The second measure of crash risk is the negative conditional return skewness of firm-specific weekly returns (*NCSKEW*) based on Chen, Hong, and Stein (2001) and Kim et al. (2011a, 2011b). The variable *NCSKEW* is the negative conditional skewness of firm-specific weekly return over the fiscal year. In particular, for firm j in year t , we calculate *NCSKEW* as

$$NCSKEW_{j,t} = - \frac{n(n-1)\sum W_{j,t}^3}{(n-1)(n-2)(\sum W_{j,t})^{\frac{3}{2}}}, \quad (2)$$

where n is the number of observations of firm-specific daily returns during the fiscal year t . A higher *NCSKEW* indicates a more left-skewed return distribution and a higher probability of future stock price crashes.

3.4. Control variables

Following prior studies (e.g., Chen et al., 2001; Jin & Myers, 2006), we control for a set of determinants of crash risk. With regard to investor characteristics, we consider differences of opinions using the detrended stock turnover ($DTURN_t$); Hong and Stein (2003) show that investor belief heterogeneity accounts for future price crashes. We incorporate the standard deviation of firm-specific weekly returns over the fiscal year ($SIGMA_t$) in the regression, since volatile stocks are more likely to undergo a future stock price crash. Chen et al. (2001) show that stocks with higher past return are more likely to crash; hence we control for the effects of past returns (RET_t). The negative conditional skewness of past firm-specific stock returns ($NCSKEW_t$) is also included in the regression, to account for the potential persistence of the third moment of stock returns.

We also control for several firm characteristics in the model, such as size ($SIZE_t$), market-to-book ratio (MB_t), financial leverage (LEV_t), and return on assets (ROA_t). In line with Hutton et al. (2009), who find that opaque firms are more prone to stock price crashes, we control for opacity ($ACCM_t$), which is defined as the absolute value of discretionary accruals estimated from the modified Jones model (Dechow, Sloan, & Sweeney, 1995). To show that CEO marriage has an incremental effect on crash risk over idiosyncratic risk, we also control for lagged idiosyncratic volatility ($IDIVOL_t$), which is the residual of annual volatility of the firm's stock returns.

We further control for CEO traits that could affect stock price crash risk. Andreou et al. (2017) find that firms managed by younger CEOs are more likely to experience stock price crashes, because these CEOs have greater incentives to hoard bad news for the purpose of securing permanent increases in compensation early in their career. Thus, we use CEO age in year t (AGE_t) as one of the controls. We control for CEO gender ($FEMALE_CEO_t$), since Li and Zeng (2019) argue that crash risk is related to the gender of top executives.⁴ Short-tenured CEOs bring about more uncertainty to firms, due to their lack of firm-specific knowledge and experience (Simsek, 2007), which may incentivize them to defend their careers by hiding bad news. Therefore, we add tenure ($TENURE_t$) as a control variable. Since option holdings grant managers more incentives to inflate short-term share prices than stock holdings (Bebchuk, 2009; Burns & Kedia, 2006; Peng & Roell, 2008), they induce more aggressive managerial bad news hoarding behavior, which leads to higher future crash risk (Kim et al., 2011a). Thus, we control for unexercised options owned by CEOs (OPT_OWN_t) and the CEOs' total holdings of their own company's stocks and options ($CEO_TOT_HOLD_t$). Further details of the variable definitions are given in Appendix A.

⁴ In particular, the authors find that female CFOs are better at curbing bad news hoarding and reducing crash risk than female CEOs.

4. Empirical analyses

4.1. Descriptive statistics and univariate analysis

Table 1 presents the average number and percentage of married CEOs and crashes over 1993–2008. The average annual percentage of crashes ranges from 0.163 to 0.287. Our sample is dominated by married CEOs. The fraction of firm-year observations associated with married CEOs varies from roughly 77% to 91% during 1993–2008. As shown in Table 1, we observe a declining trend for the percentage of married CEOs over the sample period from 1993 to 2008, from 0.906 in 1993 to 0.773 in 2008. We also observe an increasing trend for the percentage of firms with crashes, from 16.3% in 1993 to 28.7% in 2008. Though only suggestive of the underlying relation, the time-series correlation between the percentage of married CEOs and the percentage of firms experiencing crashes lends preliminary support to the view that married CEOs are negatively related to crash risk and the prevalence of crashes in recent decades might be correlated with the declining trend of firms run by married CEOs.

[Insert Table 1 about here]

Panel A of Table 2 reports the summary statistics for all the variables in our main regression. The average probability of a crash event is 21.7%, while the mean value of $NCSKEW_{t+1}$ is 0.041. Both figures are quite similar to those reported in recent studies using ExecuComp samples (e.g., Andreou et al., 2017; Kim et al., 2011a; Li & Zeng, 2019). The average fraction of CEOs who are married is 83.3%, which is in line with the means reported by Roussanov and Savor (2014) and Hegde and Mishra (2019). Panel B presents the correlation matrix of the main variables. As expected, the two measures of crash risk, $CRASH_{t+1}$ and $NCSKEW_{t+1}$, are positively correlated. The variable $MARRIED_t$ is negatively correlated to both crash risk measures, which is consistent with our predictions that firms operated by married CEOs have lower levels of future stock price crash risk than those run by single CEOs.

[Insert Table 2 about here]

4.2. Multivariate regression analysis

To examine the impact of CEO marital status on future stock price crash risk, we estimate the following regression model:

$$CrashRisk_{t+1} = \alpha + \beta MARRIED_t + \gamma Controls_t + Year \& Industry Fixed Effects + \varepsilon_t, \quad (3)$$

where the dependent variable, $CrashRisk_{t+1}$, is one of our two proxies for crash risk: $CRASH_{t+1}$ and $NCSKEW_{t+1}$. When $CRASH_{t+1}$ is used as the dependent variable, we employ a logit regression, while we use an ordinary least squares regression when $NCSKEW_{t+1}$ is regressed on the explanatory variables. The dependent variable is measured in year $t + 1$, and all the explanatory variables are measured in year t . The key parameter of interest is β , which captures the strength and direction of the relation between CEO marital status and future crash risk. Our hypothesis is supported if β is negative and significant. Our model includes the set of control variables mentioned earlier, as well as year and industry fixed effects, which account for unobserved heterogeneity across years and industries, respectively. All estimations are based on robust standard errors adjusted for firm-level clustering.

Table 3 reports the results of the regression in Eq. (3). Columns (1) and (2) present our baseline results for the two crash risk measures, $CRASH$ and $NCSKEW$, respectively, after controlling for firm-specific determinants of crash risk other than a set of variables representing CEO personal attributes. Consistent with our prediction, we find that the coefficient estimates on marital status, that is, $MARRIED_t$, are negative and significant for both measures of crash risk. The finding is consistent with our prediction, suggesting that a firm run by a married CEO has a lower probability of a stock price crash.

In columns (3) and (4) of Table 3, we further control for several CEO personal attributes. Consistent with Kim et al. (2011a), the results show that equity incentives are highly related to future stock price crash risk. Specifically, both options owned ($OPTION_OWN_t$) and total holdings ($CEO_TOT_HOLD_t$) are positively associated with crash risk. We find that the coefficient on AGE_t is significantly negative only

when crash risk is measured by $NCSKEW_{t+1}$. In a related vein, Andreou et al. (2017) report that that *only* when crash risk is measured by $NCSKEW_{t+1}$ do firms managed by younger CEOs tend to be strongly associated with higher levels of stock price crash risk.

