CEO Risk Preferences and Dividend Policy Decisions

Deren Caliskan [1] and John A. Doukas [2,3]

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ABSTRACT

This study examines whether risk aversion-inducing CEO compensation motivates managers to pay more dividends regardless of investor preferences. Using inside debt (i.e., pensions and deferred compensation) and the sensitivity of CEO equity compensation to stock price changes (i.e., high CEO delta), as proxies of CEO risk aversion, we document that inside debt induces CEOs to pay dividends while convex CEO compensation decreases dividend payout.

Keywords: Dividend policy; Risk preferences; Behavioral corporate finance; CEO compensation
JEL Codes: G35, J33

[1] **Corresponding Author**. Affiliation: Strome College of Business, Old Dominion University, USA. Address: Constant Hall 2059, 1 Old Dominion University, Norfolk, VA 23529. Email: mcaliska@odu.edu, Phone: +1 (757) 286-5196.

[2] Affiliation: Strome College of Business, Old Dominion University, USA and Judge Business School, University of Cambridge, UK.
Address: Constant Hall 2080, 1 Old Dominion University, Norfolk, VA 23529. Email: jdoukas@odu.edu, Phone: +1 (757) 683-5521.

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1. Introduction

In this study, we examine whether the risk preferences of chief executive officers (CEOs) are linked to dividend policy, since they can affect the riskiness of corporate policies.[1] Using inside debt (i.e., pensions and deferred compensation) and the sensitivity of CEO equity compensation to stock price (i.e., delta) as proxies of CEO risk aversion, we examine whether risk aversion-inducing CEO compensation motivates managers to pay more dividends regardless of the market's preferences (Core and Guay, 1999; Jensen and Meckling, 1976; Sundaram and Yermack, 2007). This is likely for two reasons. First, we consider higher payouts a conservative policy as opposed to investing in value-increasing projects (Deangelo, Deangelo, and Stulz, 2006; Grullon, Michaely, and Swaminathan, 2002) which involve risk-taking. Therefore, CEOs with high inside debt should be inclined to pay excess cash out as dividends (or buy back stocks) rather than investing in projects, which may increase firm risk and thus endanger the value of their inside debt[2]. Second, to pursue investment opportunities (i.e., gambles), high-delta CEOs must give up more certain gains, decreasing the utility that they derive from investment opportunities (Kahneman and Tversky, 1979). On the other hand, equity compensation that is sensitive to stock return volatility (i.e., convex compensation or high vega) encourages CEOs to invest in value-increasing projects (Core and Guay, 1999). We expect CEOs with convex compensation to decrease payouts since they are more likely to invest firm resources in value-increasing projects.

However, Sundaram and Yermack (2007) postulate that CEOs with more inside debt may tend to decrease dividend payouts to shareholders. Providing empirical support for this concept, White (2012, p. 2) argues that CEOs with high inside debt "seek to reinvest firm income to

[1] See Core, Guay, and Larcker (2003) for a comprehensive survey of CEO compensation.
[2] CEOs may also hold cash; however, due to investor activism and rights, there is a limit to it. Another concern may be that since CEOs with high inside debt act like creditors, they may be unwilling to pay dividends due to liquidity constraints. We discuss these in detail in the literature review.

preserve the long-term viability of the firm and their future pension benefits." Conflicting views about the riskiness of dividend-paying firms exist even outside the academic world.[3] We contribute to this line of the literature by examining the effect of CEO risk preferences on payout policy. In particular, we account for CEOs' deferred compensation (a major component of inside debt) and test the effect of inside debt on the propensity to pay, which are overlooked in previous literature (White, 2012).

Because inside debt data are available since 2006, we test our hypotheses in the period from 2006 through 2011, with more than 2000 firm-year observations. We estimate the effect of CEO risk preferences on the propensity to pay dividends via logistic regressions. Each regression accounts for industry and year fixed effects. Lending support to our hypotheses, we find that CEOs with high inside debt or delta (i.e., CEOs with lower risk tolerance) have a higher propensity to pay dividends, whereas CEOs with high vega (i.e., CEOs with high risk tolerance) have a lower propensity to pay dividends.

Our findings are robust to a battery of additional tests. First, we examine whether the relationship between inside-debt and the propensity to pay dividends is non-linear. This is because the wealth transfer view suggests that creditors dislike dividends, which may drain firm liquidity. If so, managers with significantly high inside debt may be reluctant to pay dividends since CEOs with

[3] For example, the article entitled "Dividend-Paying Stocks Are Not 'Bond Equivalents'" by the Financial Lexicon on Seeking Alpha addresses the general perception that dividend-paying firms are being compared to bonds due to their low risk (see http://seekingalpha.com/article/1132851-dividend-paying-stocks-are-not-bond-equivalents). Even though the article does not present a counterargument to the general perception regarding the low risk of dividend-paying firms, it considers the comparison of dividend-paying firms to bonds an exaggeration. Another article published on forbes.com, titled "Paying Dividends," presents a life cycle-oriented argument and highlights the idea that dividends are reliable cash flows (see http://www.forbes.com/sites/larahoffmans/2012/12/06/paying-dividends-ken-fisher). The article adds, however, that a "dividend doesn't signal sure safety." Finally, a very interesting proposition is seen on cnbc.com in the article "6 Climbing High-Yield Dividend-Paying Stocks," which presents a completely different perspective to the already puzzling story of dividends (see http://www.cnbc.com/id/100331092): The author argues that "dividend-paying company executives understand they must stay aggressive each quarter or risk being forced to cut the dividend (and upset investors)," which is completely contrary to the public belief of dividend-paying firms being less risky.

inside debt might act like creditors. As such, the relationship between inside debt and the propensity to pay dividends may be non-linear. We test this possibility using dummy variables capturing the level of CEOs' inside debt (i.e., low, mid, and high) and comparing the dividend policy decisions of CEOs with low inside debt with that of others. Our results indicate that when CEO inside debt is measured via CEO relative leverage, there is no evidence of non-linearity. This suggests that CEOs whose personal leverage is comparable to that of the firm are more likely to pay dividends, regardless of firm characteristics or other CEO compensation incentives.

In the second robustness test, we check whether our results are sensitive to endogeneity bias. Our main concern is that some firm characteristics may be among the determinants of CEO compensation, causing an endogeneity bias in our results (Core and Guay, 1999). To address this, we deconstruct CEO risk preference proxies into "expected" and "excess." Following Shen and Zhang (2012), we first run a set of ordinary least squares (OLS) regressions, where the dependent variables are CEO variables (e.g., inside debt, vega, delta, equity) and the independent variables are firm variables (e.g., the debt/equity ratio, the market/book ratio). We save the residuals of these regressions as excess CEO variables that are not related to the firm characteristics. Using these excess variables as the CEO risk preference variables, we replicate the entire logistic regression analysis, which (at least partially) allows the endogeneity problem to be resolved. Even though the endogeneity robust results are less significant, there is still evidence to support our hypotheses.

Our third robustness check follows Grullon, Paye, Underwood, and Weston (2011) who introduce alternative definitions of payouts. Because firms can pay dividends and issue equity at the same time, or buy back shares instead of paying dividends, these authors argue that, for unbiased results, it is necessary to examine net payouts (e.g., dividends minus equity issuance) as opposed to whether a firm pays cash dividends at time *t*. Based on Grullon et al. (2011), we

construct three alternative dependent variables capturing whether the firm's net payouts to shareholders are positive. Even with the alternative definitions of payouts that incorporate stock buybacks or the change in the value of treasury stock, our results still support the central hypothesis of our paper: risk-averse CEOs are more likely to pass earnings to shareholders via cash dividends or stock buybacks, whereas risk-seeking CEOs are more likely to retain earnings or issue more equity.

In our fourth robustness test, we examine the effect of CEO risk preferences on dividend policy changes such as dividend initiations, omissions, etc. This is because our main analysis may be biased, as some firms may have started or stopped paying dividends before the CEO took office. If so, examining dividend policy changes (e.g., initiations, omissions, etc.) should ensure that the dividend policy is affected by the current CEO's risk preferences, and thus alleviate a possible endogeneity problem. Consistent with our prior findings, we find that conservative CEOs are more likely to initiate or increase dividends, whereas risk-seeking CEOs are less likely to increase or initiate dividends.

In the fifth robustness tests, we replicate our original analysis in the period from 1995 through 2008. The advantage of this analysis is that it includes 2.5 times more observations than our original dataset. Further, it excludes the post-financial crisis era, which could have caused a bias in our prior results due to the pessimistic environment. Most importantly, this dataset allows us to test our hypothesis in a period that is mostly characterized by high sentiment because according to catering theory, market sentiment (measured by the average market/book ratio difference between payers and non-payers) determines the propensity to pay dividends. Thus our findings may be sample-specific due to market conditions. In this analysis, we find that CEOs with high delta or non-convex equity compensations have a higher propensity to pay dividends than

CEOs with convex equity compensations. Hence, our results alleviate some of the sensitivity concerns with respect to the selection of a specific sample period.

In our sixth and final robustness test, we examine whether our findings are robust to market conditions in a more direct way. To do so, in the spirit of Baker and Wurgler (2004), we introduce the *Relative Dividend Premium* (*RDP*) measure to our analysis; *RDP* is the average market-to-book ratio of dividend paying firms minus that of firm *i*.[4] According to the catering theory, when the *RDP* is high (i.e., when dividend paying firms trade at a premium relative to firm *i*), managers should be likely to pay dividends. Testing this prediction, we estimate our baseline logistic regression with the inclusion of the *RDP*. The purpose of this test is to investigate whether our findings still hold after controlling for the market's preference for dividends. The results of this analysis show that risk-seeking CEOs are less likely to pay dividends and conservative CEOs are more likely to pay dividends, regardless of the market's state of preference for dividends.

In sum, testing the link between CEO risk preferences and payout policy, we find that risk-averse CEOs have a higher propensity to pay dividends than risk-seeking CEOs do. In particular, CEOs may forgo investment opportunities and pay out more dividends when they have greater exposure to inside debt. This pattern is also true for CEOs with less convex compensation packages. Perhaps this type of compensation motivates CEOs to maximize their utility rather than their wealth, since the utility that people derive from dividends and capital gains is different (Baker, Nagel, and Wurgler, 2007; Shefrin and Statman, 1984; Shefrin and Thaler, 1988). Especially after the 2008 financial crisis, we expect shareholders to "care" more about dividends and to compensate CEOs with instruments ensuring higher payouts. Our results show that debt-like compensation could prevent excessive risk taking and could increase dividend payouts.

[4] Note that the *RDP* is derived based on the Dividend Premium of Baker and Wurgler (2004), defined as the average market-to-book ratio of dividend paying firms minus that of the non-paying firms.

The rest of this study is organized as follows. The next section presents a literature review on dividend policy, conflicts of interest between different parties in firms, and the antecedents and consequences of CEO risk tolerance. Section 2 develops a testable hypothesis and discusses the possible effects of CEO risk preferences on dividend policy. Section 3 presents the results of our empirical analysis and robustness checks. Section 4 concludes the paper.

2. Literature Review and Hypothesis Development

2.1. Dividends and Firm Risk

Our goal is to investigate whether CEO risk preferences affect payout policy. Although Miller and Modigliani (1961) argue that dividend policy is irrelevant, some investors demand dividends for certainty[5] (Graham and Dodd, 1951), since managers may retain earnings to invest in risky projects. For instance, Fama and French (2001) show a trade-off between dividends and investments, Grullon, Michaely, and Swaminathan (2002) document that firm risk decreases after dividend increases (see also DeAngelo and DeAngelo, 2006; DeAngelo, DeAngelo, and Stulz, 2006), and Hoberg and Prabhala (2006) show that risky firms decrease dividends. In a different strand, Redding (1998) reveals a positive relation between the demand for dividends and investor risk aversion. Confirming Redding (1998), Breuer, Rieger, and Soypak (2012) show that, in countries where investors are more impatient and loss averse, firms pay out more dividends. Findings from both the firm side and the investor side suggest that paying dividends is a more conservative policy, since the alternative scenario may be to invest in high-risk projects. Therefore, this leads to the prediction that risk-averse CEOs (e.g., CEOs with high inside debt or delta) are more likely to pay dividends.

[5] See Allen and Michaely (2003) for a complete survey of payout policy.

The catering theory of dividends, however, asserts that the disappearance of dividends since the 1960s (Fama and French, 2001) is due to the market being populated by investors with higher sentiment, leading to a higher demand for capital gains over dividends. Baker and Wurgler (2004) argue that managers cater to this investor demand by investing in value-increasing projects as opposed to paying dividends. In this study, we propose that if a CEO is risk-averse, the CEO could pass on risky projects and pay out dividends, even when the market demands capital gains. This is because risky projects lead to higher stock return volatility; in efficient markets investors put a discount on risky firms' shares, which increases the firm's market leverage. Lower share price, higher leverage, and increased volatility obstructs managers' ability to raise external capital in both equity and debt markets. These not only increase the cost of capital, but may also cause financial distress.

Therefore, using alternative measures of risk aversion, we investigate whether firms that are run by risk-averse CEOs are more likely to pay dividends even during periods of high investor sentiment. This could explain why some firms still pay dividends during low-dividend premium periods (i.e., when the market prefers capital gains over dividends). Since managers may disburse cash not only by paying dividends, but also by stock buybacks, our empirical approach considers the effect of dividend payouts and net payouts in the spirit of Grullon et al. (2011). That is, we examine conservative CEOs' propensity to pay out dividends and the propensity to have a positive net payout (which is calculated as the value of the stocks that are bought back plus the value of dividends paid, less the value of equity issuances).

2.2. CEO conservatism and cash holdings

While we test whether firms run by conservative CEOs are more likely to pay dividends, one may also argue that conservative CEOs may accumulate cash as a cushion in case of an emergency. Having such a cushion increases the firm's financial strength and decreases the likelihood of bankruptcy, which is the goal of conservative CEOs. However, this view is sound only when there are no agency costs and investors hold an optimal portfolio, regardless of their position in the firm, and is therefore unlikely to be realistic for several reasons. First, when a firm accumulates a great deal of cash, shareholders may become irritated, as managers may pursue their empire building objectives using free cash flow (Jensen, 1986). Another reason investors may be concerned is because when CEOs do not invest cash flows in projects to increase returns, shareholders bear an opportunity cost due to forgone investment projects. When managers disburse cash, investors can not only re-invest their proceeds based on their risk-return preferences, but also allocate their wealth in other assets to prevent under-diversification. Because of these reasons, if managers hoard a large sum of cash, they may face pressure from activist investors, especially in countries where investor rights are protected. Since our sample is from the U.S. where investor right-protection is the highest, the CEOs in our sample are more likely to be subject to greater investor activism and, thus, less likely to hoard cash flows.[6] This leaves CEOs with two options: investing in new projects or distributing earnings to shareholders. In the context of our study, since excess cash must be disgorged, we predict conservative CEOs to be more likely to pay dividends because they are less prone to invest cash flow in risky projects or prefer

[6]A good example is Apple Inc. In 2012, Apple had to pay more than $2 per share as dividends due to investor demand, solely because Apple accumulated excess free cash and in 2014 Apple dispersed 11.1 billion in dividends. While Apple is one of the most established and well-managed firms in the world, it was forced to disgorge surplus cash to its shareholders. Apple's CEO Tim Cook decided to pay dividends as opposed to launching their own satellites (URL: http://seekingalpha.com/article/316669-putting-a-satellite-into-orbit-a-great-use-for-aapls-cash).

protecting their job by not falling into conflict with activist investors by hoarding cash flows.[7] Conversely, we predict risk-seeking CEOs to be less eager to pay dividends as they pursue new projects in an attempt to increase firm value.

Starting with Jensen and Meckling (1976), many studies show that the method of compensation affects CEO behavior and thus corporate policies. Consequently, we use the nature of managerial compensation to proxy for CEO risk preferences.

2.3. Inside Debt

Among the methods of CEO compensation, inside debt ties the value of CEO wealth to the market value of debt, which is inversely related to firm risk (e.g., Edmans and Liu, 2011; Jensen and Meckling, 1976; Sundaram and Yermack, 2007). Put differently, inside debt turns the CEO into a creditor who is not better off with higher share prices but faces a significant cost with bankruptcy. Therefore, inside debt is believed to discourage excessive risk taking and, in turn, forcing CEOs to allocate firm resources conservatively to increase the distance to default (Sundaram and Yermack, 2007). It also restrains CEOs from leveraging the firm and increasing research and development (R&D) expenditures, but motivates operational hedging (Cassell et al., 2012). Consistent with these findings, we predict high inside debt will lead to a high propensity to pay dividends, which we consider a conservative policy. However, Chen, Dou, and Wang (2011) and Sundaram and Yermack (2007) conjecture that dividends are a threat against companies' future financial health and hypothesize that CEOs with high inside debt will decrease payouts. Using hand-collected data, White (2012) shows that CEOs with high pensions decrease payout

[7]During the 2013-14 period, Apple is forced to increase dividend payouts and repurchase 45 billion worth of shares instead of investing, due to the pressure from Carl Icahn – a major blockholder. In 2015, Carl Icahn urged Apple to increase its share-buyback program, and Apple announced a $50 billion increase in its share-repurchase program – from $90 billion to $140 billion– in April. (URL: http://www.businessinsider.com/carl-icahn-on-apple-share-price-2015-5)

ratios and dividend yields. However, White's study has a number of limitations. First, White's hand–collected dataset is limited to pension-based compensation, as opposed to a combination of deferred compensation and pension. Second, White's dataset has 1507 firm–year observations from 2000 through 2009. Standard & Poor's Execucomp data have more than 2000 firm–year observations[8] from 2006 through 2011. Hence, his findings may be sample-specific. Most importantly, he does not analyze the effect of inside debt compensation on the propensity to pay dividends, dividend initiations, or net payouts, which are addressed in the current study.

