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On compensation incentives, managerial overconfidence, and payout policy

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ABSTRACT

This paper investigates how CEO overconfidence interacts with compensation structure to influence corporate payout policy. Using a panel of 713 S&P 1500 firms from 2010 to 2019, we find that overconfident CEOs with higher equity-based (i.e., convex) compensation are associated with significantly lower levels of both cash dividends and share repurchases. In contrast, inside debt compensation (non-convex) mitigates this effect, encouraging higher dividend payouts. The results suggest that these effects operate through financial slack and risk-taking channels. The uncovered relationships are present only in firms operating in non-innovative industries and with strong corporate governance. We interpret this as evidence that boards in innovative firms preserve managerial discretion, while weak governance limits the board's ability to discipline overconfident CEOs. Our findings are robust to alternative measures of overconfidence and endogeneity controls. These results highlight the importance of tailoring CEO incentives to behavioral traits such as overconfidence, particularly in relation to payout decisions.

1. Introduction

Research on corporate finance has recognized the CEO as the primary decision-maker within companies. The impact of the CEO on corporate policies is typically examined through two main channels. The first channel involves rational incentives provided by compensation packages to the CEO in the form of equity or inside debt (see e.g. Fenn and Liang, 2001; Caliskan and Doukas, 2015; Geiler and Renneboog, 2016). The second channel focuses on the irrational biases of CEOs, such as overconfidence (Malmendier and Tate, 2005; Deshmukh et al., 2013; Banerjee, Humphery-Jenner, Nanda, 2015).

Historically, these two channels were investigated independently: researchers did not consider that compensation packages might be formed by boards of directors to affect the CEOs' biases, nor did they consider the possibility that biased CEOs may affect the compensation. The first major step to investigate the interaction between compensation and overconfidence was made by Gervais, Heaton, and Odean (2011) [hereafter GHO] in their influential paper. Their theoretical model predicts that overconfident CEOs compensated with less convex (or incentive-intensive) instruments create value for companies, while overconfident CEOs with more performance-sensitive contracts are associated with value-destroying projects. In related empirical studies, Otto (2014) provides

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Table 1
Descriptive statistics.

Variable	N	Mean	Std. dev.	Min	25 %	50 %	75 %	Max
Dividend ratio	7130	0.0158	0.0231	0	0	0.0078	0.0231	0.3114
Repurchase ratio	7130	0.0361	0.0618	0	0.0005	0.0122	0.0464	0.9657
Fraction of repurchases	7130	0.5380	0.4018	0	0.0528	0.6029	1	1
Holder67	7130	0.3840	0.4864	0	0	0	1	1
CEO inside debt	7130	8.4259	7.3434	0	0	12.6231	15.0338	19.3993
CEO equity compensations	7130	0.5918	0.2585	0	0.4722	0.6633	0.7801	0.9992
Cash holdings	7130	0.1106	0.1033	0	0.0339	0.0807	0.1544	0.7554
Tobin's Q	7130	2.3436	2.4085	0	0.9996	1.6753	2.8281	41.2632
Debt-to-Equity	7130	0.4187	0.6087	0	0.1054	0.2955	0.5315	18.032
Capex	7130	0.0456	0.0499	0	0.0167	0.0306	0.0546	0.7047
ROA	7130	0.0593	0.0782	−0.7349	0.0282	0.0585	0.0933	0.7224
Size	7130	21.8301	1.7575	0	20.6229	21.7251	22.9432	27.0362
EBITDA margin	7130	0.1789	0.1638	−4.7323	0.0966	0.1546	0.2293	1.1332
Stock return	7130	1.1359	0.4152	0	0.9123	1.1126	1.3261	6.2962
Industry dummy	7130	0.3323	0.4711	0	0	0	1	1
CEO duality	7130	0.6394	0.4802	0	0	1	1	1
Board independence	7130	0.9774	0.1486	0	1	1	1	1
Gender diversity	7130	0.8222	0.3824	0	1	1	1	1

Table 2
Difference between companies with overconfident and rational CEOs.

Variable	Holder67 = 0 1	Holder67 = 1 2	Difference 3 = 2 - 1
Dividend ratio	0.0159	0.0157	−0.0002
Repurchase ratio	0.0329	0.0412	0.008***
Fraction of repurchases	0.5073	0.5873	0.080***
CEO inside debt	8.0654	9.002	0.939***
CEO equity compensations	0.5445	0.6678	0.123***
Cash holdings	0.1108	0.1101	−0.001
Tobin's Q	2.055	2.8078	0.753***
Debt-to-Equity	0.3868	0.4700	0.083***
Capex	0.0453	0.0460	0.001
ROA	0.0557	0.0652	0.010***
Size	21.7108	22.0217	0.311**
EBITDA margin	0.1689	0.1953	0.026***
Stock return	1.1076	1.1814	0.074***
Industry dummy	0.3165	0.3581	0.041***
CEO duality	0.6371	0.6430	0.006
Board independence	0.9765	0.9788	0.002
Gender diversity	0.8019	0.8546	0.053***
Observations	4392	2738	–

The table presents the mean values for two subsamples of overconfident and rational CEOs. *, **, and *** denote statistical significance at the 10 %, 5 % and 1 % levels, respectively.

evidence that optimistic CEOs demand less convex compensation (e.g., fewer options), while other studies show that overconfident CEOs receive more option-based contracts (Humphery-Jenner et al., 2016; Hwang and Han, 2022) .[1]

However, despite the theoretical importance of GHO's predictions, empirical tests remain scarce and inconclusive. While some studies have explored related dynamics - showing that, in firms led by overconfident CEOs, equity-based compensation may disincentivize acquisitions (Croci and Petmezas, 2015), reduce price crash risk (Kim and Lee, 2025), or increase corporate risk (Aabo, Hvistendahl and Kring, 2021) - these findings are context-specific and fragmented. Research on the joint effects of CEO compensation and overconfidence, particularly in relation to shareholder value and payout policy, remains limited. Moreover, prior work has largely overlooked inside debt, a non-convex form of compensation that plays a significant role in aligning managerial incentives. Finally, the empirical investigation of GHO predictions is still frequently cited as a promising venue for research (Edmans, Gabaix, Jenter, 2017; Heavey et al., 2022).