We find that the coefficients on the key variable of interest, $MARRIED_t$, are negative and statistically significant for both measures of crash risk, even after controlling for a wide range of CEO traits. When $CRASH_{t+1}$ is the dependent variable, the coefficient on $MARRIED_t$ is -0.153 , while its odds ratio is equal to 0.858 ,⁵ meaning that the probability of married CEOs experiencing crashes is only 85.8% that of single CEOs. To assess the economic significance of the probability of experiencing a crash, we measure the marginal effect of $MARRIED_t$ on crash risk, holding all explanatory variables at their mean levels. The marginal effect is -0.026 and statistically significant, which suggests that a firm run by a married CEO exhibits a 2.6% lower probability of a crash than its counterpart with an unmarried CEO. Alternatively, the mitigating impact of CEO marital status on $CRASH_{t+1}$ is economically significant, at 11.98% of the sample mean (given that the average probability of a crash in our sample is 21.7%). Similarly, married CEOs lead to a statistically and economically significant reduction in $NCSKEW_{t+1}$ equivalent to a 104.9% ($= 0.043/0.041$) decrease over its mean level. Overall, these findings are statistically and economically significant and support the prediction that firms run by married CEOs have a lower chance of experiencing stock price crashes than those run by single CEOs.

In columns (5) and (6) of Table 3, we additionally include firm fixed effects to control for time-invariant unobserved heterogeneity. The negative relation between CEO marital status and future crash risk is still significant for both measures of crash risk, even after controlling for both firm and year fixed effects. However, note that the actual marriage date is available only for a limited sample of CEOs. Given this

⁵ The odds ratio of marriage is computed as $\exp(-0.153) = 0.858$, which represents the odds of a crash for firms run by married CEOs divided by the odds of a crash for firms run by single CEOs.

limitation, we classify CEOs as married as long as they are mentioned as such by public sources. However, we observe infrequent variation in CEO marital status within a firm. In the next section, our analysis focuses on firms with marital status transitions, to strengthen our identification strategy.

[Insert Table 3 about here]

5. Identification strategies and robustness checks

5.1. Marital transitions

To explore the causal inference that CEO marital status, rather than other executive traits, indeed matters in this context, we follow Hegde and Mishra (2019) and focus on firms that experience changes in CEO marital status during the sample period. This transition sample includes two distinct cases: i) cases in which firms replace current a married (single) CEO with a single (married) CEO and ii) cases in which the existing CEO changes marital status during tenure in a firm. The shock of marital transitions allows us to implement a difference-in-differences test and better identify changes of stock price crash risk caused by CEO marital status.⁶

We observe 177 transitions of single to married CEOs for 109 firms and 274 transitions of married to single CEOs for 154 firms in our dataset. Correspondingly, for each type of transition, we construct two separate subsamples and require the firms to have at least two years of observations available before and after the shocks. We then study the impact of CEO marital status on crash risk before and after the transition shocks. To this end, we regress stock price crash risk on changes in CEO marital status separately for the two subsamples of single-to-married and married-to single transitions:

$$CrashRisk_{t+1} = \alpha + \beta CEO_Marital_Transition_t + \gamma Controls_t + \varepsilon_t, \quad (4)$$

⁶ Hegde and Mishra (2019) argue that the difference-in-differences tests accompanying CEO turnover are informative about the causal inference of CEO marriage, although their difference-in-differences estimation may be confounded by CEO turnover.

where $CEO_Marital_Transition_t$ refers to a marital status change in year t and is captured by two indicator variables: i) $Single_to_Married_t$, which equals one for observations following the single-to-married transition of a CEO within the firm, with or without a new appointment in year t , and zero otherwise; and ii) $Married_to_Single_t$, which equals one for observations following the married-to-single transition of a CEO in year t , and zero otherwise. The dependent variable $CrashRisk_{t+1}$ is proxied by $CRASH_{t+1}$ and $NCSKEW_{t+1}$.

The estimation results are presented in Table 4. In columns (1) and (2), the sample consists of firms that experienced a CEO status change from single to married. Specifically, when a single CEO marries during his or her tenure or is replaced by a married CEO in year t , the likelihood of a stock price crash risk decrease in year $t + 1$ is significant at the 1% level for $CRASH_{t+1}$ and at the 10% level for $NCSKEW_{t+1}$. In columns (3) and (4), we study firms that experienced a CEO status change from married to single. When a firm replaces its married CEO with a single CEO, this transition tends to increase the firm's future stock price crash risk significantly for $NCSKEW_{t+1}$ in column (4), though the same effect is relatively weak for $CRASH_{t+1}$. Overall, the tests on marital status transitions suggest that the negative relation observed between CEO marital status and crash risk is unlikely to be driven by uncontrolled firm-specific nonmarital status factors.

[Insert Table 4 about here]

5.2. Estimation with additional controls

One major concern about our baseline findings is that CEO marital status could be endogenous. In such a case, the negative impact of CEO marriage on crash risk would be biased and inconsistent. Given that we measure our crash risk variables in $t + 1$ and all regressors in year t , reverse causality might not be the source of endogeneity. However, one potential identification issue that may challenge our findings is the potential presence of correlated omitted variables. To the extent that firms with married and single CEOs

differ in unobservable firm characteristics, directly comparing them may confound the effects of CEO marital status on crash risk. The inclusion of firm fixed effects in regressions, as in columns (5) and (6) of Table 3, could alleviate this omitted variable bias. Nevertheless, we further address this concern by including additional control variables.

We begin by including additional control variables used by Roussanov and Savor (2014), such as firm prominence (*FIRM_PROM*) and institutional ownership (*INSOWN*). We also include the Herfindahl–Hirschman index (*HHI*) of industry concentration to control for the effects of product market competition. Columns (1) and (2) of Table 5 present the results with regressions with these additional controls. We also control for more observable attributes relating to CEOs’ demographic, psychological, and social backgrounds and present the results of the regressions with various combinations of control variables in columns (3) to (12) of Table 5. Specifically, in columns (3) and (4), we include CEO risk-taking incentives, *OPT_NUM*, which is measured by the natural logarithm of the number of vested but unexercised options. In columns (5) and (6), we add the CEO pay gap, *PAY_GAP*, and *CEO_FOUNDER* to control for the impact of executive pay disparity and CEO power, respectively. The variable *PAY_GAP* is defined as the difference between the CEO’s pay and the median pay of other non-CEO executives (e.g., Kale, Reis, & Venkateswaran, 2009), and *CEO_FOUNDER* is an indicator variable that equals one if a currently incumbent CEO was the CEO five years before the initial public offering date reported by Compustat or before the first trading date reported by CRSP (Bebchuk, Cremers, & Peyer, 2011). In columns (7) and (8), we further incorporate three indicator variables representing CEO characteristics, namely, *AWARDS*, *MBA*, and *American*. The variables are defined in the appendix. In the last four columns of Table 5, we control for CEO managerial efficiency, which is measured by the decile rank by industry–year of the managerial ability score (*MA*) from Demerjian, Lev, and McVay (2012) and CEO past experience, proxied by the CEO general managerial skills index (*GAI*) from Custódio, Ferreira, and Matos (2013).

As shown in Table 5, overall, the results of various regressions of crash risk, proxied by *CRASH* and *NCSKEW*, on the key variable of interest, *MARRIED*, along with different combinations of control variables, reveal that the coefficients on *MARRIED* are negative and significant across all regressions. Overall, the estimation results with additional controls suggest that the negative association between CEO marriage and stock price crash risk is robust to the inclusion of additional control variables, alleviating concerns about correlated omitted variables.⁷

[Insert Table 5 about here]

It is possible that our estimates capture the impact of other CEO fixed characteristics. Since CEO marital status is collinear with CEO fixed effects and difficult to disentangle from other factors, we use the instrumental variable approach within the CEO fixed effects framework, following Gormley and Matsa (2014).⁸ Specifically, in the first stage, we regress our crash risk variables on all time-varying control variables (except for *FEMALE_CEO*) used in our baseline model and CEO fixed effects and estimate the residual crash risk. In the second stage, we regress the group-average residual crash risk on *MARRIED* and controls used in the first stage. The untabulated two-stage regression results show significantly negative coefficients for *MARRIED*, providing further support for our hypothesis.