In sum, unlike our hypothesis, this strand of literature suggests that paying dividends may reduce cash reserves, which might be considered as a wealth transfer from creditors to shareholders. However, the traditional wealth transfer hypothesis may not be applicable to CEOs with high inside debt because, even though CEOs with high inside debt may act like creditors, they are not pure creditors; they are *hybrid* stakeholders since, in addition to being a creditor due to inside debt, they are also shareholders of their own firm. In other words, when a CEO with high inside debt pays dividends, s/he is among the recipients of the dividend proceeds.

Even so, one may still argue that CEOs with high inside debt may build up slack cash instead of paying dividends. However, as we argued in subsection 2.2, there is a limit to hoarding cash due to investor activism and investor rights protection considerations. Hence, profits, at some point, need to be invested in projects or distributed to shareholders. Investing in new projects may increase stock return and cash flow volatilities, which may cause the market to perceive the firm risky. This, in turn, may hamper a firm's ability to raise external capital in the future and may lead to a financial distress, especially when closer to debt maturity dates. In short, we argue that, risk-averse CEOs are expected to be less likely to bear such a risk. Hence, the remaining possibility for

[8] This is after omitting the observation with missing variables that are needed in this study.

CEOs is either paying out dividends or buying back stocks. While paying dividends may reduce firm liquidity, it allows firms to access more external equity since mutual funds only invest in firms that pay dividends. Paying dividends or buying back stocks also help the firm in the equity markets. Stock buybacks and, according to the signaling view, paying dividends increase the share price; therefore, if needed, the firm may issue shares at a higher price and increase firm liquidity. Moreover, the literature shows that creditors are not necessarily alarmed by dividend payouts. This is because firms usually pay less than what the debt covenants allows (Kalay, 1982); based on the signaling view, Handjinicolaou and Kalay (1984) document that creditors may consider dividend payouts as "good news" regarding the future profitability of the firm and not tighten the lending terms.

2.4. CEO Equity Compensation

Unlike inside debt, equity compensation compels managers to work in the best interest of shareholders by increasing equity value (Jensen and Meckling, 1976). Therefore, equity compensation may substitute for dividends for two reasons. First, CEOs with equity compensation should seek investment projects more aggressively. Second, shareholders should demand fewer dividends, since they will be less concerned about wasting firm resources (Jensen, 1986).[9] However, high equity compensation can also induce risk aversion, restraining managers from pursuing value-increasing projects. First, higher CEO shareholding causes CEOs to incur large losses subsequent to drops in share value (Lambert et al., 1991; Smith and Stulz, 1985). This is mainly due to managerial underdiversification, since CEO intellectual capital is already invested in the firm. A possible financial distress threatens not only CEO equity holding, but also CEO lifetime annuities and reputation (Lambert, Larcker, and Verrecchia, 1991). Lending support to this, Tufano (1996)

[9] Our hypothesis is also in line with other views. First, Rozeff (1982) argues that CEOs with higher equity compensation also receive higher dividends, creating high tax penalties for CEOs. Second, Deshmukh, Goel, and Howe (2009) show that CEOs with high equity ownership tend to be overconfident and to pursue risky projects.

shows a positive relation between CEO ownership and hedging activities. The second reason equity compensation could substitute for dividends is because capital gains (i.e., gambles) and dividends (i.e., certain gains) yield different utility (Kahneman and Tversky, 1979), and CEOs could act as if they were maximizing the total utility they derive from them (Baker, Nagel, and Wurgler, 2007; Shefrin and Statman, 1984; Shefrin and Thaler, 1988). This suggests that, even though CEOs' goal is to maximize equity value, they may pass on investment opportunities when the marginal cost of pursuing projects (i.e., forgone dividends) is high. Since CEOs with high shareholding have to sacrifice more dividends when they take on investment projects, they may forgo investment opportunities leading to high payouts.

2.5. CEO Delta and Vega

Core and Guay (2002) and Guay (1999) show that the effects of CEO equity compensation on the riskiness of corporate policies depends not only on the size of the CEO equity compensation, but also on its sensitivity to stock returns and the stock return volatility (delta and vega, respectively). Core and Guay show that high delta leads to more conservative policies, while high vega increases CEO risk tolerance, since it raises the convexity of the compensation package. For instance, CEOs with high delta tend to hedge more (Knopf, Nam, and Thornton, 2002) and decrease R&D and leverage (Coles, Daniel, and Naveen, 2006). On the other hand, CEOs with high vega have a tendency to increase leverage and diversify less (Coles, Daniel, and Naveen, 2006; Hagendorff and Vallascas, 2011; Low, 2009; and Nam, Ottoo, and Thornton, 2003). Therefore, we expect CEOs with high delta (vega) to have a higher (lower) propensity to pay dividends, since

we consider paying out dividends a conservative policy compared to investing in value-increasing projects.[10]

While the effect of delta and inside debt on CEO risk preferences and thus dividend policy may seem similar, the channels through which they affect dividend policy are indeed different: High CEO delta encourages CEOs to pursue less risky strategies because CEOs with high delta faces managerial underdiversification (i.e., CEOs' human capital and stock-based compensation are tied to the firm's fortunes). Hence, the effect of a drop in stock price on CEO's wealth is immediate for CEOs with high delta.

On the other hand, increased firm risk affects the wealth of CEOs with high inside debt if the firm faces bankruptcy. One must note that, when stock price goes down, CEOs with high delta face losses; however, they still have an opportunity to recover losses by making better investment decisions and thus increasing the share price. Conversely, once the firm goes bankrupt, inside debt is mostly uncollectable. Thus, inside debt has a long-term effect on CEOs and can lead to a stronger form of risk-aversion because, unlike the value of high delta equity compensation, that of inside debt does not increase when the stock price increases. In other words, CEOs with high inside debt may pass on investments and distribute cash even if the investment project is low risk.

Using both measures, we are interested in knowing if delta and inside debt yield a consistent relationship with firm's dividend policy.

2.6. Cash Compensation: Salaries and Bonuses

In Jensen and Meckling's (1976) framework, cash compensation (salaries and bonuses) does not motivate CEOs to invest in long–term value-increasing projects because salaries are not sensitive to firm performance. Even though bonuses are granted depending on the CEO's success

[10] Following the prior literature, we scale delta by vega to derive a less noisy variable in our empirical analysis (see, e.g., Cassell et al., 2012).

in a certain goal, they are generally short-term performance based compensation arrangements (Berger, Ofek, and Yermack, 1997; Lewellen, Loderer, and Martin, 1987). In other words, since cash compensation (the sum of salaries and bonuses) does not motivate CEOs to increase firm value in the long run, we do not anticipate CEOs with high cash compensation to invest in value-increasing projects. This may imply higher payouts; however, cash compensation may also cause CEOs to abuse free cash flows (Jensen, 1986). Therefore, the effect of cash compensation on the propensity to pay could be positive or negative.

2.7. CEO Age and Tenure

Kempf, Ruenzi, and Thiele (2009) find that younger CEOs value their compensation incentives more than older CEOs do, implying that they may be more motivated to seek risk to increase equity value and, as a result, their compensation. Consistent with this, Serfling (2013) presents a wide-range analysis on how corporate policies are affected by CEO age and shows that younger CEOs increase firm risk.

Further, CEO tenure is generally used as a control variable to proxy for managerial entrenchment (e.g., Berger, Ofek, and Yermack, 1997) or risk aversion (e.g., Coles, Daniel, and Naveen, 2006), both of which indicate that CEOs with longer tenure are less likely to increase firm value. We therefore expect older CEOs and CEOs with longer tenure to pay more dividends as opposed to investing in value-increasing projects.

3. Empirical Analysis

3.1. Data and Methodology

Since the U.S. Securities and Exchange Commission's 2006 rule, managers' deferred compensation and pension data, in addition to the detailed information of each stock option

tranche (i.e., expiration date, number of stock options, and exercise price of each option grant), are available in Standard & Poor's Execucomp data. The detailed stock option data allow using the full information method rather than the one–year approximation method of Core and Guay (2002) in the calculation of stock option valuation.[11] Hence, the dataset used in this study consists of observations from 2006 through 2011.[12] In addition to Execucomp, the data are collected from Standard & Poor's Compustat, the Center of Research in Security Prices, and Kenneth French's website.[13] Finally, the three-month Treasury bill rate is obtained from the Federal Reserve's website.[14,15] We filter the dataset such that all observations have full disclosure of the CEO stock options available in Execucomp and we omit utilities and financial firms. Table 1 presents the distribution of the data by year.

3.2. Measures of CEO Risk Preference

3.2.1. CEO Compensation and Risk Preferences

Many studies in the literature use CEO equity compensation, CEO delta and vega, and CEO inside debt to proxy for CEO risk preferences. Prior findings indicate that CEO delta (or the CEO delta/vega ratio) and CEO inside debt decrease CEO risk tolerance and compel managers to employ low-risk corporate policies. On the other hand, convex CEO equity compensation incentivizes CEOs to pursue risky projects. Below, we discuss the variables we derive following prior studies.

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[11] Core and Guay (2002) use the last available year's data to estimate the total value and the sensitivities of all the outstanding stock options, rather than track each tranche over time. In particular, they assume that the tranche that is granted in the last available year has 10 years to maturity, while all the other tranches have seven and a half years to maturity. In addition, dividing the total value of all outstanding options by the number of options outstanding, the authors approximate how much each option is in the money. By subtracting this amount from the price of the underlying stock, they find the exercise price.

[12] In the robustness checks, we also use data from 1995 through 2008.

[13] See http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data_library.html.

[14] See http://www.federalreserve.gov/releases/h15/data.htm.

[15] Even though the analysis includes observations from 2006 to 2011, observations from 2005 are used to calculate the change in total assets. Additionally, since stock return volatility is calculated using stock prices over the past 60 months, the start of the stock price data is the first month of 2001.

3.2.2. Inside Debt

We proxy for CEO inside debt with three variables (e.g., Cassell et al., 2012; Jensen and Meckling, 1976; Sundaram and Yermack, 2007): First, we calculate inside debt as the total dollar value of CEO pension and deferred compensation. Second, we derive *CEO Relative Leverage* as CEO leverage (CEO inside debt divided by total CEO equity compensation) over firm leverage. In our regression analysis, we use the natural logarithm of this variable for less noisy results. Finally, we derive a dummy variable indicating that CEO leverage is higher than firm leverage (i.e., a binary variable that equals one if CEO leverage is above firm leverage and zero otherwise). In our multivariate analysis, we refer to this variable as *High CEO Relative Leverage*. Following the prior literature, we predict high inside debt and *High CEO Relative Leverage* will discourage risky projects leading to higher payouts.

3.2.3. CEO Equity

We calculate *CEO Equity* as the total dollar value of CEO common stocks, stock options, and unvested stocks. We estimate the value of stock options using the Black-Scholes option pricing model (see Black and Scholes, 1973). CEOs can have up to 10 stock option tranches, since each tranche matures in 10 years. All of these data are available since 2006 in Execucomp, allowing us to calculate the stock option value of each tranche using the full information method, as opposed to the approximation method of Core and Guay (2002). We find the value of CEO stock option portfolios by aggregating those of each tranche. See Appendix B for a detailed derivation of these variables.

3.2.4. CEO Equity Delta and Vega

We first calculate the delta and vega (sensitivity to stock price and sensitivity to stock return volatility, respectively) of each stock option tranche by taking the partial derivative of the Black–Scholes option pricing formula with respect to the stock price and the stock return volatility,

respectively. Aggregating each tranche's delta and vega, we find the CEOs' stock option portfolio delta and vega, respectively. Following Core and Guay (2002), it is assumed that the delta and vega of CEO equity are the numbers of CEO shares multiplied by 1.0 and 0.01, respectively. This is because delta and vega are the CEO equity's sensitivity to a $1 change in the stock price and a 1% change in the stock return volatility, respectively. See Appendix B for detailed derivations of these variables.

3.2.5. Other Variables

In addition to the above variables, we derive *CEO Cash Compensation* as the sum of CEO salary and bonuses. Since cash compensation does not motivate CEOs to enhance long-term firm performance and could cause managers to abuse firm resources, cash compensation could have a significant effect on payout policy. We also use *CEO Age* and *CEO Tenure* as control variables, since older CEOs and CEOs with longer tenure tend to avoid risky projects (Coles, Daniel, and Naveen, 2006; Serfling, 2014).

We define a firm dividend payer when its dividend per share by exdate is greater than zero. For more robustness, we use three dummy variables following Grullon et al. (2011) to define a firm a payer. The first variable is set to one if the value of total dividend payouts is greater than the value of stocks that are bought; otherwise, the variable is set to zero. The second one is set to one if the value of total dividend payouts plus the change in the value of treasury stock is positive, and zero otherwise. When the change in the value of treasury stock is missing, we replaced it with Purchase of Common and Preferred Stock less Sale of Common and Preferred Stock. The last dummy variable is set to one if the value of Purchase of Common and Preferred Stock less Sale of Common and Preferred Stock is positive, and zero otherwise.

We also use a variety of firm-level control variables. To proxy for growth opportunities, we derive the *Market/Book Ratio*, *Change in Assets*, the capital expenditures to total assets ratio (*Capex/Total Assets Ratio*), the ratio of R&D expenditures to assets (*R&D/Total Assets Ratio*), *Return Volatility*, and the ratio of retained earnings to assets (*Retained Earnings/Total Assets*). We proxy firm size, by the percentage of firms that are smaller than the firm in a given year and profitability with earnings available to common stock holders. In the robustness tests, we use debt/equity ratio to proxy for leverage, cash flows from operations less total dividends to proxy for free cash flows, and the natural log of sales to proxy for firm size. Following Baker and Wurgler (2004), we use the *Relative Dividend Premium*, which is the average market-to-book ratio of dividend paying firms at time *t* less the market-to-book ratio of firm *i* at time *t*. Finally, we measure firm idiosyncratic risk with the standard deviation of 36 monthly excess returns, estimated as the error term of the market model. Appendix A, presents in detail the company variable derivations.

3.2.6. Descriptive Statistics

Table 2 Part A presents the descriptive statistics of all the variables for dividend-paying and non-paying firms in the period of 2006 through 2011. We hypothesize risk-averse CEOs pay out more dividends than risk-seeking CEOs. Namely, CEOs with more inside debt, higher relative leverage, higher delta, and lower vega are expected to have a higher propensity to pay dividends. Descriptive statistics show that, in dividend-paying firms, CEOs have higher inside debt than CEOs in non-paying firms ($1.495 million compared to $0.559 million) and the natural logarithm of their relative leverage is higher than that of their non-paying counterparts (–0.587 compared to –1.588). They have less equity holdings in the firm ($20.923 million compared to $25.854 million), the delta/vega ratio of their equity compensation is larger (57.314 compared to 8.753), and their equity compensations are less sensitive to stock return volatilities (i.e., their vega is lower: $9.807 and compared to $59.477). Finally, CEOs in dividend-paying firms are older (the mean age in the

subsample of payers is 55.572 years compared to 54.311 years) and they have longer tenure (the mean number of consecutive years served in the same firm in the subsample of payers is 5.94 year compared to 4.966 years).[16] All these mean-difference findings, shown in Panel C, are statistically significant at the 1% level per two-tailed *t*-tests.

Regarding firm characteristics, the results are consistent with those of Fama and French (2001): Dividend-paying firms are larger, as measured by market equity ($768 million compared to $665 million); have fewer growth opportunities, proxied by the change in total assets from time t – 1 to time t and the market/book ratio (4.9% compared to 9.1% and 2.025 compared to 2.152, respectively); and are more profitable than their non–dividend-paying counterparts ($44.019 million compared to $20.765 million). In addition, *Capex/Total Assets Ratio* and *R&D/Total Assets Ratio* are used as investment opportunity proxies to alleviate any omitted variable bias. Both of these variables have higher mean values in the subsample in non-paying firms (4.73% compared to 4.79% and 2.29% compared to 6.459%, respectively).[17] In sum, all these findings so far support the view that dividend-paying firms are less risky: They are larger, more profitable, have less room to grow, and are managed by risk-averse CEOs.

Table 3 presents the correlation coefficients of the main variables of interest.[18] In accord with our previous discussion, we expect inside debt, CEO relative leverage, the *CEO Delta/Vega Ratio*, *CEO Age*, and tenure to be positively correlated with *Payout Ratio* and *Dividend Yield*, as

[16] Dividend payout ratios and dividend yields are not presented, since these firms do not pay dividends.

[17] The descriptive statistics indicate outlying observations in the dataset, that is, skewness that could cause heteroskedasticity, thus deteriorating the validity of the empirical analysis. Hence, we rigorously inspect the yearly subsamples for possible violation of homoskedasticity via model specification tests that also test the independence of the regressors from the error terms. For more robustness, all *t*-values of the OLS regressions are based on standard errors clustered at the firm level.