To address the gap, we focus on the following research question: How does the interaction between CEO overconfidence and compensations incentives affect payout decisions? Using a sample of 713 companies from the S&P 1500, we make two major

[1] The case in point is a famous 2018 Tesla compensation grant for Elon Musk, who can be considered overconfident based on his overly ambitious goals and management style (see e.g. Akstinaite, 2023). This grant consisted solely of options, becoming available after achieving operational and market capitalization goals. The value of the grant totaled 56 billion USD, making it the largest compensation package at the time.

Table 3
The interaction between incentives and overconfidence and its impact on payout.

Dependent variable	Dividend ratio		Repurchase ratio		Fraction of repurchases	
Model	1	2	3	4	5	6
a. Holder67	−0.0045***	−0.0021**	−0.0088*	−0.0115*	0.0472*	0.0119*
	(−5.690)	(−2.520)	(−1.830)	(−1.718)	(1.794)	(1.725)
b. CEO inside debt	0.0002***		0.0003***		−0.0021***	
	(4.340)		(3.002)		(−3.135)	
a x b	0.0002***		0.0001		0.0057***	
	(3.952)		(0.344)		(2.695)	
c. CEO equity compensation		−0.0021*		0.0061*		0.1496***
		(−1.842)		(1.634)		(7.650)
a x c		−0.0110**		−0.0275**		0.1021*
		(−2.036)		(−2.313)		(1.685)
Cash holdings	0.0065**	0.0037	0.0212***	0.0286***	−0.0395	−0.021
	(2.039)	(1.092)	(2.709)	(3.377)	(−0.793)	(−0.429)
Tobin's Q	0.0025***	0.0025***	0.0067***	0.0062***	−0.0194***	−0.0207***
	(11.338)	(10.758)	(10.641)	(9.632)	(−8.096)	(−8.780)
Debt-to-Equity	0.0001	−0.0001	−0.0042***	−0.0045***	0.0181**	0.0212***
	(0.135)	(−0.155)	(−3.010)	(−3.185)	(2.400)	(2.806)
Capex	−0.0383***	−0.0375***	−0.0289**	−0.0320**	−0.1094	−0.0836
	(−6.642)	(−6.128)	(−2.360)	(−2.497)	(−1.015)	(−0.767)
ROA	0.0770***	0.0711***	0.1580***	0.1794***	0.0142	0.0381
	(11.486)	(10.223)	(11.570)	(12.413)	(0.190)	(0.503)
Size	0.0017***	0.0021***	0.0019***	0.0027***	0.0017	−0.0072**
	(9.398)	(10.594)	(4.561)	(5.620)	(0.600)	(−2.452)
Stock return	−0.0062***	−0.0069***	−0.0139***	−0.0152***	0.0575***	0.0607***
	(−8.003)	(−8.856)	(−5.360)	(−6.529)	(4.349)	(4.599)
EBITDA margin	0.0018	0.0016	0.0031	0.0039	−0.0111	−0.0124
	(0.725)	(0.579)	(0.711)	(0.856)	(−0.319)	(−0.348)
Constant	Yes	Yes	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Adj R^2	0.310	0.221	0.327	0.273	0.237	0.244
Observations	7130	7130	7130	7130	7130	7130
F-stat	74.562	39.710	85.364	51.593	46.892	50.226
p-Value	0.000	0.000	0.000	0.000	0.000	0.000

The table contains regressions that examine the joint effects of CEO compensation and overconfidence on payout ratios. All models are OLS models that include industry and year fixed effects and use robust standard errors. Brackets contain t-statistics, and superscripts ***, **, and * denote significance at 1 %, 5 %, and 10 %, respectively.

contributions. First, consistent with GHO predictions, we demonstrate that overconfident CEOs with lower equity-based compensation (i.e., with less convex compensation schedule) enhance shareholder value by increasing payouts to shareholders in the form of cash dividends and repurchases.

Second, we show that inside debt moderates the adverse effects of CEO overconfidence, leading to higher dividend payouts. Inside debt is a non-convex compensation, unlike equity-based compensation, and aligns the incentives of CEOs with those of creditors by stimulating risk-aversion. This finding further supports GHO theoretical predictions. These effects operate through two channels: financial slack and risk-taking.

Finally, we provide evidence that these effects are not observed in companies operating in innovative industries or those with weak corporate governance, highlighting important boundary conditions.

2. Hypotheses development

According to behavioral finance theory, CEO's overconfidence is a tendency to overestimate one's ability and probabilities of successful outcomes (Malmendier and Tate, 2015). Consequently, overconfidence leads to overinvestment and value-destroying acquisitions if there are sufficient internal funds under the CEO's management (Malmendier and Tate, 2005; Kolasinski and Li, 2013). The impact on payout policy is negative because overconfident CEOs build financial slack for current and future investment opportunities as they consider external financing costly (Deshmukh, Goel, Howe, 2013). Despite these facts, overconfidence may be beneficial for shareholders in innovative companies, where risk-taking is rewarded (Hirshleifer, Low, Teoh, 2012), leading to higher company value (Burkhard et al., 2023).

Another channel of value creation for overconfident CEOs is through less convex and less expensive compensation packages (Gervais, Heaton, Odean, 2011; Otto, 2014), because overconfident CEOs do not need heavy stimulus to maximize efforts. This channel is consistent with incentive alignment hypothesis which posits that remuneration effectively aligns CEOs incentives with those of shareholders, thus, mitigating agency costs (Tosi, Katz, Gomez-Mejia, 1997; Martin, Wiseman, Gomez-Mejia, 2019). For instance, equity-based compensation (i.e., stocks and options) incentivizes CEOs to increase equity value by investing more aggressively in new

Table 4
The interaction between incentives and overconfidence and its impact on payout in innovative companies.