⁷ We acknowledge the limitation that, due to lack of data, we could not control for other CEO attributes that may be correlated with both CEO marriage and stock price crash risk, such as the CEO's offspring and personal religion.

⁸ Even though Roussanov and Savor (2014) employ variation in divorce laws (community property versus equitable division) across different states as an instrument to address potential endogeneity, this instrument is time invariant and thus lacks cross-sectional variation. The use of this variable as an instrument may therefore not satisfy the exclusion criteria in our context. The community property system may discourage firms from granting equity incentives to CEOs to avoid loss of control, since "a CEO with a significant ownership stake in a company might be forced to sell or transfer a portion of this stake to satisfy the terms of a divorce settlement" (Larcker, McCall, & Tayan, 2013). As pointed out by Kim et al. (2011a), equity incentives are highly related to crash risk. Thus, US divorce law may not qualify as a good instrument to examine crash risk.

5.3. Propensity score matching

To alleviate the self-selection bias concern that there could be systematic differences between firms that hire married CEOs and firms that hire single CEOs, we adopt a PSM approach. We choose firms that are managed by single CEOs as the treated groups and those managed by married CEOs as the control groups, due to the domination of married CEOs in our sample. Specifically, we perform one-to-one nearest neighbor matching, without replacement, based on industry, state, and year and all the control variables specified in our baseline model in Eq. (3), as well as some extra variables, including firm age, CEO age, and CEO total compensation. We identify 2,581 pairs of single and married firm-year observations.

Panel A of Table 6 reports the results of the univariate test for differences in covariates between the treated and control firms. As shown in the test statistics in the last two columns, we find nonsignificant differences in covariates between the treated firms, with single CEOs, and the propensity score–matched control firms, with married CEOs. This result suggests that the observed difference in crash risk between the treatment and control groups could be attributed to CEO marital status, rather than other observable firm characteristics and executive attributes. As reported in Panel B, we find that the average treatment effect is significant and that treated firms, with single CEOs, have a significantly higher likelihood of experiencing stock price crashes than the propensity score–matched control firms, with married CEOs. Stated another way, the crash risk captured by both $NCSKEW_{t+1}$ and $CRASH_{t+1}$ differs significantly between treated firms, with single CEOs, and control firms, with married CEOs. Further, we re-estimate our baseline regression using the propensity score–matched sample and report the results in Panel C. The coefficient estimates on $MARRIED_t$ are -0.186 and -0.063 for $CRASH_{t+1}$ and $NCSKEW_{t+1}$, respectively, both statistically significant at the 1% level. In short, our PSM results are consistent with our baseline finding that firms with married CEOs have a lower likelihood of future stock price crashes than those with single CEOs.

[Insert Table 6 about here]

5.4. Alternative measures of crash risk

To further test the robustness of the main results, we repeat the baseline analysis using alternative measures of stock price crash risk. Following Chen et al. (2001), we measure crash risk as the asymmetric volatility of negative versus positive weekly returns over a year (*DUVOL*), which is calculated as follows:

$$DUVOL_{j,t} = \log \frac{(n_u - 1) \sum_{down} W_{j,t}^2}{(n_d - 1) \sum_{up} W_{j,t}^2}, \quad (5)$$

where n_u and n_d are the numbers of up and down weeks over the fiscal year t , respectively. For each stock j over fiscal year t , we partition all firm-specific weekly returns into down (up) weeks when the weekly returns are below (above) the average value during the year. We then calculate the standard deviation of firm-specific weekly returns for each of the two groups separately. Finally, we calculate *DUVOL* as the logarithmic ratio of the standard deviation in the down weeks to the standard deviation in the up weeks. Similar to *NCSKEW*, a higher *DUVOL* indicates higher stock price crash risk. However, this measure of crash risk is less likely to be affected by a small number of extreme returns, because it does not involve the third moments of stock returns (Chen et al., 2001).

Following Callen and Fang (2015a) and Hong et al. (2017), another alternative measure of crash risk (*COUNT*) is the number of crash weeks minus the number of jump weeks over the fiscal year. We define jump weeks in the opposite way from crash weeks, namely, as those weeks during which the firm-specific weekly returns are 3.09 standard deviations above the mean firm-specific weekly returns over the fiscal year, with 3.09 chosen to generate a frequency of 0.1% in the normal distribution. Table 7 presents our regression results using *COUNT* and *DUVOL* in year $t + 1$ as the dependent variables. All regressions include year and industry fixed effects and firm- and CEO-specific controls. The results show that the negative effect of married CEOs on crashes remains robust to the use of different crash risk measures.

[Insert Table 7 about here]

6. Underlying mechanisms

In this section, we examine two underlying mechanisms, namely, bad news hoarding and bad news formation, through which marriage curbs managerial opportunism that can be translated into future stock price crash risk. In terms of the bad news hoarding channel, we examine whether CEO marital status can influence crash risk by maintaining a more conservative accounting policy. Accounting conservatism requires a higher degree of verification for recognizing good news as gains than for recognizing bad news as losses (Basu, 1997). Kim and Zhang (2016) find that firms with conservative accounting are associated with less managerial bad news hoarding and lower stock price crash risk. We compute firm-year conditional conservatism following Khan and Watts (2009) and Kim and Zhang (2016). In terms of the bad news formation channel, we test whether married CEOs tend to engage less in overinvestment activities. Kim, Wang, et al. (2016) show that overinvestment in negative-NPV projects leads to the accumulation of poor performance, which results in a market crash of stock prices once the bad performance is realized. Following Biddle, Hilary, and Verdi (2009), we first estimate abnormal investment as the residual from the following model: $INVESTMENT_t = b_0 + b_1 SALES_GROWTH_{t-1} + \varepsilon_t$, where *INVESTMENT* is the sum of capital expenditures, acquisition expenditures, and research and development expenditures less cash receipts from the sale of property, plant, and equipment, scaled by lagged total assets; and *SALES_GROWTH* is the percentage change in sales revenue. Then we define overinvestment (underinvestment) as positive (negative) abnormal investment.

Table 8 reports the results for the impact of married CEOs on accounting conservatism (*CSCORE*) and investment efficiency (*OVERINVEST* or *UNDERINVEST*). As shown in column (1), we find that the coefficient on *MARRIED_t* is positive and significant at the 1% level, suggesting that married CEOs tend to recognize economic losses more quickly than economic gains compared to single CEOs. The coefficient

on *MARRIED_t* is significantly negative for *OVERINVEST* in column (2), but nonsignificant for *UNDERINVEST* in column (3), which implies that married CEOs are associated with significantly fewer overinvestment problems than single CEOs. Given that overinvestment is related more strongly to bad news formation and crash risk than underinvestment (e.g., Deng et al., 2020), CEO marriage tends to reduce stock price crash risk through the channel of overinvestment. Overall, our findings in Table 8 suggest that constraining both bad news hoarding and bad news formation serves as important underlying mechanisms through which CEO marital status reduces future stock price crash risk.