[18] The largest correlation is observed between free cash flows and the market/book ratio (–75%), which are not used in the same estimation model throughout the study. The second largest correlation is between CEO age and tenure (39%). A possible multicollinearity issue is taken into consideration during the multivariate analysis. In untabulated results, the variance inflation factors reveal no evidence of multicollinearity.

we hypothesize risk-averse CEOs will pay out more dividends. The *Payout Ratio* is positively correlated with *CEO Inside Debt* at the 5% level and with the *CEO Delta/Vega Ratio* at the 10% level. In addition, it is negatively correlated with the *CEO Vega* at the 10% level. *Dividend Yield* is positively correlated with *CEO Inside Debt* at the 1% level. The *CEO Delta/Vega Ratio* is positively correlated, whereas *CEO Vega* is negatively correlated with dividend yield, both of which are significant at the 1% level. Finally, *CEO Age* and *CEO Tenure* are positively correlated with both payout ratio and dividend yield. While these findings do not indicate causality, they support the hypothesis that risk-seeking inducing CEO compensation decreases payout, whereas compensation strategies that discourage risk taking increase payout.

3.3. Logistic Regression Analysis: The Effect of CEO Risk Tolerance on the Propensity to Pay Dividends

The empirical goal of this study is to examine the effect of CEO risk preferences (proxied by CEO inside debt, vega, delta, etc.) on dividend policy. Prior literature suggests that inside debt and high delta compel managers to employ low-risk corporate policies, whereas high vega encourages risk-seeking behavior. Since we consider paying out dividends to be a conservative policy, we expect CEOs with high inside debt or high delta to have a higher propensity to pay dividends compared to CEOs with high vega. To test our hypothesis, we run logistic regressions in which the dependent variable equals one if the firm pays dividends at time *t*, and zero otherwise.

Table 4 presents the results of the logistic regressions. In the first seven models, we examine the effect of each CEO risk preference variable separately. For robustness, we proxy for inside debt using three variables (i.e., the sum of CEO deferred compensation and pensions, CEO relative leverage, and a dummy variable indicating that CEO leverage is higher than that of the firm), since these variables are used interchangeably in the literature. We run three more models

(models (8) through (10)) to estimate the propensity to pay dividends using all the CEO variables since we proxy for inside debt using three variables. We estimate all models using CEO- and firm-level control variables, as well as with industry and year dummies. All the coefficients in this table are log odds ratios and transformed to probability with the natural exponential function, i.e., e^c where e is the mathematical constant (2.71828) and c is any coefficient presented in Table 4. Hence, the effect of one unit change in any coefficient on the propensity to pay dividends is calculated as follows: $(e^c - 1) \times 100$.

The first model shows that CEO cash compensation has no significant effect on the propensity to pay dividends. In models (2) through (4), we find that all three inside debt proxies positively affect the propensity to pay dividends at the 1% level, supporting our hypothesis that risk aversion-inducing compensation increases payouts. In economic terms, since the coefficients of *CEO Inside Debt* and *Log CEO Relative Leverage* are 0.0698 and 0.2238, the results indicate that a $1 million increase in inside debt or a 1% increase in CEO relative leverage increases the chances of paying out dividends by 7.2% and 25%, respectively.[19] More strikingly, the coefficient of *High CEO Relative Leverage* is 1.19 indicating that CEOs whose personal leverage is above the firm's leverage are 2.31 times more likely to pay dividends compared to other CEOs. [20]

Analyzing the effect of equity compensation and the convexity of equity compensation on the propensity to pay, we find more supporting evidence for our hypothesis in models (5) through (7). Model (5) shows that a one-point increase in the *CEO Delta/Vega Ratio* increases the propensity to pay dividends by 4.4%.[21] In models (6) and (7), the coefficients *CEO Equity* and *CEO Vega* are -0.0056 and -0.0539 suggesting that a $1 million increase in equity compensation or

[19] $(e^{0.0698} - 1) \times 100 = 7.2\%$ and $(e^{0.2238} - 1) \times 100 = 25.08\%$
[20] $(e^{1.1987} - 1) \times 100 = 231.5804\%$
[21] $(e^{0.0443} - 1) \times 100 = 4.4\%$

a $1000 increase in vega decreases the propensity to pay dividends by 0.56% or 5.25%, respectively.[22] These results indicate that equity compensation and, in particular, convex equity CEO compensation decrease payouts. This finding is consistent with our argument that CEO compensation that encourages risk taking decreases payouts as CEOs invest firm resources in projects.

In models (8) through (10), Table 4, we examine the effect of CEO variables on the propensity to pay dividends when other CEO characteristics are included in these regressions. Note that we estimate three models (i.e., models (8) through (10)), since we proxy inside debt with three variables. While the magnitudes and significance change, we still find that *CEO Vega* decreases and the *CEO Delta/Vega Ratio* increases the propensity to pay dividends. We also find that when other compensation variables enter the model, the coefficient of *CEO Equity* becomes insignificant. We argue that this is probably due to the vega, since it captures the convexity of the compensation package. In other words, rather than the size of the *CEO Equity*, we find that its sensitivity to stock return volatility decreases the propensity to pay. Last but not least, in these last three models, two out of three CEO inside debt variables have positive coefficients and are significant at the 5% levels. This supports our hypothesis that conservative CEOs are more likely to pay dividends.

This hypothesis is also supported by the control variables showing that CEOs with longer tenure have a higher propensity to pay dividends. Further, mature firms (i.e., firms with high retained earnings to assets ratio) are more likely to pay dividends compared to firms that invest in R&D and increase their assets. All these results are in line with the view that there is a trade-off between investments and dividends (Deangelo, Deangelo, and Stulz, 2006; Fama and French,

[22] $(e^{-0.0056} - 1) \times 100 = -0.56\%$ and $(e^{-0.0539} - 1) \times 100 = -5.25\%$

2001; Grullon, Michaely, and Swaminathan, 2002) and with the view that risky firms are less likely to pay dividends (Hoberg and Prabhala, 2006; Grullon et al., 2011).

3.4. Robustness check: Non-linearity test with inside-debt

Inside debt makes CEOs behave like creditors and compels them to manage the firm conservatively (i.e., prefer less risk to more risk-taking management decisions). The signaling view predicts a positive reaction to dividend payouts in bond prices, indicating that creditors do not consider dividends an expropriation of creditors in favor of shareholders. The wealth transfer view, on the other hand, indicates the opposite; creditors dislike dividends, as they may drain firm liquidity. If so, managers with significantly high inside debt may be reluctant to pay dividends. That is, the relationship between inside debt and the propensity to pay dividends may be non-linear. In order to test this possibility, we develop dummy variables capturing the levels of CEO inside debt. Namely these variables are Low, Mid, and High Inside Debt, as well as Low, Mid, and High CEO relative leverage. We substitute our original inside debt variables with these variables in our empirical analysis to test the possible non-linearity issue. The results are presented in Table 5. The *Low Inside Debt Dummy* and *Low CEO Relative Leverage Dummy* variables are not included in the models; therefore, the reference group consists of CEOs with low inside debt or low CEO relative leverage. Based on the central hypothesis of this paper, the coefficient of the *Mid Inside Debt* and *Mid CEO Relative Leverage Dummy* should be positive and significant. More important, the coefficients of the *High Inside Debt Dummy* and *High CEO Relative Leverage* should be larger than those of *Mid Inside Debt Dummy* and *High Inside Debt Dummy*. However, if managers act in accord with the prediction of the wealth transfer hypothesis, the coefficients of *High Inside Debt Dummy* and *High CEO Relative Leverage Dummy* should be lower than those of the Mid Inside Debt Dummy and *Mid Inside Debt Dummy* (or should not be significant).

In Model (1), we find that both the significance and the magnitude of *High CEO Relative Leverage Dummy* are higher than those of *Mid CEO Inside Debt Dummy*. We find the same pattern in Model (2), which is estimated with Mid and High CEO Relative Leverage dummies. In this model, the magnitude and the significance of *High CEO Relative Leverage Dummy* is twice as greater compared to those of *Mid CEO Relative Leverage.* For more robustness, we estimate models (3) and (4) by including other CEO risk preference variables. In model (3), the significance and the magnitude of *High CEO Relative Leverage Dummy* variable's coefficient is lower than those of *Mid CEO Relative Leverage Dummy.* While this may be a sign of non-linearity, the results of model (4) show that the CEOs with high relative leverage are more likely to pay dividends. Thus, our results indicate that when CEO inside debt is measured via CEO relative leverage, there is no evidence of non-linearity; this indicates that CEOs whose personal leverage is comparable to that of the firm are more likely to pay dividends, regardless of firm characteristics or other CEO compensation incentives.

3.5. Robustness check: Addressing Endogeneity

Since boards pay CEOs in ways that align interests between shareholders and CEOs, CEO compensation and as a result CEO risk tolerance variables are likely to be determined endogenously (Core and Guay, 1999). To examine whether our results are robust to possible endogeneity concerns, we employ a rigorous test, following Shen and Zhang (2012). We deconstruct CEO risk tolerance variables (e.g., inside debt, delta, vega) into predicted values (i.e., predicted via firm characteristics) and excess values to strip away the effect of firm characteristics. We run OLS regressions on CEO risk tolerance variables, where the independent variables are

firm characteristics.[23] Next, we use the error terms as the excess compensation and risk tolerance variables.

Using these excess compensation and risk tolerance variables as the independent variables, we replicate the analysis presented in Table 4. We estimate the effect of the excess compensation variables on the propensity to pay and Table 6 presents the results. In the first two models, we observe that *CEO Excess Cash Compensation* and *CEO Excess Delta/Vega Ratio*, do not significantly affect the propensity to pay dividends In economic terms, in contrast with our hypotheses, these findings imply that, rather than CEO compensation or risk preferences, firm characteristics play a role in payout policy. However findings in model (3) show that *CEO Excess Inside Debt* increases the propensity to pay and it is significant at the 10% level. Further, the results of models (4) and (5) of Table 6 show that *CEO Excess Equity Compensation* and *CEO Excess Vega* decrease the propensity to pay dividends, both of which are at the 1% level. This finding supports our argument that compensation schemes which increase CEO risk tolerance lead to lower payouts. Finally, model (6) is estimated using all the excess compensation variables. Note that the sign of *CEO Excess Equity* changes while the coefficient of *CEO Excess Inside Debt* becomes significant at the 5% level. These results imply that non-convex equity compensation and inside debt increase the propensity to pay dividends, whereas convex compensation, as shown by excess vega, has the opposite effect. Overall, although the endogeneity-robust results are less significant than the original analysis reported in Table 4, they concur with the previous findings;

[23] The unreported results of the OLS regressions indicate that CEO age (positive) and firm size (positive) are the only variables that affect CEO cash compensation. CEO inside debt holding (the sum of deferred compensation and pensions) is affected by firm-specific risk (negative), free cash flows at time $t-1$ (negative), firm size (positive), and tenure (positive). A CEO's equity (sum of the value of shares, restricted shares, and options) in the firm is a function of cash compensation (positive), leverage (negative), free cash flows at time $t-1$ (positive), tenure (positive), and the firm's growth opportunities (positive). The CEO vega is a function of cash compensation (positive), leverage (negative), firm size (positive), tenure (positive), and growth opportunities (positive). Finally, the CEO delta is affected by cash compensation (positive), leverage (negative), free cash flows at time $t-1$ (positive), firm size (positive), CEO tenure (positive), and growth opportunities (positive).

this provides additional support to our central hypothesis which predicts that risk-averse CEOs are more likely to pay dividends than risk-seeking CEOs.[24] In sum, our evidence so far shows that CEO risk preferences play a role in payout policy.

3.6. Robustness check: Alternative measures of payouts

Our goal is to test whether CEO risk preferences play a role in dividend policy. Traditionally, the dividend policy literature considers the firm a dividend payer when the firm has a positive dividend per share. However, Grullon et al. (2011) introduce alternative definitions of payouts, as firms can pay dividends and issue equity at the same time or buy back shares instead of paying dividends. Therefore, these authors argue that, for unbiased results, it is necessary to examine net payouts (e.g., dividends minus equity issuance) as opposed to whether a firm pays cash dividends. Based on Grullon et al. (2011), we use the following alternative specifications: a firm is considered a payer when 1) the value of total dividend payout is greater than the value of stocks that are bought back, 2) the value of total dividend payouts plus the change in the value of treasury stock is positive[25], and 3) the value of purchase of common and preferred stock minus sale of common and preferred stock is greater than zero. In order to test our prediction using Grullon et al.'s (2011) alternative definitions, we run three sets of logistic regressions in which the dependent variables are the dummy variables. The results are presented in Tables 7 and 8. Based on the central hypothesis of our paper, the coefficients of *CEO Inside Debt* and *CEO Delta/Vega Ratio* should be positive, whereas the *CEO Vega* should be negative. The results of models (2), (4), (8), and (10) in Table 7 show that two out of three CEO inside debt proxies are positive and

[24] We also examine the effect of CEO compensation on the payout ratio and dividend yield by replicating the analyses presented in Tables 4 through 5. In unreported results, we observe that most variables do not have a statistically significant effect on the payout ratio and dividend yield, including common variables such as firm size and profitability. In fact, in these tests (including endogeneity tests), the only variable that consistently provides statistically significant results is the vega confirming that convex compensation decreases payouts.

[25] In this definition, we replaced the change in the value of treasury stock with purchase of common and preferred stock minus preferred stock, when it is missing.

significant at the 1% level, regardless of which control variable is used in the model. Similarly, according to the models (5), (8), (9), and (10), CEOs with high delta/vega ratio are likely to have a positive net payout, thus supporting the main hypothesis of our paper. However, our new results are somewhat surprising. In model (7), the coefficient of CEO vega is significant only at the 10% level. More importantly, when other CEO variables are included in the model, the sign of the CEO vega becomes positive. While this is not in accord with our main hypothesis, there is a possible explanation; this could be because high vega CEOs may be engaging in stock buybacks when they do not have investment opportunities, thus yielding mixed results.

When we look at the control variables, we observe that CEOs with longer tenure, profitable firms, and firms with high retained earnings are likely to have positive payouts. Conversely, firms that increase their assets are less likely to have positive net payouts. These results are consistent with the literature. However, we find that older CEOs are likely to have a negative net payout, which contradicts with the literature and our hypothesis. The literature suggests that older CEOs are more likely to be conservative, and we predict conservative CEOs to have positive net payouts. It may be that older CEOs are overconfident and choose to invest in their own stock. Overall, however, the findings regarding the effect of CEO inside debt and CEO delta/vega ratio strongly support the core hypothesis of our paper; conservative CEOs are more likely to pay dividends (i.e., have positive net payouts).

The results in Table 8, based on the second dummy variable we derived following Grullon et al., are similar to those in Table 7. In models (2), (3), (4), (8), (9), and (10), *CEO Inside Debt* is positive and significant mostly at the 1% or 5% level. In models (5), (8), (9), (10), the effect of *CEO Delta/Vega Ratio* on payouts is positive and significant at the 1% level, regardless of all other variables included in the regression. *CEO Vega* is initially negative in model (7); however, in

models (8), (9), and (10), it is not significant once all other variables are included in the regression. While the findings regarding CEO tenure, change in assets, profitability, and retained earnings are similar to those in Table 7, our findings regarding CEO age are mostly insignificant.

The third set of regressions is based on Grullon et al.'s alternative definitions, where the dependent variable is one if the value of purchase of common and preferred stock less sale of common and preferred stock is positive, and zero otherwise. While we do not present these results for brevity, they are available upon request. The results show that the effect of most variables, including common variables such as profitability, change in assets, and retained earnings on the propensity of positive net payouts are not statistically significant. Results regarding the effect of CEO risk aversion on the propensity to have a positive net payout are consistent with the central hypothesis of our paper. We find that CEOs whose relative leverage is higher than the firm leverage are more likely to have positive payouts. We also have little evidence showing that firms run by CEOs with high delta are likely to have positive net payout whereas those run by high vega CEOs are less likely to have a positive net payout. The results regarding the return volatility are consistent with the literature; firms with high return volatility are less likely to have a positive net payout. However, results of this final analysis also indicate that firms with high Capex, R&D, or market-to-book ratio are likely to have a positive net payout, which is inconsistent with the literature; therefore, the findings of this model are questionable.

Overall, two out of three alternative definitions that we derived based on Grullon et al. show that firms run by conservative CEOs are more likely to have positive payouts. Conversely, firms that are run by risk-seeking CEOs tend to have negative payouts. These findings support the central hypothesis of our paper.

3.7. Robustness check: CEO risk preferences and dividend increases, initiations, and omissions

In this subsection, we test another possible source of endogeneity. Our original analyses test CEOs' propensity to pay dividends; hence, our examination may be biased because the firm may have or may not have been paying dividends when the CEO took office. A probable solution to this issue is to test the effect of CEO compensation on dividend policy changes (i.e., dividend increases, cuts, initiations, and omissions) during the CEO's tenure. This would ensure that dividend policy decision is affected by the CEO's risk preference and alleviate the aforementioned concerns.

