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Pay Schemes: Their Micro and Macro Level Dynamics within Organizations

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Pay Schemes: Their Micro and Macro Level Dynamics within Organizations

Abstract

Compensation is multifaceted, extending beyond base salaries and bonuses to include financial instruments such as stock options and restricted stocks. This complexity introduces variability among employees in terms of pay amount and pay duration—the time until compensation benefits are realized. Extant literature highlights that employees' behaviors and decisions are influenced not only by their own pay but also by that of other employees, particularly those in higher ranks. This raises the question of whether and how employees receiving complex compensation packages react to disparities, not only in monetary terms but also in other dimensions of pay. The first chapter delves into this underexplored area by investigating the effect of the disparity in pay duration between CEOs and non-CEO executives on the departure decisions of non-CEO executives. We find that greater pay duration disparity increases voluntary non-CEO executive departures, potentially because it signals a delay in promotion opportunities and reflects the board's valuation of the executive. Furthermore, our study reveals heterogeneous responses to pay duration disparities depending on factors affecting promotion expectancy. This finding constitutes the first empirical evidence of employee responses to temporal pay disparities beyond monetary amounts.

While gender inequalities in compensation are well-documented across various sectors, reports vary on the extent and nature of these inequalities in CEO compensation. Potentially limiting our understanding of these inequalities is the focus on disparities in pay amounts among CEOs, which may mask inequalities in structural processes that influence pay distribution at the CEO level. The second chapter addresses this gap by examining potential differences between

female and male CEOs in two key criteria that guide performance-pay allocation: the number of performance goals and the length of performance evaluation periods. Performance-based pay, which constitutes a significant portion of CEO compensation, relies heavily on these criteria, making their analysis crucial for understanding gender disparities at the CEO level. We explore variations in these performance evaluation criteria for CEOs. The findings reveal that female CEOs often face stricter evaluation criteria, particularly in male-dominated boards and when they have limited past managerial experience. This study contributes to the strategic management literature by providing insights into the complex structures of compensation packages and performance evaluation processes, emphasizing the need for fairer compensation systems that consider gender equity at the CEO level.

The third chapter investigates the events involving the vesting of long-term payments to the CEO and their impact on the firm's legal strategy in handling subsequent lawsuits. Prolonged lawsuits incur rising legal costs, divert resources from core business activities, and potentially harm the company's reputation. To avoid long-term penalties associated with lengthy lawsuits, firms may seek early settlements, though these can be costly and reduce short-term stock value. Managers face a trade-off between avoiding prolonged legal battles and deferring the legal process to maintain current stock values. Given research linking long-term payments with myopic loss aversion, we expect CEOs vested with long-term compensation before lawsuits to prioritize maintaining payment value over long-term firm benefits. Examining lawsuits against firms, we find a positive relationship between long-term compensation value and lawsuit duration that is more pronounced among CEOs who display a tendency to hold onto their options. In turn, lawsuit duration is negatively linked with firm performance and earnings. This study reveals a novel link between long-term CEO compensation and corporate legal strategy, shedding light on the potentially adverse effects of long-term incentives.

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1.1 INTRODUCTION

Employees' behaviors are influenced not only by their own compensation but also by that of other employees (Carnahan, Agarwal, and Campbell, 2012; Gartenberg and Wulf, 2017; Nickerson and Zenger, 2008). In particular, the disparity in pay between different levels of an organization has been shown to affect employee attitudes and motivation (Chin, Acharya, and Devers, 2023; Kacperczyk and Balachandran, 2018; Ridge, Hill, and Aime, 2017). Although much of the existing literature on pay comparisons between different organizational ranks examines the disparities in *pay amounts*, the nature of compensation packages calls for a deeper investigation into other dimensions of pay. Indeed, firms increasingly employ complex, long-term compensation mechanisms, such as stock options and restricted stocks, for executives and employees across various organizational levels in both startups and established firms (Aran and Murciano-Goroff, 2023; Nyberg et al., 2018; Zhang, 2006). These long-term components are characterized not only by their monetary value (that is, their *amount*) but also by their vesting periods, i.e., the *duration* until payments are fully received (DesJardine and Shi, 2021; Groysberg et al., 2021, Wowak and Hambrick, 2010). This raises a question: Do employees receiving complex and multifaceted compensation packages react to disparities not only in monetary terms but also in the temporal dimension of pay?

We answer this question by investigating the response of executives to disparities in *pay duration*—the average time before an individual can reap the benefits from their compensation package—compared to that of the CEO. We propose that executives may interpret differences in pay duration as a signal about their promotion prospects. A longer CEO pay duration, while incentivizing CEOs to remain with a firm to secure their unvested payments (Balsam and Miharjo,

2007; Gopalan, Huang, and Maharjan, 2021), may simultaneously demotivate other executives by signaling a lower likelihood of the CEO vacating their position, thereby limiting their own opportunities for advancement. Furthermore, we suggest that a disparity in pay duration between the CEO and other executives may be interpreted as a signal that the board places less value on the executives' retention and contributions compared to the CEO and does not consider them viable candidates to succeed the CEO. Given that promotion to the CEO position is a strong incentive for executive retention (Shen and Zhang 2018; Shi, Connelly, and Sanders, 2016; Wowak, Gomez-Mejia, and Steinbach, 2017), we predict that large disparities in pay duration between the CEO and other executives will lead to increased executive turnover.

To test this hypothesis, we use the Incentive Lab database from Institutional Shareholder Services (ISS), which provides detailed information on executive compensation, including grant dates, fair values, and precise vesting dates of each long-term grant (Chu, Faasse, and Rau, 2018). Our analysis focuses on non-CEO executives holding positions at or above the vice-president (VP) level at Fortune 500 U.S. public companies from 2006 to 2019. Our sample tracks approximately 3,000 executives across nearly 350 firms.

We find that a larger disparity in pay duration between a CEO and other executives is positively related to the voluntary departure of non-CEO executives. To mitigate potential endogeneity concerns, we further examine instances that can lead to sudden changes in the disparity in pay duration between CEOs and other executives. First, we examine instances where large grants awarded to the CEO in the distant past have fully vested, as these events are less likely to be influenced by present factors affecting executive departure (Gopalan et al., 2021). Second, we use a difference-in-difference (DiD) analysis leveraging the 2010 Dodd–Frank Act. This legislation mandated shareholder votes on CEO compensation and impacted the disparity in pay duration differently among firms with and without prior shareholder engagement on CEO compensation before the legislation. Furthermore, to deepen our understanding of the underlying mechanisms, we investigate executive-level and firm-level factors influencing executives'

expectations of promotion opportunities. We observe that executives are more sensitive to disparities in pay duration when they receive a pay package similar in monetary value to the CEO's, which can be regarded as a signal that they are viewed as potential candidates for succession, as well as when the current CEO has been promoted internally. Conversely, executives are less likely to react to disparities in pay duration when they have only recently joined the firm.

This study makes several contributions to the existing literature. First, we contribute to the strategic management literature on pay disparity (e.g., Carnahan et al., 2012; Feldman, Gartenberg, and Wulf, 2018; Gartenberg and Wulf, 2017; Obloj and Zenger, 2017). Although some studies have explored how within- and cross-level disparities in pay amount can influence employee behavior (Carnahan et al., 2012; Fredrickson, Davis-Blake, and Sanders, 2010; Siegel and Hambrick 2005), there has been relative silence on the effects of disparities in other compensation components, such as pay duration. Our findings suggest that individuals react not only to differences in monetary reward across levels (Kacperczyk and Balachandran, 2018; Ridge et al., 2017; Wade, O'Reilly, and Pollock, 2006) but also to the temporal dimension of these rewards. Our study makes a novel contribution to the literature by exploring how cross-level differences in elements of pay structure, beyond sheer monetary value, can affect employee behavior. Our results suggest that differences in the temporal dimension of compensation packages may exert strong signaling effects on employees' perceptions of their valuation and promotion prospects within the organization, effects that are not explained by differences in pay amount.

Second, we contribute to the literature on the consequences of long-term payments to CEOs (Hou, Priem, and Goranova, 2017; Sanders and Hambrick, 2007). Long-term incentives have been found to shape CEO decision-making and foster commitment to the organization (Martin, Wiseman, and Gomez-Mejia, 2016), encouraging a greater focus on long-term outcomes (Bebchuk and Fried, 2010; Flammer and Bansal, 2017). Whereas most of the literature

emphasizes the positive effects of long-term CEO compensation, our research sheds light on a potential pitfall associated with such incentives. Specifically, increasing long-term payments to CEOs can widen the gap in pay duration between the CEO and other executives, leading to a higher rate of executive turnover.

Finally, we contribute to the literature on executive mobility. Despite the important role played by top executives (Boone et al., 2019; Cummings and Knott, 2018) and the substantial costs associated with their departure (Bilgili et al., 2017; Dess and Shaw, 2001; Nanda et al., 2023), the determinants of executive departure remain an underexplored area of study (Andrus et al., 2019). We extend the literature that has examined the effect of pay and pay differences at the executive level (Andrus et al., 2019; Bloom and Michel, 2002; Ridge, Aime, and White, 2015; Ridge et al., 2017) by investigating the role of pay disparity in terms of duration, a key dimension of pay structure.

1.2 THEORY

Extant research shows that employees often evaluate their pay in relation to higher-ranked employees (Chin et al., 2023; Gartenberg and Wulf, 2017; Kacperczyk and Balachandran, 2018). However, the impact of such comparisons on employee behaviors such as departure remains ambiguous due to conflicting dynamics. On the one hand, employees are said to experience a sense of relative deprivation when they receive smaller pay packages compared to employees in higher ranks, thus reducing their commitment and motivation, potentially leading to increased staff turnover (Bloom and Michel, 2002; Chin et al., 2023; Nickerson and Zenger, 2008; Siegel and Hambrick, 2005; Wade et al., 2006). On the other hand, larger pay differences across ranks may motivate the employee to remain in the firm because they highlight the financial benefits of future promotions (Cullen and Perez-Truglia, 2022; Kacperczyk and Balachandran, 2018; Ridge et al., 2017). Thus, the debate on how the differences in compensation across organizational ranks (or inter-rank differences) influences employee turnover, especially among executives, remains

active. Whereas most existing studies have focused on inter-rank differences on pay amounts, the complex structure of executive compensation suggests the need for a deeper dive into various pay dimensions.

1.2.1 The Multifaceted Nature of Executive Compensation: Pay Amount and Pay Duration

Long-term payments, including stock options and restricted stocks, constitute a substantial portion of executives' compensation, accounting for more than 60% among the top 3,000 U.S. firms (Groysberg et al., 2021). These financial instruments are often used to shape executive decision-making and foster their commitment to the organization (Cadman, Rusticus, and Sunder, 2013; Martin et al., 2016; Souder and Bromiley 2012), thereby encouraging a greater focus on long-term outcomes (Bebchuk and Fried, 2010; Flammer and Bansal, 2017). Such long-term instruments are characterized by both monetary value and vesting periods—the time executives must wait to receive their payments in full (DesJardine and Shi, 2021; Wowak and Hambrick, 2010). Executives typically retain vested pay upon departure but forfeit remaining unvested long-term pay, which cannot be immediately exercised or sold, with forfeiture observed in up to 96% of cases of executive departure (Cadman et al., 2013; Morgan Stanley, 2014). Because forfeiture can lead to substantial financial losses, the effectiveness of these long-term incentives in shaping executive decision-making hinges on their unvested component and on the length of the vesting periods (Aldatmaz, Ouimet, and Van Wesep, 2018; Balsam and Miharjo 2007, Jochem, Ladika, and Sautner, 2018).

An insightful approach to analyzing the effects of executive compensation, including the critical role of the temporal dimension, involves distinguishing between *pay amount* and *pay duration*. Pay duration is defined as the average time before an individual can reap the benefits from their compensation package (Gopalan et al., 2014; Thanassoulis 2013). It quantifies the extent to which executive compensation leans more toward short-term rewards (such as salaries

or vested grants) or is anchored in long-term incentives (such as unvested awards with extended vesting periods). This concept captures the essence of time as a fundamental element in understanding the strategic structuring of executive pay packages and offers a lens through which to examine the multifaceted nature of executive compensation. For instance, Gopalan et al. (2021) posited that CEOs and other executives are more likely to remain with a firm to avoid forfeiting unvested pay as the size of this pay and the length of its vesting period increase. Accordingly, they found that longer pay duration is associated with fewer voluntary departures among both CEOs and other executives.

1.2.2 Disparity in Pay Duration and Executive Departure

The prospect of promotion to the CEO position serves as a powerful motivator for other executives (Bloom, 1999; Henderson and Fredrickson, 2001; Ridge et al., 2015). Whereas promotions within organizations typically entail a 5% to 10% pay raise, the advance from a non-CEO executive role to CEO frequently results in a pay increase of 60% or more (Chatterjee and Hambrick, 2007). Beyond the financial rewards, ascending to the position of CEO brings with it considerably higher prestige and power, compared to conventional promotions (Porter, Lorsch, and Nohria, 2004). Given the substantial pay increase and elevated status the CEO position confers, the opportunity for promotion is highly coveted by executives (Bognanno, 2001; Connelly et al., 2014; Lazear and Rosen, 1981; Shi et al., 2016). To preserve their chances of promotion and seize the opportunity when the current CEO departs, executives must remain employed in the firm. Thus, the prospect of ascending to the CEO role and receiving the resulting rewards effectively deters executives from leaving voluntarily (Ridge et al., 2017).

However, the effectiveness of the prospect of promotion to CEO as an incentive is contingent upon the availability of the CEO role. As discussed earlier, a CEO's compensation structure can affect their likelihood of leaving, in that longer pay durations typically make them less inclined to leave (Gopalan et al., 2021). A lower likelihood of CEO departure may, in turn,

weaken other executives' motivation and incentives to stay with the firm, prompting them to explore opportunities elsewhere (Kale, Reis, and Venkateswaran, 2009). Hence, extending the duration of CEO pay improves the retention of the CEO but simultaneously increases uncertainty around succession and reduces the effectiveness of the prospect of promotion to the CEO role as an incentive to retain other executives.

Employee perceptions of compensation often hinge on comparisons between their own pay and that of higher-ranked individuals (e.g., Chin et al., 2023; Connelly et al. 2014). Therefore, executives likely evaluate the CEO's pay duration—and its impact on their own promotion prospects—against their own pay. Although shorter pay durations may appear preferable for executives who desire quicker, more predictable compensation (Pepper and Gore 2014, Zajac and Westphal, 1995), we argue that disparities in pay duration can convey information about an executive's contribution importance, the emphasis placed on their retention relative to the CEO, and their viability as potential successors.

As mentioned, long-term payments are recognized as effective retention tools, incentivizing individuals to remain within the firm to receive their rewards (Balsam and Miharjo, 2007). These long-term payments play a key role in sorting and retaining employees with desirable characteristics (Balsam and Miharjo, 2007; Gopalan et al., 2021; Oyer and Schaefer, 2005; Tsui and Vance, 2023). This strategic use of long-term compensation as a governance mechanism to ensure loyalty is recognized by both executives and boards of directors (Pepper, Gore, and Crossman, 2013). For instance, Russell Klosk, a managing director within Accenture's Strategy Group for Talent & Organization, states, "incentive-based pay (e.g. restricted stock units, etc) is among the best tools for retention" (Forbes, 2021).

Given the pivotal role that long-term pay components play in retaining key employees, disparities in the share of long-term components in pay packages or differences in their vesting periods between a non-CEO executive and the CEO may reflect different intentions by the board of director to retain these individuals. Therefore, although executives might prefer immediate,

shorter-term payments, a notable gap in their pay duration compared to the CEO's could be interpreted negatively: Such a gap may signal that the board of directors places a lower priority on the executives' long-term retention compared to that of the CEO.

Relatedly, a difference in pay duration between an executive and the CEO may indicate the value the board places on the executive's contribution to the firm. Long-term payments, in addition to their retention purposes, are often used to influence decision-making and mitigate the "short-termism" of key decision-makers (Devers et al., 2007; Flammer and Bansal, 2017; Flammer, Hong, and Minor, 2019; Zhang and Gimeno, 2016). However, the usage of long-term compensation as a governance mechanism to influence the employees' decision-making is only "sensible for incentive purposes under a very limited set of circumstances—namely, when employees can take actions that have large value implications for the firm" (Oyer and Schaefer, 2005, p. 101). Therefore, the board is likely to employ incentives with long durations to shape an executive's decision-making only if the executive's actions are believed to have a strong influence on firm outcomes. Executives understand that these payments are used not only for retention but also to guide decision-making and to align interests among key executives and shareholders (Pepper et al., 2013). Hence, executives who receive compensation with a shorter pay duration than that of their CEO may perceive this as a signal that the board regards their contribution as less important, thus interpreting this relative gap unfavorably.

Finally, the disparity in pay duration between the CEO and other executives may inform those executives about their potential to succeed the CEO. Essman et al. (2021) found a positive relationship between the disparity in pay amount between the CEO and other executives and the likelihood of appointing a successor from outside the company to the CEO position. The authors suggest—although not tested empirically—that executives may interpret this gap in pay amount as a signal that they are not considered viable candidates for the CEO role. Beyond the mere difference in pay amounts, which may act as a motivating factor (Cullen and Perez-Truglia, 2022;

Kacperczyk and Balachandran 2018), we propose that the disparity in pay duration may be perceived by executives as an even clearer indication of their prospects for promotion.