[Insert Table 8 about here]

7. Cross-sectional analyses

We have so far documented an inverse relation between CEO marital status and future stock price crash risk. To further strengthen our arguments, we perform several cross-sectional analyses to investigate whether and, if so, how the strength of this inverse relation can be influenced by corporate governance and CEO personal attributes.

7.1. Corporate governance

Compared to single CEOs, married CEOs are more risk averse and less likely to manipulate earnings. This feature may mitigate agency problems, such as managerial short-term risk taking and bad news hoarding. Ineffective governance mechanisms might encourage managers to engage in more risk taking and to withhold bad news to a greater extent, leading to higher future firm crash risk (Andreou et al., 2016; Kim et al., 2011a, 2011b). Thus, we posit that the negative association between CEO marital status and future stock price crash risk is more pronounced for firms with poor governance mechanisms.

We use the ownership of transient institutional investors, product market competition, and analyst coverage to proxy for the effectiveness or strength of corporate governance and/or external monitoring mechanisms. Bushee (1998, 2001) documents that transient institutional investors exhibit high portfolio

turnover and own small stakes in individual firms with an aim to seek short-term trading profits. This finding suggests that firms with large transient institutional holdings (*TRA_INS*) are likely to have weak investor oversight and poor external monitoring mechanisms (Callen & Fang, 2015b). Product market competition can act as a disciplining force by restricting managerial short-termism (Giroud & Mueller, 2010, 2011). Hence, we use the fitted Herfindahl–Hirschman industry concentration ratio (*FITHHI*) at the three-digit Standard Industrial Classification code level as suggested by Hoberg and Phillips (2010) to measure product market competition. Yu (2008) and Kim, Lu, et al. (2019) find that firms followed by more financial analysts engage in less earnings management and have lower expected crash risk as proxied by the options implied volatility smirk. Hence, we also test the moderating effect of analyst coverage (*COVER*).

We partition the sample into two subsamples based on the median value of each corporate governance measure in each year and present the estimation results in Table 9. Weak governance groups are defined as having above-median *TRA_INS*, above-median *FITHHI*, and below-median *COVER* values. As shown in Table 9, we find that all coefficients on *MARRIED_t* are *negative* for both strong and weak corporate governance subsamples. However, the coefficients are only statistically significant for firms with *weak* corporate governance mechanisms, that is, a higher level of transient institutional investors, a higher fitted *HHI* (lower product market competition), and a lower number of analyst followings. Our empirical evidence suggests that the mitigating effect of a married CEO on stock price crash risk is stronger for poorly governed firms, which is in line with our expectation.

[Insert Table 9 about here]

7.2. CEO compensation, delta, and prominence

We further examine several attributes and circumstances that may influence CEOs' incentives to withhold bad news and thus increase crash risk. Career or compensation concerns incentivize CEOs to withhold

negative information (Kothari et al., 2009), and these concerns are greater when CEO compensation is low. We therefore conjecture that, compared to single CEOs, married CEOs are more risk averse and thus less likely to engage in bad news hoarding and bad news formation, especially when their compensation is relatively low. Similarly, CEOs whose compensation is more sensitive to stock prices are more incentivized to hide unfavorable news, because inflating stock prices improves their personal benefits, including compensation (Al Mamun et al., 2020). We expect that single CEOs engage more aggressively in bad news hoarding and bad news formation than married CEOs, especially when their compensation level is tied more closely to stock prices.

Further, we examine the role of CEO prominence, another potential motivation that may affect CEOs' decisions to hide bad news. CEOs are likely to reveal bad news in a timelier manner due to litigation risk and reputation concerns (Kaszniak & Lev, 1995; Kothari et al., 2009). "Superstar" CEOs may have more of such concerns and fewer incentives to boost stock prices and their compensation (Milbourn, 2003). Similarly, Francis, Huang, Rajgopal, and Zang (2008) find that CEOs with a significant reputation at stake will not indulge in opportunistic rent-seeking behavior. We therefore expect that single CEOs with lower prominence are more likely to withhold bad news, compared with single CEOs of high prominence. Taken together, we argue that the mitigating impact of CEO marriage on crash risk will be more pronounced for CEOs with lower compensation, a higher delta, and less prominence.

Following Coles, Daniel, and Naveen (2006), we measure the sensitivity of CEO wealth to stock prices as the CEO's delta. We split our sample based on the sample median value of CEO total compensation, delta, and prominence. Panels A to C of Table 10 present the results of the three subsamples based on compensation, delta, and prominence, respectively. We find that, for all these measures of crash risk, the coefficients on *MARRIED_t* are negative and significant only for the subsample of firms whose CEOs have lower pay, a higher delta, and less prominence. The findings lend further support to the view

that married CEOs are less likely to engage in bad news hoarding due to concerns about their compensation level, compensation structure, and personal prominence.

[Insert Table 10 about here]

8. Concluding remarks

This study has examined the relation between CEO marital status and firm-specific stock price crash risk. Using a large sample of US public firms for the period 1993–2008, we find that firms with married CEOs have lower stock price crash risk than those with single CEOs, after controlling for a range of firm characteristics and CEO personal traits. Our results remain robust after we examine CEO marital transitions within a firm, handle potential endogeneity issues with respect to CEO marriage, and control for additional firm, industry, and executive attributes. Our test for underlying channels suggests that CEO marriage can curb managerial bad news hoarding by improving accounting conservatism and can reduce bad news formation by constraining corporate overinvestment activities. We further find that the inverse relation between married CEOs and crash risk is more pronounced for poorly governed firms and firms run by CEOs with lower pay, less prominence, and a higher delta. These findings enhance our understanding of the impact of CEO marital status on crash risk and shed light on how marriage interacts with corporate governance mechanisms and executive compensation to mitigate agency problems.

This study contributes to the ongoing debate over the importance of executives' marital status in corporate policies. We examine an underresearched area, that is, the association between married CEOs and stock price crash risk, and show that married and single CEOs systematically differ in their impacts on the protection of shareholder wealth. Our findings provide practical implications for equity investors and other stakeholders who wish to predict future stock price crash risk based on one of the most important CEO characteristics, namely, marital status. We note, however, that any causal attribution remains a

challenge, due to various other reasons for the estimated negative relation between CEO marital status and stock price crash risk.

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Appendix. Variable definitions

Crash risk variables

<i>CRASH</i>	An indicator variable that equals one when a firm experiences at least one crash week during the fiscal year, and zero otherwise.
<i>NSCKEW</i>	The negative skewness of firm-specific weekly returns over the fiscal year.

CEO attributes variables

<i>MARRIED</i>	A dummy equal to one if the CEO is married, and zero otherwise. Data source: Roussanov and Savor (2014).
<i>AGE</i>	The age of the CEO.
<i>TENURE</i>	The number of years the CEO has been in office.
<i>FEMALE_CEO</i>	A dummy equal to one for a female CEO, and zero otherwise.
<i>OPT_OWN</i>	The estimated value of in-the-money unexercised CEO options divided by total compensation.
<i>TOT_HOLD</i>	The natural logarithm of the CEO's total holdings of the CEO's own company stock and options.
<i>TOT_COM</i>	The total compensation of a CEO, including salary, bonus, other annual compensation, restricted stock grants, long-term incentive plan payouts, all other compensation, and the value of option grants.
<i>CEO delta</i>	The dollar change in the value of options or restricted stock grants, shareholdings, and any restricted stock and option holdings for a 1% change in the stock price.
<i>CEO prominence</i>	The logarithm of the total number of a CEO's media mentions, i.e., the number of news stories mentioning the CEO in the Factiva Dow Jones database. Data source: Roussanov and Savor (2014).