We examine the effect of CEO risk preferences on dividend policy changes in Table 9 and 10. First, we examine dividend increases. In these tests, the dependent variable is set to one if firm *i*'s dividend per share at time *t* is greater than that of time *t*-1, and zero otherwise. In models (2), (3), and (4) of Table 9, the coefficients of inside debt proxies are all positive and significant at no less than the 10% level. Significant at the 1% level, the results of model (4) indicate that managers whose leverage is higher than that of the firms are 79.6% more likely to increase dividends.[26] The results of model (5) regarding the effect of *CEO Delta/Vega Ratio* on the propensity to increase dividends suggest that a one point increase in CEO delta/vega ratio increases the propensity to increase dividends by 1.52%.[27] Conversely, the results of model (7) show that CEOs with convex compensation (i.e., CEOs with high vega) are less likely to increase dividends. Estimation results of model (7) indicate that a $1000 increase in CEO vega decrease the propensity to increase dividends by 2.57%.[28] As before, we estimate the last three models by including all our proxies. We find that inside debt proxies become insignificant when other risk preference variables are

[26] $(e^{0.5857} - 1) \times 100 = 79.6\%$
[27] $(e^{0.0151} - 1) \times 100 = 1.52\%$
[28] $(e^{-0.0261} - 1) \times 100 = 2.57\%$

included to the model. However, the *CEO Delta/Vega Ratio* and *CEO Vega* are still significant at the 1% level and support the central hypothesis of our paper. In addition, *CEO Equity* becomes significant at the 1% level with a positive sign, thus indicating that non-convex equity compensation increases the likelihood of dividend increases.

The control variables in these regressions point out that larger firms and firms with high retained earnings are likely to increase dividends. Conversely, firms that invest in R&D, firms that increase their asset stock, or risky firms are less likely to increase dividends. These findings are consistent with the literature which suggests that small firms, risky firms, and firms with growth opportunities are more likely to retain earnings.

Next we examine the effect of CEO risk preferences on dividend initiations. Note that this is a subsample-based analysis; in this examination, we run logistic regressions among the firms that were non-payers at time *t-1*. Naturally, the dependent variable is set to one if the firm starts paying dividends at time *t*, and zero otherwise. The results of the regression models in Table 10 show that the *CEO Delta/Vega Ratio* and *CEO Vega* are stronger determinants of dividend initiations compared to all other variables, including firm characteristics. We find in model (5) that a one-point increase in CEO delta/vega ratio increases the propensity to initiate dividends by 0.52.[29] In model (7), we find that a $1000 increase in CEO vega decreases the propensity to initiate dividends by 0.71%.[30] The results of models (8), (9), (10) are estimated using all CEO proxies and show that the *CEO Delta/Vega Ratio* is significant, regardless of other variables in the model. In model (9), its economic significance more than triples when the *Log of CEO Relative Leverage* is added to the model; however, *CEO Vega* becomes insignificant. Across the models presented in Table 10, the only statistically significant firm level variable is *Change in Assets*, suggesting that dividend

[29] $(e^{0.0052} - 1) \times 100 = 0.52\%$
[30] $(e^{-0.0072} - 1) \times 100 = -0.71\%$

initiations are mostly determined by the CEO delta/vega ratio, CEO vega, and whether or not the firm increases its outstanding assets.

Finally, we study the effect of CEO risk preferences on the propensity to omit dividends. While we do not present these results for brevity, they are available upon request. In our regressions, we find little evidence showing that CEOs with longer tenure or a higher delta/vega ratio are less likely to omit dividends. However, results regarding the effects of retained earnings and return volatility are consistently significant and stronger in all models. Finally, we examine the effect of CEO risk preferences on the propensity to reduce dividends; we find the only variable that affects the propensity to decrease dividends is the change in assets. However, it is worth pointing out that the analyses on the propensity to omit or reduce dividends are subsample-based analyses and the findings of these analyses may be questionable due to small sample size.

In sum, the results regarding the effect of CEO risk preferences on the propensity to increase or initiate dividends show that CEO risk preferences are strong determinants of dividend increases and initiations. The findings regarding the propensity to omit or reduce dividends are mixed, and the small quantity of statistically significant results indicate that firm characteristics play more of a role in dividend omissions or decreases than CEO risk preferences.

3.8. Robustness check: Using an alternative period characterized by high investor sentiment

To test the sensitivity of our results, we conduct an additional robustness test by replicating our main analysis with a larger sample that contains data from 1995 through 2008. We exclude the period after 2008 due to the recent near-collapse of the financial system, which could have increased CEO risk aversion, causing higher sensitivity to pay dividends.[31] Further, this section

[31] This was not possible in the original dataset, since the period from 2009 to 2011 accounts for half of the entire dataset.

examines whether our results remain robust over a period that is characterized by high investor optimism (Baker and Wurgler, 2004). Thus, in this section we examine whether our findings are robust to market conditions and are not sample specific. However, in this section, the effect of inside debt on dividend policy is not analyzed, but we investigate the effect of stock option values, deltas, and vegas, using the approximation method of Core and Guay (2002) instead of the full information method, on dividend policy. This is because detailed information on stock option tranches and inside debt data have only been available since 2006.

Table 2 Part B presents the descriptive statistics of this dataset, showing that *CEO Vega* is higher while *CEO Delta/Vega Ratio* is smaller among non-paying firms,[32] dividend-paying firms are managed by older CEOs or CEOs with longer tenure, and dividend-paying firms are larger and have fewer growth opportunities (e.g., a smaller *Market/Book Ratio* or higher *Sales*). These results are in line with our prior findings that risk-seeking (risk-averse) CEOs have a lower (higher) propensity to pay dividends.

Using this extended dataset, we re-run logistic regressions, testing the effect of CEO risk preferences on the propensity to pay dividends, and report the results in Table 11. While in model (1) we find that *CEO Cash Compensation* does not significantly affect dividend policy, in model (2) the coefficient of *CEO Delta/Vega Ratio* is 0.0018 indicating that a one-point increase in the delta/vega ratio increases the propensity to pay dividends by 0.18%.[33] However, this finding is less significant compared to our previous results. Further, the results in models (3) and (4) indicate that a $1 million increase in equity compensation or a $1000 increase in vega decreases the propensity

[32] According to the descriptive statistics, there are two main differences between the original dataset and the larger dataset. First, in the smaller set, the change in assets is significantly higher in the subsample of non-paying firms. Second, in the large dataset, there is no statistically significant difference between non-payers and payers in terms of firm size (i.e., market equity).

[33] $(e^{0.0018} - 1) \times 100 = 0.18\%$

to pay dividends by 0.31% or 2.98%, since the coefficients of *CEO Equity* and *CEO Vega* are -0.0031 and -0.0303, respectively.[34] Estimated by using all proxies, model (5) shows that vega significantly decreases the propensity to pay dividends. Similar to the previous findings, the sign of *CEO Equity* becomes positive in this model,[35] implying that high equity compensation increases managerial conservatism and thus dividend payout when not convex, i.e., when the model includes vega as a control variable (see Lambert, Larcker, and Verrecchia, 1991).

In sum, these logistic regressions further support our hypothesis that CEO compensation is a determinant of dividend policy and, in particular, convex pay packages decrease the propensity to pay dividends. While the coefficients of *CEO Equity* and *CEO Vega* are smaller than those in previous findings, the results are still significant at the 1% level and confirm our prior findings. Therefore, we still find evidence showing that CEO risk preferences play a role in dividend policy in a period of high market sentiment[36].

3.9. Robustness check: Market's preference for dividends

The catering theory of Baker and Wurgler (2004, pg. 1160) suggests that "managers give investors what they currently want." In the case of dividends, the theory predicts the majority of firms decide to pay dividends when dividend paying firms trade at a premium (i.e., when the market prefers dividends over capital gains)[37]. Thus far, we find that risk-seeking managers are less

[34] $(e^{-0.0023} - 1) \times 100 = -0.22\%$ and $(e^{-0.034} - 1) \times 100 = -3.34\%$

[35] We observe the same in Tables 4 and 5.

[36] We employ the same endogeneity test as before based on Shen and Zhang (2012) to check the robustness of these findings in the larger dataset. We find that the results are still consistent with the central hypothesis of the current method. While we do not present the results for brevity, they are available upon request.

[37] Baker and Wurgler (2004) test this theory with the following model (pg. 1148):

$$Initiate_t = a + bP_{t-1}^{D-ND} + c\,\frac{M}{B_{t-1}} + d\,\frac{D}{P_{t-1}} + e\,Tax_{t-1} + fYear_{t-1} + u_t.$$

In this model, P^{D-ND} is the dividend premium, which is the log of the average market-to-book ratio of dividend paying firms (P^D) less that of the non-paying firms (P^{ND}). M/B is the average market-to-book ratio of non-paying firms, and $\frac{D}{P}$

likely to pay dividends. However, according to Baker and Wurgler (2004), the disappearance of dividends is due to the market's preference. Hence, it is necessary to run this final analysis to investigate whether our findings still hold after controlling for the market's preference for dividends. We do so by introducing the *Relative Dividend Premium (RDP)* variable in our baseline regression, which, in the spirit of Baker and Wurgler (2004), is defined as the value-weighted average of dividend paying firms' market-to-book ratio minus the market-to-book ratio of firm *i* at time *t*. Formally, we estimate the following model:

$$Logit(Pay) = a + b\ RDP_{i,t} + c\ Firm_{i,t} + d\ CEO_{i,t} + e\ Fixed_t + v_t$$

In this model, *RDP* is the relative dividend premium as defined above; *Firm* is a set of firm-level control variables; *CEO* is the set of CEO compensation variables that are used throughout the current study; and *Fixed* is a set of binary variables based on year and two-digit industry codes. Similar to the previous section, we conduct this test for the 1995 to 2008 period. Consistent with the catering theory, *RDP* is expected to have a positive impact on the propensity to pay dividends. If our findings continue to show that *CEO Delta/Vega Ratio* or *CEO Vega* exert a significant effect on the propensity to pay dividends, even after we include the *RDP* in the estimation model, they would indicate that they are not sensitive to specific market conditions.

Table 12 presents the logistic regression results. The first regression model, in accord with the prediction of catering theory, shows that the coefficient of *Relative Dividend Premium* is positive and significant at the 1% level. In economic terms, a one point increase in dividend paying

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is the dividend yield, *Tax* is the ratio of after-tax returns from dividends to that from capital gains ($\frac{1-Tax_{dividend}}{1-Tax_{capital\ gains}}$), and finally *Year* is the calendar year. The theory predicts the coefficient of the dividend premium b to be positive suggesting that when the market prefers dividends (i.e., when the dividend premium is high), the propensity to pay dividends should be higher. This prediction is supported empirically in Baker and Wurgler (2004).

firms market-to-book ratio relative to that of the firm *i*, increases the propensity of firm *i* to pay dividends by 40 times[38].

In the next four regression models, we examine the significance of the CEO risk preference variables when *RDP* enters the model. While we do not find a relationship between *CEO Cash Compensation* and the propensity to pay dividends in Model (2), the coefficient of the *CEO Delta/Vega Ratio*, in Model (3), indicates that it has a positive standalone effect on the propensity to pay. Significant at the 5% level, this finding aligns with the central hypothesis of this study suggesting that conservative managers are more likely to pay dividends compared to others. The results in models (4) and (5) are also in line with the central hypothesis of the current paper and stronger compared to those in Model (3). The results of models (4) and (5) suggest that higher equity compensation or convex compensation leads to a lower propensity to pay dividends.

The sixth model is estimated with all the CEO risk preference variables; similar to our previous findings, the sign of the *CEO Equity* changes to positive and both *CEO Equity* and *CEO Vega* are highly significant. This consistently suggests that convex equity compensation decreases the propensity to pay dividends whereas non-convex equity compensation leads to risk-aversion (see Lambert, Larcker, and Verrecchia, 1991) and as a result increases the propensity to pay dividends. In economic terms, we find that a $1 million increase in *CEO Equity* compensation increases the likelihood of the propensity to pay dividends by 0.32%, whereas a $1 thousand increase in *CEO Vega* decrease the propensity to pay dividends by 3.32%, even after controlling for the market's preferences for dividends[39]. These findings provide incremental support to our argument that risk-seeking managers are less likely to pay dividends. More important, this examination shows that our findings are robust to the market conditions.

[38] $(e^{3.7348} - 1) \times 100 = 4087.96\%$
[39] $(e^{0.0032} - 1) \times 100 = 0.32\%$ and $(e^{-0.0338} - 1) \times 100 = -3.32\%$

4. Conclusion

This study examines whether risk aversion-inducing CEO compensation motivates managers to pay more dividends regardless of investor preferences. Using inside debt (i.e., pensions and deferred compensation) and the sensitivity of CEO equity compensation to stock price changes (i.e., high CEO delta), as proxies of CEO risk aversion, we document that inside debt induces CEOs to pay dividends while CEOs with convex compensations decrease dividend payout.

Our tests are performed using two data samples, from 2006 through 2011 and from 1995 through 2008. We use the former as the main dataset, since it includes inside debt, and we use the latter for increased robustness. Confirming our predictions, our results show that high inside debt (i.e., pension and deferred compensation) and CEO delta increase the propensity to pay dividends, whereas convex compensation (i.e., vega) decreases payouts. This implies that risk-averse/risk-seeking CEOs are more/less likely to pay dividends. We end our empirical analysis by examining how the market's preference affects the dividend policy of firms run by risk-averse and risk-seeking managers. Consistent with our main findings, we find that risk-seeking managers are less likely to pay dividends even when the market has a preference for dividends.

References

Allen, F., Michaely R., 2003. Payout policy, *Handbook of the Economics of Finance* 1, 337–429.

Baker, M., Nagel, S., and Wurgler, J., 2006, The effect of dividends on consumption, *National Bureau of Economic Research Working Paper Series* No. 12288.

Baker, M., and Wurgler, J., 2004, A catering theory of dividends, *Journal of Finance* 59, 1125–1166.

Berger, P. G., Ofek E., and Yermack, D. L., 1997, Managerial entrenchment and capital structure decisions, *Journal of Finance* 52, 1411–1438.

Black, F., and Scholes, M., 1973, The pricing of options and corporate liabilities, *Journal of Political Economy* 81, 637–654.

Breuer, W., Rieger, M. O., and Soypak, K. C., 2012, The behavioral foundations of corporate dividend policy. A cross-country empirical analysis, Working paper, http://ssrn.com/abstract=1804265.

Cassell, C. A., Huang, S. X., Sanchez, J. M., and Stuart, M. D., 2012, Seeking safety: The relation between CEO inside debt holdings and the riskiness of firm investment and financial policies, *Journal of Financial Economics* 103, 588–610.

Chen, F., Dou, Y., and Wang, X., 2011, Executive inside debt holdings and creditors' demand for pricing and non-pricing protections, Working paper, http://www-2.rotman.utoronto.ca/userfiles/departments/accounting/File/inside%20debt%20contracting%200930.pdf.

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

Core, J. E., Guay, W., and Larcker, D. F., 2003, Executive equity compensation and incentives: A survey, *Economic Policy Review* 9, 27–50.

Core, J., and Guay, W., 1999, The use of equity grants to manage optimal equity incentive levels, *Journal of Accounting and Economics* 28, 151–184.

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

DeAngelo, H., and DeAngelo, L., 2006, The irrelevance of the mm dividend irrelevance theorem, *Journal of Financial Economics* 79, 293–315.

DeAngelo, H., DeAngelo, L., and Stulz, R. M., 2006, Dividend policy and the earned/contributed capital mix: A test of the life-cycle theory, *Journal of Financial Economics* 81, 227–254.

Deshmukh, S., Goel, A. M., and Howe, K. M., 2009, CEO overconfidence and dividend policy, Working paper, Federal Reserve Bank of Chicago.

Edmans, A., and Liu, Q., 2011, Inside debt, *Review of Finance* 15, 75–102.

Fama, E. F., and French, K. R., 2001, Disappearing dividends: Changing firm characteristics or lower propensity to pay? *Journal of Financial Economics* 60, 3–43.

Graham, B., and Dodd, D. L. F., 1951. *Security Analysis* (McGraw-Hill, New York).

Grullon, G., Paye B., Underwood, S., and Weston, J. P., 2011, Has the Propensity to Pay Out Declined?, *Journal of Financial and Quantitative Analysis* 46, 1–24.

Grullon, G., Michaely, R., and Swaminathan, B., 2002, Are dividend changes a sign of firm maturity? *Journal of Business* 75, 387–424.

Guay, W. R., 1999, The sensitivity of CEO wealth to equity risk: An analysis of the magnitude and determinants, *Journal of Financial Economics* 53, 43–71.

Hagendorff, J., and Vallascas, F., 2011, CEO pay incentives and risk-taking: Evidence from bank acquisitions, *Journal of Corporate Finance* 17, 1078–1095.

Handjinicolaou, G., and Kalay, A., 1984, Wealth Redistributions of Changes in Firm Value - An Analysis of Returns to Bondholders and Stockholders around Dividend Announcements, *Journal of Financial Economics* 13, 35–63.

Hoberg, G., and Prabhala, N. R., 2009, Disappearing dividends, catering, and risk, *Review of Financial Studies* 22, 79–116.

Jensen, M. C., 1986, Agency costs of free cash flow, corporate finance, and takeovers, *American Economic Review* 76, 323–329.

Jensen, M. C., and Meckling, W. H., 1976, Theory of the firm: Managerial behavior, agency costs and ownership structure, *Journal of Financial Economics* 3, 305–360.

Kahneman, D., and Tversky, A. 1979, Prospect theory: An analysis of decision under risk, *Econometrica* 47, 263–292.

Kalay, A., 1982, Stockholder-bondholder conflict and dividend constraints, *Journal of Financial Economics* 10, 211–233.

Kempf, A., Ruenzi, S., and Thiele, T., 2009, Employment risk, compensation incentives, and managerial risk taking: Evidence from the mutual fund industry, *Journal of Financial Economics* 92, 92–108.

Knopf, J. D., Nam, J., and Thornton, Jr., J. H., 2002, The volatility and price sensitivities of managerial stock option portfolios and corporate hedging, *Journal of Finance* 57, 801–813.