In summary, executives may compare their pay duration with that of their CEO and adjust their decisions accordingly. CEOs receiving disproportionately long pay durations may be indicative of greater CEO retention and limited upward mobility for executives seeking promotion. Furthermore, if the CEO's pay duration is significantly longer than that of a non-CEO executive, that executive may interpret this as a signal that the board ascribes less value to their retention and contribution toward the firm's outcomes, and that they are not perceived as strong candidates for the CEO position, thus weakening their incentive to remain. Therefore, a substantial difference in pay duration between executives and the CEO is likely to increase the likelihood of voluntary departures. Formally, we predict the following:

Hypothesis 1: A greater disparity in pay duration between a CEO and non-CEO executives is positively related to the voluntary departure of non-CEO executives.

1.3 METHOD

1.3.1 Data and Sample

Our sample includes non-CEO executives (hereinafter "executives") who were at or above the VP level within Fortune 500 U.S. public firms from 2006 to 2019. We restrict the sample to firms listed in the 2006 Fortune 500 to ensure consistency. Specifically, our sample consists of C-level executives, divisional and/or geographical region heads, presidents, senior VPs, executive VPs, and VPs who also hold key roles such as that of company secretary, treasurer, or controller. Furthermore, the vast majority of the executives in our sample are among the five most highly paid executives in the given year. We focus on executives at this level because they can reasonably expect to be considered for promotion to CEO and to be included in the top management team (Messersmith et al., 2011), from within which executives are said to be likely

candidates for internal promotion (Ridge et al. 2015).[1] In supplementary analyses, we leverage heterogeneity among these executives.

We use the Incentive Lab database from ISS to obtain detailed information on executive compensation, including the grant date, fair value, and precise vesting date for each long-term grant (Chu et al. 2018); Compustat to obtain firm-level control variables; Execucomp to obtain executives' characteristics, such as age and gender (Messersmith et al. 2011); and BoardEx to obtain prior job experience and departure-related information (Andrus et al. 2019).

Our initial sample consists of 4,921 non-CEO executives across 373 firms and 17,988 executive-firm-year observations. We exclude from the sample firms and individuals with gaps in the panel, as our measure of pay duration relies on cumulative prior year grant data and may be sensitive to such gaps in observations[2], and those who have previously served as CEOs within the company. We also exclude observations with incomplete financial information and missing or incomplete vesting dates or periods. Further, we remove any firms where CEO-related information is missing. For firms with multiple CEOs in a given year, we focus on the CEOs with longer tenure and exclude all others, as our theory and operationalization generally pertain to single-CEO firms.[3] Finally, following the literature on departure (e.g., Balsam and Miharjo 2007), we use a one-year lag for our independent and control variables. Overall, we obtain a final sample of 9,744 executive-firm-year observations involving 2,739 executives at 351 firms.

1.3.2 Dependent Variables

The dependent variable is *departure*, coded 1 if the executive departed in a given year and 0 otherwise. First, we record departure based on the last year an individual is observed in a given

[1] We observe that only 3.8% of insider (i.e., internally promoted) CEOs were not among the five most highly paid non-CEO executives.
[2] We exclude 2,161 observations (corresponding to 564 executives) due to gaps in observation. The results remain consistent when including these 564 executives (see Appendix Table A9).
[3] In cases where the CEOs had the same tenure, we focused on the older one.

firm within the Incentive Lab data, and the year of departure as reported in BoardEx.[4] We then further refine our identification of departures using Lexis-Nexis, Factiva, firm proxy filings, LinkedIn, and other similar sites.

We further distinguish between voluntary and involuntary departures using the executive's age at the time of departure (Balsam and Miharjo, 2007) and their career trajectory (Stern and James, 2016) in a multi-stage process. First, we classify a departure as involuntary if the executive was younger than 60 at the time of departure and failed to take another job in the year following departure, and voluntary otherwise (Fee and Hadlock, 2003; Kacperczyk and Balachandran, 2018; Suk, Lee, and Kross, 2021).[5] Following this, we investigate individuals older than 60 who were initially classified as having voluntarily departed, but failed to take another job in the year following departure otherwise. We classify their departure as involuntary if the media reported that the executive was forced out of their position (Balsam and Miharjo, 2007; Stern and James, 2016; Wiersema and Zhang, 2011).[6]

Prior literature has used the abruptness of a departure, or the lack of an announcement, to indicate that it was involuntary (Jiang et al., 2017; Parrino, 1997; Suk et al., 2021, Wiersema and Zhang, 2011). Therefore, we also use the time and manner of the official announcement of the departure to classify a departure as voluntary or involuntary (Gopalan et al., 2021). Specifically, for individuals younger than 60 at the time of departure who failed to "jump ship", and were therefore classified as having involuntarily departed in the first stage, we consider that a departure was voluntary if it was announced by the firm or media sources at least two months before the departure occurred, or if it was reported to be planned, or was reported as being due to the executive seeking alternative career opportunities. Overall, we observe 1,296 instances of

[4] If there are discrepancies between Incentive Lab and BoardEx, we assume that BoardEx is more accurate.
[5] Executives younger than 60 at the time of departure who accepted another job (including board positions) in the year following departure are categorized as having voluntarily departed.
[6] We do not consider departures due to health-related issues or deaths as a departure event (Balsam and Miharjo, 2007; Parrino, 1997).

voluntary departure[7] and 310 instances of involuntary departure.[8] As we discuss in the Results section, our analyses are robust when relaxing the assumptions regarding age and abruptness of the departure for the classification of voluntary and involuntary departures.

1.3.3 Independent Variables

We measure *Pay Duration* using the method proposed by Gopalan et al. (2014): It is a weighted average of the lengths of the vesting periods of five pay components (salary, bonus, restricted stocks, stock options, and other types of grants).[9] This measure accounts for both the grants awarded from previous years that are still vesting as well as grants with gradual vesting. The general formula we use, omitting the subscripts referring to the year (for ease of readability), is as follows:

$$PayDuration_i = \frac{(Salary_i + Bonus_i) * 0 + \sum_{si=1}^{S} Stock_{si} * t_{si} + \sum_{oi=1}^{O} Option_{oi} * t_{oi} + \sum_{hi=1}^{H} Other_{hi} * t_{hi}}{Salary_i + Bonus_i + \sum_{si=1}^{S} Stock_{oi} + \sum_{oi=1}^{O} Option_{oi} + \sum_{hi=1}^{H} Other_{hi}}$$

where $Salary_i$ and $Bonus_i$ are the dollar values of annual salary and bonuses, with a vesting period of 0, as they are received at the end of the current year. $Stock_{si}$, $Option_{oi}$, and $Other_{hi}$ indicate the grant-date fair value (that is, the dollar value at the date on which the grant is awarded, as reported by the firm) of the restricted stock grants, option grants, and other types of grants, which have a final vesting period of t_{si}, t_{oi}, and t_{hi}, respectively. *S*, *O*, and *H* are the number of stocks, options, and other types of grants awarded to the individual. For grants with gradual vesting periods (which vest incrementally until they are fully vested), we follow Gopalan et al. (2014) and replace the t_{si},

[7] The annual number of voluntary departures (M=99.7, SD= 10.5) is evenly spread over the years, with a minimum of 83 in 2010 and a maximum of 119 in 2015 (see Table A10 in the Appendix for the distribution).
[8] The proportion of involuntary departures (19.3%) is comparable with figures reported in studies that examine CEO and other executive departures (Balsam and Miharjo, 2007; Gopalan et al., 2021; Suk et al., 2021; Wiersema and Zhang, 2011).
[9] Gopalan et al., (2014) considered only four categories; we added "Other" to account for grants that could not be readily classified as restricted stocks or stock options (e.g., phantom stocks, or cash grants with vesting periods). Following Gopalan et al., (2014), vested grants from prior years are included and have vesting periods of 0. Our findings remain consistent across both main and supplementary analyses when we exclude awards vested from previous years in the operationalization of pay-duration related variables.

t_{oi}, and t_{hi} in the formula above with (t_{si} + 1)/2, (t_{oi} + 1)/2, and (t_{hi} +1)/2 (see the Appendix for more details).

The measure of pay duration accounts for both unvested grants awarded in the focal year and unvested grants from previous years, with the vesting periods adjusted depending on the time remaining for the grants to be fully vested. The measure also takes account of the vested grants held by the executives, which have a vesting period of 0. Based on these specifications, we calculate the pay duration, measured in years, for both executives and CEOs.

Our main independent variable, *Pay Duration Disparity*, is operationalized as the ratio between the pay duration of the CEO and that of the focal executive.[10] As we discuss in the Results section, we run additional analyses in which we operationalize this variable as the difference between the CEO and executive pay durations. We observe that our findings are robust to these specifications.

As an illustration, let us consider the case of an executive who joined their firm in 2012.[11] In 2013, they received a salary of $635,000 and a bonus of $710,000, both with a vesting period of 0 years because they were paid in the same year. Additionally, in 2012, they were granted a restricted stock award with a fair value of $715,000 and a three-year vesting period, and another restricted stock award in the same year with a fair value of $300,000 and a four-year vesting period. In 2013, the executive was granted a restricted stock award with a fair value of $813,000 and a three-year vesting period, as well as another restricted stock award with a fair value of $440,000 and a four-year vesting period. A visual representation of this scenario is provided in Figure 1.

Insert Figure 1.7.1 about here.

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[10] We winsorize pay-duration related variables at 1 and 99% to control for outliers in the data.
[11] The dollar values and vesting periods for this executive are rounded for a clearer illustration.

As explained, pay duration is a weighted average of the vesting periods of pay (weighted by monetary amounts), considering both the current year's grants and past grants that are still vesting. In this case, the executive's pay duration for 2013 would be:

$$\frac{635{,}000 * 0 \ + \ 710{,}000 * 0 \ + \ 715{,}000 * (3-1) \ + \ 300{,}000 * (4-1) \ + \ 813{,}000 * 3 \ + \ 440{,}000 * 4}{635{,}000 \ + \ 710{,}000 \ + \ 715{,}000 \ + \ 300{,}000 \ + \ 813{,}000 \ + \ 440{,}000} \approx 1.8$$

This means that in 2013, the executive's pay duration was approximately two years. As we discuss in the Results section, we run additional analyses in which we operationalize our measure by removing cash and performance-based grants from the calculations while also removing vested grants from the past years. The results are robust following these modifications.

1.3.4 Control Variables

We control for firm-level, executive-level, and CEO-level variables that may affect executive departures. At the executive level, we control for *Age*, *Tenure*, *Gender,* and *Pay Duration* (Balsam and Miharjo, 2007; Bonet, Cappelli, and Hamori, 2020; Gopalan et al., 2021; Loprest,1992). We further control for *Total Pay*, which is the total compensation of the individual as reported in the firm's proxy filings in a fiscal year. We also include additional controls to account for the executive's role: Namely, we use *CFO* and *COO/President* dummies to account for possible variations in compensation and distinct treatment by the board towards individuals holding these positions (Tao and Zhao, 2019). At the CEO level, we control for *CEO Total Pay, CEO Age,* and *CEO Departure* (i.e., if the CEO left the firm in a given year). At the firm level, we control for *Firm Performance* (Fee and Hadlock, 2003), using the natural logarithm of Tobin's Q. Because acquisitions are highly predictive of departures during the year of acquisition and the following year (Krug and Aguilera, 2004), we added the control variable *Acquired*, which equals 1 if the firm was acquired in the current or prior year, and 0 otherwise.[12]

[12] Please see the Appendix for a summary of the names and descriptions of the variables used in the analyses.

1.4 RESULTS

1.4.1 Pay Duration Disparity and Executive Departure

Table 1.7.1 reports descriptive statistics and correlations.[13] Table 1.7.2 (columns 1-4) reports the results of a series of linear regressions of executive voluntary and involuntary departure on pay duration disparity. For our main analyses, we use linear models for ease of interpretation; for robustness purposes, we also report logistic models in the Appendix (Table A1). To address any unobserved heterogeneity at the firm, CEO, and year levels, we incorporate CEO-firm and year fixed effects. Furthermore, to account for potential correlations in the error term across observations, we cluster our standard errors at the CEO-firm level. We further include results obtained with firm fixed effects instead of CEO-firm fixed in Table 1.7.2 (columns 2 and 4).

Insert Table 1.7.1 about here.

Insert Table 1.7.2 about here.

We observe that *Pay Duration Disparity* is positively related to voluntary departure ($p < .001$ in column 1). In economic terms, the results indicate that an increase of one standard deviation in the pay duration disparity is associated with a 3-percentage-point increase in the likelihood of voluntary departure, which corresponds to a 22.5% increase over the base rate.

Our arguments revolve around executives interpreting the disparity in pay duration as a signal about their promotion prospects and consequently deciding whether to stay with or leave their firm. In this context, involuntary departure can serve as an important counterfactual that, by definition, is more heavily influenced by external factors, such as a decision to dismiss the executive (Shaw et al. 1998). Given that our arguments concerning the disparity in pay duration

[13] The maximum variance inflation factor for *Pay Duration Disparity* and *Pay Duration* is 2.7, which is below the threshold criterion of 10 (Greene 2012).

center on executives' decisions, we expect a weaker association between pay duration disparity and involuntary departure.

Our results support this expectation, as the relationship between pay duration disparity and departure is present only for voluntary departure. We do not observe *Pay Duration Disparity* to be significantly related to involuntary departure (see columns 3 and 4 in Table 1.7.2). This provides robustness to our findings, as we theorized that pay duration disparity would primarily relate to the executives' reaction and their voluntary departures. Instead, in line with Gopalan et al. (2021), we find that the executive's *Pay Duration* is negatively related to both voluntary departure and involuntary departure.

These results invite a question: Do executives tend to join firms with different pay structures, specifically those offering relatively shorter CEO pay durations? Within our sample, we have identified 106 instances of executives who departed to join another firm present in the sample. For these instances, we conducted a two-sided paired *t*-test comparing the executive's pay duration disparity at the departing firm (at the year of departure) with the one at the firm they joined (during the first year of employment). The analysis reveals that executives tend to join firms with lower disparity in pay duration compared to the firms they left ($t(105) = 3.85$, $p < .001$).

To further test the robustness of our findings, we perform a series of additional analyses. In Table A1 of the Appendix, we show that the results are robust to using logistic regressions. In Table A2 of the Appendix, we show the results' robustness to alternative operationalizations of pay duration disparity (using the difference rather than the ratio between the CEO's and other executives' pay durations or changes in pay duration disparity) and alternative measures of pay duration, i.e., excluding performance-based grants, excluding cash grants, or excluding all vested grants. In Table A3 of the Appendix, we show that the results are also robust to alternative measures of voluntary departure, i.e., adjusting the condition for the age at the time of departure to 65, or relaxing the condition for the abruptness of departure. Moreover, to account for potential biases when using ratio variables (Essman et al., 2021), we replicated the results using three

alternative specifications, i.e., excluding the control for the executive's own pay duration, replacing *Pay Duration Disparity* with the CEO's pay duration in its absolute form, and controlling for both the executive's and the CEO's pay duration alongside *Pay Duration Disparity* (Table A4 in the Appendix). Finally, we replicated the analyses controlling for *Total Pay Amount Disparity* (the ratio between *CEO Total Pay* and the focal executive's *Total Pay*).[14] The results are consistent with the main analyses and further show that, unlike the disparity in pay duration, the disparity in pay amount between CEOs and executives is not significantly related to voluntary departure (Table A5 in the Appendix). This highlights the importance of considering both amount and duration as distinct dimensions of pay.

1.4.2 Endogeneity of Pay Duration Disparity

Our results suggest that the disparity in pay duration between CEOs and executives is positively related to voluntary executive departure. We further perform a series of analyses attempting to alleviate concerns about potential simultaneous causality, specifically the possibility that the pay-duration gap between the CEO and other executives might be correlated with or influenced by factors that could explain departures, such as the board's talent management strategies. First, we look at cases where large grants awarded to the CEO in the distant past have fully vested, because these are less likely to be influenced by current factors affecting executive departure (Gopalan et al. 2021). Second, we use the Dodd–Frank Act (which mandated shareholder votes on CEO compensation and impacted CEO pay duration) to estimate a DiD model.

Prior research indicates that long-term compensation plans can effectively retain executives at all levels when the grants are yet to be vested, but also that their positive effect on retention decreases once they are fully vested (Aldatmaz et al., 2018). To the extent that the vesting of a sizable grant can affect the CEO's retention, it may also influence the executive's

[14] We winsorize Total Pay Amount Disparity at 1 and 99% to control for outliers in the data.

potential for career advancement. Consequently, an executive's decision to remain within the firm may be impacted if a CEO's large, long-term grants become fully vested.