Other variables

<i>DTURN</i>	The average monthly share turnover over the current fiscal year minus the average monthly share turnover over the previous fiscal year, where the monthly share turnover is calculated as the monthly trading volume divided by the total number of shares outstanding during the month.
<i>SIGMA</i>	The standard deviation of firm-specific weekly returns over the fiscal year.
<i>RET</i>	The mean of firm-specific weekly returns over the fiscal year, times 100.
<i>MB</i>	The market value of equity ($csho \times prccf$) divided by the book value of equity (market to book).
<i>SIZE</i>	The natural logarithm of market capitalization ($csho \times prccf$) at the end of the fiscal year.
<i>LEV</i>	Total debt ($dltt + dlc$) divided by total assets (at).
<i>ROA</i>	Income before extraordinary items (ib) divided by total assets (at).

<i>IDIVOL</i>	The annual volatility of the residuals of the firm's stock returns regressed on the CRSP value-weighted stock market portfolio return.
<i>ACCM</i>	The absolute value of discretionary accruals, where discretionary accruals are estimated by the modified Jones model.
<i>FIRM_AGE</i>	Number of years since the firm's first appearance in the Compustat database.
<i>FIRM_PROM</i>	The logarithm of the total number of a firm's media mentions in the Factiva Dow Jones database.
<i>INSOWN</i>	The percentage of shares outstanding held by institutional investors.
<i>TRA_INS</i>	The percentage of shares held by transient institutional investors. The institutional ownership classification data are from Bushee (1998, 2001).
<i>FITHHI</i>	The fitted Herfindahl–Hirschman index at the three-digit Standard Industrial Classification code industry level, developed by Hoberg and Phillips (2010).
<i>COVER</i>	The natural logarithm of one plus the number of analysts following.
<i>OPT_NUM</i>	The natural logarithm of the number of vested but unexercised options.
<i>PAY_GAP</i>	The difference between CEO pay and the median pay of other non-CEO executives.
<i>CEO_FOUNDER</i>	A dummy variable equal 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 the CRSP.
<i>AWARDS</i>	A dummy variable equal to one if the CEO received job-related awards, a best alumni award, or a best research award.
<i>MBA</i>	A dummy variable equal to one if the CEO has an MBA.
<i>AMERICAN</i>	A dummy variable equal to one if the CEO's nationality is American.
<i>MA</i>	The decile rank by industry–year of the managerial ability score of Demerjian et al. (2012).
<i>GAI</i>	The CEO general managerial skills index of Custódio et al. (2013).
<i>CSCORE</i>	The conservatism score based on Khan and Watts (2009).
<i>OVERINVEST</i> <i>(UNDERINVEST)</i>	The calculation of investment efficiency based on Biddle et al. (2009). We first estimate abnormal investment as the residual from the following model: $INVESTMENT_t = b_0 + b_1 SALES_GROWTH_{t-1} + \varepsilon_t$, where <i>INVESTMENT</i> is the sum of capital expenditures, acquisition expenditures, and research and development expenditures less cash receipts from the sale of property, plant, and equipment, scaled by lagged total assets; and <i>SALES_GROWTH</i> is the percentage change in sales revenue. Then we define overinvestment (underinvestment) as positive (negative) abnormal investment.

Table 1. Number of married CEOs and firm crash risk

This table reports the sample distribution and mean values of married CEOs and stock price crash risk by year. The sample includes 16,042 firm-year observations from 1993 to 2008. The variable *CRASH* is a dummy variable equal to one for a firm-year that has one or more crash weeks, and zero otherwise.

Year	N	Married CEOs obs.	Proportion of married CEOs	<i>CRASH</i>_{<i>t</i>}	<i>CRASH</i>_{<i>t+1</i>}
1993	564	511	0.906	0.163	0.161
1994	877	753	0.859	0.186	0.161
1995	977	833	0.853	0.166	0.175
1996	977	840	0.860	0.175	0.167
1997	998	862	0.864	0.168	0.180
1998	1,018	891	0.875	0.186	0.183
1999	1,051	921	0.876	0.177	0.233
2000	1,045	877	0.839	0.230	0.214
2001	1,057	880	0.833	0.216	0.258
2002	1,072	885	0.826	0.257	0.205
2003	1,129	933	0.826	0.204	0.248
2004	1,098	895	0.815	0.232	0.258
2005	1,078	870	0.807	0.263	0.237
2006	1,049	821	0.783	0.254	0.242
2007	1,071	831	0.776	0.244	0.291
2008	981	758	0.773	0.287	0.201

Table 2. Summary statistics and correlation matrix

This table presents the summary statistics and correlation matrix for the variables used in this study. Panel A reports the descriptive statistics for two measures of stock price crash risk, marital status, and the main control variables. The sample period is from 1994 to 2008. The table shows the number of observations (N), the mean, the standard deviation (SD), the 25th percentile (p25), the median (p50), and the 75th percentile (p75) of the variables. Panel B presents the correlation matrix of the main variables (see the variable definitions in the appendix).

Panel A: Full-sample summary statistics						
Variable	N	Mean	SD	p25	p50	p75
<i>CRASH_{t+1}</i>	16,042	0.217	0.412	0.000	0.000	0.000
<i>NCSKEW_{t+1}</i>	16,042	0.041	0.790	-0.398	-0.011	0.402
<i>MARRIED_t</i>	16,042	0.833	0.373	1.000	1.000	1.000
<i>DTURN_t</i>	16,042	0.077	0.948	-0.158	0.042	0.298
<i>SIGMA_t</i>	16,042	0.050	0.025	0.032	0.044	0.061
<i>RET_t</i>	16,042	-0.153	0.270	-0.184	-0.096	-0.051
<i>SIZE_t</i>	16,042	7.280	1.587	6.188	7.121	8.245
<i>MB_t</i>	16,042	3.774	44.610	1.599	2.410	3.815
<i>LEV_t</i>	16,042	0.204	0.166	0.051	0.195	0.314
<i>ROA_t</i>	16,042	0.043	0.132	0.022	0.055	0.092
<i>IDIVOL_t</i>	16,042	0.314	0.227	0.178	0.273	0.402
<i>NCSKEW_t</i>	16,042	0.045	0.774	-0.392	-0.014	0.396
<i>ACCM_t</i>	16,042	0.050	0.080	0.015	0.033	0.063
<i>AGE_t</i>	16,042	54.490	7.641	49.000	54.000	59.000
<i>TENURE_t</i>	16,042	5.144	4.986	2.000	4.000	7.000
<i>FEMALE CEO_t</i>	16,042	0.016	0.127	0.000	0.000	0.000
<i>OPT_OWN_t</i>	16,042	2.817	5.266	0.144	1.001	3.033
<i>CEO_TOT_HOLD_t</i>	16,042	9.545	1.880	8.439	9.576	10.690