Lambert, R. A., Larcker, D. F., and Verrecchia, R. E., 1991, Portfolio considerations in valuing executive compensation, *Journal of Accounting Research* 29, 129–149.

Lewellen, W., Loderer, C. and Martin, K. 1987, Executive compensation and executive incentive problems: An empirical analysis, *Journal of Accounting and Economics* 9, 287–310.

Low, A., 2009, Managerial risk-taking behavior and equity-based compensation, *Journal of Financial Economics* 92, 470–490.

Merton, R. C., 1973, Theory of rational option pricing, *Bell Journal of Economics* 4, 141–183.

Miller, M. H., and Modigliani, F., 1961, Dividend policy, growth, and the valuation of shares, *Journal of Business* 34, 411–433.

Nam, J., Ottoo, Richard E., and Thornton, Jr., J. H., 2003, The effect of managerial incentives to bear risk on corporate capital structure and R&D investment, *Financial Review* 38, 77–101.

Redding, L. S., 1998, Can risk aversion explain the demand for dividends? Working paper, http://dspace.gla.ac.uk/handle/1905/555.

Rozeff, M. S., 1982, Growth, beta and agency costs as determinants of dividend payout ratios, *Journal of Financial Research* 5, 249–259.

Serfling, M. A., 2014, CEO age and the riskiness of corporate policies, *Journal of Corporate Finance* 25, 251–273.

Shefrin, H. M., and Statman, M., 1984, The disposition to sell winners too early and ride losers too long: Theory and evidence, *Journal of Finance* 40, 777–790.

Shefrin, H. M., and Thaler, R. H., 1988, The behavioral life-cycle hypothesis, *Economic inquiry* 26, 609–643.

Shen, C. H., and Zhang, H., 2013, CEO risk incentives and firm performance following R&D increases, *Journal of Banking & Finance* 37, 1176–1194.

Smith, C. W., and Stulz, R M., 1985, The determinants of firms' hedging policies, *Journal of Financial and Quantitative Analysis* 20, 391–405.

Sundaram, R. K., and Yermack, D. L., 2007, Pay me later: Inside debt and its role in managerial compensation, *Journal of Finance* 62, 1551–1588.

Tufano, P., 1996, Who manages risk? An empirical examination of risk management practices in the gold mining industry, *Journal of Finance* 51, 1097–1137.

White, R. S., Three Essays on Inside Debt (2012). Doctoral Dissertations. Paper 5.

http://digitalcommons.uconn.edu/dissertations/5

Appendix A. Company Variables

This Appendix presents company variables in *italics*. Variables are listed in the alphabetical order and Compustat Mnemonics are given in parentheses.

- *Book Equity* = *Shareholder Equity* – *Preferred Stock* + Balance Sheet Deferred Taxes and Investment Tax Credits (TXDITC);
- *Capex/Total Assets Ratio* = Capital Expenditures (CAPX)/Assets (AT);
- *Daily Excess Return* (e) is estimated using the market model in the 36-month period before $t = 0$ $r - r_f = a + \beta\,(r_m - r_f) + e$, where r is daily stock return, r_m is daily market return, r_f is daily risk–free rate. Market return and daily risk-free is obtained from Kenneth French's website (see footnote 9);
- *Debt/Equity* = Liabilities (LT) / *Market Equity*;
- *Dividend Yield* = Dividend per Share by ExDate (DVPSX)/Stock Price (PRCCF);
- *Dividend Payout Ratio* = Total dividends [Dividend per Share by ExDate (DVPSX) * Shares Outstanding (CSHO)]/*Earnings Available for Common*;
- *Earnings Available for Common* = Earnings before Extraordinary Items (IB) – Preferred Dividends (DVP) + Income Statement Deferred Taxes (TXDITC);
- *Idiosyncratic Risk* is the standard deviation of *Daily Excess Returns* over the period of t= -36 to t=-1;
- *Market/Book Ratio* = *Market Equity/Book Equity*;
- *Market Equity* = Stock Price (PRCCF) * Shares Outstanding (CSHO);

- *Net payout (1):* Total dividends [Dividend per Share by ExDate (DVPSX) * Shares Outstanding (CSHO)] - *Value of Stocks that are Bought Back*;
- *Net payout (2):* Total dividend payouts [Dividend per Share by ExDate (DVPSX) * Shares Outstanding (CSHO)] + the change in the value of treasury stock [or Purchase of Common and Preferred Stock (PRSTKC) - Sale of Common and Preferred Stock (SSTK)];
- *Net payout (3):* Purchase of Common and Preferred Stock (PRSTKC) - Sale of Common and Preferred Stock (SSTK);
- *Preferred Stock* = Preferred Stock Liquidating Value (PSTKL) [or Preferred Stock Redemption Value (PSTKRV), or Preferred Stock Par Value (PSTK)];
- *R&D/Total Assets Ratio* = R&D Expense (XRD)/Assets (AT);
- *Relative Dividend Premium* = Value-weighted average *Market/Book Ratio* of dividend paying firms less the *Market/Book Ratio* of firm *i;*
- *Retained Earnings/Total Assets Ratio*= Retained Earnings (RE) / Total Assets (AT);
- *Return volatility* = Standard deviation of daily stock returns: $\sqrt{\frac{\sum_{t=-255}^{-1}(r_t-\bar{r})^2}{254}}$, where r_t is the daily stock return of firm *i,* which is collected from CRSP with mnemonic *RETX.*
- *Shareholder Equity* = Shareholders' Equity (SEQ) [or Common Equity (CEQ) + Preferred Stock Par Value (PSTK) or Assets (AT) – Liabilities (LT)];
- *Firm Size* = the percentage of firms with smaller Market Equity at time *t;*
- *Value of Stocks that are Bought Back* = (Number of shares outstanding time *t* – Number of shares outstanding time *t-1*) * ((Share price time *t* + Share price time *t-1*)/2). Number of shares outstanding and share price are collected from CRSP with mnemonics *CRSP_ADJ_SHR and CRSP_ADJ_PRC,* respectively;

Appendix B. Derived CEO Variables

In this study, we derive CEO stock option values, deltas, and vegas twice: One for the 2006 through 2011 period, which is the main data set since it includes CEO inside debt and one for 1995 through 2008 period. For the 2006 through 2011 period, we derive CEO stock option values, deltas, and vegas separately for each tranche and aggregate them to find the sum of those of the CEO stock option portfolio. For the 1995 through 2012 period, we use Core and Guay's (1999) approximation method (see footnote 7 for details). In our derivation we use the Black–Scholes (1973) option pricing model as modified by Merton (1973) following Core and Guay (1999) and Guay (1999).

In this Appendix, we first present how we derive CEO stock option values, deltas, and vegas and then we define other variables. As before, we italicize the variables we derive and we provide Compustat Mnemonics in parentheses.

The Black-Scholes model requires the following variables to estimate CEO stock option values and "greeks":

· d = natural logarithm of the expected dividend yield over the life of the option: $\ln\left(1 + \left(\sum_{t=-3}^{-1} D_t \div 3\right)\right)$, where the dividend yield at year t is D_t (DVYDF);

· r = Risk-Free Rate: $\text{Ln}(1 + R_f)$, where R_f is Three-Month U.S. Treasury Bills which is obtained from the website of the U.S. Department of the Treasury (see footnote 10);

· S_t = Stock Price at time t (PRCCF);

· σ = Expected Stock Return Volatility Over the Life of the Option: Annualized monthly return (r) volatility over the past 60 months which equals $\left(\sqrt{\frac{\sum_{t=-60}^{-1}(r_t - \bar{r})^2}{59}}\right) * \sqrt{12}$, where $r = \ln(S_t/S_{t-1})$;

- N = Cumulative Probability Function for the Normal Distribution;
- N' = Normal Density Function;
- T= Time Until the Maturity of the Option;
- X = Strike Price (EXPRIC);
- $Z = \left[\ln\left(\frac{S}{X}\right) + T\left(r - d + \frac{\sigma^2}{2}\right)\right] / \sigma T^{(1/2)}$.

Using these variables, we derive CEO stock option values, deltas, and vegas as follows:

- $Delta = \frac{\partial V}{\partial S} = e^{-dt} N(Z) * (S/100)$;
- $Value = S\, e^{-dt} N(Z) - X\, e^{-rT} N(Z - \sigma T^{(1/2)})$;
- $Vega = \frac{\partial V}{\partial \sigma} = e^{-dt} N'(Z) S T^{(1/2)} * (0.01)$.

We list the other CEO variables in alphabetical order as follows:

- *CEO Inside debt* = Total Aggregate Balance in Deferred Compensation Plans at Fiscal Year (DEFER_BALANCE_TOT) + Present Value of Accumulated Pension Benefits from All Pension Plans (PENSION_VALUE_TOT);
- *CEO Unvested Stock Value* = Stock Price (PRCCF) * Restricted Stock Holdings (STOCK_UNVEST_NUM);
- *CEO Common Stock Value* = Stock Price (PRCCF) * Shares Owned (SHROWN_EXCL_OPTS);
- *CEO Equity Holdings = CEO Common Stock Value + CEO Unvested Stock Value + CEO Stock Options Value*;
- *CEO Cash Compensation* = Salary (SALARY) + Bonus (BONUS);
- *CEO Leverage = CEO Inside Debt /CEO Equity Holdings*;
- *CEO Relative Leverage = CEO Leverage/[Debt/Equity]*;

· *High CEO Relative Leverage* is a dummy variable = one if *CEO Relative Leverage* > *[Debt/Equity],* and zero otherwise.

Table 1. Sample distribution

This table presents the sample distribution by year and industry. Panel A shows the breakdown of the sample observations by year and Panel B by two-digit Standard Industrial Classification (SIC) industry codes.

	Main		Robustness	
	2006-2011		1995-2008	
YEAR	**N**	**%**	**N**	**%**
1996	-	-	219	5.62%
1997	-	-	228	5.85%
1998	-	-	240	6.16%
1999	-	-	270	6.93%
2000	-	-	290	7.45%
2001	-	-	304	7.80%
2002	-	-	316	8.11%
2003	-	-	313	8.04%
2004	-	-	315	8.09%
2005	-	-	303	7.78%
2006	246	11.62	299	7.68%
2007	377	17.81	366	9.40%
2008	393	18.56	432	11.09%
2009	401	18.94	-	-
2010	376	17.76	-	-
2011	324	15.30	-	-
Total observations	2117	100%	3895	100%

Table 2. Descriptive statistics

Part A. Descriptive statistics in the 2006 through 2011 period

This table presents descriptive statistics for Non-Payers and Payers separately in Panel A and Panel B. The *t*-values of a *t*-test for the difference in sample means (non-payers less payers) are presented in parentheses. The superscripts ***, **, and * indicate significance at 1%, 5%, and 10%, respectively. Company and CEO variable definitions are explained in detail in Appendix A and B, respectively.

	Non-Payers (NP)						Payers (P)						NP-P
	N	*MEAN*	*Q1*	*MEDIAN*	*Q3*	*STD*	*N*	*MEAN*	*Q1*	*MEDIAN*	*Q3*	*STD*	*t-value*
CEO Cash Comp. ($ million)	1453	0.617	0.425	0.529	0.7	0.439	664	0.7	0.492	0.603	0.768	0.506	(-3.8801)***
CEO Delta/Vega Ratio	1453	8.753	1.703	3.141	6.939	36.561	664	57.317	16.841	39.52	75.897	69.167	(-21.086)***
CEO Equity ($ million)	1453	25.854	4.187	9.8	23.137	56.263	664	20.923	2.622	5.862	14.872	50.8	(1.9277)*
CEO Vega ($ thousand)	1453	59.477	16.148	35.787	72.874	75.195	664	9.807	0.594	1.583	8.055	27.701	(16.5152)***
CEO Age	1453	54.311	49	54	60	7.865	664	55.572	51	55	60	6.754	(-3.5735)***
CEO Tenure	1453	4.966	2	4	6	3.652	664	5.94	3	5	8	4.229	(-5.4126)***
Log of CEO Relative Leverage	416	-1.588	-2.611	-1.513	-0.497	1.819	418	-0.587	-1.671	-0.594	0.343	2.835	(-6.0639)***
CEO Inside Debt ($ million)	1453	0.559	0	0	0.136	2.458	664	1.495	0	0.341	1.653	2.788	(-7.7893)***
Capex/Total Assets	1453	4.799	1.481	2.788	5.586	6.177	664	4.732	2.101	3.515	6.244	3.805	-0.2582
Change in Assets (%)	1453	0.091	-0.032	0.075	0.19	0.249	664	0.049	-0.023	0.038	0.107	0.317	(3.29)***
Dividend Yield	1453	-	-	-	-	-	664	0.025	0.009	0.015	0.027	0.072	-
Market Equity ($ million)	1453	665.339	235.418	482.922	859.99	700.281	664	765.345	369.661	596.091	977.563	586.479	(-3.2022)***
Market/Book	1453	2.152	1.207	1.718	2.576	1.593	664	2.025	1.217	1.639	2.357	1.287	(1.8086)*
Profitability ($ thousand)	1453	20.765	0.009	20.682	48.58	68.224	664	44.019	18.15	38.434	72.029	60.128	(-7.5454)***
Payout Ratio	1453	-	-	-	-	-	664	0.386	0.091	0.201	0.373	2.926	-
R&D/Total Assets	1453	6.459	0	3.401	9.462	9.435	664	2.298	0	0	3.145	4.033	(10.9165)***
Retained Earnings/Total Assets	1453	-0.348	-0.377	0.129	0.372	2.055	664	0.408	0.258	0.439	0.605	0.437	(-9.3796)***
Return Volatility	1453	29.123	2.63	3.354	4.303	265.979	664	3.11	2.271	2.818	3.627	1.217	(2.5199)**
Sale ($ thousand)	1324	361.701	164.687	309.956	531.356	245.367	501	539.23	332.703	542.896	740.475	239.71	(-13.8808)***
Debt/Equity	1442	0.616	0.109	0.229	0.543	2.026	664	0.612	0.151	0.312	0.61	2.116	-0.0363
Free Cash Flow/Total Assets	1442	-0.297	-0.422	-0.234	-0.087	0.356	664	-0.303	-0.445	-0.277	-0.135	0.23	-0.3601
Idiosyncratic Risk	1424	0.033	0.025	0.03	0.038	0.013	654	0.025	0.02	0.024	0.028	0.007	(15.1927)***
Net Payout (1)	1332	7.313	-3.619	-0.289	6.657	54.869	639	30.984	4.356	13.543	35.245	53.059	(-9.0607)***
Net Payout (2)	1452	-20.837	-18.265	-3.449	1.219	195.721	664	29.847	-0.227	7.662	27.161	124.784	(-6.1274)***
Net Payout (3)	1450	7.719	0	0	0.232	43.615	664	22.289	5.019	10.825	24.533	47.543	(-6.9275)***

Part B. Descriptive statistics in the 1995 though 2008 period

This table presents descriptive statistics for Non-Payers and Payers separately in Panel A and Panel B. The *t*-values of a *t*-test for the difference in sample means (non-payers – payers) are presented in parentheses. Company and CEO variable definitions are explained in detail in Appendix A and B, respectively.