To explore this effect, we created a variable *CEO Large Vested*, which takes a value of 1 if the largest sum of grants awarded to the current CEO in the past was fully vested in the previous year and 0 otherwise. We consider only those grants that were awarded at least two years prior to the year the grant is vested (Gopalan et al., 2021). To the extent that the awards were granted in the distant past, *CEO Large Vested* can be regarded as an instance where the CEO's pay duration sees a sudden drop, and the vesting of these past grants is less likely to be correlated with firm and executive-level variables that might explain executive departure in the current year (see Gopalan et al. 2021). In further analyses, we show that the vesting of these large grants widens the gap in pay duration (see Table A6 in Appendix), because it shortens CEOs' pay duration but does not affect executives' pay duration.

The results in column 5 of Table 1.7.2 show that *CEO Large Vested* is negatively related to voluntary executive departure (p = .035), supporting our arguments that the vesting of large, past awards to the CEO reduces executive departure. Said differently, we observe that executives are less likely to voluntarily leave when there is a sudden decrease in the pay duration of the CEO.

Next, we leverage the Dodd–Frank Act, enacted in July 2010 with effects starting in 2011, which introduced mandatory 'say on pay' votes for shareholders of publicly traded U.S. companies. This legislation required public companies to offer shareholders the opportunity to vote on executive compensation packages in a non-binding manner at least once every three years (Jacoby, 2020). Studies have shown that post-Dodd–Frank, shareholders were more likely to vote for CEO compensation packages that were perceived as sufficiently linked to firm performance and stock prices (Fisch, Palia, and Solomon, 2018; Iliev and Vitenova 2019). Although these votes were only advisory in nature, firms were motivated to avoid failed votes due to potential reputational damage and signals of reduced trust in management (Cotter, Palmiter,

and Thomas, 2013; Iliev and Vitenova, 2019). Consequently, boards adjusted the structure of CEO compensation to be more performance-sensitive following the passage of Dodd–Frank, notably by increasing the proportion of long-term pay (Iliev and Vitenova, 2019).

Although the Dodd–Frank legislation gave shareholders the right to vote on the pay of both CEO and non-CEO executives, CEO compensation is regarded as a particularly salient issue for shareholders (Ertimur, Ferri, and Muslu, 2011), given the distinct role that CEOs play in a firm's decision-making process. Accordingly, shareholder engagement primarily targets CEO compensation, impacting non-CEO executives to a lesser extent (Collins, Marquardt, and Niu, 2019; Kronlund and Sandy, 2018). Hence, we argue that the Dodd–Frank Act prompted boards to increase CEOs' pay sensitivity and proportion of long-term pay, extending their pay duration more than that of other executives and thus broadening the pay duration disparity.

However, the effect of the Dodd–Frank Act on widening the pay duration gap between CEOs and other executives may depend on prior shareholder engagement. Firms that had received shareholder proposals on executive compensation before the Dodd–Frank Act likely had a deeper engagement with shareholders on compensation issues and would have already taken steps to adjust the CEO's pay structure accordingly. In contrast, firms without pre-Dodd–Frank proposals related to executive compensation would have had less experience with shareholder engagement in this area. With the Dodd–Frank Act granting shareholders the right to vote on CEO compensation, these firms are likely to have experienced more changes in CEO pay structure compared to firms that have already had shareholder proposals relating to compensation before the legislation.[15] Consequently, we argue that firms that had not received shareholder proposals on executive compensation would experience a greater increase in pay duration disparity compared to firms that had received such proposals. Our analyses support this,

[15] We observe that firms that had not received compensation-related shareholder proposals before the Dodd–Frank Act are more likely to receive such proposals in the years following the legislation, compared to firms that had received such proposals prior to the legislation ($p < .001$).

showing a greater increase in *Pay Duration Disparity* post Dodd–Frank for firms without pre-Dodd–Frank proposals on executive compensation compared to firms that had received such proposals (see Table A6 in Appendix).

To investigate this dynamic, we employ a DiD approach based on the enactment of the Dodd–Frank Act and the shareholder engagement regarding executive compensation prior to the enactment. We created a variable *Dodd–Frank*, which takes the value of 1 for 2011 and subsequent years, and 0 otherwise. We further created a variable called *No Prior Engagement,* which sorts firms as 'control' if they had at least one shareholder proposal on executive compensation between 2006 and 2010 and as 'treated' if they had no such proposals during the same period.[16,17] We examine the effect of the interaction of these variables on voluntary departure, substituting for *Pay Duration Disparity.* As with other analyses, we used CEO-firm fixed effects, which absorb the main effects of our interacted variables. We restricted our sample to firms that were present in both our shareholder voting database and Incentive Lab. To focus on the immediate impacts of the Dodd–Frank legislation and to minimize the potential influence of long-term confounding factors, we restrict our analysis to data up to the year 2015. Nevertheless, our findings remain robust across longer time periods. The results lend support to our arguments, as we observe a positive interaction between *Dodd–Frank* and *No Prior Engagement* (p = .046 in column 6 of Table 1.7.2). Figure A1 (in Appendix) shows no violation of the parallel trend assumption prior to the Dodd–Frank legislation and a differential reaction after the enactment of the legislation.

[16] We use the shareholder proposals data provided by Institutional Shareholder Services (ISS), which gives a brief outline of the nature of shareholder proposals and their pass/fail status for S&P 1000 firms between the years 2006 and 2019. For our analyses, we consider all executive compensation-related proposals in the period prior to the Dodd–Frank Act, regardless of whether they passed.

[17] Our initial consideration was to employ a regression-discontinuity design based on shareholder proposals, similar to the approach used by Flammer and Bansal (2017), to mitigate the potential correlation between CEO pay duration and various firm- and executive-level factors influencing departure decisions. However, considering the relative rarity of executive departure and the narrow focus on a small number of cases that is characteristic of a regression-discontinuity design, we could not generate a sample to employ a regression-discontinuity design with sufficient explanatory power and interpretability. Given these limitations, we decided against utilizing a regression-discontinuity design.

In summary, we observe that instances that suddenly affected the CEO's pay duration to a greater extent than the executives' own pay duration also influenced the likelihood of executives' voluntary departure. This finding reinforces the notion that executives' decisions to depart are influenced not only by their individual pay duration but also by that of the CEO. In the next section, we examine executive-level and CEO-level factors that may introduce variance into executives' promotion expectations, which, in turn, are expected to influence their responses to disparities in pay duration.

1.4.3 Heterogeneity in Promotion Expectations and Reaction to Pay Duration Disparity

We argued that the disparity in pay duration between CEOs and executives influences executives' promotion expectations, ultimately affecting their decisions to remain with or leave the firm. To delve deeper into this mechanism, we conduct a series of analyses, leveraging the heterogeneity among executives. Specifically, we focus on three elements: signals that an executive is viewed as a strong candidate for succession, the timing of their entry into the firm, and whether the current CEO was promoted from within or hired externally.

First, executives' reactions to CEO pay duration relative to their own may vary based on the recency of their entry to the firm. Newcomer executives who joined the firm within the current year are less likely to have strong employer ties (Carnahan et al., 2012), which is worth noting because ties with the incumbent CEO can be an important factor in the promotion to the CEO role (Balsam and Kwack, 2022). Further, as boards can learn about executives' capabilities over time (Holmström, 1982; Zhang, 2008), these newcomers may be at a disadvantage compared to longer-tenured peers who had more opportunities to display their competence to the board. Having already devoted considerable effort and resources to securing their current role, newcomers should be less inclined to seek other opportunities or promotions early in their tenure (Finkelstein, Hambrick, and Cannella, 2009). Finally, firms generally favor promoting longer-

tenured executives as a means of motivating executives who aspire to promotion (Williams, Chen, and Agarwal, 2017). Our data corroborates this, indicating that newcomer executives are less likely to succeed the incumbent CEO, compared to their longer-tenured peers (see Table A7 in the Appendix). Combining these observed trends, we expect newcomer executives to have lower promotion expectations than longer-tenured executives—and, therefore, pay duration disparity to influence newcomer executives' departure decisions to a lesser extent.

Insert Table 1.7.3 about here.

To test this proposition, we create a variable *Newcomer* that equals 1 if the executive has joined the firm in the prior year and was not the president or COO, and 0 otherwise.[18] We report the analysis exploring the effect of the interaction between *Newcomer* and *Pay Duration Disparity* in column 1 of Table 1.7.3. The results support our expectations: We observe a negative interaction between *Newcomer* and *Pay Duration Disparity* (p = .038 in model 1), thus supporting the argument that newcomer executives, who may have less expectancy of being immediately promoted to CEO, are less likely to depart due to a large disparity between their pay duration and that of the CEO.

Executives' reactions to disparities in pay duration may also depend on how likely they are to be regarded as candidates for succession. The level of total compensation that an executive receives is often viewed as a signal of the board's perception of the executive's quality, human capital, and performance level (Carpenter and Wade, 2002; Shaw, 2015). For instance, research shows that boards tend to allocate higher pay to executives with recognized talent and valuable experiences compared to their peers (Datta and Iskandar-Datta, 2014; Quigley, Wowak, Crossland, 2020). The level of total compensation that an executive receives may also signal an

[18] Research suggests that newcomer executives holding the position of COO or President may be brought in to replace the CEO in the subsequent years (Cannella and Shen, 2001; Chan et al., 2022; Essman et al., 2021). Because newcomers in these roles may have different aspirations, we focus only on newcomers that are not in these roles.

executive's readiness for the CEO position in cases of internal promotion, as successors for internal succession are often selected from executives with higher pay (Bognano, 2001). Similarly, recent literature suggests that the similarity of an executive's total compensation with that of a CEO may indicate that the board considers the executive a candidate for future succession. For instance, Essman et al. (2021) note that the smaller the pay amount disparity between a CEO and other top executives, the greater the likelihood that the board will select its next CEO from within the firm. Likewise, Tao and Zhao (2019) report that executives with total compensation similar to that of the CEO are more likely to be chosen as the next CEO.

Therefore, we contend that executives receiving compensation similar (in monetary terms) to the CEO's would perceive themselves as strong candidates for internal succession. Such executives are likely to be more sensitive to signals indicating diminished promotion opportunities. A discrepancy in pay duration relative to the CEO's would be viewed as a signal incongruous with that of the similarity in pay amount, potentially indicating limited advancement opportunities for these executives. Indeed, in supplementary analyses, we find that *Total Pay Amount Disparity* (the ratio of the CEO's pay to that of an executive) is negatively correlated with the executive's chances of promotion (see Table A7 in the Appendix). Hence, we expect the effect of pay duration disparity on voluntary departure to be stronger for executives with a total pay amount similar to that of the CEO.

To examine this heterogeneous response, we created a variable *Total Pay Similarity*, which takes the value of 1 if the executive's total compensation (as reported in proxy filings) is at least 80% of the CEO's and 0 otherwise (Tao and Zhao, 2019). We examine the effect of the interaction of this variable with *Pay Duration Disparity* on voluntary executive departure (see column 2 of Table 1.7.3). The interaction term of *Total Pay Similarity* and *Pay Duration Disparity* is positive and statistically significant (p = .014 in column 2). The findings support our argument that executives whose pay is similar in amount to that of the CEO would be more sensitive to gaps in pay duration.

Promotion expectations may also vary based on whether the incumbent CEO came to the role from inside or outside the firm. Specifically, if the incumbent CEO was originally hired from outside the firm, it may signal to executives that the firm is more likely to consider future external CEO hires. Consequently, executives working for externally hired CEOs may perceive their promotion prospects as lower than those working for a CEO who was promoted from within (Kale et al. 2009), a perception that can weaken any promotion incentives (Chan, Evans, and Hong, 2022). Therefore, we expect that the effect of disparity in pay duration on executive departure will be weaker in firms with an externally hired CEO compared to those with one who was promoted from within.

To test this proposition, we identified CEOs who were hired from outside and those who were hired internally. We classify a CEO as an outsider CEO if they had a tenure in the focal firm of less than one year before being promoted to CEO, or if they were hired externally (Chan et al., 2022; Essman et al., 2021). We examine only those firms where the CEO was hired during the sample period. We report the effects of the interaction between *Outsider CEO*, indicating whether the CEO was initially hired from the outside, and *Pay Duration Disparity* on voluntary departure in column 3 of Table 1.7.3. Moreover, firms that hire external CEOs may differ from those that internally promote CEOs in several ways, including performance (Berns and Klarner, 2017; Helfat and Bailey, 2005), CEO compensation (Hambrick and Finkelstein, 1995; Henderson and Fredrickson, 2001), and the strategies used for resource allocation, as exemplified by differences in investment patterns in R&D and advertising (Zhang and Rajagopalan, 2010). To account for these potential differences, we conduct additional analyses on two subsamples: firms with outsider CEOs, and firms with insider CEOs (as presented in columns 4 and 5 of Table 1.7.3).[19]

As expected, the interaction between *Outsider CEO* and *Pay Duration Disparity* is negatively correlated with voluntary departure, but the effect is not statistically significant.

[19] We report the same table with controls displayed in the Appendix Table A8.

However, as noted, firms that hire CEOs from outside the firm may differ considerably from firms that hire from within the firm. Thus, it may be more appropriate to consider the effects of CEOs' hiring origins between subsamples of firms that hired their CEOs externally or internally. Looking at the subsample analyses, the results align with our expectations: There is no significant effect of pay duration disparity on voluntary departure in firms managed by an outsider CEO (p = .780 in column 4). By contrast, in firms managed by an insider CEO, pay duration disparity is positively correlated with voluntary departure (p = .020 in column 5). Further, we observe that *CEO Total Pay* is positively associated with voluntary departure (p = .017 in column 5 of Appendix Table A8) in firms led by outsider CEOs. Conversely, in firms with insider CEOs, we observe a negative yet statistically insignificant correlation. These findings further support the notion that external CEO appointments can weaken executives' promotion incentives (Chan et al., 2022; Kale et al., 2009) as evidenced by *CEO Total Pay* no longer being a retention incentive for executives in firms led by outsider CEOs.

1.5 DISCUSSION

Managerial compensation is often multifaceted, encompassing not only a base salary and bonuses but also financial instruments such as stock options and restricted stocks (Kole 1997, Wade et al., 2006). These components are further distinguished not only by their monetary value but also by their vesting periods (DesJardine and Shi, 2021, Groysberg et al., 2021, Wowak and Hambrick, 2010), thus introducing heterogeneity among managers not only in pay amount but also in pay duration (defined as the average time before an individual can reap the benefits from their compensation package). Extant literature suggests that disparities in pay amounts within organizations can influence employees' behavior (Carnahan et al., 2012, Gartenberg and Wulf, 2017, Gupta et al., 2012, Kacperczyk and Balachandran, 2018, Nickerson and Zenger, 2008), which raises the question of whether employees also react to disparities in other dimensions of

pay. Our study explores this question by examining the effect of inter-rank differences in pay duration on executives' departure decisions.

Extending a CEO's pay duration may help retain the CEO yet simultaneously reduce the promotion opportunities of other executives, potentially weakening their incentives to remain in the firm. We argue that, by comparing their pay to that of their CEO, executives likely see a longer CEO pay duration as a signal of increased CEO retention and blocked promotion opportunities. A large disparity in pay duration between the CEO and an executive may also be interpreted as a sign that the board places less value on the executive's retention and contributions compared to the CEO's. Given that promotion to the CEO position serves as a strong incentive for executive retention (Shi et al., 2016; Wowak et al., 2017), we expect that a greater disparity in pay duration between the CEO and an executive increases the propensity for the latter to depart.

To test our hypothesis, we analyzed executive compensation data from Fortune 500 U.S. public firms from 2006 to 2019. Our findings reveal that larger gaps in pay duration between CEOs and executives are associated with an increased likelihood of executive departures. This pattern is further corroborated when we examine events associated with sudden changes in pay duration disparity. Moreover, we observe the relationship between pay duration disparity and executive pay duration to be moderated by (1) whether the executive's compensation is similar in monetary value to that of the CEO, which signals that the executive is a strong candidate for succession; (2) the recency of the executive's entry; and (3) the CEO's hiring origins (i.e., internal vs external).

This study makes several contributions to the existing literature. First, we contribute to the strategic human capital literature that examines the effects of pay differences on employee behavior and mobility. The literature has predominantly focused on examining how differences in pay amounts between employees can affect their behavior (e.g., Carnahan et al., 2012; Kacperczyk and Balachandran, 2018; Feldman et al. 2018, Obloj and Zenger 2017). By showing that disparity in another component of pay—pay duration—can affect executive departure, we aim to enrich our understanding of the dynamics of compensation structures and their implications

for employee mobility and organizational behavior. To the best of our knowledge, this study is the first to examine how differences in pay beyond monetary amounts can affect employee behavior.

Notably, our analyses indicate that the disparity in pay duration between executives and their CEO is a key factor determining executive departure, whereas we do not observe disparity in pay amount to be as influential in predicting executive departure. Furthermore, through our secondary analyses, we observe executives to be more or less sensitive toward relative gaps in pay duration, depending on factors that shape their promotion expectancies. Essman et al. (2021) suggested that large gaps in pay amount may be interpreted by executives as a signal that they are not being considered for internal succession. In turn, given the importance of promotion for executives, this signal may increase turnover. Our results suggest that employees may interpret pay duration as a stronger signal regarding their value and prospects for promotion than pay amount.