Panel B: Correlation matrix

Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)
(1) $CRASH_{t+1}$	1.00																	
(2) $NCSKEW_{t+1}$	0.34	1.00																
(3) $MARRIED_t$	-0.03	-0.02	1.00															
(4) $DTURN_t$	0.01	0.01	-0.00	1.00														
(5) $SIGMA_t$	0.03	0.01	-0.12	0.08	1.00													
(6) RET_t	-0.01	0.01	0.08	-0.05	-0.74	1.00												
(7) $SIZE_t$	-0.01	0.06	0.18	0.01	-0.40	0.22	1.00											
(8) MB_t	0.01	0.01	0.00	0.01	0.02	-0.01	0.02	1.00										
(9) LEV_t	-0.03	-0.02	0.07	0.02	-0.07	0.04	0.03	0.03	1.00									
(10) ROA_t	0.01	0.06	0.05	-0.01	-0.30	0.20	0.24	-0.01	-0.11	1.00								
(11) $IDIVOL_t$	0.05	0.02	-0.09	0.08	0.65	-0.41	-0.29	0.00	-0.07	-0.24	1.00							
(12) $NCSKEW_t$	0.02	0.02	-0.01	0.03	0.13	-0.05	-0.02	-0.01	-0.00	-0.02	0.05	1.00						
(13) $ACCM_t$	0.02	0.01	-0.02	0.05	0.19	-0.11	-0.08	0.01	-0.05	-0.08	0.13	0.00	1.00					
(14) AGE_t	-0.02	-0.03	0.12	-0.00	-0.17	0.11	0.06	-0.01	0.07	0.06	-0.12	-0.02	-0.07	1.00				
(15) $TENURE_t$	0.02	0.01	0.03	0.02	-0.05	0.03	0.08	0.00	-0.03	0.04	0.02	0.02	-0.06	0.17	1.00			
(16) $FEMALE_CEO_t$	0.01	0.01	-0.01	-0.00	0.02	-0.01	-0.04	-0.00	-0.04	-0.01	0.03	0.01	0.00	-0.06	-0.02	1.00		
(17) OPT_OWN_t	0.02	0.06	0.01	0.02	0.02	-0.01	0.23	0.02	-0.10	0.11	0.00	-0.02	0.05	-0.04	0.05	-0.01	1.00	
(18) $CEO_TOT_HOLD_t$	0.02	0.06	0.15	0.04	-0.18	0.10	0.55	0.02	-0.06	0.26	-0.13	-0.01	0.01	0.14	0.26	-0.04	0.36	1.00

Table 3. CEO marital status and stock price crash risk

This table presents the regression results of the effect of CEO marital status on firm-level stock price crash risk. The dependent variable for crash risk is proxied by the indicator variable of crash risk (*CRASH*) and the negative conditional skewness (*NCSKEW*) in year $t + 1$. The independent variables are measured in year t . The CEO's marital status is measured as an indicator variable that equals one if the CEO is legally married, and zero otherwise. Other variable definitions are given in the appendix. The z -statistics (t -statistics) reported in parentheses are based on standard errors clustered at the firm level. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)
	<i>CRASH</i> _{$t+1$}	<i>NCSKEW</i> _{$t+1$}	<i>CRASH</i> _{$t+1$}	<i>NCSKEW</i> _{$t+1$}	<i>CRASH</i> _{$t+1$}	<i>NCSKEW</i> _{$t+1$}
<i>MARRIED</i> _{t}	-0.148*** (-2.68)	-0.046*** (-2.69)	-0.153*** (-2.75)	-0.043** (-2.51)	-0.237** (-2.48)	-0.066** (-2.23)
<i>DTURN</i> _{t}	0.024 (1.24)	0.000 (0.05)	0.023 (1.17)	-0.000 (-0.05)	0.017 (0.82)	-0.002 (-0.25)
<i>SIGMA</i> _{t}	7.192** (2.15)	1.914*** (4.20)	6.529* (1.93)	1.528*** (3.33)	-0.773 (-0.23)	-0.161 (-0.26)
<i>RET</i> _{t}	0.813* (1.83)	0.140*** (4.90)	0.765* (1.72)	0.131*** (5.05)	0.082 (0.23)	0.064*** (3.42)
<i>SIZE</i> _{t}	0.004 (0.28)	0.029*** (5.78)	-0.017 (-0.95)	0.018*** (3.35)	0.385*** (7.71)	0.234*** (14.40)
<i>MB</i> _{t}	0.001*** (2.98)	0.000*** (2.74)	0.001*** (2.87)	0.000** (2.25)	0.001 (0.94)	0.000 (1.59)
<i>LEV</i> _{t}	0.076 (0.56)	0.041 (0.89)	0.091 (0.67)	0.055 (1.22)	0.186 (0.86)	0.197*** (2.61)
<i>ROA</i> _{t}	0.509*** (2.62)	0.344*** (5.52)	0.448** (2.34)	0.312*** (5.02)	0.277 (1.32)	0.127** (2.50)
<i>IDIVOL</i> _{t}	0.260** (2.43)	-0.002 (-0.04)	0.266** (2.48)	0.004 (0.08)	0.163 (1.35)	-0.019 (-0.49)
<i>NCSKEW</i> _{t}	0.020 (0.82)	0.006 (0.72)	0.023 (0.91)	0.008 (0.91)	-0.121*** (-4.52)	-0.102*** (-11.00)
<i>ACCM</i> _{t}	0.225 (1.10)	0.096 (1.26)	0.190 (0.94)	0.069 (0.93)	-0.098 (-0.33)	-0.051 (-0.73)
<i>AGE</i> _{t}			-0.001 (-0.45)	-0.002** (-2.35)	-0.001 (-0.24)	-0.000 (-0.09)
<i>TENURE</i> _{t}			-0.003 (-0.61)	-0.001 (-0.56)	0.008 (0.99)	-0.003 (-1.02)
<i>FEMALE_CEO</i> _{t}			-0.021 (-0.14)	0.022 (0.39)	0.189 (0.74)	0.051 (0.61)
<i>OPT_OWN</i> _{t}			0.001 (0.15)	0.005*** (3.28)	-0.002 (-0.45)	0.002 (1.27)
<i>CEO_TOT_HOLD</i> _{t}			0.031** (2.09)	0.010** (2.15)	0.025 (1.07)	0.013* (1.94)
Constant	-1.485*** (-3.69)	-0.529*** (-5.40)	-1.536*** (-3.40)	-0.423*** (-3.72)		-1.645*** (-12.06)
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	No	No
Firm FE	No	No	No	No	Yes	Yes
N	16,042	16,042	16,042	16,042	13,558	16,042
Pseudo-/adjusted R ²	0.027	0.019	0.027	0.021	0.023	0.054

Table 4. Marital transitions and crash risk

This table presents results regarding the impact of marital transitions on stock price crash risk. In columns (1) and (2), the sample consists of firms that experienced a CEO marital status change from single to married. The variable *Single_to_Married_t* is an indicator variable that equals one for all the years following the single-to-married transition. In columns (3) and (4), the sample consists of firms that experienced CEO marital status changes from married to single. The variable *Married_to_Single_t* is an indicator variable that equals one for all the years following the married-to-single transition. We require the sample firms to have at least two years of observations available before and after the transitions. The regressions include all the controls in Eq. (3) and year and industry fixed effects. The variable definitions are given in the appendix. The z-statistics (*t*-statistics) reported in parentheses are based on standard errors clustered at the firm level. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

	(1)	(2)	(3)	(4)
	<i>CRASH_{t+1}</i>	<i>NCSKEW_{t+1}</i>	<i>CRASH_{t+1}</i>	<i>NCSKEW_{t+1}</i>
<i>Single_to_Married_t</i>	-0.771*** (-3.33)	-0.102* (-1.69)		
<i>Married_to_Single_t</i>			0.281 (1.63)	0.084* (1.70)
Controls	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes
N	1,231	1,231	1,804	1,804
Pseudo-/adjusted R ²	0.095	0.030	0.052	0.026