Dependent variable	Dividend ratio		Repurchase ratio		Fraction of repurchases	
Model	1	2	3	4	5	6
a. Holder67	−0.0087***	−0.0053*	−0.0058	−0.0095	0.1169***	0.0867*
	(−3.629)	(−1.997)	(−0.803)	(−0.889)	(2.961)	(1.713)
b. CEO inside debt	0.0003***		0.0003***		−0.0047***	
	(6.162)		(3.064)		(−6.140)	
a x b	0.0003**		0.0002		0.0010*	
	(2.008)		(0.449)		(1.750)	
c. CEO equity compensation		0.0002		0.0091**		0.1085***
		(0.107)		(2.305)		(4.839)
a x c		−0.0039*		−0.0157*		0.0565
		(−1.723)		(−1.745)		(0.626)
d. Industry dummy	−0.0038***	−0.0052**	−0.0031	−0.0042	0.1037***	0.0298
	(−2.848)	(−2.519)	(−0.911)	(−0.718)	(3.660)	(0.904)
b x d	−0.0001		−0.0001		0.0083***	
	(−0.750)		(−0.432)		(6.263)	
a x d	−0.0043*	−0.0072	−0.0052	−0.0042	−0.0973*	−0.3064***
	(−1.625)	(−1.001)	(−0.557)	(−0.237)	(−1.893)	(−2.874)
a x b x d	0.0001		−0.0007		0.0062	
	(0.005)		(−0.989)		(1.382)	
c x d		−0.0071***		−0.0098		0.1190***
		(−2.978)		(−1.224)		(3.055)
a x c x d		−0.0139		−0.0112		0.2761*
		(−1.400)		(−0.473)		(1.875)
Constant	Yes	Yes	Yes	Yes	Yes	Yes
Firm control variables	Yes	Yes	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Adj R^2	0.310	0.223	0.327	0.274	0.243	0.247
Observations	7130	7130	7130	7130	7130	7130
F-stat	68.789	37.386	78.535	46.741	46.286	47.641
p-Value	0.000	0.000	0.000	0.000	0.000	0.000

The table contains regressions that examine the joint effects of CEO compensation and overconfidence on payout ratios in companies from innovative industries. All models are OLS models that include industry and year fixed effects and use robust standard errors. Brackets contain t-statistics, and superscripts ***, **, and * denote significance at 1 %, 5 %, and 10 %, respectively.

projects (Jensen and Meckling, 1976). Consequently, shareholders will demand fewer dividends as agency costs decline (Caliskan and Doukas, 2015). However, overconfident CEOs do not require heavy incentives to invest. They will increase investments even with no or low levels of equity-based compensation, with high levels of equity compensation leading to overinvestment and value destruction (Gervais, Heaton, Odean, 2011). Therefore, we formulate our first hypothesis as follows:

Hypothesis 1. Overconfident CEOs with higher equity-based compensation are associated with lower payout levels.

Inside debt is another type of compensation consisting of deferred compensation and pension benefits. The payment to the CEO from inside debt is contingent on the long-term survival of the company and is negatively correlated with the default probability. This compensation type aligns CEOs interests with those of company's creditors and stimulates risk aversion (Edmans and Liu, 2011; Anantharaman, Fang, Gong, 2014). Risk aversion leads to a narrower set of investment opportunities and to more funds available for distribution among shareholders (Anilov and Ivashkovskaya, 2025; Caliskan and Doukas, 2015). Thus, the incentives provided by inside debt are opposite to those provided by equity-based compensation. Moreover, the value of inside debt is not affected by the value of the company's stocks, making this type of compensation 'flat' (i.e., not convex). Therefore, we conjecture that inside debt can moderate the excessive risk-taking and overinvestment by overconfident CEOs, leading to higher payouts. We formulate the second hypothesis as follows:

Hypothesis 2. Overconfident CEOs with more inside debt compensation are associated with higher payout levels.

3. Data and methodology

3.1. Variables

To test hypotheses, we analyze data from 713 companies included in the S&P 1500 index for the period of 2010–2019. We start by including all companies from the index, eliminating, first, financial and utilities companies. Next, we exclude companies lacking data on executive stock options and compensation structure, companies with >5 years of missing data, and outliers. This process results in a final sample of 7130 observations. The period was chosen as to avoid the impact of two major crises. The data was obtained from S&P CapitalIQ. Table A.1 in Appendix summarizes the variables.

We use dividend ratio, repurchase ratio, and fraction of repurchases as dependent variables. This allows us to analyze the impact of compensation-overconfidence interaction on both payout channels and on the choice of payout channel.

Table 5
The interaction between incentives and overconfidence and its impact on payout in companies with CEO duality.

Dependent variable	Dividend ratio		Repurchase ratio		Fraction of repurchases	
Model	1	2	3	4	5	6
a. Holder67	−0.0085***	−0.0066**	−0.0128*	−0.0088	0.0111	−0.0267
	(−4.210)	(−1.974)	(−1.696)	(−0.479)	(0.279)	(−0.267)
b. CEO inside debt	0.0002***		0.0002		−0.0028***	
	(4.352)		(1.322)		(−2.656)	
a x b	0.0003*		−0.0003		0.0155***	
	(1.868)		(−0.521)		(4.317)	
c. CEO equity compensation		−0.0063***		0.0103*		0.1129***
		(−3.503)		(1.823)		(3.305)
a x c		−0.0204**		−0.0354*		0.1750*
		(−2.283)		(−1.786)		(1.794)
d. CEO duality	0.0018**	−0.0017	−0.0006	0.0032	−0.0137	−0.0308
	(2.309)	(−1.145)	(−0.253)	(0.758)	(−0.879)	(−1.202)
b x d	0.0001		0.0001		0.0012	
	(0.591)		(0.748)		(0.921)	
a x d	−0.0046*	−0.0125*	0.0072	0.0021	0.0604	0.0582
	(−1.793)	(−1.715)	(0.752)	(0.099)	(1.169)	(0.494)
a x b x d	0.0002		0.0005		−0.0142***	
	(0.921)		(0.669)		(−3.195)	
c x d		0.0064***		−0.0060		0.0536
		(2.865)		(−0.898)		(1.386)
a x c x d		0.0136		0.0163		−0.1127
		(1.226)		(0.591)		(−0.697)
Constant	Yes	Yes	Yes	Yes	Yes	Yes
Firm control variables	Yes	Yes	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Adj R^2	0.312	0.224	0.327	0.273	0.238	0.244
Observations	7130	7130	7130	7130	7130	7130
F-stat	66.137	36.217	75.050	45.685	42.190	44.174
p-Value	0.000	0.000	0.000	0.000	0.000	0.000