This differential impact may stem from the distinct types of information and emotional reactions triggered by pay amount and pay duration. Although larger inter-rank disparities in pay amount may evoke envy and a sense of relative deprivation (Fredrickson et al., 2010; Nickerson and Zenger, 2008), they also convey signals from the firm to employees, whether deliberate or inadvertent (Connelly et al., 2011). These signals may be interpreted positively, highlighting the financial benefits of future promotions (Cullen and Perez-Truglia, 2022; Kacperczyk and Balachandran, 2018; Ridge et al., 2017), or negatively, indicating limited chances of promotion (Bognano, 2001; Essman et al., 2021). By contrast, large disparities in pay duration are less likely to induce envy because shorter durations—which provide more immediate compensation—are generally preferred, and the signal conveyed by disparities in pay duration is likely to be interpreted negatively. Therefore, disparities in pay duration may exert stronger signaling effects than disparities in pay amount on employees' perceptions of their valuation and promotion prospects within the organization.

Second, our research contributes to the understanding of executive mobility, a topic that has received considerable interest due to the substantial impact of executive departure on a firm's survival, performance, cohesion, and customer relationships (Bermiss and Murmann, 2015; Hilger, Mankel, and Richter, 2013; Messersmith et al., 2014; Rogan, 2014). Executive departures are costly, involving not only large search-and-replacement expenses but also a period of adjustment after the departure that can harm performance (Andrus et al., 2019; Dai, De Meuse, and Gaeddert, 2011).

While existing literature has predominantly focused on CEO departures (Berns and Klarner, 2017; Finkelstein et al,. 2009, Flickinger et al., 2016; Gentry et al., 2021; Wang, Zhao, and Chen, 2017; Wowak, Hambrick, and Henderson, 2011), there has been less emphasis on non-CEO executives, whose departure decisions, particularly around promotion prospects, may differ (Andrus et al., 2019; Connelly et al. 2014). Most previous studies have analyzed executive departures from a group-level perspective, focusing on top management teams (Bilgili et al., 2017; Boeker, 1992; Hambrick, Humphrey, and Gupta, 2015; Ridge et al., 2017), yet there remains a "lack of individual-level turnover research in the executive setting" (Andrus et al., 2019, p. 1152). We contribute to a recent stream of literature addressing this gap (Jiang et al., 2017; Ng and Stuart, 2022; Pissaris, Heavey, and Golden, 2017) by shedding light on the effect of pay structure on executive departures. Specifically, we extend the existing research that has examined pay disparity within top management teams (Andrus et al., 2019) by investigating the role of disparity across levels in pay duration, a key dimension of pay structure.

Third, we contribute to the research on long-term CEO compensation (Hou et al., 2017; Lovett, Rasheed, and Hou, 2022, Sanders and Hambrick, 2007). Research in this area shows that firms increasingly use long-term incentives to curtail CEOs' prioritization of short-term gains over long-term projects with potentially larger payoffs (Martin, Gomez-Mejia, and Wiseman, 2013; Martin et al., 2016; Souder and Shaver, 2010). Increasing CEOs' long-term compensation has been linked with positive effects on strategic decisions (such as R&D investments), corporate

social responsibility activities, and long-term competitiveness (Flammer and Bansal 2017; Flammer et al., 2019; Zhang and Gimeno, 2016). However, long-term CEO compensation can also be detrimental; for instance, options payments have been associated with reduced product safety, earnings manipulation, and detrimental risk-taking (Hou, Lovett, and Rasheed, 2020; Wowak, Mannor, and Wowak, 2015; Zhang et al., 2008). Our study contributes to this stream of work by examining the potentially adverse effects of disparities in pay duration between the CEO and other executives—a concept rooted in long-term compensation—on executive turnover.

Finally, our study provides managerial implications, underscoring the influence of compensation package design across different job levels in shaping employee behavior. Our results indicate that boards can strategically adjust the pay-duration gap between the CEO and other executives to increase or decrease voluntary departure as needed. Considering the importance of executive departure to the firm's outcomes (Andrus et al., 2019; Dai et al., 2011), it is crucial that boards carefully consider both pay amount and duration in compensation package designs across various organizational levels.

Our study is not without limitations. First, we focus on a subsample of U.S. public companies, and the effects we find may not be generalizable to other countries, given that reactions to pay differences can vary across cultures (Lee, Ribbink, and Eckerd, 2018). Furthermore, although we present evidence of empirical patterns consistent with our suggested mechanism, while also endeavoring to address potential endogeneity concerns common in studies on executive compensation (Essman et al., 2021), we cannot fully claim causality. Moreover, we lack access to detailed information regarding executive pay contracts. Unvested long-term payments are forfeited upon departure in most cases (Cadman et al., 2013), but we are unable to verify this based on the information available to us. Additionally, although our study sheds light on factors related to executive departure, we do not explore the subsequent implications of such departures on firm-level performance. Finally, our results focus on the

departure of executives and may not be wholly applicable to explain the behavior of employees further down the organizational structure.

Although long-term payments are predominantly associated with executive compensation, their application extends to various organizational levels. Stock options, for instance, are common in startups, enabling employees to partake in the company's success without an immediate cash outlay (Aran and Murciano-Goroff, 2023; Harroch, 2016). Startups, particularly those backed by venture capital, often allocate more than 20% of their stock to employees as part of their compensation (Somerville, 2017). This practice is also being extended into more established firms that offer long-term payment options to employees, including middle managers. Oyer and Schaefer (2005) found that nearly 11% of U.S. public firms offer stock options to at least 20% of their workforce. Investigating how employees are influenced by disparities in pay duration, both across organizational levels and within the same level, is a promising avenue for future research.

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1.7 FIGURES AND TABLES

Figure 1.7.1 Visualization of Executive Pay Structure

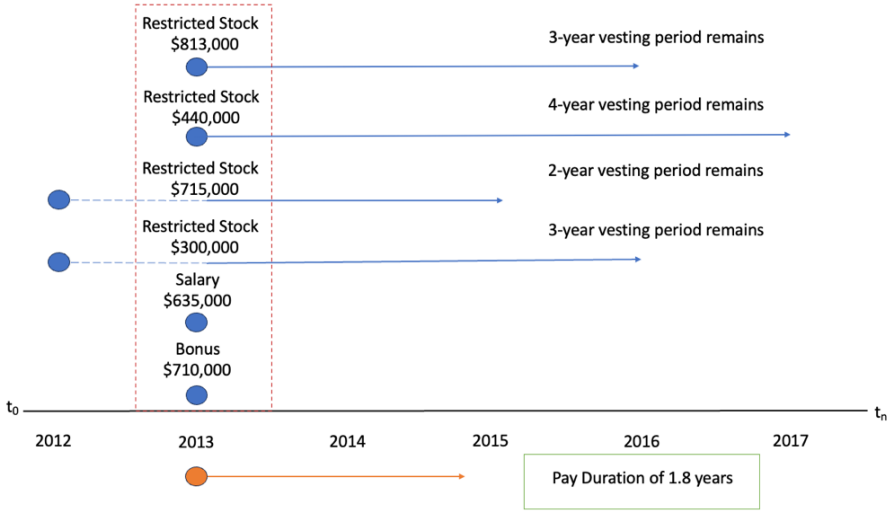


Table 1.7.1 Descriptive Statistics and Correlations

Variables	Mean(SD)	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
(1) Voluntary Departure	.133(.34)	1.000															
(2) Involuntary Departure	.032(.176)	-0.071	1.000														
(3) Pay Duration Disparity	.969(.441)	0.097	0.021	1.000													
(4) Pay Duration	1.514(.594)	-0.079	-0.016	-0.416	1.000												
(5) Total Pay	14.996(.667)	-0.015	-0.007	-0.085	0.129	1.000											
(6) Age	53.307(5.746)	0.123	0.006	0.116	-0.171	0.156	1.000										
(7) Tenure	11.15(7.803)	-0.011	-0.006	0.040	-0.132	0.126	0.197	1.000									
(8) Gender	.106(.307)	0.013	0.020	-0.023	0.046	-0.035	-0.061	-0.018	1.000								
(9) CFO	.303(.46)	-0.088	-0.034	0.030	-0.065	0.015	-0.112	0.009	-0.013	1.000							
(10) COO or President	.22(.414)	0.001	-0.003	0.018	0.030	0.128	0.029	-0.007	-0.095	-0.319	1.000						
(11) CEO Age	56.987(5.512)	-0.010	-0.016	-0.173	-0.022	0.102	0.147	0.086	0.020	0.012	0.016	1.000					
(12) CEO Departure	.091(.288)	0.066	0.032	-0.106	0.014	-0.022	-0.011	-0.012	0.023	0.015	-0.057	0.166	1.000				
(13) CEO Total Pay	16.142(.624)	-0.030	-0.008	-0.123	0.160	0.685	0.069	0.088	0.039	0.019	-0.011	0.164	-0.008	1.000			
(14) Acquired	.014(.118)	0.193	0.092	-0.015	-0.039	-0.026	-0.019	-0.028	0.024	-0.013	-0.005	0.028	-0.020	-0.021	1.000		
(15) Firm Performance	.96(.257)	-0.017	0.010	-0.017	0.125	0.167	0.026	0.143	-0.010	0.013	0.015	-0.012	-0.009	0.182	-0.020	1.000	
(16) Newcomer	.041(.198)	-0.004	-0.020	-0.063	0.153	-0.065	-0.090	-0.268	0.068	0.048	-0.110	-0.039	0.008	-0.034	0.015	-0.041	1.000
(17) Total Pay Similarity	.036(.186)	0.045	0.012	0.016	0.030	0.142	0.023	-0.034	-0.005	-0.034	0.083	-0.010	0.027	-0.252	0.019	-0.024	0.013

Table 1.7.2 Effect of Pay Duration Disparity on Executive Departure

	Voluntary Departure		Involuntary Departure		Voluntary Departure	
	(1)	(2)	(3)	(4)	(5)	(6)
Pay Duration Disparity	0.068***	0.068***	0.009	0.003		
	(0.019)	(0.014)	(0.008)	(0.007)		
	[0.000]	[0.000]	[0.302]	[0.667]		
CEO Large Vested					-0.035**	
					(0.017)	
					[0.035]	
No Prior Engagement # Dodd–Frank						0.046**
						(0.023)
						[0.046]
Pay Duration	-0.044***	-0.035***	-0.009	-0.012**	-0.079***	-0.071***
	(0.012)	(0.010)	(0.006)	(0.006)	(0.008)	(0.011)
	[0.000]	[0.001]	[0.149]	[0.031]	[0.000]	[0.000]
Total Pay	0.010	0.011	0.000	0.002	0.010	0.016
	(0.010)	(0.009)	(0.006)	(0.005)	(0.010)	(0.014)
	[0.348]	[0.208]	[0.966]	[0.670]	[0.313]	[0.260]
Age	0.008***	0.008***	0.001**	0.001*	0.009***	0.010***
	(0.001)	(0.001)	(0.000)	(0.000)	(0.001)	(0.001)
	[0.000]	[0.000]	[0.011]	[0.058]	[0.000]	[0.000]
Tenure	-0.000	-0.001	0.000	0.000	-0.000	0.000
	(0.001)	(0.001)	(0.000)	(0.000)	(0.001)	(0.001)
	[0.582]	[0.343]	[0.387]	[0.378]	[0.685]	[0.873]
Gender	-0.002	-0.004	0.011*	0.011	-0.001	-0.021
	(0.014)	(0.013)	(0.007)	(0.007)	(0.013)	(0.019)
	[0.861]	[0.787]	[0.098]	[0.108]	[0.926]	[0.264]
CFO	-0.056***	-0.060***	-0.012***	-0.014***	-0.055***	-0.069***
	(0.008)	(0.007)	(0.004)	(0.004)	(0.008)	(0.010)
	[0.000]	[0.000]	[0.003]	[0.001]	[0.000]	[0.000]
COO or President	-0.015	-0.017*	-0.003	-0.004	-0.015	-0.033**
	(0.010)	(0.009)	(0.005)	(0.005)	(0.010)	(0.013)
	[0.134]	[0.057]	[0.625]	[0.475]	[0.140]	[0.011]
CEO Age		0.001		0.000		
		(0.001)		(0.001)		
		[0.561]		[0.829]		
CEO Departure	0.080***	0.078***	0.013	0.017**	0.079***	0.086***
	(0.017)	(0.016)	(0.008)	(0.008)	(0.017)	(0.023)
	[0.000]	[0.000]	[0.135]	[0.028]	[0.000]	[0.000]
CEO Total Pay	-0.018	-0.021**	-0.005	-0.001	-0.013	-0.033**
	(0.012)	(0.010)	(0.006)	(0.005)	(0.012)	(0.016)
	[0.132]	[0.039]	[0.402]	[0.902]	[0.277]	[0.043]
Acquired	0.616***	0.568***	0.152***	0.128***	0.613***	0.550***
	(0.050)	(0.050)	(0.036)	(0.035)	(0.050)	(0.137)
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
Firm Performance	-0.127***	-0.101***	-0.003	0.012	-0.128***	-0.105**
	(0.036)	(0.031)	(0.022)	(0.016)	(0.037)	(0.051)
	[0.000]	[0.001]	[0.883]	[0.455]	[0.001]	[0.038]
Fixed Effects	Year and CEO-Firm	Year and Firm	Year and CEO-Firm	Year and Firm	Year and CEO-Firm	Year and CEO-Firm
Observations	9,709	9,744	9,709	9,744	9,709	5,988
R-squared	0.193	0.144	0.107	0.065	0.191	0.173

* p<0.1, ** p<0.05, *** p<0.01 Standard errors are in parentheses, and p-values are in brackets. Constant is included, not reported. CEO-Firm and year fixed effects are included in models 1 and 3, while firm and year fixed effects are included in models 2 and 4. CEO Age is absorbed in models 1, 3, 5, and 6 due to CEO-Firm fixed effects. Models 5 and 6 examine the effect of CEO Large Vested and the interaction between No Prior Engagement and Dodd–Frank on voluntary executive departure. N=5,988 in model 6, as we restricted the sample to the period 2006-2015.

Table 1.7.3 Heterogeneous Reaction to Pay Duration Disparity

	Voluntary Departure				
				Outsider CEOs	Insider CEOs
	(1)	(2)	(3)	(4)	(5)
Pay Duration Disparity	0.029***	0.025***	0.024**	-0.015	0.070**
	(0.008)	(0.008)	(0.012)	(0.053)	(0.030)
	[0.000]	[0.001]	[0.038]	[0.780]	[0.020]
Newcomer	-0.046**				
	(0.021)				
	[0.028]				
Pay Duration Disparity # Newcomer	-0.048**				
	(0.023)				
	[0.038]				
Total Pay Similarity		0.047*			
		(0.026)			
		[0.067]			
Pay Duration Disparity # Total Pay Similarity		0.042**			
		(0.017)			
		[0.014]			
Pay Duration Disparity # Outsider CEO			-0.004		
			(0.012)		
			[0.727]		
Pay Duration	-0.044***	-0.047***	-0.060***	-0.128**	-0.049***
	(0.012)	(0.012)	(0.017)	(0.049)	(0.017)
	[0.000]	[0.000]	[0.000]	[0.010]	[0.005]
Controls	Included	Included	Included	Included	Included
Fixed Effects	Year and CEO-Firm	Year and CEO-Firm	Year and CEO-Firm	Year and CEO-Firm	Year and CEO-Firm
Observations	9,709	9,709	5,585	1,151	4,434
R-squared	0.194	0.194	0.209	0.316	0.178

* p<0.1, ** p<0.05, *** p<0.01 Standard errors are in parentheses, and p-values are in brackets. Constant and controls are included, not reported. CEO-Firm and year fixed effects are included. Model 1 examines the effect of the interaction between Newcomer and Pay Duration Disparity on voluntary executive departure. Model 2 examines the effect of the interaction between Total Pay Similarity and Pay Duration Disparity on voluntary executive departure. Model 3 examines the effect of the interaction between Outsider CEOs and Pay Duration Disparity on voluntary executive departure. N=5,585 in model 3 as we only examine firms where the CEO was hired during the sample period. Model 4 and 5 examine the effects of pay duration-related variables on voluntary executive departure within firms with outsider CEOs and insider CEOs, respectively.