Table 5. CEO marital status and crash risk: Additional controls for crash risk

This table presents the regression results of the effect of CEO marital status on firm-level stock price crash risk with additional control variables. The dependent variable crash risk is proxied by the indicator variable of crash risk (*CRASH*) and negative conditional skewness (*NCSKEW*) in year $t + 1$. The independent variable is measured in year t . All the regressions include the control variables in Eq. (3) and year and industry fixed effects. Variable definitions are given in the appendix. The z-statistics (t-statistics) reported in parentheses are based on standard errors clustered at the firm level. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	<i>CRASH</i>	<i>NCSKEW</i>	<i>CRASH</i>	<i>NCSKEW</i>	<i>CRASH</i>	<i>NCSKEW</i>	<i>CRASH</i>	<i>NCSKEW</i>	<i>CRASH</i>	<i>NCSKEW</i>	<i>CRASH</i>	<i>NCSKEW</i>
<i>MARRIED</i>	-0.146** (-2.38)	-0.044** (-2.29)	-0.127** (-2.00)	-0.045** (-2.20)	-0.139** (-2.15)	-0.047** (-2.29)	-0.131** (-2.02)	-0.047** (-2.28)	-0.139** (-2.13)	-0.046** (-2.25)	-0.122* (-1.71)	-0.042* (-1.88)
<i>FIRM_PROM</i>	-0.014 (-1.01)	-0.006 (-1.32)	-0.011 (-0.73)	-0.004 (-0.92)	-0.010 (-0.69)	-0.005 (-0.98)	-0.007 (-0.48)	-0.004 (-0.92)	-0.007 (-0.48)	-0.004 (-0.78)	0.003 (0.16)	-0.005 (-0.88)
<i>INSOWN</i>	0.557*** (4.56)	0.258*** (6.64)	0.558*** (4.25)	0.252*** (6.08)	0.560*** (4.19)	0.250*** (5.92)	0.552*** (4.14)	0.248*** (5.89)	0.531*** (3.97)	0.247*** (5.84)	0.480*** (3.27)	0.244*** (5.27)
<i>FITHHI</i>	-1.804** (-2.04)	-0.291 (-0.92)	-2.266** (-2.32)	-0.400 (-1.10)	-2.182** (-2.22)	-0.328 (-0.90)	-2.136** (-2.17)	-0.312 (-0.85)	-2.073** (-2.11)	-0.299 (-0.81)	-2.866** (-2.41)	-0.420 (-0.93)
<i>OPT_NUM</i>			0.001 (0.06)	-0.014** (-2.23)	0.006 (0.28)	-0.016** (-2.42)	0.008 (0.38)	-0.016** (-2.37)	0.010 (0.47)	-0.014** (-2.17)	0.006 (0.28)	-0.016** (-2.27)
<i>PAY_GAP</i>					-0.000 (-0.15)	0.000* (1.77)	-0.000 (-0.11)	0.000* (1.81)	-0.000 (-0.20)	0.000* (1.74)	-0.000 (-0.42)	0.000 (1.64)
<i>CEO_FOUNDER</i>					0.029 (0.30)	0.026 (0.84)	0.030 (0.31)	0.026 (0.84)	0.046 (0.48)	0.030 (0.98)	-0.017 (-0.16)	0.026 (0.78)
<i>AWARDS</i>							-0.130** (-2.24)	-0.019 (-1.08)				
<i>MBA</i>							-0.022 (-0.33)	0.002 (0.12)				
<i>AMERICAN</i>							-0.077 (-1.02)	-0.037 (-1.45)				
<i>MA</i>									0.538*** (2.73)	0.124** (2.12)		
<i>GAI</i>											0.030 (0.82)	-0.013 (-1.15)
Constant	-1.455*** (-2.70)	-0.451*** (-2.93)	-1.829*** (-3.22)	-0.439*** (-2.60)	-1.906*** (-3.35)	-0.409** (-2.39)	-1.951*** (-3.34)	-0.404** (-2.36)	-1.869*** (-3.30)	-0.403** (-2.33)	-1.892*** (-2.74)	-0.416** (-2.11)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	13,102	13,102	11,750	11,750	11,496	11,496	11,496	11,496	11,435	11,435	9,795	9,806
Pseudo-/adj. R ²	0.030	0.025	0.031	0.026	0.031	0.025	0.031	0.025	0.031	0.025	0.032	0.022

Table 6. Propensity score matching

This table reports the results of one-to-one nearest neighbor propensity score matching using a caliper distance of 0.05, without replacement, based on a set of firm and CEO characteristics. The treated groups consist of firms managed by single CEOs, while the control groups consist of firms managed by married CEOs. Panel A reports the diagnostic statistics for the differences in the firm and CEO characteristics of the treatment and control groups. We also report the t -statistics and p -values of the univariate comparisons. Panel B reports the average treatment effects. Panel C reports the regression results with the propensity score–matched sample, including all the controls in Table 3 and year and industry fixed effects. Variable definitions are given in the appendix. The z -statistics (t -statistics) reported in parentheses are based on standard errors clustered at the firm level. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

Panel A: Diagnostics statistics, differences in the means of variables

Variables	Treated	Control	t -Stat.	p -Value
$DTURN_t$	0.078	0.068	0.33	0.742
$SIGMA_t$	0.057	0.057	-0.46	0.644
RET_t	-0.194	-0.195	0.13	0.898
$SIZE_t$	6.602	6.590	0.32	0.745
MB_t	3.321	3.298	0.09	0.926
LEV_t	0.178	0.183	-0.98	0.327
ROA_t	0.027	0.028	-0.3	0.762
$IDIVOL_t$	0.353	0.357	-0.66	0.511
$NCSKEW_t$	0.063	0.072	-0.39	0.696
$ACCM_t$	0.055	0.054	0.79	0.428
AGE_t	52.370	52.461	-0.46	0.649
$TENURE_t$	4.771	4.920	-1.09	0.274
$FEMALE_CEO_t$	0.020	0.019	0.3	0.763
OPT_OWN_t	2.732	2.776	-0.29	0.771
TOT_HOLD_t	8.904	8.922	-0.34	0.731
$FIRM_AGE_t$	18.859	18.462	1.07	0.285
TOT_COM_t	7.474	7.443	1.08	0.281

Panel B: Average treatment effects

	Single CEO (N = 2,581)	Married CEO (N = 2,581)	Difference	t -Stat.
$CRASH_{t+1}$	0.253	0.222	0.031***	2.62
$NCSKEW_{t+1}$	0.074	0.009	0.065***	2.90

Panel C: Regressions with the propensity score–matched sample

	$CRASH_{t+1}$	$NCSKEW_{t+1}$
$MARRIED_t$	-0.186*** (-1.96)	-0.063*** (-2.74)
Controls	Yes	Yes
Year FE	Yes	Yes
Industry FE	Yes	Yes
N	5,162	5,162
Pseudo-/adjusted R^2	0.029	0.024

Table 7. CEO marital status and crash risk: Alternative measures of crash risk

This table presents the regression results for the effect of CEO marital status on firm-level stock price crash risk with alternative measures of crash risk. The dependent variable crash risk is proxied by the number of crash weeks ($COUNT_{t+1}$) or down-to-up volatility ($DUVOL_{t+1}$) in year $t + 1$. The independent variable is measured in year t . All regressions include year and industry fixed effects. Columns (3) and (4) also control for firm fixed effects. Variable definitions are given in the appendix. The z -statistics (t -statistics) reported in parentheses are based on standard errors clustered at the firm level. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

	(1) $COUNT_{t+1}$	(2) $DUVOL_{t+1}$	(3) $COUNT_{t+1}$	(4) $DUVOL_{t+1}$
$MARRIED_t$	-0.034** (-2.35)	-0.020*** (-2.62)	-0.065*** (-2.92)	-0.032** (-2.38)
Controls	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes
Firm FE	No	No	Yes	Yes
N	16,042	16,042	16,042	16,042
Pseudo-/adjusted R^2	0.013	0.028	0.020	0.061