The table contains regressions that examine the joint effects of CEO compensation and overconfidence on payout ratios in companies where CEO is a board's chairman. All models are OLS models that include industry and year fixed effects and use robust standard errors. Brackets contain t-statistics, and superscripts ***, **, and * denote significance at 1 %, 5 %, and 10 %, respectively.

To measure CEO's overconfidence, we use Holder67 measure proposed by Campbell et al. (2011). To calculate it, we divide the value of vested but not exercised options by the number of these options to obtain the average value of vested but not exercised options. Then, we calculate their average "moneyness" by dividing their average value by the difference between the stock price on the year's end and the average value. We then transform it into a binary measure, which equals 1 if the average moneyness of the options exceeds 67 % for two consecutive years (Humphery-Jenner et al., 2016; Ge, Jamil, Yu, 2024).

To measure inside debt, we use the natural logarithm of the sum of deferred compensation and the present value of accumulated pension benefits (Caliskan and Doukas, 2015). We calculate the equity-based compensation of the CEO as the sum of equity awards, option awards, and restricted stock units awards, divided by the total CEO compensation (Geiler and Renneboog, 2016).

Finally, we use a set of control variables that capture the financial performance of the company. We also use additional binary variables to capture the effects of innovative industries and corporate governance.

3.2. Econometric model

We use the following regression model to test our hypotheses:

$$Payout_{i,t} = \alpha + \beta_1 \bullet Overconf_{i,\,t} + \beta_2 \bullet Comp_{i,\,t} + \beta_3 \bullet Overconf_{i,\,t} \bullet Comp_{i,\,t} + \sum_{k=4}^{11} \beta_k \bullet Control_{i,t,k} + \theta_i + \delta_t + \varepsilon_{i,t} \quad (1)$$

where $Payout_{i,t}$ – is the dependent variable; $Overconf_{i,\,t}$- is the measure of CEO's overconfidence; $Comp_{i,\,t}$ – is one of two compensation variables; $Control_{i,t,k}$ – is the set of control variables; α, β_k- are coefficients for regressions; $\varepsilon_{i,t}$, – is a normally distributed error term; θ_i- are industry-specific effects; δ_t – are the year-specific effects; i – is a company's index; t – is a year's index.

To account for the panel structure of the data and address endogeneity issues, we include industry and year dummies in the model. Industry-level dummies are typically preferred in studies of strategic policies, such as dividend policies (Mauri and Michaels, 1998). Robust standard errors are used for all models.

Table 6
The interaction between incentives and overconfidence and its impact on payout in companies with independent boards.

Dependent variable	Dividend ratio		Repurchase ratio		Fraction of repurchases	
Model	1	2	3	4	5	6
a. Holder67	−0.0104*	−0.0095*	−0.0336	−0.0368***	0.0107	0.1966
	(−1.721)	(−1.832)	(−0.670)	(−2.708)	(0.065)	(0.662)
b. CEO inside debt	0.0003*		0.0003		−0.0005	
	(1.879)		(0.601)		(−0.097)	
a x b	0.0010*		−0.0048		0.0237*	
	(1.696)		(−1.290)		(1.832)	
c. CEO equity compensation		−0.0080*		−0.0169*		0.3951***
		(−1.731)		(−1.973)		(3.285)
a x c		−0.0085*		0.0329		0.1583
		(−1.650)		(1.359)		(0.343)
d. Board independence	0.0087***	0.0042	0.0071	−0.0038	0.0918**	0.0026***
	(4.054)	(1.447)	(1.168)	(−0.609)	(1.967)	−2.804
b x d	−0.0001		−0.0001		−0.0017	
	(−0.274)		(−0.060)		(−0.353)	
a x d	−0.0007	0.0086	−0.0437	0.0540***	0.0606	−0.0024
	(−0.107)	(0.913)	(−0.870)	(3.302)	(0.364)	(−0.625)
a x b x d	−0.0006		0.0051*		−0.0185	
	(−0.980)		(1.857)		(−1.183)	
c x d		0.0058		0.0235		−0.0032**
		(1.243)		(1.606)		(−2.142)
a x c x d		−0.0210*		−0.0678**		−0.0004
		(−1.671)		(−2.484)		(−0.070)
Constant	Yes	Yes	Yes	Yes	Yes	Yes
Firm control variables	Yes	Yes	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Adj R^2	0.312	0.222	0.327	0.274	0.238	0.245
Observations	7130	7130	7130	7130	7130	7130
F-stat	65.966	35.021	75.650	45.531	41.391	44.137
p-Value	0.000	0.000	0.000	0.000	0.000	0.000

The table contains regressions that examine the joint effects of CEO compensation and overconfidence on payout ratios in companies with independent boards of directors. All models are OLS models that include industry and year fixed effects and use robust standard errors. Brackets contain t-statistics, and superscripts ***, **, and * denote significance at 1 %, 5 %, and 10 %, respectively.