1.8 APPENDIX

Notes on the Operationalization of Pay Duration

$$PayDuration_i = \frac{(Salary_i + Bonus_i) * 0 + \sum_{si=1}^{S} Stock_{si} * t_{si} + \sum_{oi=1}^{O} Option_{oi} * t_{oi} + \sum_{hi=1}^{H} Other_{hi} * t_{hi}}{Salary_i + Bonus_i + \sum_{si=1}^{S} Stock_{oi} + \sum_{oi=1}^{O} Option_{oi} + \sum_{hi=1}^{H} Other_{hi}}$$

The variable $PayDuration$ is computed for each individual *i* and year *y*. For simplicity and ease of readability, we have omitted the subscripts referring to the year. $Salary_i$ and $Bonus_i$ are the dollar values of annual salary and bonus, with a vesting period of 0, as they are received at the end of the current year. $Stock_{si}$, $Option_{oi}$, and $Other_{hi}$ indicate the grant date fair value (that is, the dollar value at the date on which the grant is awarded as reported by the firm) of the restricted stock grant, option grant, and other types of grants, which have a final vesting period of t_{si}, t_{oi}, and t_{hi}, respectively. *S*, *O*, and *H* are the number of stocks, options, and other types of grants awarded to the individual. For grants with gradual vesting periods (which vest incrementally until they are fully vested), we replace the t_{si}, t_{oi}, and t_{hi} in the formula above with $(t_{si} + 1)/2$, $(t_{oi} + 1)/2$, and $(t_{hi} + 1)/2$. Gopalan et al. (2014) use the sum of consecutive natural numbers formula to conceptualize gradual vesting and derive the amendment stated here. To visualize it, consider a stock grant *si'* that vests equally over $t_{si'}$ years. Since a fraction of $1/t_{si'}$ of the grant is vested each year, the term $Stock_{si'} * t_{si'}$ in the formula should be replaced by $Stock_{i'} * (1/t_{si'} + 2/t_{si'} + \cdots + t_{si'}/t_{si'}) = Stock_{si'}/ t_{si'} * (t_{si'} * (t_{si'} + 1)/2) = Stock_{si'} * (t_{si'} + 1)/2)$. Variables *Option* and *Other* can also be modified in the same way.

For instance, consider a stock option with a gradual vesting period of three years that vests equally over the three years. For every year until the end, one-third of the option would be vested to the individual. Using the former operationalization here as $Stock_{si} * 3$ would be inaccurate, as a portion of the stock option corresponding to the remaining vesting period would be vested to the individual. Instead, we operationalize such a grant as $Stock_{si} * (1/3 + 2/3 + 3/3)$, or $Stock_{si} / 3 * (3 * (3 + 1) / 2)$, or $Stock_{si} * (3 + 1) / 2)$, to account for the gradual vesting over the vesting period.

Table A0: Variable Descriptions

Variable Name	Definition
Voluntary Departure	Dummy variable indicating whether a non-CEO executive has voluntarily departed from the firm at year t.
Involuntary Departure	Dummy variable indicating whether a non-CEO executive has involuntarily departed from the firm at year t.
Pay Duration	The (average) time before the non-CEO executive can expect to obtain the value from their compensation package, derived from the grant date fair value of the grants, their (remaining) vesting periods at t-1, salary, and bonus.
CEO Pay Duration	The (average) time before the CEO can expect to obtain the value from their compensation package, derived from the grant date fair value of the grants, their (remaining) vesting periods at t-1, salary, and bonus.
Pay Duration Disparity	The ratio of the CEO's pay duration over that of the executive at t-1.
Total Pay	The total compensation of the non-CEO executive as reported in proxy filings at t-1, log-transformed.
CEO Total Pay	The total compensation of the CEO as reported in proxy filings at t-1, log-transformed.
Age	The age of the non-CEO executive at t-1.
Tenure	The tenure of the non-CEO executive within the firm at t-1.
Gender	The non-CEO executive's gender (equals to 1 if Female).
CFO	Dummy indicating whether the executive was identified as the CFO in the prior year.
COO or President	Dummy indicating whether the executive was identified as the COO or President in the prior year.
CEO Age	The age of the CEO at t-1.
CEO Departure	Dummy indicating the departure and the change in the CEO position at t-1.
Firm Performance	Tobin's Q at t-1, log-transformed.
Acquired	Dummy indicating whether the firm was acquired at year t or t-1.
CEO Large Vested	Dummy indicating whether the largest sum of grants awarded to the current CEO was fully vested in the prior year.
Newcomer	Dummy indicating whether the executive had joined the firm in the prior year and was not the president or COO.
Total Pay Similarity	Dummy indicating whether the executive's total pay was at least 80% of the CEO's in prior year.
Outsider CEO	Dummy indicating whether the incumbent CEO had been hired from outside.
Dodd–Frank	Dummy indicating years 2011 and onwards.
No Prior Engagement	Dummy indicating firms that received no shareholder proposals relating to executive compensation prior to 2011 and during the sample period.

Table A1: Effect of Pay Duration Disparity on Executive Departure (Logistic Models)

	Voluntary Departure		Involuntary Departure	
	(1)	(2)	(3)	(4)
Pay Duration Disparity	0.463***	0.483***	0.155	0.070
	(0.171)	(0.115)	(0.247)	(0.188)
	[0.007]	[0.000]	[0.530]	[0.708]
Pay Duration	-0.561***	-0.399***	-0.462**	-0.475**
	(0.130)	(0.101)	(0.227)	(0.189)
	[0.000]	[0.000]	[0.042]	[0.012]
Total Pay	0.126	0.124	0.026	0.086
	(0.109)	(0.090)	(0.171)	(0.171)
	[0.246]	[0.168]	[0.878]	[0.614]
Age	0.084***	0.079***	0.041***	0.029**
	(0.009)	(0.008)	(0.014)	(0.013)
	[0.000]	[0.000]	[0.004]	[0.023]
Tenure	-0.004	-0.003	0.012	0.011
	(0.006)	(0.005)	(0.010)	(0.010)
	[0.539]	[0.536]	[0.231]	[0.292]
Gender	-0.060	-0.053	0.341*	0.338*
	(0.135)	(0.130)	(0.194)	(0.190)
	[0.657]	[0.683]	[0.078]	[0.075]
CFO	-0.655***	-0.659***	-0.500***	-0.512***
	(0.093)	(0.085)	(0.162)	(0.165)
	[0.000]	[0.000]	[0.002]	[0.002]
COO or President	-0.128	-0.135	-0.094	-0.118
	(0.100)	(0.085)	(0.178)	(0.173)
	[0.197]	[0.110]	[0.596]	[0.494]
CEO Age		0.001		0.004
		(0.010)		(0.018)
		[0.884]		[0.831]
CEO Departure	0.675***	0.661***	0.390*	0.527***
	(0.132)	(0.116)	(0.230)	(0.195)
	[0.000]	[0.000]	[0.090]	[0.007]
CEO Total Pay	-0.162	-0.156	-0.159	0.053
	(0.117)	(0.096)	(0.235)	(0.171)
	[0.167]	[0.105]	[0.499]	[0.758]
Acquired	3.733***	3.310***	2.132***	1.679***
	(0.309)	(0.303)	(0.392)	(0.362)
	[0.000]	[0.000]	[0.000]	[0.000]
Firm Performance	-1.203***	-0.979***	0.014	0.347
	(0.363)	(0.303)	(0.629)	(0.433)
	[0.001]	[0.001]	[0.982]	[0.422]
Fixed Effects	Year and CEO-Firm	Year and Firm	Year and CEO-Firm	Year and Firm
Observations	8,410	9,455	3,967	5,496
Pseudo R-squared	0.124	0.109	0.060	0.046

* p<0.1, ** p<0.05, *** p<0.01. Standard errors are in parentheses, and p-values are in brackets. Constants are included, not reported. CEO-Firm and Year fixed effects are included in models 1 and 3, while firm and year fixed effects are included in models 2 and 4. Models 1 and 2 examine the effect of Pay Duration Disparity on voluntary executive departure. Models 3 and 4 examine the effect of Pay Duration Disparity on involuntary executive departure. CEO Age is absorbed in models 1 and 3 due to CEO-Firm and year fixed effects.

Table A2: Effect of Pay Duration Disparity on Voluntary Executive Departure (Alternative Operationalizations of Pay Duration)

	Voluntary Departure				
	(1)	(2)	(3)	(4)	(5)
Pay Duration Disparity	0.056***	0.046***	0.033***	0.064***	0.073***
	(0.015)	(0.014)	(0.012)	(0.019)	(0.022)
	[0.000]	[0.001]	[0.005]	[0.001]	[0.001]
Pay Duration	-0.033**	-0.094***	-0.049***	-0.041***	-0.045***
	(0.014)	(0.011)	(0.010)	(0.012)	(0.013)
	[0.025]	[0.000]	[0.000]	[0.000]	[0.000]
Total Pay	0.010	-0.001	0.015	0.013	0.018*
	(0.010)	(0.014)	(0.011)	(0.010)	(0.010)
	[0.353]	[0.921]	[0.153]	[0.221]	[0.092]
Age	0.008***	0.010***	0.008***	0.009***	0.009***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
Tenure	-0.000	-0.001	-0.000	-0.000	0.000
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
	[0.567]	[0.423]	[0.958]	[0.778]	[0.811]
Gender	-0.002	-0.012	0.002	-0.003	-0.004
	(0.014)	(0.017)	(0.014)	(0.014)	(0.013)
	[0.903]	[0.479]	[0.860]	[0.806]	[0.761]
CFO	-0.056***	-0.051***	-0.054***	-0.057***	-0.051***
	(0.008)	(0.010)	(0.008)	(0.008)	(0.008)
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
COO or President	-0.015	-0.013	-0.016	-0.013	-0.013
	(0.010)	(0.012)	(0.010)	(0.010)	(0.010)
	[0.126]	[0.265]	[0.127]	[0.183]	[0.179]
CEO Departure	0.080***	0.084***	0.082***	0.080***	0.077***
	(0.017)	(0.020)	(0.017)	(0.017)	(0.017)
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
CEO Total Pay	-0.020*	0.001	-0.019	-0.019	-0.019*
	(0.012)	(0.015)	(0.013)	(0.012)	(0.012)
	[0.092]	[0.928]	[0.133]	[0.110]	[0.100]
Acquired	0.615***	0.593***	0.637***	0.638***	0.609***
	(0.050)	(0.053)	(0.051)	(0.050)	(0.050)
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
Firm Performance	-0.129***	-0.159***	-0.124***	-0.128***	-0.130***
	(0.036)	(0.045)	(0.038)	(0.038)	(0.037)
	[0.000]	[0.000]	[0.001]	[0.001]	[0.000]
Fixed Effects	Year and CEO-Firm	Year and CEO-Firm	Year and CEO-Firm	Year and CEO-Firm	Year and CEO-Firm
Observations	9,709	6,963	9,097	9,495	9,709
R-squared	0.192	0.213	0.193	0.195	0.189

* p<0.1, ** p<0.05, *** p<0.01. Standard errors are in parentheses, p-values are in brackets. Constants are included, not reported. CEO-Firm and Year fixed effects are included. In model 1, Pay Duration Disparity is operationalized as the difference between CEO and executive Pay Durations. In model 2, Pay Duration Disparity is operationalized as the ratio of pay duration disparity at t-1 over that in t-2. In model 3, performance-based awards are excluded from the operationalization of the duration-related variables. In model 4, cash-based awards are excluded from the operationalization of the pay duration-related variables. In model 5, fully vested awards are excluded from the operationalization of the pay duration-related variables.

Table A3: Effect of Pay Duration Disparity on Voluntary Executive Departure (Alternative Operationalizations of Voluntary Departure)

	Voluntary Departure (Age criterion to 65) (1)	Voluntary Departure (no suddenness criterion) (2)
Pay Duration Disparity	0.053***	0.063***
	(0.017)	(0.017)
	[0.002]	[0.000]
Pay Duration	-0.037***	-0.034***
	(0.011)	(0.011)
	[0.001]	[0.002]
Total Pay	0.003	-0.001
	(0.009)	(0.010)
	[0.754]	[0.954]
Age	0.005***	0.008***
	(0.001)	(0.001)
	[0.000]	[0.000]
Tenure	-0.001*	-0.001*
	(0.001)	(0.001)
	[0.061]	[0.076]
Gender	0.001	-0.009
	(0.013)	(0.013)
	[0.943]	[0.492]
CFO	-0.042***	-0.047***
	(0.007)	(0.007)
	[0.000]	[0.000]
COO or President	-0.010	-0.008
	(0.009)	(0.009)
	[0.288]	[0.396]
CEO Departure	0.064***	0.078***
	(0.016)	(0.016)
	[0.000]	[0.000]
CEO Total Pay	-0.007	-0.009
	(0.011)	(0.011)
	[0.510]	[0.444]
Acquired	0.602***	0.627***
	(0.053)	(0.051)
	[0.000]	[0.000]
Firm Performance	-0.100***	-0.123***
	(0.031)	(0.034)
	[0.001]	[0.000]
Fixed Effects	Year and CEO-Firm	Year and CEO-Firm
Observations	9,709	9,709
R-squared	0.187	0.196

* p<0.1, ** p<0.05, *** p<0.01. Standard errors are in parentheses, and p-values are in brackets. Constants are included, not reported. CEO-Firm and year fixed effects are included. Model 1 examines the effect of Pay Duration Disparity on voluntary departure when the age criterion is extended from 60 to 65. Model 2 examines the effect of Pay Duration Disparity on voluntary departure when it is operationalized without using the abruptness of their departure announcement as a criterion.

Table A4: Effect of Pay Duration Disparity and CEO Pay Duration on Voluntary Executive Departure

	Voluntary Departure		
	(1)	(2)	(3)
Pay Duration Disparity	0.110***		0.053**
	(0.013)		(0.026)
	[0.000]		[0.038]
CEO Pay Duration		0.052***	0.019
		(0.015)	(0.020)
		[0.001]	[0.355]
Pay Duration		-0.087***	-0.054***
		(0.008)	(0.016)
		[0.000]	[0.001]
Total Pay	0.008	0.010	0.010
	(0.010)	(0.010)	(0.010)
	[0.418]	[0.330]	[0.347]
Age	0.009***	0.008***	0.008***
	(0.001)	(0.001)	(0.001)
	[0.000]	[0.000]	[0.000]
Tenure	-0.000	-0.000	-0.000
	(0.001)	(0.001)	(0.001)
	[0.852]	[0.580]	[0.565]
Gender	-0.004	-0.001	-0.002
	(0.013)	(0.014)	(0.014)
	[0.751]	[0.915]	[0.871]
CFO	-0.054***	-0.056***	-0.056***
	(0.008)	(0.008)	(0.008)
	[0.000]	[0.000]	[0.000]
COO or President	-0.015	-0.015	-0.015
	(0.010)	(0.010)	(0.010)
	[0.134]	[0.121]	[0.129]
CEO Departure	0.080***	0.080***	0.080***
	(0.017)	(0.017)	(0.017)
	[0.000]	[0.000]	[0.000]
CEO Total Pay	-0.024**	-0.020	-0.020
	(0.012)	(0.012)	(0.012)
	[0.044]	[0.101]	[0.104]
Acquired	0.619***	0.615***	0.616***
	(0.051)	(0.050)	(0.050)
	[0.000]	[0.000]	[0.000]
Firm Performance	-0.128***	-0.128***	-0.128***
	(0.035)	(0.036)	(0.036)
	[0.000]	[0.000]	[0.000]
Fixed Effects	Year and CEO-Firm	Year and CEO-Firm	Year and CEO-Firm
Observations	9,709	9,709	9,709
R-squared	0.191	0.192	0.193

* p<0.1, ** p<0.05, *** p<0.01. Standard errors are in parentheses, and p-values are in brackets. Constants are included, not reported. CEO-Firm and Year fixed effects are included. Model 1 examines the effect of Pay Duration Disparity on voluntary executive departure without controlling for the executive's pay duration. Model 2 examines the effect of CEO Pay Duration on voluntary departure. Model 3 examines the effect of Pay Duration Disparity on voluntary executive departure while controlling for the executive's pay duration and the CEO pay duration.

Table A5: Effect of Total Pay Amount Disparity on Executive Departure

	Voluntary Departure		Involuntary Departure	
	(1)	(2)	(3)	(4)
Pay Duration Disparity	0.065***	0.067***	0.009	0.003
	(0.019)	(0.015)	(0.008)	(0.007)
	[0.001]	[0.000]	[0.304]	[0.666]
Total Pay Amount Disparity	0.001	0.000	-0.001	-0.000
	(0.003)	(0.003)	(0.002)	(0.002)
	[0.786]	[0.962]	[0.437]	[0.924]
Pay Duration	-0.046***	-0.036***	-0.009	-0.012**
	(0.012)	(0.010)	(0.006)	(0.006)
	[0.000]	[0.000]	[0.151]	[0.032]
Total Pay	0.006	0.004	-0.005	0.002
	(0.011)	(0.010)	(0.006)	(0.006)
	[0.598]	[0.722]	[0.446]	[0.755]
Age	0.008***	0.008***	0.001**	0.001*
	(0.001)	(0.001)	(0.000)	(0.000)
	[0.000]	[0.000]	[0.011]	[0.059]
Tenure	-0.000	-0.001	0.000	0.000
	(0.001)	(0.001)	(0.000)	(0.000)
	[0.595]	[0.355]	[0.385]	[0.377]
Gender	-0.003	-0.005	0.011*	0.011
	(0.014)	(0.013)	(0.007)	(0.007)
	[0.808]	[0.713]	[0.096]	[0.108]
CFO	-0.055***	-0.059***	-0.012***	-0.014***
	(0.008)	(0.007)	(0.004)	(0.004)
	[0.000]	[0.000]	[0.003]	[0.001]
COO or President	-0.013	-0.015*	-0.003	-0.004
	(0.010)	(0.009)	(0.005)	(0.005)
	[0.194]	[0.095]	[0.640]	[0.477]
CEO Age		0.000		0.000
		(0.001)		(0.001)
		[0.816]		[0.831]
CEO Departure	0.081***	0.079***	0.013	0.017**
	(0.017)	(0.016)	(0.008)	(0.008)
	[0.000]	[0.000]	[0.131]	[0.028]
Acquired	0.618***	0.568***	0.152***	0.128***
	(0.050)	(0.050)	(0.036)	(0.035)
	[0.000]	[0.000]	[0.000]	[0.000]
Firm Performance	-0.135***	-0.108***	-0.004	0.012
	(0.036)	(0.031)	(0.022)	(0.016)
	[0.000]	[0.001]	[0.866]	[0.456]
Fixed Effects	Year and CEO-Firm	Year and Firm	Year and CEO-Firm	Year and Firm
Observations	9,709	9,744	9,709	9,744
R-squared	0.192	0.143	0.107	0.065

* p<0.1, ** p<0.05, *** p<0.01. Standard errors are in parentheses, and p-values are in brackets. Constants are included, not reported. CEO-Firm and Year fixed effects are included in models 1 and 3, while firm and year fixed effects are included in models 2 and 4. CEO Age is absorbed in models 1 and 3 due to CEO-Firm and year fixed effects.