Table 8. Effects of married CEOs on accounting conservatism and overinvestment

This table presents the regression results to test whether marriage is related to accounting conservatism and overinvestment. Accounting conservatism is proxied by the conservatism score (*CSCORE*) based on Khan and Watts (2009). Overinvestment (underinvestment) is measured as positive (negative) abnormal investment based on Biddle et al. (2009). The *t*-statistics of regressions are based on standard errors clustered at the firm level. Variable definitions are given in the appendix. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

	(1) <i>CSCORE</i> _{<i>t</i>+1}	(2) <i>OVERINVEST</i> _{<i>t</i>+1}	(3) <i>UNDERINVEST</i> _{<i>t</i>+1}
<i>MARRIED</i> _{<i>t</i>}	0.009*** (7.82)	-0.016** (-2.33)	0.002 (1.18)
<i>SIZE</i> _{<i>t</i>}	-0.042*** (-92.62)	-0.018*** (-8.46)	-0.004*** (-8.10)
<i>MB</i> _{<i>t</i>}	-0.003*** (-6.59)	0.004*** (4.13)	-0.000*** (-4.94)
<i>LEV</i> _{<i>t</i>}	0.078*** (15.76)	-0.049*** (-2.95)	0.027*** (7.55)
<i>ROA</i> _{<i>t</i>}	-0.021*** (-3.81)	-0.041 (-1.18)	-0.022*** (-3.45)
<i>AGE</i> _{<i>t</i>}	0.000 (0.71)	-0.001** (-2.30)	0.000*** (3.25)
<i>TENURE</i> _{<i>t</i>}	-0.000 (-1.16)	-0.001** (-2.33)	-0.000 (-0.46)
<i>FEMALE_CEO</i> _{<i>t</i>}	0.007* (1.85)	0.024 (0.73)	0.004 (1.31)
<i>OPT_OWN</i> _{<i>t</i>}	0.000 (1.04)	0.001* (1.73)	-0.000 (-1.64)
<i>CEO_TOT_HOLD</i> _{<i>t</i>}	0.001 (1.61)	0.005*** (2.81)	-0.000 (-0.94)
Constant	0.284*** (13.89)	0.230*** (6.26)	0.064*** (5.95)
Year FE	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes
N	12,729	9,412	6,473
Adjusted R ²	0.754	0.174	0.062

Table 9. Cross-sectional analysis: Corporate governance

This table presents the results regarding the impact of CEO marital status on future stock price crash risk conditional on corporate governance. In Panel A, we partition our sample based on the median value of transient institutional ownership (*TRA_INS*). In Panel B, we partition our sample based on the median value of the fitted Herfindahl–Hirschman index (*FITHHI*). In Panel C, we partition our sample based on the median value of analyst coverage (*COVER*). The regressions include all the controls described in Eq. (3) and year and industry fixed effects. Variable definitions are given in the appendix. The z-statistics (t-statistics) reported in parentheses are based on standard errors clustered at the firm level. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

Panel A: Transient institutional ownership				
	(1)	(2)	(3)	(4)
	High	Low	High	Low
	<i>CRASH</i> _{<i>t</i>+1}	<i>CRASH</i> _{<i>t</i>+1}	<i>NCSKEW</i> _{<i>t</i>+1}	<i>NCSKEW</i> _{<i>t</i>+1}
<i>MARRIED</i> _{<i>t</i>}	-0.180** (-2.30)	-0.131 (-1.42)	-0.051** (-2.05)	-0.048 (-1.62)
Controls	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes
N	8,016	5,086	8,016	5,086
Pseudo-/adjusted R ²	0.037	0.029	0.027	0.014
Panel B: Fitted Herfindahl–Hirschman index				
	(1)	(2)	(3)	(4)
	High	Low	High	Low
	<i>CRASH</i> _{<i>t</i>+1}	<i>CRASH</i> _{<i>t</i>+1}	<i>NCSKEW</i> _{<i>t</i>+1}	<i>NCSKEW</i> _{<i>t</i>+1}
<i>MARRIED</i> _{<i>t</i>}	-0.204** (-2.11)	-0.130 (-1.44)	-0.102*** (-3.19)	-0.035 (-1.32)
Controls	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes
N	6,038	5,920	6,038	5,920
Pseudo-/adjusted R ²	0.024	0.041	0.025	0.030
Panel C: Analyst coverage				
	(1)	(2)	(3)	(4)
	Low	High	Low	High
	<i>CRASH</i> _{<i>t</i>+1}	<i>CRASH</i> _{<i>t</i>+1}	<i>NCSKEW</i> _{<i>t</i>+1}	<i>NCSKEW</i> _{<i>t</i>+1}
<i>MARRIED</i> _{<i>t</i>}	-0.213*** (-2.82)	-0.065 (-0.62)	-0.056** (-2.24)	0.012 (0.40)
Controls	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes
N	7,522	6,081	7,522	6,081
Pseudo-/adjusted R ²	0.032	0.045	0.019	0.035

Table 10. Cross-sectional analysis: CEO compensation, delta, and prominence

This table presents the results regarding the impact of CEO marital status on future stock price crash risk conditional on CEO compensation, delta, and prominence. In Panel A, we partition our sample based on the median value of the CEO's total compensation. In Panel B, we split our sample based on the median value of the CEO's delta. In Panel C, we divide our sample based on the median value of the CEO's prominence. The regressions include all the controls in Eq. (3) and year and industry fixed effects. Variable definitions are given in the appendix. The z-statistics (*t*-statistics) reported in parentheses are based on standard errors clustered at the firm level. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

Panel A: CEO compensation				
	(1)	(2)	(3)	(4)
	Low pay	High pay	Low pay	High pay
	<i>CRASH</i> _{<i>t</i>+1}	<i>CRASH</i> _{<i>t</i>+1}	<i>NCSKEW</i> _{<i>t</i>+1}	<i>NCSKEW</i> _{<i>t</i>+1}
<i>MARRIED</i> _{<i>t</i>}	-0.175** (-2.38)	-0.134 (-1.62)	-0.057** (-2.45)	-0.016 (-0.60)
Controls	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes
N	7,994	8,048	7,994	8,048
Pseudo-/adjusted R ²	0.029	0.033	0.023	0.019
Panel B: CEO delta				
	(1)	(2)	(3)	(4)
	High delta	Low delta	High delta	Low delta
	<i>CRASH</i> _{<i>t</i>+1}	<i>CRASH</i> _{<i>t</i>+1}	<i>NCSKEW</i> _{<i>t</i>+1}	<i>NCSKEW</i> _{<i>t</i>+1}
<i>MARRIED</i> _{<i>t</i>}	-0.197*** (-2.81)	-0.098 (-1.07)	-0.059*** (-2.64)	-0.015 (-0.54)
Controls	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes
N	7,899	8,143	7,899	8,143
Pseudo-/adjusted R ²	0.031	0.033	0.022	0.024
Panel C: CEO prominence				
	(1)	(2)	(3)	(4)
	Low	High prominence	Low prominence	High prominence
	<i>CRASH</i> _{<i>t</i>+1}	<i>CRASH</i> _{<i>t</i>+1}	<i>NCSKEW</i> _{<i>t</i>+1}	<i>NCSKEW</i> _{<i>t</i>+1}
<i>MARRIED</i> _{<i>t</i>}	-0.190*** (-2.85)	-0.075 (-0.76)	-0.047** (-2.10)	-0.024 (-0.88)
Controls	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes
N	8,029	8,013	8,029	8,013
Pseudo-/adjusted R ²	0.026	0.040	0.025	0.020