4. Results

4.1. Descriptive statistics

We report summary statistics for our sample in Table 1. Preferable payout channel is repurchases. Approximately 38 % of the observations are classified as overconfident, which is slightly lower than in previous studies (Humphery-Jenner et al., 2016). However, this is consistent with evidence suggesting that the proportion of overconfident CEOs is declining over time (Banerjee, Humphery-Jenner, Nanda, 2015), as our dataset is more recent than those used in earlier studies. Table 2 highlights the differences between companies with overconfident and rational CEOs. Apparently, these companies differ significantly in terms of compensation structure, with higher inside debt and equity in companies with overconfident CEOs (consistent with Kaplan, Sorensen, Zakolyukina, 2022), and their financial performance. Finally, Table A.2 in Appendix reports correlation matrix.

4.2. Baseline results

The results reported in Table 3 support our predictions. The interaction between equity compensation and overconfidence results in lower cash dividends and repurchases, supporting the theoretical predictions that overconfident CEOs with more equity compensation may destroy shareholder value. Conversely, inside debt mitigates the negative impact of overconfidence on cash dividends (but not on the repurchases), as interaction between inside debt and overconfidence has a positive and significant coefficient. Finally, both inside debt and equity-based compensation lead to a preference for repurchases over dividends in companies with overconfident CEOs, suggesting this payout channel may be optimal from the point of view of both shareholders and creditors.

We argue that the interaction between CEO overconfidence and compensation structure influences payout decisions through two channels: financial slack and risk-taking. Overconfident CEOs with higher equity-based pay may retain earnings to build cash reserves for investment, rather than return cash to shareholders. They may also pursue riskier projects, avoiding more conservative payout decisions. To examine these mechanisms, we conducted additional regressions (Table A.3).

The findings suggest support for both channels. The interaction between overconfidence and equity-based compensation is positively associated with cash holdings, firm risk (proxied by stock return volatility), and capital expenditures, indicating a preference for retaining financial slack and engaging in risk-taking behavior.

Table 7
The interaction between incentives and overconfidence and its impact on payout in companies with female directors.

Dependent variable	Dividend ratio		Repurchase ratio		Fraction of repurchases	
Model	1	2	3	4	5	6
a. Holder67	−0.0108***	−0.0094*	−0.0037	−0.0062	0.1596***	0.0563
	(−4.467)	(−1.699)	(−0.334)	(−0.441)	(3.120)	(0.561)
b. CEO inside debt	0.0001		0.0001		−0.0025*	
	(0.184)		(0.349)		(−1.638)	
a x b	0.0004*		−0.0011		0.0194***	
	(1.863)		(−1.337)		(3.830)	
c. CEO equity compensation		−0.0024**		−0.0020		0.2049***
		(−1.964)		(−0.230)		(4.619)
a x c		0.0037		−0.0150		−0.1949
		(0.495)		(−0.783)		(−1.351)
d. Gender diversity	0.0020*	0.0044**	0.0021	−0.0014	−0.0325*	−0.0043
	(1.800)	(2.481)	(0.737)	(−0.258)	(−1.765)	(−0.149)
b x d	0.0002**		0.0002		0.0008	
	(2.504)		(0.767)		(0.446)	
a x d	−0.0005	0.0102	−0.0170	0.0071	0.2810***	−0.0580
	(−0.182)	(1.372)	(−1.405)	(0.399)	(4.833)	(−0.491)
a x b x d	0.0001		0.0016*		−0.0186***	
	(0.393)		(1.791)		(−3.348)	
c x d		−0.0002		0.0098		−0.0649
		(−0.060)		(1.055)		(−1.342)
a x c x d		−0.0194*		−0.0156*		0.3771**
		(−1.917)		(−1.842)		(2.243)
Constant	Yes	Yes	Yes	Yes	Yes	Yes
Firm control variables	Yes	Yes	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Adj R^2	0.313	0.225	0.327	0.273	0.240	0.247
Observations	7130	7130	7130	7130	7130	7130
F-stat	68.201	36.878	76.443	46.228	42.729	47.087
p-Value	0.000	0.000	0.000	0.000	0.000	0.000

The table contains regressions that examine the joint effects of CEO compensation and overconfidence on payout ratios in companies with female directors on the board. All models are OLS models that include industry and year fixed effects and use robust standard errors. Brackets contain t-statistics, and superscripts ***, **, and * denote significance at 1 %, 5 %, and 10 %, respectively.

Table 8
Robustness test: holder100 as overconfidence measure.

Dependent variable	Dividend ratio		Repurchase ratio		Fraction of repurchases	
Model	1	2	3	4	5	6
a. Holder100	−0.0112***	−0.0021**	−0.0088*	−0.0115*	0.0472*	0.0119*
	(−8.159)	(−2.520)	(−1.830)	(−1.718)	(1.794)	(1.725)
b. CEO inside debt	0.0002***		0.0003***		−0.0021***	
	(6.801)		(3.002)		(−3.135)	
a x b	0.0004***		0.0001		0.0057***	
	(4.030)		(0.344)		(2.695)	
c. CEO equity compensation		−0.0021*		0.0061*		0.1496***
		(−1.842)		(1.634)		(7.650)
a x c		−0.0110**		−0.0275**		0.1021*
		(−2.036)		(−2.313)		(1.685)
Constant	Yes	Yes	Yes	Yes	Yes	Yes
Firm control variables	Yes	Yes	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Adj R^2	0.302	0.212	0.326	0.271	0.234	0.241
Observations	7130	7130	7130	7130	7130	7130
F-stat	71.936	37.121	85.198	51.142	44.152	48.775
p-Value	0.000	0.000	0.000	0.000	0.000	0.000

The table contains regressions that examine the joint effects of CEO compensation and overconfidence on payout ratios with alternative overconfidence measure (Holder100). All models are OLS models that include industry and year fixed effects and use robust standard errors. Brackets contain t-statistics, and superscripts ***, **, and * denote significance at 1 %, 5 %, and 10 %, respectively.