	Non-Payers (NP)						Payers (P)						NP-P
	N	*MEAN*	*Q1*	*MEDIAN*	*Q3*	*STD*	*N*	*MEAN*	*Q1*	*MEDIAN*	*Q3*	*STD*	*t-value*
CEO Cash Comp. ($ million)	2371	0.723	0.424	0.575	0.855	0.53	1524	0.839	0.496	0.702	1	0.56	(-6.5612)***
CEO Delta/Vega Ratio	2371	21.886	2.557	5.779	16.403	287.23	1524	54.706	20.968	40.407	74.125	54.07	(-4.4106)***
CEO Equity ($ million)	2371	34.802	3.699	10.855	30.06	80.81	1524	27.989	1.499	4.962	16.246	72.59	(2.6709)***
CEO Vega ($ thousand)	2371	61.577	4.503	22.708	58.539	193.57	1524	9.537	0.367	1.318	6.354	25.14	(10.4381)***
CEO Age	2371	54.544	49	54	60	8.2	1524	57.168	51	57	62	8.48	(-9.6133)***
CEO Tenure	2371	4.558	2	4	6	3.01	1524	5.042	3	4	7	3.2	(-4.7782)***
Capex/Total Assets	2371	6.45	2.073	4.218	8.192	6.82	1524	6.034	2.656	4.499	7.571	6.03	(1.945)*
Change in Assets (%)	2371	-0.001	-0.093	0.061	0.19	0.58	1524	0.023	-0.031	0.048	0.13	0.42	(-1.3797)
Dividend Yield	2371	-	-	-	-	-	1524	0.023	0.007	0.014	0.024	0.09	-
Market Equity ($ million)	2371	829.102	276.778	557.391	993.207	1103.11	1524	794.823	344.391	589.017	985.177	735.16	-1.07
Market/Book	2371	2.505	1.303	1.873	2.895	2.37	1524	2.025	1.26	1.619	2.259	1.34	(7.216)***
Profitability ($ thousand)	2371	22.289	0.624	24.896	50.959	66.94	1524	53.019	22.078	44.329	79.099	47.88	(-15.5474)***
Payout Ratio	2371	-	-	-	-	-	1524	0.434	0.085	0.169	0.322	3.95	-
R&D/Total Assets	2371	6.208	0	1.579	8.597	12.27	1524	1.701	0	0	2.094	3.38	(14.0014)***
Retained Earnings/Total Assets	2371	-0.183	-0.07	0.201	0.395	1.68	1524	0.458	0.29	0.438	0.633	0.28	(-14.7288)***
Return Volatility	2371	16.759	2.582	3.292	4.432	194.93	1524	5.275	1.968	2.403	3.101	87.67	(2.1634)**
Sale ($ thousand)	2098	372.943	176.69	325.698	543.031	251.07	1122	533.91	329.507	526.797	731.702	242.37	(-17.5438)***
Debt/Equity	2359	0.543	0.103	0.245	0.552	1.25	1520	0.591	0.163	0.344	0.643	1.48	(-1.088)
Free cash flow/Total Assets	2358	-0.332	-0.469	-0.296	-0.111	0.34	1520	-0.314	-0.456	-0.322	-0.148	0.21	(-1.7916)*
Idiosyncratic Risk	2331	0.036	0.027	0.034	0.042	0.01	1508	0.024	0.019	0.023	0.028	0.01	(33.5799)***
Relative Dividend Premium	2371	-0.487	-0.845	0.181	0.714	2.37	1524	-0.000	-0.227	0.400	0.756	1.33	(-7.2983)***
Relative Dividend Premium (VW)	2371	0.359	-0.059	0.977	1.548	2.37	1524	0.856	0.566	1.228	1.615	1.36	(-7.4429)***

Table 3. Correlation coefficients

This table presents the Pearson correlations for the sample observations for all the variables used. *p*-values are presented in parentheses. Company and CEO variable definitions are explained in detail in Appendix A and B, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
1 *CEO Age*															
2 *Capex/Total Assets*	0.0008														
	(0.9702)														
3 *CEO Equity ($ million)*	0.0456	0.1554													
	(0.0361)	(<.0001)													
4 *CEO Vega ($ thousand)*	-0.026	0.0134	0.3452												
	(0.231)	(0.5382)	(<.0001)												
5 *CEO Delta/Vega Ratio*	-0.0272	0.0574	0.123	-0.2146											
	(0.2116)	(0.0082)	(<.0001)	(<.0001)											
6 *Profitability ($ thousand)*	-0.0299	0.1159	0.1591	0.1034	0.1807										
	(0.1691)	(<.0001)	(<.0001)	(<.0001)	(<.0001)										
7 *CEO Inside Debt ($ million)*	0.1028	-0.0235	-0.0073	0.0543	0.0961	0.0899									
	(<.0001)	(0.2806)	(0.7369)	(0.0125)	(<.0001)	(<.0001)									
8 *Idiosyncratic Risk*	0.0045	-0.0725	-0.0217	-0.0656	-0.2247	-0.2046	-0.1292								
	(0.8381)	(0.0009)	(0.3231)	(0.0028)	(<.0001)	(<.0001)	(<.0001)								
9 *Log of CEO Relative Leverage*	0.11	-0.0538	-0.1791	-0.1657	0.1148	0.0456	0.2941	-0.1455							
	(0.0015)	(0.1204)	(<.0001)	(<.0001)	(0.0009)	(0.1886)	(<.0001)	(<.0001)							
10 *Market/Book*	-0.0863	0.081	0.237	0.1526	0.1362	0.1927	-0.0591	0.038	0.0742						
	(0.0001)	(0.0002)	(<.0001)	(<.0001)	(<.0001)	(<.0001)	(0.0066)	(0.0829)	(0.0322)						
11 *Market equity ($ million)*	-0.0975	0.1302	0.3084	0.3144	0.1767	0.4976	0.111	-0.2363	0.0859	0.5028					
	(<.0001)	(<.0001)	(<.0001)	(<.0001)	(<.0001)	(<.0001)	(<.0001)	(<.0001)	(0.0131)	(<.0001)					
12 *Payout Ratio*	0.0399	0.0037	-0.0131	-0.0389	0.0397	0.0112	0.0532	-0.0434	0.0491	0.0027	-0.0035				
	(0.0662)	(0.8642)	(0.5456)	(0.0732)	(0.0681)	(0.6056)	(0.0144)	(0.048)	(0.1567)	(0.9009)	(0.8705)				
13 *Change in Assets (%)*	-0.0559	0.0598	0.1066	0.0833	0.0283	0.2132	-0.0211	0.0542	-0.0133	0.1916	0.1834	-0.0517			
	(0.0102)	(0.0059)	(<.0001)	(0.0001)	(0.1927)	(<.0001)	(0.332)	(0.0135)	(0.7021)	(<.0001)	(<.0001)	(0.0173)			
14 *R&D/Total Assets*	-0.0532	-0.1429	0.0045	0.1604	-0.1443	-0.2077	-0.099	0.1792	0.0244	0.2045	-0.0365	-0.0211	-0.0771		
	(0.0143)	(<.0001)	(0.8355)	(<.0001)	(<.0001)	(<.0001)	(<.0001)	(<.0001)	(0.4816)	(<.0001)	(0.093)	(0.3321)	(0.0004)		
15 *CEO Tenure*	0.3918	-0.0372	0.0976	0.0628	0.0022	-0.013	0.1698	-0.0305	0.0058	-0.1541	-0.0132	0.0394	-0.0917	-0.0224	
	(<.0001)	(0.0866)	(<.0001)	(0.0038)	(0.9177)	(0.55)	(<.0001)	(0.1646)	(0.8666)	(<.0001)	(0.5443)	(0.07)	(<.0001)	(0.3024)	
16 *Dividend Yield*	0.0454	0.0015	-0.0228	-0.0996	0.082	-0.0251	0.0663	-0.0892	0.0569	-0.0252	-0.0316	0.863	-0.0647	-0.066	0.0694
	(0.0368)	(0.9441)	(0.295)	(<.0001)	(0.0002)	(0.2478)	(0.0023)	(<.0001)	(0.1005)	(0.2473)	(0.1455)	(<.0001)	(0.0029)	(0.0024)	(0.0014)

Table 4. CEO risk tolerance and the propensity to pay dividends

This table presents the results of the logistic regression in which the dependent variable equals one if the firm pays dividends at time *t*, and zero otherwise. Presented in parentheses is the square root of the Wald statistic, which is analogous to the *t*-value. The superscripts ***, **, and * indicate significance at 1%, 5%, and 10%, respectively. Company and CEO variable definitions are explained in detail in Appendix A and B, respectively. Models (3) and (9) are estimated with 834 observations and all the others with 2117 observations. All models include industry and year dummies.

	Dependent variable: Equals one if the firm pays dividends at time *t*, and zero otherwise									
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
CEO Cash Comp. ($ million)	0.0782							0.2355	0.0449	0.2612
	(0.6829)							(1.3029)	(0.1371)	(1.5265)
CEO Inside Debt ($ million)		0.0698***						0.0808**		
		(2.8771)						(2.1416)		
Log of CEO Relative Leverage			0.2238***						0.0785	
			(4.4199)						(1.3128)	
CEO Relative Leverage Dummy				1.1987***						0.5127**
				(6.598)						(2.2085)
CEO Delta/Vega Ratio					0.0443***			0.0203***	0.0706***	0.0209***
					(14.6607)			(6.2707)	(8.0559)	(6.4491)
CEO Equity ($ million)						-0.0056***		0.0007	-0.0008	0.0007
						(-3.9659)		(0.3977)	(-0.1574)	(0.3836)
CEO Vega ($ thousand)							-0.0539***	-0.0395***	-0.0186***	-0.0383***
							(-14.6871)	(-9.6505)	(-3.7203)	(-9.386)
CEO Age	0.0006	0	-0.0246*	-0.0034	-0.0017	0.0044	-0.0071	-0.0079	-0.0405**	-0.0078
	(0.0723)	(0.0052)	(-1.7455)	(-0.4116)	(-0.1795)	(0.5397)	(-0.7289)	(-0.7783)	(-2.0188)	(-0.7755)
Log of Tenure	0.2227***	0.1858**	-0.0883	0.204**	0.3285***	0.2656***	0.5793***	0.5186***	0.2609	0.5359***
	(2.7235)	(2.2503)	(-0.7099)	(2.4609)	(3.4601)	(3.1993)	(6.0067)	(5.0908)	(1.5253)	(5.2947)
R&D/Total Assets	-0.0948***	-0.0899***	-0.0786**	-0.0907***	-0.0633***	-0.0922***	-0.0189	-0.0133	0.0329	-0.0174
	(-5.5907)	(-5.3171)	(-2.575)	(-5.3094)	(-3.4861)	(-5.4115)	(-0.9872)	(-0.6776)	(0.7403)	(-0.8831)
R&D Missing Dummy	0.3942***	0.4292***	0.4587**	0.5117***	0.3097**	0.4501***	0.374**	0.4185**	0.6524**	0.4259**
	(2.8557)	(3.0991)	(2.1916)	(3.6289)	(1.9627)	(3.2337)	(2.3367)	(2.48)	(2.2951)	(2.5175)
Capex/Total Assets	-0.0235**	-0.0221*	0.005	-0.0226*	-0.0422***	-0.0182	-0.0099	-0.0223	-0.0101	-0.0236*
	(-1.9979)	(-1.889)	(0.2266)	(-1.9256)	(-3.1034)	(-1.5548)	(-0.7325)	(-1.5587)	(-0.3515)	(-1.6506)
Change in Assets (%)	-1.991***	-1.9532***	-3.1627***	-1.8589***	-1.6788***	-1.9513***	-1.6631***	-1.5591***	-3.8493***	-1.5558***
	(-5.4888)	(-5.3663)	(-5.1703)	(-5.0943)	(-4.2194)	(-5.3517)	(-3.9853)	(-3.5978)	(-4.6171)	(-3.597)
Market/Book	0.0677	.0816	0.1801*	0.0483	-0.0348	0.1086*	0.0125	-0.0076	0.0926	-0.0255
	(1.1754)	(1.4192)	(1.657)	(0.8313)	(-0.5071)	(1.8361)	(0.1759)	(-0.0993)	(0.5657)	(-0.33)
Profitability ($ thousand)	0.0001	0.0001	0.0019	0.0002	-0.0004	0.0003	0.0008	0.0002	0.0021	0.0003
	(0.1144)	(0.1066)	(1.1088)	(0.1312)	(-0.271)	(0.2073)	(0.5195)	(0.1603)	(0.9464)	(0.1675)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Size	0.0032	0.0019	-0.0053	0.0029	-0.004	0.0049	0.0157***	0.0074*	-0.0067	0.0081**
	(1.0231)	(0.609)	(-1.1451)	(0.9343)	(-1.1172)	(1.5583)	(4.2504)	(1.8595)	(-1.0238)	(2.0439)
Retained Earnings/Total Assets	1.6584***	1.6814***	1.3639***	1.5834***	1.3786***	1.71***	1.6236***	1.5374***	0.9516***	1.5015***
	(9.6614)	(9.7279)	(5.3882)	(9.1496)	(7.3603)	(9.8531)	(8.0965)	(7.4961)	(3.0596)	(7.3149)
Return Volatility	-0.2656***	-0.2595***	-0.2626***	-0.243***	-0.1786***	-0.2503***	-0.3302***	-0.2585***	-0.2313**	-0.2477***
	(-4.0412)	(-3.9502)	(-2.8404)	(-3.6612)	(-2.587)	(-3.8097)	(-4.3804)	(-3.3844)	(-2.0154)	(-3.2409)
Intercept	-0.7146	-0.6266	2.2675**	-0.5738	-1.3427**	-1.104**	-0.3507	-0.9181	1.0699	-0.9936
	(-1.3018)	(-1.1402)	(2.4735)	(-1.0326)	(-2.1916)	(-1.9693)	(-0.5441)	(-1.3333)	(0.8676)	(-1.4515)

Table 5. Robustness test: Inside debt and non-linearity

This table presents the results of the logistic regression in which the dependent variable equals one if the firm pays dividends at time *t*, and zero otherwise. Presented in parentheses is the square root of the Wald statistic, which is analogous to the *t*–value. The superscripts ***, **, and * indicate significance at 1%, 5%, and 10%, respectively. Company and CEO variable definitions are explained in detail in Appendix A and B, respectively. Models (3) and (9) are estimated with 834 observations and all the others with 2117 observations. All models include industry and year dummies.

Dependent variable: Equals one if the firm pays dividends at time *t*, and zero otherwise				
	(1)	(2)	(3)	(4)
CEO Cash Comp. ($millions)			0.2222	0.221
			(1.201)	(1.2207)
MID CEO Inside Debt ($millions)	0.9441***		0.615***	
	(6.1466)		(3.1892)	
HIGH CEO Inside Debt ($millions)	1.0094***		0.4695**	
	(6.1008)		(2.1432)	
MID Log of CEO relative lev. dummy		0.747***		0.4086**
		(4.903)		(2.1729)
HIGH Log of CEO relative lev. dummy		1.491***		0.7***
		(9.072)		(3.3512)
CEO Delta/Vega Ratio			0.0199***	0.02***
			(6.1755)	(6.2511)
CEO Equity ($ million)			0.0008	0.0015
			(0.4636)	(0.8149)
CEO Vega ($ thousand)			-0.0384***	-0.0378***
			(-9.5152)	(-9.3535)
CEO Age	0.0008	-0.0005	-0.0062	-0.0064
	(0.0988)	(-0.0553)	(-0.6088)	(-0.6332)
Log of Tenure	0.1339	0.1933**	0.4948***	0.5175***
	(1.5989)	(2.2997)	(4.8051)	(5.095)
R&D/Total Assets	-0.0776***	-0.0806***	-0.0114	-0.0137
	(-4.5435)	(-4.6337)	(-0.5785)	(-0.6906)
R&D Missing Dummy	0.4881***	0.5482***	0.4224**	0.4438***
	(3.458)	(3.8296)	(2.5016)	(2.6123)
Capex/Total Assets	-0.0179	-0.0169	-0.0209	-0.0226
	(-1.5045)	(-1.4305)	(-1.4598)	(-1.5832)
Change in Assets (%)	-1.7864***	-1.6869***	-1.5538***	-1.5013***
	(-4.8592)	(-4.5607)	(-3.5624)	(-3.4472)
Market/Book	0.1322**	0.0818	0.0197	-0.0077
	(2.281)	(1.3898)	(0.2554)	(-0.0997)
Profitability ($ thousand)	0.0002	0.0001	0.0004	0.0003
	(0.1246)	(0.1097)	(0.2935)	(0.2238)
Size	-0.0005	0.0013	0.0067*	0.007*
	(-0.157)	(0.4114)	(1.6629)	(1.7476)
Retained Earnings/Total Assets	1.7007***	1.5822***	1.532***	1.4867***
	(9.6949)	(9.0336)	(7.4157)	(7.2169)
Return Volatility	-0.2697***	-0.2269***	-0.2613***	-0.244***
	(-4.0231)	(-3.4032)	(-3.3869)	(-3.1743)
Intercept	-0.8889	-1.0249*	-1.1331	-1.1516*
	(-1.5766)	(-1.8077)	(-1.628)	(-1.6657)

Table 6. Robustness test: A Robustness test for endogeneity bias in the 2006 though 2011 period

This table presents the results of a robustness test checking for endogeneity bias using logistic regressions, where the dependent variable equals one if the firm pays dividends at time *t* and zero otherwise. Following Shen and Zhang (2012), we deconstruct CEO compensation variables into their "expected" and "excess" components. We estimate all regression models using industry (two-digit SIC codes) and year dummy variables. The square root of the Wald statistic, which is analogous to the *t*-value, is reported in parentheses. The superscripts ***, **, and * indicate significance at 1%, 5%, and 10%, respectively. Company and CEO variable definitions are explained in detail in Appendix A and B, respectively. All models are estimated using 1781 observations.