Table A6: Effect of CEO Large Vested and No Prior Shareholder Engagement on Pay Duration Disparity

	Pay Duration Disparity	
	(1)	(2)
CEO Large Vested	-0.088***	
	(0.024)	
	[0.000]	
No Prior Engagement # Dodd-Frank		0.087**
		(0.042)
		[0.037]
Total Pay	0.084***	0.063***
	(0.016)	(0.017)
	[0.000]	[0.000]
Firm Performance	0.046	-0.049
	(0.072)	(0.083)
	[0.517]	[0.559]
Acquired	-0.072*	0.026
	(0.040)	(0.033)
	[0.068]	[0.433]
CEO Total Pay	-0.022	0.000
	(0.021)	(0.022)
	[0.307]	[0.986]
Age	0.017***	0.015***
	(0.001)	(0.001)
	[0.000]	[0.000]
Tenure	0.009***	0.006***
	(0.001)	(0.001)
	[0.000]	[0.000]
Gender	-0.005	-0.004
	(0.022)	(0.026)
	[0.822]	[0.886]
CFO	0.087***	0.066***
	(0.014)	(0.015)
	[0.000]	[0.000]
COO or President	-0.014	-0.022
	(0.016)	(0.017)
	[0.359]	[0.187]
CEO Departure	0.511***	0.424***
	(0.036)	(0.043)
	[0.000]	[0.000]
Fixed Effects	Year and CEO-Firm	Year and CEO-Firm
Observations	9,709	5,988
R-squared	0.478	0.461

* p<0.1, ** p<0.05, *** p<0.01. Standard errors are in parentheses, and p-values are in brackets. Constants are included, not reported. CEO-Firm and year fixed effects are included. Model 1 examines the effect of CEO Large Vested on Pay Duration Disparity. Model 2 examines the effect of the interaction between No Prior Engagement and Dodd-Frank on Pay Duration Disparity. N=5,988 in model 2, as we restricted the sample to the period 2006-2015.

Table A7: Predictors of Internal CEO Promotion

	Promotion to CEO	
	(1)	(2)
Newcomer	-0.098*	
	(0.054)	
	[0.071]	
Total Pay Amount Disparity		-0.016*
		(0.009)
		[0.072]
Age	-0.009***	-0.009***
	(0.002)	(0.002)
	[0.000]	[0.000]
Tenure	-0.003*	-0.003
	(0.002)	(0.002)
	[0.066]	[0.104]
Gender	0.034	0.036
	(0.036)	(0.036)
	[0.356]	[0.325]
Total Pay	0.423***	0.380***
	(0.035)	(0.046)
	[0.000]	[0.000]
Firm Performance	-0.159	-0.122
	(0.152)	(0.144)
	[0.296]	[0.399]
Fixed Effects	Year and Firm	Year and Firm
Observations	1,314	1,314
R-squared	0.251	0.251

* p<0.1, ** p<0.05, *** p<0.01. Standard errors are in parentheses, and p-values are in brackets. Constants are included, not reported. Firm and year fixed effects are included. Our analyses focus on the year leading up to the CEO succession, which marks the last year of visibility for the incumbent CEO. As each CEO would be observed for one firm-year when using CEO-fixed effects, both CEO and firm-level variables would be time-invariant and be absorbed. Consequently, we employ firm fixed effects to allow for variation in these variables throughout the sample period. Model 1 examines the effect of Newcomer on the likelihood of being promoted to the CEO role in the subsequent year. Model 2 examines the effect of Total Pay Amount Disparity on the likelihood of being promoted to the CEO role in the subsequent year.

Table A8: Heterogeneous Reaction to Pay Duration Disparity

	Voluntary Departure				
				Outsider CEOs	Insider CEOs
	(1)	(2)	(3)	(4)	(5)
Pay Duration Disparity	0.029***	0.025***	0.024**	-0.015	0.070**
	(0.008)	(0.008)	(0.012)	(0.053)	(0.030)
	[0.000]	[0.001]	[0.038]	[0.780]	[0.020]
Newcomer	-0.046**				
	(0.021)				
	[0.028]				
Pay Duration Disparity # Newcomer	-0.048**				
	(0.023)				
	[0.038]				
Total Pay Similarity		0.047*			
		(0.026)			
		[0.067]			
Pay Duration Disparity # Total Pay Similarity		0.042**			
		(0.017)			
		[0.014]			
Pay Duration Disparity # Outsider CEO			-0.004		
			(0.012)		
			[0.727]		
Pay Duration	-0.044***	-0.047***	-0.060***	-0.128**	-0.049***
	(0.012)	(0.012)	(0.017)	(0.049)	(0.017)
	[0.000]	[0.000]	[0.000]	[0.010]	[0.005]
Total Pay	0.008	0.002	0.011	-0.023	0.027
	(0.010)	(0.011)	(0.014)	(0.025)	(0.016)
	[0.455]	[0.820]	[0.453]	[0.371]	[0.102]
Age	0.008***	0.008***	0.008***	0.004*	0.009***
	(0.001)	(0.001)	(0.001)	(0.002)	(0.001)
	[0.000]	[0.000]	[0.000]	[0.081]	[0.000]
Tenure	-0.000	-0.000	-0.000	0.000	-0.001
	(0.001)	(0.001)	(0.001)	(0.002)	(0.001)
	[0.434]	[0.549]	[0.774]	[0.856]	[0.509]
Gender	-0.001	-0.004	0.012	0.037	0.006
	(0.014)	(0.013)	(0.017)	(0.028)	(0.021)
	[0.914]	[0.779]	[0.481]	[0.181]	[0.761]
CFO	-0.056***	-0.056***	-0.041***	-0.019	-0.046***
	(0.008)	(0.008)	(0.011)	(0.025)	(0.012)
	[0.000]	[0.000]	[0.000]	[0.466]	[0.000]
COO or President	-0.016	-0.015	-0.015	-0.022	-0.015
	(0.010)	(0.010)	(0.014)	(0.029)	(0.016)
	[0.118]	[0.140]	[0.282]	[0.447]	[0.338]
CEO Departure	0.079***	0.079***	0.065***	0.085	0.062**
	(0.017)	(0.017)	(0.024)	(0.056)	(0.026)
	[0.000]	[0.000]	[0.006]	[0.129]	[0.018]
CEO Total Pay	-0.017	-0.004	0.021	0.085**	-0.009
	(0.012)	(0.013)	(0.019)	(0.035)	(0.022)
	[0.142]	[0.755]	[0.270]	[0.017]	[0.684]
Acquired	0.621***	0.617***	0.552***	0.490***	0.586***
	(0.049)	(0.050)	(0.063)	(0.079)	(0.097)
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
Firm Performance	-0.129***	-0.130***	-0.145***	-0.267**	-0.130**
	(0.036)	(0.036)	(0.051)	(0.111)	(0.056)
	[0.000]	[0.000]	[0.004]	[0.018]	[0.020]
Fixed Effects	Year and	Year and	Year and	Year and	Year and

	CEO-Firm	CEO-Firm	CEO-Firm	CEO-Firm	CEO-Firm
Observations	9,709	9,709	5,585	1,151	4,434
R-squared	0.194	0.194	0.210	0.316	0.179

* p<0.1, ** p<0.05, *** p<0.01. Standard errors are in parentheses, and p-values are in brackets. Constants are included, not reported. CEO-Firm and Year fixed effects are included. Model 1 examines the effect of the interaction between Newcomer and Pay Duration Disparity on voluntary executive departure. Model 2 examines the effect of the interaction between Total Pay Similarity and Pay Duration Disparity on voluntary executive departure. Model 3 examines the effect of the interaction between Outsider CEOs and Pay Duration Disparity on voluntary executive departure. N=5,585 in model 3 as we only examine firms where the CEO was hired during the sample period. Models 4 and 5 examine the effects of pay duration-related variables on voluntary executive departure within firms with outsider CEOs and insider CEOs, respectively.

Table A9: Effect of Pay Duration Disparity on Voluntary Executive Departure (Executives with Gaps in Information Retained)

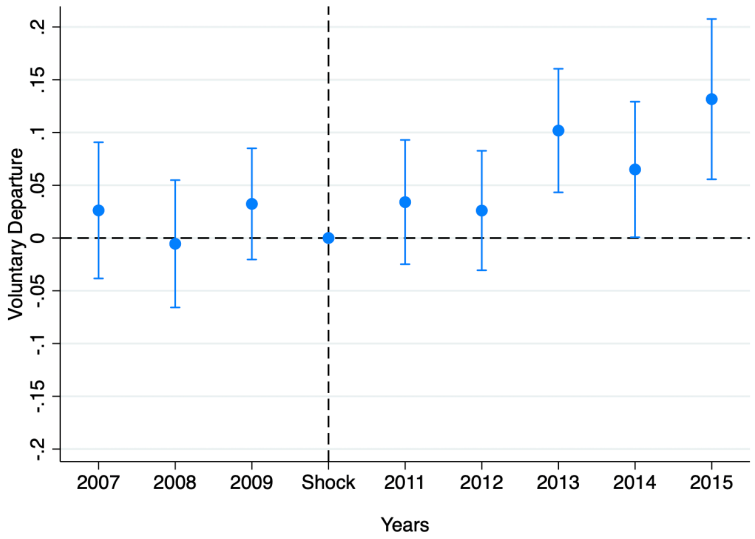
	Voluntary Departure		Involuntary Departure	
	(1)	(2)	(3)	(4)
Pay Duration Disparity	0.050***	0.054***	0.007	0.005
	(0.015)	(0.012)	(0.008)	(0.006)
	[0.001]	[0.000]	[0.366]	[0.393]
Pay Duration	-0.040***	-0.029***	-0.013**	-0.013***
	(0.010)	(0.008)	(0.006)	(0.005)
	[0.000]	[0.001]	[0.028]	[0.008]
Total Pay	0.008	0.009	0.003	0.003
	(0.009)	(0.008)	(0.005)	(0.004)
	[0.365]	[0.247]	[0.517]	[0.543]
Age	0.008***	0.008***	0.001**	0.001*
	(0.001)	(0.001)	(0.000)	(0.000)
	[0.000]	[0.000]	[0.012]	[0.060]
Tenure	-0.001*	-0.001*	0.000	0.000
	(0.001)	(0.000)	(0.000)	(0.000)
	[0.063]	[0.059]	[0.428]	[0.405]
Gender	0.002	0.001	0.012*	0.012*
	(0.012)	(0.012)	(0.006)	(0.006)
	[0.869]	[0.951]	[0.066]	[0.058]
CFO	-0.048***	-0.052***	-0.011***	-0.012***
	(0.007)	(0.006)	(0.004)	(0.004)
	[0.000]	[0.000]	[0.003]	[0.002]
COO or President	-0.015*	-0.018**	-0.002	-0.001
	(0.009)	(0.008)	(0.005)	(0.005)
	[0.080]	[0.022]	[0.724]	[0.865]
CEO Age		0.000		-0.000
		(0.001)		(0.000)
		[0.714]		[0.728]
CEO Departure	0.076***	0.075***	0.024***	0.025***
	(0.015)	(0.013)	(0.009)	(0.008)
	[0.000]	[0.000]	[0.005]	[0.001]
CEO Total Pay	-0.013	-0.019**	-0.004	0.000
	(0.010)	(0.009)	(0.005)	(0.005)
	[0.209]	[0.031]	[0.409]	[0.947]
Acquired	0.620***	0.572***	0.148***	0.125***
	(0.047)	(0.049)	(0.036)	(0.033)
	[0.000]	[0.000]	[0.000]	[0.000]
Firm Performance	-0.106***	-0.083***	-0.015	-0.003
	(0.032)	(0.028)	(0.019)	(0.014)
	[0.001]	[0.003]	[0.413]	[0.847]
Fixed Effects	Year and CEO-Firm	Year and Firm	Year and CEO-Firm	Year and Firm
Observations	11,905	11,920	11,905	11,920
R-squared	0.180	0.134	0.091	0.057

* p<0.1, ** p<0.05, *** p<0.01. Standard errors are in parentheses, and p-values are in brackets. Constants are included, not reported. CEO-Firm and Year fixed effects are included in models 1 and 3, while firm and year fixed effects are included in models 2 and 4. Models 1 and 2 examine the effect of Pay Duration Disparity on voluntary executive departure. Models 3 and 4 examine the effect of Pay Duration Disparity on involuntary executive departure. CEO Age is absorbed in models 1 and 3 due to CEO-Firm and year fixed effects.

Table A10: Distribution of Voluntary Departure Across Years Observations in Analyses

Year	Voluntary Departure		
	No	Yes	Total
2007	599	110	709
2008	696	107	803
2009	694	93	787
2010	721	83	804
2011	708	92	800
2012	674	104	778
2013	648	108	756
2014	638	94	732
2015	600	119	719
2016	601	85	686
2017	642	97	739
2018	622	107	729
2019	605	97	702
Total	8,448	1,296	9,744

Figure A1. Coefficient Plot of Differences-in-Differences Between Treated (No prior shareholder engagement) and Control (Prior shareholder engagement) Firms on Voluntary Departure



Note: Figure A1 presents the coefficient estimates (and their 90% confidence intervals) for the interactions between the year indicators and No Prior Engagement (Treated) firms. The year 2010 is used as the benchmark period. The delay between the legislation taking effect in 2011 and the observable differences in executive departure by 2013 is likely attributable to the time required for voting on proposals, subsequent modifications to the incentives, and the time executives needed to respond to these changes. We have extended the post-period through 2015 to accommodate the observed delayed effects of the legislation.

CHAPTER 2

SAME PAYCHECK, DIFFERENT YARDSTICKS: GENDER DIFFERENCES IN THE PERFORMANCE EVALUATION CRITERIA OF CEO COMPENSATION

2.1 INTRODUCTION

Gender differences in compensation have been extensively documented across various sectors and job levels (Joshi, Son, and Roh, 2015; Leslie, Manchester, and Dahm, 2017; Penner et al., 2023). However, the issue of CEO compensation presents a more nuanced situation, with studies offering conflicting conclusions about the extent and direction of the gender pay gap (Bugeja, Matolcsy, and Spiropoulos, 2012; Chen, Torsin, and Tsang, 2022; Gupta, Mortal, and Guo, 2018; Hill, Upadhyay, and Beekun, 2015; Leslie, Manchester, and Dahm, 2017; Maoret, Moriera, and Sabanci, 2023). A challenge in understanding gender disparities at the CEO level lies in the focus on differences in pay amounts, which may mask deeper systemic issues related to the processes leading to these outcomes (Kanbur and Snell, 2019; Sen, 2000). Indeed, merely observing similar pay amounts between female and male CEOs does not necessarily indicate fairness, as the processes leading to these outcomes may differ considerably (e.g., Roemer and Trannoy, 2015; Sen, 2000; Ugarte and Rubery, 2020). Studying these processes is particularly critical for understanding inequalities in CEO compensation, especially since a significant portion of CEO pay packages consist of complex, performance-based schemes (Cable and Vermuelen, 2016). Performance-based pay aims to align CEO actions with organizational goals, making it a fundamental aspect of executive compensation strategies across industries (e.g., Graffin et al., 2020; Shi et al., 2019). Notably, the CEO's eligibility for these payments depends largely on their performance evaluations, which can vary considerably in the criteria set by the board. Therefore, gender disparities in CEO compensation may extend beyond mere pay differences to the criteria used in performance evaluations that determine pay eligibility.

This paper explores these potential differences by investigating two important criteria that guide the process of performance-pay allocation: the *number of performance goals* (e.g., accounting metrics such as earnings or return on assets) CEOs are required to meet to be fully eligible for their payments, and the average *performance periods* assigned to CEOs, which denotes the timeframe used to assess eligibility for performance-based compensation. Understanding gender differences in these performance evaluation criteria is crucial because a greater number of performance goals and shorter performance evaluation periods can increase the complexity of the CEO's work environment and time pressure, potentially exacerbating the difficulty of goal attainment (Liu and Li, 2012; Sussman and Sekuler, 2022; Bennett et al., 2017) and impacting the fairness of performance-based compensation.