Table 9
Robustness test: binary variable for top quartile as overconfidence measure.

Dependent variable	Dividend ratio		Repurchase ratio		Fraction of repurchases	
Model	1	2	3	4	5	6
a. TopQ_OC	−0.0065***	−0.0009	−0.0052*	−0.0039	0.0469***	0.0524*
	(−7.501)	(−0.467)	(−1.932)	(−0.805)	(2.831)	(1.774)
b. CEO inside debt	0.0002***		0.0002*		−0.0023***	
	(4.870)		(1.886)		(−3.055)	
a x b	0.0003***		0.0004*		0.0005*	
	(4.925)		(1.848)		(1.806)	
c. CEO equity compensation		−0.0015*		0.0032		0.1246***
		(−1.843)		(0.810)		(5.941)
a x c		−0.0042*		0.0048		0.1330***
		(−1.868)		(0.655)		(3.109)
Constant	Yes	Yes	Yes	Yes	Yes	Yes
Firm control variables	Yes	Yes	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Adj R^2	0.308	0.214	0.326	0.271	0.236	0.244
Observations	7130	7130	7130	7130	7130	7130
F-stat	73.810	37.332	85.661	52.182	46.508	50.387
p-Value	0.000	0.000	0.000	0.000	0.000	0.000

The table contains regressions that examine the joint effects of CEO compensation and overconfidence on payout ratios with alternative overconfidence measure (TopQ_OC). All models are OLS models that include industry and year fixed effects and use robust standard errors. Brackets contain t-statistics, and superscripts ***, **, and * denote significance at 1 %, 5 %, and 10 %, respectively.

Table 10
Robustness test: longholder as overconfidence measure.

Dependent variable	Dividend ratio		Repurchase ratio		Fraction of repurchases	
Model	1	2	3	4	5	6
a. Longholder	−0.0002*	−0.0043***	0.0011	0.0030	0.0184	−0.0122
	(−1.850)	(−2.681)	(0.466)	(0.646)	(1.268)	(−0.514)
b. CEO inside debt	0.0002***		0.0003**		−0.0016**	
	(4.192)		(2.565)		(−1.981)	
a x b	0.0002***		0.0001		−0.0001	
	(3.036)		(0.206)		(−0.048)	
c. CEO equity compensation		−0.0019*		0.0047*		0.1460***
		(−1.706)		(1.952)		(6.469)
a x c		−0.0052**		−0.0027		0.0425*
		(−2.234)		(−0.378)		(1.860)
Constant	Yes	Yes	Yes	Yes	Yes	Yes
Firm control variables	Yes	Yes	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Adj R^2	0.303	0.210	0.326	0.271	0.233	0.242
Observations	7130	7130	7130	7130	7130	7130
F-stat	72.443	36.129	85.778	51.401	43.689	48.824
p-Value	0.000	0.000	0.000	0.000	0.000	0.000

The table contains regressions that examine the joint effects of CEO compensation and overconfidence on payout ratios with alternative overconfidence measure (Longholder). All models are OLS models that include industry and year fixed effects and use robust standard errors. Brackets contain t-statistics, and superscripts ***, **, and * denote significance at 1 %, 5 %, and 10 %, respectively.

In contrast, the interaction between overconfidence and inside debt is negatively associated with these variables, suggesting that inside debt moderates slack-building and risk-taking incentives.

4.3. Additional tests

Previous studies on overconfidence suggested some nuances in terms of its effects. First, overconfidence may be beneficial for innovation (Hirshleifer, Low, Teoh, 2012; Kraft, Dickler, Withers, 2025). Second, strong corporate governance seems to mitigate the adverse effects of overconfidence (Banerjee, Humphery-Jenner, Nanda, 2015). We use the dummy variables for innovative industries, CEO duality, board independence, and board gender diversity to test how the baseline results depend on the innovativeness and corporate governance. More specifically, we are interested in triple interaction terms between one of the dummies, compensation and overconfidence. Tables 4–7 summarize the results.

The baseline results do not hold for firms in innovative industries (Table 4) or those with CEO duality (Table 5), consistent with

Table 11
Robustness test: 2SLS instrumental variable regression.

Dependent variable	Holder67	Dividend ratio		Repurchase ratio		Fraction of repurchases	
Model	–	1	2	3	4	5	6
Average Holder67	0.4420***						
	(5.60)						
Lagged Holder67	0.5320***						
	(12.60)						
Personal tax rate	−0.0369						
	(−0.62)						
a. Fitted values		−0.0079***	−0.0005*	−0.0070**	−0.0031	0.0498*	0.0704
		(−4.31)	(−1.84)	(−1.99)	(−0.26)	(1.82)	(0.55)
b. CEO inside debt		0.0005***		0.0005**		−0.0019*	
		(6.06)		(3.28)		(−1.65)	
a x b		0.0005***		0.0004*		0.0004*	
		(4.03)		(1.69)		(1.71)	
c. CEO equity compensation			−0.0036*		0.0195***		0.2271***
			(−1.92)		(3.50)		(5.82)
a x c			−0.0046**		−0.0028*		0.0411*
			(−2.05)		(−1.99)		(1.75)
Constant	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm control variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adj R^2	0.768	0.334	0.242	0.337	0.275	0.232	0.240
Observations	6416	6416	6416	6416	6416	6416	6416
F-stat	75.902	76.623	40.317	78.545	51.936	44.826	46.182
p-Value	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Sargan-Hansen test	–	0.565	0.826	0.460	0.233	0.165	0.472

This table presents results from the instrumental regressions for the complete sample using two-step estimator. All regressions include intercept and dummy variables for companies and years. z-Statistics are reported in parentheses below each coefficient estimate. The validity of instruments is confirmed by high R^2 and F-statistic of the first step regression and p-values of the Sargan-Hansen tests. Brackets contain t-statistics, and superscripts ***, **, and * denote significance at 1 %, 5 %, and 10 %, respectively.

evidence that digitalization weakens pay–performance sensitivity (Li et al., 2024). In contrast, the effects persist in firms with independent or diverse boards (Tables 6 and 7). These findings suggest that compensation–overconfidence interactions are significant only in traditional industries - where overconfidence may adversely impact shareholders wealth - and in well-governed firms, where boards have sufficient authority to implement and enforce incentive structures that constrain the behavior of overconfident CEOs.