Dependent variable: Equals one if the firm pays dividends at time *t*, and zero otherwise

	(1)	(2)	(3)	(4)	(5)	(6)
CEO Excess Cash Compensation	0.039					-0.254
	(0.3317)					(-1.2554)
CEO Excess Delta/Vega Ratio		-0.0003				-0.0003
		(-0.5867)				(-0.874)
CEO Excess Inside Debt			0.0417*			0.1338**
			(1.717)			(2.5423)
CEO Excess Equity				-0.0064***		0.0053***
				(-3.5544)		(2.7332)
CEO Excess Vega					-0.0446***	-0.0477***
					(-13.0908)	(-12.9304)
CEO Age	-0.0131	-0.0128	-0.0129	-0.0109	0.0029	0.0012
	(-1.4342)	(-1.4068)	(-1.4159)	(-1.1762)	(0.2656)	(0.1118)
Capex/Total Assets	-0.0218*	-0.0218*	-0.0209	-0.0165	0.0027	-0.0005
	(-1.6518)	(-1.6513)	(-1.5876)	(-1.2442)	(0.1862)	(-0.0347)
Log of Tenure	0.3775***	0.3763***	0.3714***	0.3692***	0.1121	0.1167
	(3.9161)	(3.9063)	(3.8563)	(3.7907)	(1.0048)	(1.0407)
R&D/Total Assets	-0.1007***	-0.1003***	-0.099***	-0.0957***	-0.0259	-0.025
	(-5.3696)	(-5.3532)	(-5.283)	(-5.0772)	(-1.2619)	(-1.1994)
R&D Missing Dummy	0.4508***	0.4525***	0.4615***	0.4787***	0.3402*	0.3294*
	(2.7904)	(2.8007)	(2.8555)	(2.9435)	(1.8894)	(1.8146)
Change in Assets (%)	-1.7681***	-1.771***	-1.7817***	-1.7852***	-1.6225***	-1.5952***
	(-4.3546)	(-4.3624)	(-4.3841)	(-4.347)	(-3.4077)	(-3.3654)
Market/Book	0.2482***	0.2495***	0.2517***	0.2397***	-0.0252	-0.018
	(3.8275)	(3.8496)	(3.8826)	(3.6059)	(-0.3056)	(-0.223)
Profitability ($ thousand)	0.0033*	0.0033*	0.0035**	0.0038**	0.0043**	0.0041**
	(1.9367)	(1.9493)	(2.0018)	(2.1762)	(2.1244)	(1.9932)
Size	-0.0036	-0.0037	-0.004	-0.0031	-0.0021	-0.0035
	(-0.9732)	(-0.9871)	(-1.0853)	(-0.8291)	(-0.4893)	(-0.7993)
Retained Earnings/Total Assets	1.9203***	1.9194***	1.937***	1.9324***	1.5926***	1.5678***
	(9.6089)	(9.6027)	(9.6481)	(9.6316)	(7.2213)	(7.003)
Return volatility	-0.2205***	-0.2198***	-0.2152***	-0.2063***	-0.2703***	-0.2749***
	(-2.9479)	(-2.9416)	(-2.8738)	(-2.7489)	(-3.2076)	(-3.2301)
Intercept	-0.6102	-0.6343	-0.6315	-0.8686	-1.1922*	-1.0888
	(-0.9968)	(-1.036)	(-1.0311)	(-1.3969)	(-1.7027)	(-1.5421)

Table 7. Robustness test: First alternative definition of net payouts

This table presents the results of the logistic regression in which the dependent variable is equal to one if the value of total dividend payouts is greater than the value of stocks that are bought; otherwise, the variable is set to zer0. We estimate all regression models using industry (two-digit SIC codes) and year dummy variables. The square root of the Wald statistic, which is analogous to the *t*-value, is reported in parentheses. The superscripts ***, **, and * indicate significance at 1%, 5%, and 10%, respectively. Models (3) and (9) are estimated with 788 observations and all the others with 1971 observations. All models include industry and year dummies.

Dependent variable: Equals one if the value of total dividend payouts greater than the value of stocks that are bought at time *t*, and zero otherwise

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
CEO Cash Comp. ($ million)	-0.0553							-0.1632	0.1825	-0.138
	(-0.4723)							(-1.2895)	(0.6384)	(-1.1197)
CEO Inside Debt ($ million)		0.1441***						0.1017***		
		(3.8615)						(2.8682)		
Log of CEO Relative Leverage			0.0812						0.0625	
			(1.6265)						(1.4184)	
CEO Relative Leverage Dummy				0.9677***						0.8243***
				(4.569)						(3.7168)
CEO Delta/Vega Ratio					0.0167***			0.0178***	0.0378***	0.0183***
					(7.2962)			(6.8397)	(6.6658)	(7.0222)
CEO Equity ($ million)						0.0001		-0.0013	0.0016	-0.0012
						(0.1117)		(-1.2316)	(0.5447)	(-1.1069)
CEO Vega ($ thousand)							-0.0014*	0.0017*	0.0023	0.0023**
							(-1.6853)	(1.6867)	(1.2456)	(2.2449)
CEO Age	-0.0209***	-0.0227***	-0.0392**	-0.0234***	-0.0217***	-0.0212***	-0.0211***	-0.0213***	-0.0461***	-0.0224***
	(-2.6848)	(-2.8934)	(-2.5692)	(-2.9816)	(-2.7493)	(-2.7184)	(-2.7148)	(-2.6792)	(-2.8325)	(-2.7997)
Log of Tenure	0.2834***	0.2238***	0.1579	0.2613***	0.2995***	0.2806***	0.298***	0.2481***	0.2322	0.2662***
	(3.5826)	(2.7986)	(1.1777)	(3.2919)	(3.6967)	(3.5351)	(3.7342)	(2.99)	(1.6115)	(3.2322)
R&D/Total Assets	-0.0233**	-0.0176	0.0113	-0.0196*	-0.0133	-0.0231**	-0.0206*	-0.0124	0.0392	-0.0144
	(-2.1283)	(-1.6064)	(0.3716)	(-1.7958)	(-1.2117)	(-2.1159)	(-1.8746)	(-1.1247)	(1.1538)	(-1.3026)
R&D Missing Dummy	0.2143	0.2675*	0.6915***	0.2819*	0.2448	0.2107	0.2086	0.303*	0.6003**	0.315*
	(1.3629)	(1.6927)	(2.9084)	(1.773)	(1.5091)	(1.3412)	(1.3263)	(1.8553)	(2.3594)	(1.9211)
Capex/Total Assets	-0.0171	-0.0152	-0.0384*	-0.0159	-0.0195*	-0.0168	-0.0158	-0.0186*	-0.0437*	-0.0198*
	(-1.567)	(-1.3999)	(-1.6686)	(-1.4666)	(-1.8464)	(-1.5369)	(-1.4629)	(-1.7284)	(-1.8051)	(-1.8409)
Change in Assets (%)	-2.9972***	-2.9167***	-3.3362***	-2.9059***	-2.8292***	-2.994***	-2.9692***	-2.8057***	-3.155***	-2.7899***
	(-9.554)	(-9.2542)	(-5.4932)	(-9.2439)	(-9.0177)	(-9.5503)	(-9.4712)	(-8.8741)	(-4.8897)	(-8.8358)
Market/Book	0.0861	0.1125**	0.2289*	0.077	0.0646	0.0869	0.0857	0.0881	0.1558	0.0651
	(1.6119)	(2.0932)	(1.7946)	(1.4297)	(1.1715)	(1.6083)	(1.6068)	(1.5559)	(1.1497)	(1.1423)
Profitability ($ thousand)	0.0061***	0.0061***	0.0045***	0.006***	0.0055***	0.0061***	0.0061***	0.0055***	0.0044***	0.0054***
	(5.1967)	(5.1398)	(2.7482)	(5.0898)	(4.7471)	(5.1889)	(5.1691)	(4.7129)	(2.6456)	(4.6524)
Size	0.0008	-0.0021	-0.0053	-0.0001	-0.002	0.0006	0.0016	-0.0044	-0.0145***	-0.0039
	(0.2951)	(-0.7351)	(-1.1041)	(-0.0497)	(-0.732)	(0.216)	(0.5868)	(-1.4917)	(-2.6516)	(-1.312)
Retained Earnings/Total Assets	0.5533***	0.5673***	1.6312***	0.5316***	0.4851***	0.5538***	0.5583***	0.4886***	1.3082***	0.4605***

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	(6.7529)	(6.8993)	(6.7847)	(6.5405)	(6.1257)	(6.746)	(6.8009)	(6.1405)	(5.4474)	(5.8423)
Return Volatility	0	0	0.0002	0	0	0	0	0	0.0002	0
	(-0.0978)	(-0.0925)	(0.7337)	(-0.0981)	(0.1993)	(-0.0932)	(-0.0141)	(0.1166)	(0.7499)	(0.0728)
Intercept	1.4847***	1.6275***	2.4634***	1.5595***	1.2553**	1.4773***	1.407***	1.3851***	2.2483**	1.3918***
	(2.8782)	(3.1488)	(2.6632)	(3.0169)	(2.4002)	(2.8399)	(2.7269)	(2.591)	(2.3508)	(2.6078)

Table 8. Robustness test: Second alternative definition of net payouts

This table presents the results of the logistic regression in which the dependent variable is equal to one if the value of total dividend payouts plus the change in the value of treasury stock is positive, and zero otherwise. When the change in the value of treasury stock is missing, we replaced it with purchase of common and preferred stock less sale of common and preferred stock. We estimate all regression models using industry (two-digit SIC codes) and year dummy variables. The square root of the Wald statistic, which is analogous to the *t*-value, is reported in parentheses. The superscripts ***, **, and * indicate significance at 1%, 5%, and 10%, respectively. Company and CEO variable definitions are explained in detail in Appendix A and B, respectively. Models (3) and (9) are estimated with 834 observations and all the others with 2116 observations. All models include industry and year dummies.

Dependent variable: Equals one if the value of total dividend payouts plus the change in the value of treasury stock is positive at time *t*, and zero otherwise

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
CEO Cash Comp. ($ million)	-0.2615**							-0.349***	-0.1872	-0.3346**
	(-2.0696)							(-2.5981)	(-0.9653)	(-2.507)
CEO Inside Debt h. ($ million)		0.0495**						0.0423**		
		(2.277)						(2.0078)		
Log of CEO Relative Leverage			0.0979**						0.1378***	
			(2.1882)						(2.6481)	
CEO Relative Leverage Dummy				0.8179***						0.7594***
				(4.629)						(4.1799)
CEO Delta/Vega Ratio					0.0074***			0.0072***	0.0075***	0.0069***
					(5.056)			(4.5096)	(3.3685)	(4.3819)
CEO Equity ($ million)						0.0012		0.0009	0.0069**	0.0013
						(1.2612)		(0.9166)	(2.0031)	(1.2421)
CEO Vega ($ thousand)							-0.0014*	-0.0001	0	0.0004
							(-1.7135)	(-0.0605)	(-0.0107)	(0.4329)
CEO Age	-0.0109	-0.0127*	-0.0189	-0.0146*	-0.0115	-0.0128*	-0.0121	-0.0107	-0.0198	-0.0128*
	(-1.4505)	(-1.6896)	(-1.3675)	(-1.9298)	(-1.5181)	(-1.7059)	(-1.6176)	(-1.4102)	(-1.28)	(-1.6694)
Capex/Total Assets	-0.0205*	-0.018*	0.0023	-0.0181*	-0.0201*	-0.0207*	-0.0184*	-0.0227**	-0.0178	-0.0234**
	(-1.9419)	(-1.7039)	(0.1095)	(-1.7134)	(-1.9112)	(-1.9451)	(-1.7471)	(-2.1291)	(-0.7011)	(-2.1923)
Log of Tenure	0.2594***	0.2223***	0.069	0.2273***	0.2622***	0.2419***	0.2671***	0.2396***	0.1692	0.2328***
	(3.4632)	(2.9387)	(0.5745)	(3.0169)	(3.4762)	(3.2257)	(3.5453)	(3.0965)	(1.3025)	(3.0171)
R&D/Total Assets	-0.001	0.0025	0.0264	0.0024	0.0052	-0.0007	0.0025	0.006	0.0354	0.0048
	(-0.0926)	(0.2344)	(0.9326)	(0.2216)	(0.4856)	(-0.0614)	(0.2283)	(0.5528)	(1.138)	(0.4408)
R&D Missing	0.0294	0.0422	0.373*	0.0748	0.0236	0.006	0.0104	0.0674	0.2595	0.0951
	(0.2119)	(0.3039)	(1.8561)	(0.5348)	(0.1685)	(0.0431)	(0.0751)	(0.4783)	(1.1105)	(0.6711)
Change in Assets (%)	-2.8119***	-2.7565***	-3.2199***	-2.6947***	-2.6913***	-2.7882***	-2.765***	-2.7208***	-3.0746***	-2.6662***
	(-8.7728)	(-8.6241)	(-5.3805)	(-8.4368)	(-8.3905)	(-8.7333)	(-8.6633)	(-8.4316)	(-4.9397)	(-8.2674)
Market/Book	0.042	0.0618	0.2301**	0.0461	0.035	0.0393	0.0495	0.0243	0.1698	0.0088
	(0.851)	(1.2509)	(2.1327)	(0.9277)	(0.6933)	(0.7853)	(1.0044)	(0.4706)	(1.5169)	(0.1683)
Profitability ($ thousand)	0.0057***	0.0056***	0.0036**	0.0056***	0.0053***	0.0056***	0.0056***	0.0054***	0.0038**	0.0053***
	(5.0319)	(5.0128)	(2.2854)	(4.9456)	(4.7121)	(4.9785)	(4.9911)	(4.7481)	(2.3283)	(4.6701)
Size	0.0039	0.0018	-0.0024	0.0022	0.0014	0.0027	0.0039	0.0018	-0.0067	0.0017

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	(1.4817)	(0.6634)	(-0.5461)	(0.8285)	(0.5305)	(1.0214)	(1.4475)	(0.6249)	(-1.4008)	(0.5887)
Retained Earnings	0.771***	0.7868***	1.5424***	0.7409***	0.7223***	0.7713***	0.7833***	0.7129***	1.3301***	0.6717***
	(7.5899)	(7.7191)	(6.4674)	(7.3296)	(7.2208)	(7.5898)	(7.6967)	(7.1139)	(5.5)	(6.7746)
Return Volatility	0.0002	0.0003	0.0001	0.0003	0.0003	0.0003	0.0003	0.0003	0.0001	0.0003
	(1.1153)	(1.1399)	(0.2173)	(1.1637)	(1.2993)	(1.1363)	(1.2161)	(1.2792)	(0.4327)	(1.2607)
Intercept	0.366	0.3587	0.6327	0.422	0.151	0.3936	0.266	0.3355	1.0124	0.4444
	(0.7796)	(0.7654)	(0.7636)	(0.8972)	(0.3206)	(0.834)	(0.5677)	(0.7004)	(1.0637)	(0.924)

Table 9. Robustness test: CEO risk tolerance and the propensity to increase dividends

This table presents the results of the logistic regression in which the dependent variable equals one if the firm increase dividends at time *t*, and zero otherwise. Presented in parentheses is the square root of the Wald statistic, which is analogous to the *t*–value. The superscripts ***, **, and * indicate significance at 1%, 5%, and 10%, respectively. Company and CEO variable definitions are explained in detail in Appendix A and B, respectively. Models (3) and (9) are estimated with 834 observations and all the others with 2117 observations. All models include industry and year dummies.

Dependent variable: Equals one if dividend per share at time *t*-1 is greater at time *t*, and zero otherwise										
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
CEO Cash Comp. ($ million)	-0.0071							0.0212	-0.0946	0.0324
	(-0.0627)							(0.1431)	(-0.5313)	(0.2205)
CEO Inside Debt ($ million)		0.0362*						0.0265		
		(1.8771)						(0.9658)		
Log of CEO Relative Leverage			0.0838*						0.0136	
			(1.9117)						(0.3785)	
CEO Relative Leverage Dummy				0.5857***						0.1179
				(3.3577)						(0.6162)
CEO Delta/Vega Ratio					0.0151***			0.0056***	0.0123***	0.0057***
					(9.6267)			(3.4999)	(4.8869)	(3.5588)
CEO Equity ($ million)						-0.001		0.0045***	0.0051*	0.0045***
						(-0.9071)		(3.0234)	(1.9228)	(2.998)
CEO Vega ($ thousand)							-0.0261***	-0.0237***	-0.0179***	-0.0236***
							(-9.8398)	(-7.7874)	(-4.4611)	(-7.7147)
CEO Age	0.0111	0.0104	0.0015	0.0089	0.0135	0.0117	0.0067	0.0052	-0.0011	0.0057
	(1.241)	(1.1657)	(0.1075)	(0.986)	(1.4334)	(1.2978)	(0.6966)	(0.5297)	(-0.0676)	(0.5823)
Log of Tenure	-0.0012	-0.0237	-0.2755**	-0.0096	0.0229	0.0081	0.1459	0.0968	-0.1368	0.1077
	(-0.0135)	(-0.2623)	(-2.2202)	(-0.1069)	(0.2438)	(0.09)	(1.5604)	(1.0028)	(-1.0082)	(1.1273)
R&D/Total Assets	-0.0822***	-0.0784***	-0.0525**	-0.0786***	-0.0556***	-0.0813***	-0.0313*	-0.0267	0.0076	-0.0286
	(-4.7594)	(-4.5545)	(-2.0602)	(-4.577)	(-3.1737)	(-4.7305)	(-1.7264)	(-1.4522)	(0.2555)	(-1.5592)
R&D Missing Dummy	0.1293	0.1658	0.1059	0.2057	0.1579	0.1415	0.1383	0.1631	0.1916	0.1538
	(0.8894)	(1.1295)	(0.5271)	(1.3914)	(1.0347)	(0.9697)	(0.9025)	(1.0289)	(0.866)	(0.9713)
Capex/Total Assets	-0.016	-0.0146	-0.0013	-0.0142	-0.0186	-0.0147	-0.0067	-0.0154	-0.0132	-0.0156
	(-1.2535)	(-1.143)	(-0.0605)	(-1.1203)	(-1.3941)	(-1.1483)	(-0.4986)	(-1.1057)	(-0.5361)	(-1.1208)
Change in Assets (%)	-1.7747***	-1.7611***	-1.4908**	-1.6877***	-1.6226***	-1.7543***	-1.5557***	-1.6359***	-1.316*	-1.6318***
	(-4.2038)	(-4.1725)	(-2.3622)	(-4.0036)	(-3.6506)	(-4.1533)	(-3.4578)	(-3.5493)	(-1.8375)	(-3.537)
Market/Book	0.0765	0.089	0.1603	0.0812	0.05	0.0843	0.1121*	0.08	0.2115*	0.0724
	(1.3958)	(1.6176)	(1.6369)	(1.4888)	(0.8387)	(1.521)	(1.8551)	(1.261)	(1.8766)	(1.1461)
Profitability ($ thousand)	0.0023	0.0024	0.0011	0.0024	0.0022	0.0023	0.0037**	0.0035**	0.0027	0.0034**
	(1.55)	(1.5887)	(0.6195)	(1.614)	(1.4223)	(1.5521)	(2.173)	(2.0176)	(1.2236)	(1.9794)
Size	0.009**	0.0079**	0.0089*	0.0082**	0.0056	0.0093***	0.0136***	0.0102**	0.0074	0.0107***
	(2.5446)	(2.2277)	(1.8703)	(2.3369)	(1.5056)	(2.6349)	(3.6376)	(2.5575)	(1.3457)	(2.7277)
Retained Earnings/Total Assets	1.1444***	1.1469***	0.7468***	1.0621***	1.0317***	1.1502***	1.0344***	0.9849***	0.7229***	0.9705***
	(6.3709)	(6.3773)	(3.1536)	(5.9069)	(5.5018)	(6.4005)	(5.4945)	(5.1504)	(2.7447)	(5.0332)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Return Volatility	-0.3245***	-0.3261***	-0.2929***	-0.3241***	-0.2211***	-0.3212***	-0.3488***	-0.3171***	-0.171	-0.3136***
	(-3.935)	(-3.9471)	(-2.6945)	(-3.9104)	(-2.604)	(-3.8932)	(-4.0317)	(-3.5661)	(-1.4567)	(-3.5321)
Intercept	-1.5068**	-1.4635**	-0.1889	-1.4348**	-2.2781***	-1.5894**	-1.3358**	-1.3401*	-1.072	-1.3957**
	(-2.4074)	(-2.3344)	(-0.1996)	(-2.2761)	(-3.4547)	(-2.5114)	(-1.9979)	(-1.9086)	(-1.0007)	(-1.9991)

Table 10. Robustness test: CEO risk tolerance and the propensity to initiate dividends

This table presents the results of the logistic regression in which the dependent variable equals one if the firm initiates dividends at time *t*, and zero otherwise. Presented in parentheses is the square root of the Wald statistic, which is analogous to the *t*–value. The superscripts ***, **, and * indicate significance at 1%, 5%, and 10%, respectively. Company and CEO variable definitions are explained in detail in Appendix A and B, respectively. Models (3) and (9) are estimated with 414 observations and all the others with 1462 observations. All models include industry and year dummies.