To examine these differences, we use the Incentive Lab database by ISS, which provides detailed information on executive compensation, including the grant dates, fair values, performance metrics, and performance periods of each long-term grant. Our analyses focus on CEOs at S&P 1200 U.S. public firms from 2009 to 2022. Given the scarcity of female CEOs among the top firms and pay differences being related to factors that affect the selection and retention of CEOs (e.g., Amore, Garofalo, and Minichilli, 2014), we use coarsened exact matching on various CEO and firm-level characteristics. Due to the novel aspects of compensation covered in this study, we adopt a question-driven approach rather than specifying hypotheses (Graebner et al., 2023).

The findings reveal that, in a matched sample of CEOs, female CEOs are subject to more stringent performance evaluation criteria, characterized by shorter performance periods and a greater number of performance goals. This contrasts with the absence of gender differences in total compensation and the proportion of performance-based pay among CEOs, suggesting that apparent pay equality may mask deeper inequalities in other pay allocation mechanisms. Further analyses show that the number of performance goals is positively related to the likelihood of failing to meet these goals, indicating that these performance criteria may hinder goal attainment.

Additionally, our findings indicate that the gender difference in performance evaluation criteria is stronger when the CEO has limited general managerial skills and experience, and weaker when there is a female presence on the board of directors. This suggests that female CEOs with less extensive managerial backgrounds working within male-dominated boards face compounded challenges through more rigorous evaluations.

This study makes several contributions to the existing literature. First, we contribute to the literature on performance-contingent pay and performance evaluations. Performance-contingent pay constitutes a large share of a CEO's compensation package. While studies have explored the use and effectiveness of performance-contingent pay (e.g., Edmans, Gosling, and Jenter, 2023; Matolcsy and Wright, 2011), our understanding of how managers are evaluated under performance-contingent pay schemes remains limited. Second, we contribute to the strategic management literature on gender pay disparity (Gupta, Mortal, and Guo, 2018; Hill, Upadhyay, and Beekun, 2015). While previous research has explored gender disparities in CEO compensation (Gupta, Mortal, and Guo, 2018; Hill, Upadhyay, and Beekun, 2015), it has largely overlooked differences in other compensation dimensions that can influence pay allocation among CEOs. Our study addresses this gap by showcasing the gender differences in performance evaluation criteria at the CEO level, offering new insights into the complexities of compensation structures beyond mere monetary comparisons. These differences may stem from widespread biases and the heightened scrutiny female CEOs face in proving their competencies both within and outside the organization (e.g., Cook, Ingersoll, and Glass, 2019; Lee and James, 2007; Glass and Cook, 2020), potentially leading boards to impose stricter criteria on female CEOs to verify their performance more rigorously and frequently than their male counterparts. The findings underscore how structural inequalities influence the evaluation processes that determine compensation, underscoring the need for fairer and more transparent pay processes that ensure gender equity at the CEO level.

2.2 THEORY

Gender-based disparities in workplace compensation are well-documented. Studies indicate that, on average, women receive 75-90% of the pay that men in comparable roles receive (Aragao, 2023). Although the extent of this gap is actively debated (Leslie, Manchester, and Dahm, 2017), and some reports suggest it has narrowed over the years (Gayle and Golan, 2012), it remains a global concern. Various factors contributing to the gender pay gap, such as biases and discrimination in hiring, promotion, and salary decisions, have been identified over the decades (e.g., Joshi et al., 2015). However, the gap remains incompletely explained. As Abraham (2017) poignantly notes, “despite 50 years of political mobilization and dedicated public policy, the gender wage gap remains one of the most persistent forms of workplace inequality” (p. 29).

2.2.1 Gender Differences in CEO Compensation

While gender differences in pay are well reported in various contexts, only a limited body of research has explored the gender pay gap at the CEO level, possibly due to the historical scarcity of women ascending to top executive positions (Gupta, Mortal, and Guo, 2018). However, the growing body of studies in this area provides mixed evidence on the existence of a pay difference at the CEO level. Some suggest a ‘female premium,’ where women who reach the upper echelons of an organization are highly sought after due to their rarity, commanding higher compensation and faster promotions compared to their male counterparts (Bertrand and Hallock, 2001; Gayle, Golan, and Miller, 2012; Leslie et al., 2017). This pay advantage may also be attributed to the diverse knowledge and perspectives gained through overcoming professional obstacles (Hill, Upadhyay, and Beekun 2015) or the enhanced risk management skills demonstrated by female CEOs (Kang, Bang, and Ryu, 2023).

Other studies report insignificant or narrowing pay disparities between female and male CEOs. For instance, Gupta, Mortal, and Guo (2018) found that female CEOs received comparable total compensation to male CEOs, challenging earlier assertions of a female

premium. Similarly, Bugeja, Matolcsy, and Spiropoulos (2012) found that apparent disparities in total pay, salary, and bonuses diminish when female CEOs are matched with male CEOs based on firm and board characteristics, suggesting that women who achieve CEO positions are compensated comparably to men. Maoret, Moriera, and Sabanci (2023) also found no significant gender differences in compensation among CEOs and other executives, even after accounting for firm and TMT-level characteristics. The similarity in pay between female and male CEOs may be attributed to potential improvements in the executive labor market due to the increasing global pressure for gender equality (Vieito and Khan, 2012).

Conversely, some studies indicate that female CEOs may receive lower compensation compared to their male counterparts, further challenging the notion of the female premium (Carter, Franco, and Gine, 2017; Chen, Torsin, and Tsang, 2022; Keller, Molina, and Oldley, 2023). This may be due to the unique penalties women face when negotiating for higher compensation contracts, as women who exhibit dominant traits necessary for effective bargaining are often perceived as inconsistent with traditional gender norms (Amanatullah and Tinsley, 2013). In turn, pay differences arising from reduced bargaining power may be further exacerbated by women's increased difficulties in being recognized for their capabilities throughout their tenure (Glass and Cook, 2020; Williams, 2014), which may hinder their opportunities to negotiate for pay raises.

2.2.2 Potential Differences in Pay Processes

The gender pay gap at the CEO level remains a topic of heated debate, with reports varying in magnitude and direction. Scholars examining gender disparities in CEO compensation have primarily focused on examining variations in pay amounts. However, in discussions of economic and social justice, merely comparing the pay scales of male and female CEOs may fall short when subjected to deeper socio-economic analyses. Economic theories, such as the ‘capability approach’ and others emphasizing process and opportunity equality (Rawls, 1971; Roemer and Trannoy, 2015; Sen, 2000), suggest that inequality is driven not only by differences

in compensation outcomes but also by the fairness of the processes that lead to these outcomes. For instance, focusing solely on income to understand gender-based inequalities may overlook critical aspects such as HR processes for determining wage setting and promotion to higher ranks with better pay, which may disproportionately favor males (Ugarte and Rubery, 2020).

Differences in compensation processes are also likely to arise between female and male CEOs. Even if female CEOs appear to receive comparable compensation to their male counterparts, the processes and criteria employed by the boards to structure their payments might be more stringent due to systemic biases for women (e.g., Cook, Ingersoll, and Glass, 2019; Lee and James, 2007; Glass and Cook, 2020), effectively placing female CEOs at a disadvantage. Said differently, equality in pay between female and male CEOs may mask underlying structural disparities that require female CEOs to exert more effort to achieve the same pay.

The fairness of compensation processes is especially pertinent in the context of performance-based compensation, which comprises 60% to 80% of CEO payments in top U.S. firms (Cable and Vermuelen, 2016). The compensation elements differ not only in monetary value but also in the performance evaluation criteria used to determine a CEO's eligibility for payment. Given the prevalence of performance-based payments and the existing literature's focus on outcome inequalities, it is crucial to investigate possible differences in the processes that influence the allocation of these payments (Kanbur and Snell, 2019).

Namely, firms increasingly tie CEO compensation to *performance goals* to align the CEO's interests with those of the shareholders and drive overall performance and growth (De Angelis and Grinstein, 2015). Similarly, the eligibility for executives to receive performance-based pay is determined during the timeframe of *performance periods.* The number of concurrent performance goals and the time allocated to achieve these goals likely affect the complexity and the difficulty in achieving these goals (Lam et al., 2011; Leroy, Schmidt, and Madjar, 2020; Liu

and Li, 2012; Obloj and Sengul, 2020).[20] These performance evaluation criteria can vary widely among CEOs (Bennett et al., 2017; Harry et al., 2018), affecting the CEO's performance evaluations. In turn, since performance evaluations are used to determine the CEO's pay eligibility, these criteria may influence the pay distribution between CEOs.

2.2.3 Number of Performance Goals

Performance goals in compensation packages are objectives CEOs must meet to receive performance-based payments, often based on accounting metrics like return on assets or earnings (Bennett et al., 2017; Chen et al., 2022). Firms often set multiple performance goals for their CEOs and executives (Arnold and Artz, 2019; Chen et al., 2022; Bettis, Bizjak, and Coles, 2018) to incentivize them to excel in their roles, driving overall performance and growth (De Angelis and Grinstein, 2015). The number of these goals varies across CEOs, reflecting the firm's specific needs (Bennett et al., 2017). [21]

For firms, determining the appropriate number of performance goals for the CEO's evaluations is essential for a comprehensive and effective assessment. On one hand, incorporating multiple performance goals into the CEO's evaluation addresses the complexity of managers' task environments and reduces information asymmetry between the CEO and the board, allowing for a holistic understanding of the CEO's capabilities and contributions (Holmstrom, 1979; Holmstrom, 2017; Shavell, 1979). Assigning multiple goals may encourage CEOs to devise innovative solutions, facilitating broader improvements in firm outcomes (Obloj and Sengul, 2020). Additionally, it can enhance corporate governance by reducing CEO

[20] In the Results section, we present analyses examining the relationship between the number of performance goals and the duration of performance evaluation periods on the likelihood of the CEO failing to meet performance targets. Our findings indicate that a higher number of performance goals is positively associated with an increased likelihood of failing to meet performance targets, supporting the idea that these performance evaluation criteria can be associated with the difficulty of achieving objectives.

[21] Individuals can vary in either performance goals, performance periods, or both. Consider three CEOs from our sample, CEO A, B, and C. CEOs A and B have the same number of performance goals, but CEO A is evaluated over a longer performance period than CEO B. Conversely, CEOs B and C have the same performance period of 3 years, but CEO B's pay is based on a higher number of performance goals.

manipulation of reported performance, as their pay becomes contingent on meeting diverse objectives (Gao, Hwang, and Wu, 2017).

On the other hand, pursuing multiple goals simultaneously can become increasingly challenging for the CEO. As the number of goals increases, the complementarity among these goals may decrease, making it harder for the CEO to identify solutions that achieve holistic progress (Hu and Bettis, 2018). A greater number of goals may require the CEO to divide their attention, leading to confusion and poorer allocation of effort between objectives (Leroy, Schmidt, and Madjar, 2020). In turn, pursuing multiple objectives may increase the CEO's risk of falling short of their targets (e.g., Dong, 2021; Hu and Bettis, 2018; Joseph and Gaba, 2015; Obloj and Sengul, 2020). Further, because multiple objectives may only loosely correlate, progress in one objective may not necessarily translate into improvements in others, or it may do so to a limited extent. Therefore, CEOs may find it more challenging to achieve payouts that require meeting multiple performance targets than those tied to singular targets (Bennett et al., 2017). Consequently, while having a greater number of goals may be desirable for firms, it can also raise the likelihood of the CEO falling short of targets, incurring financial and reputational costs (Bennett et al., 2017). Considering the increased cognitive strain, task complexity, and the risks of falling short of performance goals, a greater number of performance goals can be regarded as more demanding than a smaller set of evaluation criteria.

2.2.4 Duration of Performance Periods

While CEOs must achieve their performance goals to receive their performance-based pay in full, the time allotted by boards to meet these objectives—known as *performance evaluation periods*—can vary considerably across the performance goals and between different CEOs (Gao, Hwang, and Wu, 2017; Harry et al., 2018; Wruck and Wu, 2022). Although similar to vesting periods, performance evaluation periods (hereafter, performance periods for simplicity) are conceptually different. Instead of denoting the time the executive must wait to receive their

pay, the performance period represents the observation period during which the CEO's performance is evaluated. At the end of these periods, the CEO's eligibility to receive their grants is determined based on the evaluations. Upon eligibility, the executive is vested their pay at the end of their vesting periods (De Angelis and Grinstein, 2020; Harry et al., 2018; PwC, 2023).

To illustrate the variations of performance periods, consider a hypothetical CEO who was granted four performance-based awards in 2013. The first award had a fair value of $813,000 and a 3-year performance period, the second had a fair value of $813,000 and a 4-year performance period, the third had a fair value of $715,000 and a 2-year performance period, and the fourth had a fair value of $300,000 and a 3-year performance period. The average performance period is calculated as a weighted average of performance periods of these awards, weighted by dollar value (see Harry et al., 2018). In this case, the CEO's average performance was approximately 2.7 years in 2013 (see Figure 2.7.1 for a visual representation).

Insert Figure 2.7.1 about here.

Choosing the appropriate duration for the performance measurement period for the CEO's evaluations is vital for boards to obtain accurate, reliable, and meaningful evaluations that support informed decision-making and continuous improvement (Gao, Hwang, and Wu, 2017). Frequent performance reviews can help employees learn quickly and implement feedback effectively, enabling management to reinforce positive behaviors or swiftly correct undesirable ones, thereby enhancing the learning process and improving future performance (Lechermeier and Fassnacht, 2018; Luke and Alavosius, 2011; Goomas, Smith and Ludwig, 2011). Likewise, as performance periods are concluded with assessments of the CEO's performance, shorter performance evaluation periods may also enable boards to provide CEOs with more frequent feedback, thereby facilitating rapid adjustments to the CEO's focus and strategy. Similarly, shorter performance

periods could be advantageous during periods of high uncertainty and when more risk-seeking corporate strategies are desired (Do, Zhang, and Zuo, 2022; Harry et al., 2018).

However, shorter evaluation periods may increase the possibility of misclassifying a CEO as underperforming, potentially damaging their reputation through inaccurate assessments (Bennett et al., 2017). As noted by Harry et al. (2018), shorter evaluation periods may be particularly prone to noise. They might not effectively differentiate the CEO's capabilities from market trends as accurately as longer evaluation periods, potentially trading off greater precision for speed. Further, shorter evaluation periods may increase the complexity of the CEO's work environment. The pressure to achieve performance goals within a limited timeframe can lead to higher cognitive strain and stress, diminishing the CEO's ability to strategize, select relevant information, and make efficient decisions (Liu and Li, 2012; Sussman and Sekuler, 2022), which may in turn adversely affect performance. Further, to the extent that shorter performance periods involve more frequent performance evaluations, they may exacerbate the CEO's difficulty in reaching objectives. Similar to how frequent performance evaluations and feedback can overwhelm individuals by straining the allocation of their cognitive resources (Lam et al., 2011), the accelerated feedback dynamics under shorter evaluation periods may require CEOs to process performance feedback more frequently and challenge their ability to effectively allocate their attention and direct their focus, potentially impacting their performance. Thus, while shorter performance periods may be appealing for some firms, complexity and cognitive strain induced by such evaluation criteria may impact a CEO's effectiveness and decision-making processes, ultimately influencing their difficulty in meeting performance targets and potentially debilitating the firm's outcomes. In other words, due to their association with increased task complexity and time pressure, shorter performance evaluation periods may be considered more demanding for CEOs than longer periods.

2.3 METHOD

2.3.1 Data and Sample

Our sample includes CEOs within S&P 1200 from 2009 to 2022.[22] We restrict the sample to firms that could be consistently matched across Compustat, Incentive Lab, Boardex, and CRSP. We use the database Incentive Lab by ISS to obtain detailed information on executive compensation, including the grant date, fair value, and precise vesting date for each long-term grant (Chu, Faasse, and Rau, 2018). We use Compustat to obtain firm-level control variables. Further, we use Execucomp and Boardex to obtain CEO characteristics, such as age, tenure, and gender (Messersmith et al., 2011). We also obtain board characteristics from Boardex (Andrus et al., 2019). Additionally, we obtain stock return information from CRSP.

Our initial sample consisted of 1,565 firms representing 2,921 CEOs and 14,035 firm-year observations. We remove individuals with incomplete demographic or incomplete financial information, missing or incomplete grant dates and performance periods, and those with gaps in the panel. For firms with multiple CEOs during the same period, we focused on the CEOs with longer tenure and excluded information regarding the other CEOs, as our matching criteria and operationalization of variables relating to performance evaluation criteria pertain to single-CEO firms.[23] Moreover, we lagged our independent variables and control variables by one year.