4.4. Robustness test

As overconfidence cannot be directly observed, our results may be driven by misspecification of this variable. To test the robustness, we use additional variables. First, we increase the moneyness threshold to 100 % to construct Holder100 measure (Campbell et al., 2011). Second, we use a binary variable equal to 1 if the calculated moneyness is in the top quartile of our sample (Banerjee, Humphery-Jenner, Nanda, 2015). Finally, we use a traditional Longholder measure, proposed by Malmendier and Tate (2005, 2008) which utilizes the direct data on executive stock options moneyness from SEC EDGAR database. The results reported in Tables 8,9, 10 support the baseline results.

Finally, the results may be driven by endogeneity. Previous studies stipulate that the impact of overconfidence on corporate policies is unlikely to be affected by endogeneity, as this is a stable time-invariant trait (Kraft, Dickler, Withers, 2025). Moreover, using fixed-effects at the industry-level and including interaction terms is likely to alleviate possible endogeneity bias (Busenbark et al., 2022). However, to increase certainty of our results, we utilize a two-step instrumental variable regression. The following instrumental variables were selected: (i) industry-average overconfidence, as companies in certain industries may willingly choose overconfident CEOs (Jiraporn et al., 2014); (ii) the first lag of overconfidence, as this trait is time-persistent and is based on previous behavior, and (iii) the personal state tax faced by a CEO, as it may induce them to defer more compensation into the future postponing the exercise of the options.

The results are summarized in Table 11. The first column shows the outcomes of the first-step regression. The results in Table 11 indicate that baseline results hold after accounting for endogeneity.

Additionally, we run nearest-neighbor matching estimation (Table A.4) and difference-in-differences analysis using the implementation of Sections 952 and 953 of Dodd-Frank Act as an exogenous shock to CEO compensation (Table A.5). The baseline results hold under these settings.

5. Conclusions

This paper examines how CEO overconfidence interacts with compensation structure to influence corporate payout policy. We

provide two key contributions. First, we show that overconfident CEOs with higher equity-based incentives are associated with lower payouts, consistent with value-destroying behavior when incentives are excessively convex. Second, inside debt mitigates this effect, promoting higher payouts to shareholders.

These effects operate through two channels - financial slack accumulation and increased risk-taking. Importantly, we find that these relationships are significant only in firms from traditional industries and with strong internal governance. These results have practical implications for boards and compensation committees, highlighting the importance of aligning pay structures with CEO behavioral traits.

Our findings align with the predictions of GHO but offer the first empirical test of these ideas. Future research could explore how specific compensation components (e.g., options vs. restricted stock) interact with behavioral traits, or examine whether these relationships evolved in the post-COVID era amid shifting risk and governance norms.

Declaration of generative AI and AI-assisted technologies in the writing process

During the preparation of this work, the authors used Microsoft Office Copilot to double-check the grammar and vocabulary. The tool suggested several minor corrections without altering the style or content of the article. After using this tool, the authors reviewed and edited the content as needed and take full responsibility for the content of the article.

Declaration of competing interest

None.

CRediT authorship contribution statement

Artem Anilov: Writing – original draft, Methodology, Formal analysis, Data curation. **Irina Ivashkovskaya:** Writing – review & editing, Supervision, Project administration.

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Appendix

Table A.1
Variables and definitions.

Variable type	Variable name	Symbols	Definition
Dependent variables	Dividend ratio	*Payout*	Cash dividends on common and preferred stocks divided by total assets
	Repurchase ratio		Repurchases divided by total assets
	Fraction of repurchases		Repurchases divided by total payout
Overconfidence	Holder67	*Overconf*	1 – if executive stock options are at least 67 % in the money, 0 - otherwise
Compensation	CEO inside debt	*Comp*	Natural logarithm of CEO inside debt (pension benefits and deferred compensation)
	CEO equity compensations		Equity-based compensation (stocks, restricted stocks and options grants) divided by total compensation
Control variables	Cash holdings	*Control*	Cash holdings divided by total assets
	Tobin's Q		Market value of equity divided by book value of equity
	Debt-to-Equity		Book value of debt divided by book value of equity
	Capex		Capital expenditures divided by total assets
	ROA		Net income divided by total assets
	Size		Natural logarithm of total assets
	EBITDA margin		EBITDA divided by revenue
	Stock return		The annual return on a company's common stocks
Additional variables	Industry dummy	*ADD*	1 – if a company is from IT or Pharma, 0 - otherwise
	CEO duality		1 – if CEO is also a chairman, 0 - otherwise
	Board independence		1 – if the majority of the directors are independent, 0 - otherwise
	Gender diversity		1 – if there is at least one female director, 0 - otherwise

Table A.2
Correlation matrix.