Dependent variable: Equals one if dividend per share is equal zero at time *t*-1 and greater than zero at time *t*, and zero otherwise

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
CEO Cash Comp. ($ million)	-0.0668							-0.0275	-1.6161	-0.0353
	(-0.2599)							(-0.0997)	(-1.3807)	(-0.1235)
CEO Inside Debt ($ million)		-0.0842						-0.1024		
		(-0.6586)						(-0.747)		
Log of CEO Relative Leverage			-0.206						-0.2811**	
			(-1.515)						(-1.9597)	
CEO Relative Leverage Dummy				-0.9398						-1.0822
				(-0.9024)						(-1.0296)
CEO Delta/Vega Ratio					0.0052***			0.0043**	0.0156**	0.0042**
					(2.8558)			(2.0841)	(2.4922)	(2.0153)
CEO Equity ($ million)						0.0009		0.0021	-0.0013	0.002
						(0.4334)		(0.8447)	(-0.2522)	(0.7952)
CEO Vega ($ thousand)							-0.0072**	-0.0073**	-0.0056	-0.0076**
							(-2.1068)	(-2.0499)	(-0.9006)	(-2.1125)
CEO Age	0.0105	0.0108	0.0205	0.0117	0.0099	0.0099	0.007	0.0088	0.0099	0.0092
	(0.5047)	(0.5207)	(0.5455)	(0.5646)	(0.4783)	(0.4764)	(0.3392)	(0.4276)	(0.2549)	(0.4468)
Log of Tenure	-0.2096	-0.1835	-0.3336	-0.2012	-0.1831	-0.2191	-0.0656	-0.0381	-0.1128	-0.0506
	(-0.9054)	(-0.7836)	(-0.9184)	(-0.8671)	(-0.7933)	(-0.9424)	(-0.279)	(-0.1614)	(-0.2939)	(-0.2161)
R&D/Total Assets	-0.0289	-0.0304	0.0912	-0.0292	-0.0269	-0.0289	-0.0154	-0.018	0.0992	-0.0157
	(-0.8734)	(-0.9147)	(1.5796)	(-0.8886)	(-0.8257)	(-0.8777)	(-0.4804)	(-0.5595)	(1.595)	(-0.4939)
R&D Missing Dummy	0.615*	0.581	0.339	0.5585	0.6012*	0.5868	0.6608*	0.6054*	0.4575	0.5833
	(1.6945)	(1.5999)	(0.5415)	(1.5394)	(1.665)	(1.6093)	(1.8324)	(1.6623)	(0.6864)	(1.6071)
Capex/Total Assets	-0.0112	-0.0119	-0.0014	-0.0105	-0.0104	-0.0114	-0.0143	-0.0194	-0.0191	-0.0177
	(-0.41)	(-0.4351)	(-0.0248)	(-0.3876)	(-0.3852)	(-0.4158)	(-0.5179)	(-0.6773)	(-0.3147)	(-0.6207)
Change in Assets (%)	-1.8519**	-1.8651**	-1.4903	-1.8411**	-2.1246**	-1.8341**	-2.1711**	-2.4387**	-2.787	-2.4179**
	(-2.0177)	(-2.0334)	(-0.9283)	(-2.0128)	(-2.2611)	(-1.9999)	(-2.2774)	(-2.5099)	(-1.4767)	(-2.4944)
Market/Book	-0.1163	-0.1216	0.0118	-0.111	-0.1071	-0.1198	-0.0791	-0.1112	0.1044	-0.0944
	(-0.7267)	(-0.7596)	(0.0385)	(-0.7016)	(-0.6709)	(-0.7506)	(-0.4909)	(-0.6707)	(0.3207)	(-0.5788)
Profitability ($ thousand)	0.002	0.0021	0.0051	0.0022	0.0022	0.002	0.003	0.0035	0.0079	0.0038
	(0.6304)	(0.6602)	(1.1306)	(0.7042)	(0.674)	(0.6363)	(0.8767)	(1.0063)	(1.4573)	(1.0763)
Size	0.0071	0.0076	-0.0142	0.007	0.0061	0.0062	0.0105	0.0102	-0.009	0.0095
	(0.849)	(0.9097)	(-1.1178)	(0.8451)	(0.7365)	(0.7424)	(1.2527)	(1.175)	(-0.6135)	(1.1128)
Retained Earnings/Total Assets	0.2293	0.2281	0.5229	0.2416	0.2355	0.2235	0.2719	0.2631	0.6131	0.283
	(0.9115)	(0.9056)	(1.0022)	(0.942)	(0.9355)	(0.8936)	(1.0566)	(1.0232)	(1.1458)	(1.0756)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Return Volatility	-0.0836	-0.0838	-0.0038	-0.0812	-0.0894	-0.0856	-0.1563	-0.156	-0.0047	-0.1559
	(-0.4216)	(-0.4222)	(-0.1618)	(-0.409)	(-0.4451)	(-0.4315)	(-0.7583)	(-0.7483)	(-0.1649)	(-0.745)
Intercept	-2.8856**	-2.9424**	-3.2041	-2.9881**	-2.9312**	-2.8374*	-2.6792*	-2.726*	-2.2642	-2.7418*
	(-1.9647)	(-2.0015)	(-1.4259)	(-2.0358)	(-1.9991)	(-1.9331)	(-1.8118)	(-1.8342)	(-0.9586)	(-1.8487)

Table 11. Robustness test: Propensity to pay in the 1996 though 2008 period

This table presents the results of the logistic regression in which the dependent variable equals one if the firm pays dividends at time *t* and zero otherwise. Presented in parentheses is the square root of the Wald statistic, which is analogous to the *t*-value. The superscripts ***, **, and * indicate significance at 1%, 5%, and 10%, respectively. Company and CEO variable definitions are explained in detail in Appendix A and B, respectively. All models are estimated with 3895 observations. All models include industry and year dummies.

Dependent variable: Equals one if the firm pays dividends at time *t*, and zero otherwise

	(1)	(2)	(3)	(4)	(5)
CEO Cash Comp. ($ million)	0.0624				0.2375**
	(0.7413)				(2.3337)
CEO Delta/Vega Ratio		0.0018**			0
		(2.1082)			(0.1389)
CEO Equity ($ million)			-0.0031***		0.0032***
			(-4.326)		(3.7312)
CEO Vega ($ thousand)				-0.0303***	-0.0338***
				(-14.167)	(-13.7357)
CEO Age	0.0097*	0.0095*	0.0136**	0.0097	0.0055
	(1.7846)	(1.745)	(2.4724)	(1.6424)	(0.9196)
Log of Tenure	0.1723**	0.1723**	0.2045***	0.3437***	0.319***
	(2.5101)	(2.5113)	(2.9657)	(4.6636)	(4.3101)
R&D/Total Assets	-0.1162***	-0.1141***	-0.1178***	-0.1182***	-0.1153***
	(-7.76)	(-7.6124)	(-7.8145)	(-7.3004)	(-7.1217)
R&D Missing Dummy	-0.1607	-0.167	-0.1476	-0.1651	-0.1751
	(-1.3218)	(-1.3731)	(-1.2114)	(-1.2782)	(-1.3495)
Capex/Total Assets	-0.0156**	-0.0149*	-0.0154**	-0.0106	-0.0093
	(-2.0283)	(-1.9345)	(-1.9957)	(-1.3173)	(-1.1614)
Change in Assets (%)	-0.0744	-0.0687	-0.0789	-0.0642	-0.0585
	(-0.8524)	(-0.7856)	(-0.8944)	(-0.7038)	(-0.6408)
Market/Book	-0.2152***	-0.2188***	-0.194***	-0.1733***	-0.1752***
	(-5.1271)	(-5.2409)	(-4.5756)	(-3.9467)	(-3.9568)
Profitability ($ thousand)	0.0078***	0.0078***	0.0078***	0.0093***	0.009***
	(5.9659)	(6.0211)	(6.0104)	(6.5294)	(6.3577)
Size	-0.0024	-0.0025	-0.0007	0.0036	0.0012
	(-0.9275)	(-0.9773)	(-0.2888)	(1.3253)	(0.4323)
Retained Earnings/Total Assets	3.2568***	3.1804***	3.2855***	3.0832***	3.0602***
	(17.6024)	(17.0881)	(17.7564)	(15.7749)	(15.4624)
Return Volatility	-0.0002	-0.0002	-0.0002	-0.0001	-0.0001
	(-0.5649)	(-0.5457)	(-0.5797)	(-0.1542)	(-0.177)
Intercept	-0.754**	-0.7629**	-1.0325***	-0.7485**	-0.562
	(-2.1482)	(-2.171)	(-2.8815)	(-1.9929)	(-1.4722)

Table 12. Relative dividend premium (RDP) and the propensity to pay dividends

This table presents the results of the logistic regression in which the dependent variable equals one if the firm pays dividends at time *t* and zero otherwise. The models are estimated using industry (two-digit SIC codes) and year dummy variables. Presented in parentheses is the square root of the Wald statistic, which is analogous to the *t*-value. The superscripts ***, **, and * indicate significance at 1%, 5%, and 10%, respectively. *Relative Dividend Premium* is the value-weighted average of dividend paying firms' market-to-book ratio less the market-to-book ratio of firm *i* at time *t*. Other company and CEO variable definitions are explained in detail in Appendix A and B, respectively. All models are estimated using 3895 observations. All models include industry and year dummies.

Dependent variable: Equals one if the firm pays dividends at time *t*, and zero otherwise

Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Relative Dividend Premium (VW)	3.7348***	3.7145***	3.7811***	3.5624***	2.8033***	2.8653***						
	(4.6642)	(4.638)	(4.7185)	(4.4366)	(3.3739)	(3.446)						
Relative Dividend Premium							2.0488***	2.0377***	2.0742***	1.9543***	1.5378***	1.5719***
							(4.6642)	(4.638)	(4.7185)	(4.4366)	(3.3739)	(3.446)
CEO Cash Comp. ($ million)		0.0624				0.2375**		0.0624				0.2375**
		(0.7413)				(2.3337)		(0.7413)				(2.3337)
CEO Delta/Vega Ratio			0.0018**			0			0.0018**			0
			(2.1082)			(0.1389)			(2.1082)			(0.1388)
CEO Equity ($ million)				-0.0031***		0.0032***				-0.0031***		0.0032***
				(-4.326)		(3.7312)				(-4.326)		(3.7312)
CEO Vega ($ million)					-0.0303***	-0.0338***					-0.0303***	-0.0338***
					(-14.167)	(-13.7357)					(-14.167)	(-13.7357)
CEO Age	0.0101*	0.0097*	0.0095*	0.0136**	0.0097	0.0055	0.0101*	0.0097*	0.0095*	0.0136**	0.0097	0.0055
	(1.8591)	(1.7846)	(1.745)	(2.4724)	(1.6424)	(0.9196)	(1.8591)	(1.7846)	(1.745)	(2.4724)	(1.6424)	(0.9196)
Capex/Total Assets	-0.016**	-0.0156**	-0.0149*	-0.0154**	-0.0106	-0.0093	-0.016**	-0.0156**	-0.0149*	-0.0154**	-0.0106	-0.0093
	(-2.0746)	(-2.0283)	(-1.9345)	(-1.9957)	(-1.3173)	(-1.1614)	(-2.0746)	(-2.0283)	(-1.9345)	(-1.9957)	(-1.3173)	(-1.1614)
Log of Tenure	0.1763**	0.1723**	0.1723**	0.2045***	0.3437***	0.319***	0.1763**	0.1723**	0.1723**	0.2045***	0.3437***	0.319***
	(2.5747)	(2.5101)	(2.5113)	(2.9657)	(4.6636)	(4.3101)	(2.5747)	(2.5101)	(2.5113)	(2.9657)	(4.6636)	(4.3101)
R&D/Total Assets	-0.117***	-0.1162***	-0.1141***	-0.1178***	-0.1182***	-0.1153***	-0.117***	-0.1162***	-0.1141***	-0.1178***	-0.1182***	-0.1153***
	(-7.8321)	(-7.76)	(-7.6124)	(-7.8145)	(-7.3004)	(-7.1217)	(-7.8321)	(-7.76)	(-7.6124)	(-7.8145)	(-7.3004)	(-7.1217)
R&D Missing Dummy	-0.1649	-0.1607	-0.167	-0.1476	-0.1651	-0.1751	-0.1649	-0.1607	-0.167	-0.1476	-0.1651	-0.1751
	(-1.3579)	(-1.3218)	(-1.3731)	(-1.2114)	(-1.2782)	(-1.3495)	(-1.3579)	(-1.3218)	(-1.3731)	(-1.2114)	(-1.2782)	(-1.3495)
Change in Assets (%)	-0.0743	-0.0744	-0.0687	-0.0789	-0.0642	-0.0585	-0.0743	-0.0744	-0.0687	-0.0789	-0.0642	-0.0585
	(-0.8507)	(-0.8524)	(-0.7856)	(-0.8944)	(-0.7038)	(-0.6408)	(-0.8507)	(-0.8524)	(-0.7856)	(-0.8944)	(-0.7038)	(-0.6408)
Market/Book	3.5169***	3.4993***	3.5623***	3.3685***	2.63***	2.6902***	1.8309***	1.8225***	1.8554***	1.7603***	1.3645***	1.3967***
	(4.3989)	(4.3767)	(4.4519)	(4.202)	(3.1695)	(3.2413)	(4.1714)	(4.1525)	(4.2234)	(4)	(2.9946)	(3.0657)
Profitability ($ thousand)	0.0079***	0.0078***	0.0078***	0.0078***	0.0093***	0.009***	0.0079***	0.0078***	0.0078***	0.0078***	0.0093***	0.009***
	(6.06)	(5.9659)	(6.0211)	(6.0104)	(6.5294)	(6.3577)	(6.06)	(5.9659)	(6.0211)	(6.0104)	(6.5294)	(6.3577)
Size	-0.002	-0.0024	-0.0025	-0.0007	0.0036	0.0012	-0.002	-0.0024	-0.0025	-0.0007	0.0036	0.0012
	(-0.795)	(-0.9275)	(-0.9773)	(-0.2888)	(1.3253)	(0.4323)	(-0.795)	(-0.9275)	(-0.9773)	(-0.2888)	(1.3253)	(0.4323)
Retained Earnings/Total Assets	3.2458***	3.2568***	3.1804***	3.2855***	3.0832***	3.0602***	3.2458***	3.2568***	3.1804***	3.2855***	3.0832***	3.0602***
	(17.6135)	(17.6024)	(17.0881)	(17.7564)	(15.7749)	(15.4624)	(17.6135)	(17.6024)	(17.0881)	(17.7564)	(15.7749)	(15.4624)
Return Volatility	-0.0002	-0.0002	-0.0002	-0.0002	-0.0001	-0.0001	-0.0002	-0.0002	-0.0002	-0.0002	-0.0001	-0.0001

Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	(-0.5715)	(-0.5649)	(-0.5457)	(-0.5797)	(-0.1542)	(-0.177)	(-0.5715)	(-0.5649)	(-0.5457)	(-0.5797)	(-0.1542)	(-0.177)
Intercept	-7.4957***	-7.4685***	-7.5979***	-7.4721***	-5.8158***	-5.7415***	-5.7744***	-5.7565***	-5.8551***	-5.8302***	-4.5238***	-4.4209***
	(-4.8548)	(-4.8378)	(-4.917)	(-4.8284)	(-3.6185)	(-3.5767)	(-4.8639)	(-4.8498)	(-4.9278)	(-4.8982)	(-3.6548)	(-3.5766)