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
1	Dividend ratio	1.0																	
2	Repurchase ratio	0.131***	1.0																
3	Fraction of repurchases	−0.257***	0.425***	1.0															
4	Holder67	−0.069**	0.056***	0.082***	1.0														
5	CEO inside debt	0.140***	−0.008	−0.051***	−0.044***	1.0													
6	CEO equity compensation	0.011	0.081***	0.158***	0.083***	0.237***	1.0												
7	Cash holdings	0.013	0.130***	0.065***	0.054***	−0.267**	−0.057***	1.0											
8	Tobin's Q	0.265***	0.313***	0.088***	0.201***	−0.131	0.079***	0.201***	1.0										
9	Debt-to-Equity	0.084***	0.006	−0.002	−0.006	0.099***	0.047***	−0.206***	0.229***	1.0									
10	Capex	−0.038***	−0.045***	−0.076***	0.023**	−0.004	−0.005	−0.145***	−0.001	−0.012	1.0								
11	ROA	0.312***	0.335***	0.118***	0.103***	0.017	−0.015	0.129***	0.320***	−0.113***	0.007	1.0							
12	Size	0.168***	0.054***	0.026**	−0.024**	0.391***	0.284***	−0.288***	−0.062***	0.212***	0.018	0.047***	1.0						
13	EBITDA margin	0.114***	0.118***	0.033***	0.076***	0.043***	0.107***	−0.036***	0.153***	0.070***	0.247***	0.298***	0.249***	1.0					
14	Stock return	−0.043***	−0.004	0.035***	0.121***	−0.050***	−0.009	0.082***	0.223***	−0.053***	−0.103***	0.120***	−0.026**	−0.001	1.0				
15	Industry dummy	−0.113***	0.106***	0.185***	0.080***	−0.207***	0.130***	0.264***	0.149***	−0.101***	−0.235***	−0.004	−0.113***	0.052***	0.064***	1.0			
16	CEO duality	0.085***	0.025**	−0.013	−0.003	0.062***	−0.054***	−0.083***	0.023*	−0.003	0.044***	0.064***	0.105***	0.005	0.005	−0.095***	1.0		
17	Board independence	0.038***	0.041***	0.055***	−0.019*	0.040***	0.088***	0.001	0.002	−0.036***	−0.002	0.012	0.042***	0.014	0.002	0.067***	0.039***	1.0	
18	Gender diversity	0.126***	0.031***	0.011	−0.039***	0.206***	0.137***	−0.143***	0.012	0.098***	−0.059***	0.016	0.281***	0.003	−0.024**	−0.069***	0.042***	0.070***	1.0

This table reports correlation matrix for variables for the full sample. The moderate correlation levels suggest the absence of multi-collinearity issues. Definitions of all variables are provided in Table A.1. Superscripts ***, **, and * denote significance at 1 %, 5 %, and 10 %, respectively.

Table A.3
Results of the mechanism validation regressions.

Dependent variable	Cash holdings	SD of stock returns	Capex
Holder 67 x Inside debt	−0.0030***	−0.0492*	−0.0003***
	(−11.74)	(−1.81)	(−2.93)
Holder 67 x Equity compensation	0.0349***	9.2133***	0.0089***
	(6.52)	(6.10)	(4.08)
Constant	Yes	Yes	Yes
Company controls	Yes	Yes	Yes
Industry and Year fixed effects	Yes	Yes	Yes
Adj R^2	0.132	0.082	0.223
Observations	7130	7130	7130
F-stat	57.74	33.97	48.65

The table contains regressions that examine the joint effects of CEO compensation and overconfidence on the level of cash holdings, standard deviation of stock returns (company risk), and capital expenditures. All models are OLS models that include industry and year fixed effects and use robust standard errors. Brackets contain t-statistics, and superscripts ***, **, and * denote significance at 1 %, 5 %, and 10 %, respectively.

Table A.4
Results of the matching estimation.

Average treatment effects of:	Dividend ratio	Repurchase ratio	Fraction of repurchases
Holder 67 x Inside debt	0.009***	−0.002	0.024*
	(5.41)	(−0.41)	(1.82)
Holder 67 x Equity compensation	−0.003**	−0.006*	0.042*
	(−2.13)	(−1.73)	(1.83)

This table presents results for the bias-corrected nearest-neighbor matching estimation between outcome variables (payout) and average treatment effects of interaction between overconfidence and two compensation types. Overconfident CEOs with more than median inside debt or equity compensation are considered a treatment group, others – control group. All control variables, industry and year effects are included as matching variables. Full sample is used in both cases. z-Statistics are reported in parentheses below each coefficient estimate. *, **, and *** denote statistical significance at the 10 %, 5 % and 1 % levels, respectively.

Table A.5
Payout policy after exogenous event of the Dodd-Frank act implementation.

Dependent variable	Dividend ratio		Repurchase ratio		Fraction of repurchases	
Model	1	2	3	4	5	6
Holder 67 x Inside debt x Post	0.005***		0.003		0.083**	
	(2.72)		(0.66)		(2.38)	
Holder 67 x Inside debt	0.002*		0.003		0.020*	
	(1.92)		(0.62)		(1.69)	
Holder 67 x Equity compensation x Post		−0.003*		−0.007*		0.051*
		(−1.72)		(−1.79)		(1.82)
Holder 67 x Equity compensation		−0.002*		−0.003		0.061**
		(−1.76)		(−0.92)		(1.97)
Post	−0.003	−0.002*	−0.003*	−0.003	0.098***	0.098***
	(−0.43)	(−1.77)	(−1.82)	(−0.86)	(5.02)	(4.99)
Constant	Yes	Yes	Yes	Yes	Yes	Yes
Firm control variables	Yes	Yes	Yes	Yes	Yes	Yes
Industry and Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Adj R^2	0.300	0.211	0.328	0.200	0.236	0.236
Observations	7130	7130	7130	7130	7130	7130

The table presents results of a difference-in-differences analysis of payout ratios after the exogenous implementation of the Dodd-Frank Act (DF) provisions. Several provisions of the DF (Sections 952 (independent compensation committee) and 953 (pay-for-performance and pay-ratio disclosures)) imposed additional requirements in terms of CEO compensation disclosure. These provisions enhanced governance mechanisms within companies and affected the compensation structure of CEOs. Post – is a dummy variable which equals 1 after the implementation of these provisions (after 2013), and 0 – otherwise. Overconfident CEOs with more than median inside debt or equity compensation are considered a treatment group, others – control group.
All control variables, industry and year effects are included as matching variables. Brackets contain t-statistics, and superscripts ***, **, and * denote significance at 1 %, 5 %, and 10 %, respectively.

Data availability

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