Following this process, we obtain a full sample of nearly 12,379 firm-year observations from 1,372 firms, which includes 124 female CEOs. After matching (see the Matching section for

[22] We start our analyses after the financial crisis period to account for the idiosyncrasies associated with potential compensation practices in this period (e.g., Hill, Uphadyay, and Beekun (2015)). Our results are robust for when the this period is included in our analyses.
[23] In the case where the CEOs had the same tenure, we focused on the older CEO.

more details), we obtain a matched sample of 5,004 observations from 901 firms, including 109 female CEOs. [24]

2.3.2 Dependent Variables

The first stage of our analysis focuses on four dependent variables: CEO total compensation, performance pay ratio, number of performance goals, and average performance period. *Total compensation* is measured from the CEO's total pay as reported in proxy filings, which includes salary, bonuses, and equity payments granted to the CEO in the focal year. The *performance pay ratio* is operationalized as the proportion of performance-based grants awarded in a given year relative to the total compensation. We measure the *number of performance goals* by summing the number of performance goals within the CEO's pay package for the focal year, as reported in the Incentive Lab database. We measure the average duration of *performance periods* using the method proposed by Harry et al. (2018). It is operationalized as the weighted average of the duration of the performance periods, weighted by dollar value, for all performance-based awards granted to the individual in the current year. Only the values of performance-based awards are considered in the operationalization, excluding time-based awards, salary, and bonuses. The general formula we use is as follows:

$$AvPerformancePeriod_i = \frac{\sum_{si=1}^{S} Stock_{si} * pt_{si} + \sum_{oi=1}^{O} Option_{oi} * pt_{oi} + \sum_{hi=1}^{H} Other_{hi} * pt_{hi}}{\sum_{si=1}^{S} Stock_{oi} + \sum_{oi=1}^{O} Option_{oi} + \sum_{hi=1}^{H} Other_{hi}}$$

$Stock_{si}$, $Option_{oi}$, and $Other_{hi}$ indicate the grant date fair value (that is, the dollar value at the date on which the grant is awarded as reported by the firm) of the performance-based restricted stock grant, option grant, and other types of grants, which have performance periods with durations of pt_{si}, pt_{oi}, and pt_{hi}, respectively. *S*, *O*, and *H* are the number of stocks, options, and other types of

[24] We do not exclude specific industries in our analyses due to the lack of existing literature that showcases industry-specific differences in CEO performance evaluation criteria. Moreover, in analyses not detailed in this paper, we observe that industry does not correlate with the CEO's performance evaluation criteria.

grants awarded to the individual. We focus on grants awarded in the focal year only, as past awards are less relevant for explaining the board's decision to structure CEO pay in the focal year. We calculate the average performance period based on these specifications, which are measured in years.

2.3.3 Independent and Control Variables

The independent variable is the Female CEO, which is operationalized as a binary variable that takes the value of one if the CEO is Female and 0 if the CEO is Male.

Following prior research, we controlled for a variety of CEO, firm, and board-related factors that can impact the CEO's compensation scheme, including CEO age, CEO tenure, female presence on the board, board independence, firm performance, firm size, equity returns, and firm risk (Bugeja, Matolcsy, and Spiropoulos, 2012; Carter, Franco and Gine, 2017; Gupta, Mortal and Guo, 2018; Hill, Upadhyay and Beekun, 2015). CEO tenure is operationalized as the number of years since the CEO was appointed to their role. Existing literature indicates that the presence of female directors on boards may cluster around one or two individuals due to 'tokenism' (a pattern also observed in our dataset) and underscores the similarities in firms that retain one or two female directors (e.g., You, 2021). Therefore, female presence on the board is operationalized as a dummy variable that indicates whether the firm has more than one female director. Board independence is operationalized as the ratio of independent directors to the total number of directors. Firm performance is operationalized as return on assets (ROA). Equity returns are measured as the firm's annual stock returns. Firm size is operationalized as net sales (Bermiss and Murmann, 2015). Firm risk is measured as the volatility of the firm's daily stock returns, converted to an annual measure for the purposes of analyses. As noted earlier, we lag our independent and control variables by one year in our analyses.

2.3.4 Matching Process

We run our first round of analyses on CEO total compensation and performance pay ratio using the full sample. However, using OLS regression with an unbalanced sample such as ours, where female CEOs constitute a small percentage of our observations, may lead to biased interpretations as the results may be disproportionately influenced by the majority group of male CEOs. Further, the results may be driven by factors affecting the selection and retention of CEOs based on gender, making it more challenging to isolate the effect of CEO gender on pay outcomes (Amore, Garofalo, and Minichilli, 2014). Therefore, in addition to analyses on the unmatched sample, we use matching techniques to alleviate these potential biases and create a more balanced sample of comparable male and female CEOs on observable criteria.

Specifically, we use coarsened exact matching (CEM) to match female CEOs to male CEOs on various CEO and firm-level characteristics used in prior literature, including year, firm performance, firm size, and CEO age (Carter, Franco, and Gine, 2017; Chen, Torsin and Tsang, 2022; Maoret, Moriera, and Sabanci, 2023). Given the tendency of boards to employ one or two female directors and the apparent similarities between the firms where boards display such tokenism, we also incorporate female presence on the board as a matching criterion.

We opt for a one-to-many matching technique to avoid excessive loss of information (Maoret, Moriera, and Sabanci, 2023). Further, we use CEM for the matching processes, as it is said to be more efficient compared to alternative matching techniques like Propensity Score Matching (PSM), as it makes more effective use of the available data and reduces reliance on the model (Khanna and Guler, 2022; Iacus et al., 2011).

2.4 RESULTS

2.4.1 Descriptive Statistics

Table 2.7.1 describes the variables used in the matching process and the analyses. Table 2 reports the correlations of variables used in the matching process and analyses for the matched sample. We observe the sample of firms with female CEOs to be generally comparable with the sample of firms with male CEOs on the matching criteria.[25]

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Insert Table 2.7.1 about here.

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Insert Table 2.7.2 about here.

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2.4.2 CEO Total Compensation, Performance Pay Ratio, Performance Evaluation Criteria and Gender Differences

Table 2.7.3 presents the results of Poisson (columns 5 and 6) and linear regression analyses (columns 1-4 and 7-8) for total compensation, performance pay ratio, number of performance goals, and performance period considering both the full and matched samples. All analyses in Table 2.7.3 and subsequent tables include firm and year-fixed effects, with standard errors

[25] Using a t-test adjusted with CEM weights, we observe that firms with female CEOs are comparable to male CEOs in terms of ROA (proxy for firm performance) ((t(5401) = 0.148, p = .882), sales (proxy for firm size) (t(5401)=0.033, p=.974), and CEO age (t(5401)=0.228, p=.819). Year, industry and presence of female directors in the board were exact matches.

clustered at the firm level to account for potential correlations in the error term across observations.

Insert Table 2.7.3 about here.

The analyses on total compensation and performance-based pay ratio do not show significant differences between male and female CEOs in either the full or matched samples (columns 1 to 4). These results align with previous research suggesting that women who rise to the top of their organizations are compensated similarly to their male counterparts in both monetary value (Maoret, Moriera, and Sabanci, 2023) and the proportion of performance pay (Graffin et al., 2020; Kulich et al., 2011; Vieito and Khan, 2012).

However, we observe differences in performance evaluation criteria. Female CEOs have a higher number of performance goals in both the full and matched samples (p=.067 in column 5, p=.069 in column 6). The economic impact is considerable, with an approximate increase of 10.7% in the expected number of performance goals for the full sample and about 15% in the matched sample compared to male CEOs.

We do not observe any statistically significant difference between female and male CEOs regarding performance evaluation periods in the full sample (column 7). However, the matched sample analysis shows a different picture: female CEOs face shorter performance evaluation periods (p=.030 in column 8) than male CEOs. In this case, the economic impact represents a decrease of 11.7% in the performance evaluation period over the base rate.

These findings suggest that female CEOs are subject to more demanding performance evaluation criteria, characterized by a higher number of performance goals performance goals and shorter evaluation periods.

2.4.3 Performance Evaluation Criteria and Performance Outcomes

We suggested earlier that a greater number of goals and a reduced duration of the evaluation period of these goals may be related to time pressure and heightened task complexity. Consequently, we argued that these factors can exacerbate the CEO's difficulty in achieving their performance targets. To test whether a greater number of performance goals or shorter performance periods can influence the difficulty in goal attainment, we examine the effects of these performance evaluation criteria on the extent to which CEOs meet their performance goal targets.

To accurately assess whether CEOs have met their performance targets, we follow the methodology of Chen et al. (2022), who investigated the interplay between analyst forecasts and performance goal target levels on a firm's risk-taking. Similar to Chen and colleagues, we restrict our sample to firms that use absolute accounting performance goals in CEOs' compensation contracts. We exclude performance goals with targets based on growth rates, such as earnings per share (EPS) growth, due to the ambiguous baseline values and varying operationalization across firms (Chen et al., 2022; Guay et al., 2019). The list of accounting performance goals considered in the sample, analogous to Chen et al. (2022), includes earnings per share (EPS), earnings before taxes (EBT), earnings before interest and taxes (EBIT), earnings before interest, taxes, depreciation, and amortization (EBITDA), earnings, operating income, sales, profit margin, return on assets (ROA), return on equity (ROE), and cash flow. We further exclude performance goals with incomplete information on performance periods and associated targets. From this sample, we focus on the years where the performance evaluation periods of the accounting goals previously assigned to the CEO ended. We determine whether the target of an accounting performance goal has been met using firm outcome data sourced from Compustat.

We created a variable called *Accounting Performance Goal Failure*, a dummy variable that takes the value of 1 if the CEO failed to meet the target of at least one performance goal

whose performance evaluation period ended in the current year and 0 otherwise. Further, we created a variable *Accounting Performance Goal Failure Ratio*, which denotes the percentage of goals whose evaluation ended in the current year that the CEO had failed to meet.

The independent variables are the number of assigned performance goals and their average performance periods in the prior year.[26] As before, we lagged the covariates by one year. Moreover, as the dependent variables involve accounting performance goals, including ROA and sales, we exclude from our controls and matching criteria ROA (proxying firm performance) and firm's sales (proxying firm size) to avoid potential multicollinearity.

Insert Table 2.7.4 about here.

Table 2.7.4 displays the outcomes of linear regression analyses for Accounting Performance Goal Failure and Accounting Performance Goal Failure Ratio. The number of performance goals from the previous year is positively related to the likelihood that the CEO failed to meet at least one performance goal in the current year (p=.002 in columns 2 and 3). Similarly, the number of performance goals from the prior year is positively related to the Accounting Performance Goal Failure Ratio (p=.020 in column 5 and p=.024 in column 6). Instead, we do not observe any significant relationship between the duration of the performance evaluation period and the likelihood of the CEO failing to meet at least one performance goal (columns 2 and 3) or the ratio of failed performance goals in the current year (columns 5 and 6). In other words, the results suggest that an increased number of performance goals assigned in the prior year can interfere with goal attainment in the current year but that the duration of the performance period is less

[26] As the failure in accounting performance goals can be conceived as a firm performance outcome, we lag our independent variables by one year following prior research in firm performance (e.g., Vanacker, Collewaert, and Zahra, 2017).

consequential in influencing the goal failure. These results partially support the premise that more stringent performance evaluation criteria can hinder goal attainment.[27]

We also observe Female CEO to be negatively related to the likelihood of an accounting performance goal failure (p=.006 in column 1 and p=.013 in column 3) and the percentage of failed accounting performance goals (p=.042 in column 4 and p=.058 in column 6). This suggests that despite facing more stringent performance evaluation criteria, which could heighten the risk of not meeting performance targets, female CEOs are able to meet these challenges, showcasing their competence and resilience under pressure.

We will discuss some potential reasons as to why female CEOs are assigned with more demanding performance evaluation criteria despite their proficiency in meeting performance targets in the following section and in the Discussion section.

2.4.4 Potential Moderating Roles of Other CEO Characteristics

We have shown that female CEOs tend to receive compensation packages with more demanding performance evaluation criteria, marked by a higher number of performance goals and shorter evaluation periods. A potential reason for this differential treatment may be the board's lack of trust in female leadership (e.g., Vial, Napier, and Brescoll, 2016). Research suggests that within organizations, "women's mistakes tend to be noticed more and remembered longer" and "objective requirements tend to be applied rigorously to women but leniently to men" (Williams, 2014, p. 190). Female leaders report that they often face suspicion regarding their competence and hyper-surveillance of their performance (Glass and Cook, 2020). Female leaders are also subject to a 'prove-it-again' bias, where "women as a group must provide roughly twice

[27] In unreported analyses for the matched sample, we find that both Accounting Performance Goal Failure in the current year (p<.001) and Accounting Performance Goal Failure Ratio in the current year (p<.001) are negatively related to the CEO's total compensation (log) as reported in the proxy filings for the current year. This supports our argument that performance evaluation criteria, by influencing the CEO's success in meeting performance targets, can impact the CEO's compensation.

as much evidence of competence as men in order to be seen as equally competent" (Williams, 2014, p. 189). Furthermore, the performance of female leaders is more likely to be attributed to extraneous circumstances such as luck over competence, reinforcing the demand for women to display their capabilities to the board (Swim and Sanna, 1996; Rosette and Tost, 2010).

This reduced trust in female leadership may lead boards to assign a greater number of performance goals or shorter performance evaluation periods to female CEOs. As noted, increasing the number of performance goals can improve the informativeness of the CEO's performance evaluations and provide a more thorough understanding of the CEO's capabilities and influence on the firm outcomes (e.g., Gao, Hwang, and Wu, 2017). This need for comprehensive assessment may be more pressing for female CEOs due to the higher requirements and the stricter work standards set by their boards (e.g., Vial, Napier, and Brescoll, 2016; Williams, 2014). Additionally, Harry et al. (2018) suggest that firms might shorten performance periods for CEOs when there is a lack of trust in their capabilities. The authors argue that longer performance periods can reduce the influence of market fluctuations on evaluations and lower the risk of misjudging a CEO's abilities. However, shorter evaluation periods allow for quicker assessments and potential corrective actions, which might be preferred for female CEOs due to heightened scrutiny and suspicion of their abilities (Glass and Cook, 2020).

Research suggests that informational gaps about a CEO's capabilities may lead boards to rely on visible cues like gender in their decision-making process, potentially amplifying the effects of gender-related biases in their decisions regarding the CEO (Bordalo et al., 2016; Botelho and Abraham, 2017; Carnahan and Greenwood, 2018). Similarly, the design of compensation features between male and female CEOs may be more equitable within boards with female presence, as "women's service on the board can decrease the salience of gender and gender bias in board members' evaluation of compensation deservingness" (Cook, Ingersoll and Glass, 2019, p.1296). Hence, if the differences in performance evaluation criteria between

female and male CEOs arise from organizational biases towards women leadership, we expect the differences to lessen for firms that are more familiar with the female CEO's capabilities and those with female-friendly boards.

To test these arguments, we first examine how the CEO's general ability, demonstrated through their past experiences, might moderate the effect of the CEO's gender on the performance evaluation criteria. If gender differences in these criteria stem from the board's higher suspicion toward female leadership, then as more information about the CEO's capabilities becomes available, the impact of gender and associated biases may diminish. Hence, gender-related biases may weaken female CEOs with notable past experiences, which can appraise the board of the CEO's capabilities. For female CEOs with distinguished past careers, boards may have fewer reasons to suspect the CEO's capabilities and thus may not require as rigorous assessments, potentially favoring a smaller number of performance goals or longer performance periods.

To investigate this, we used the General Ability Index for CEOs developed by Custódio, Ferreira, and Matos (2013). This index measures the CEO's general ability through various factors, including the number of positions held, whether the CEO held a CEO position before at a different company, firms they worked for, industries they engaged in, as well as experience in working within conglomerates. This measure serves as a proxy for expected CEO capabilities that are independent of current firm achievements, which the boards may otherwise ascribe to external factors (Williams, 2014).

Insert Table 2.7.5 about here.

Table 2.7.5 presents the interaction between the CEO's gender and their general ability and its relationship with performance evaluation criteria in the matched sample. We observe that

the interaction between Female CEO and General Ability is positively related to the duration of performance periods (p=.047 in column 4). However, we do not observe a statistically significant effect of this interaction on the number of performance goals. These results partially support the notion that higher general managerial ability displayed through distinguished past careers may alleviate the boards' tendency to impose more stringent performance evaluation criteria on female CEOs.

Further, potential gender-related biases within the board may be alleviated by the presence of female board members. To test this, we examine the interactions between Female CEO and Board Female Presence in columns 2 and 5 of Table 2.7.5. We do not observe the interaction between Female CEO and Board Female Presence to be significantly related to the number of performance goals. Instead, we observe a positive relationship with the performance period (p=.033 in column 5). Therefore, our analyses provide some evidence that female board members may help reduce gender biases in performance evaluation criteria.

Finally, research indicates that although boards gradually become more familiar with new hires over time, there is considerable information asymmetry between board members and new hires in the initial years following succession (Zhang, 2008). In the initial years of the CEO's tenure, the board may lack information regarding the CEO's capabilities and rely more on salient contextual cues, such as gender, thereby amplifying potential gender-related biases in the design of performance evaluation criteria. To investigate this, we have examined the effects of the interaction between the CEO's gender and tenure on the performance evaluation criteria.

Table 2.7.5 presents these interactions. While we observe the interaction to be negatively related to the number of performance goals and positively related to the duration of the performance period (columns 3 and 6), the relationships are not statistically significant. Thus, the results do not support the notion that gender-related biases may be amplified for newly hired

female CEOs. Instead, the results suggest that female CEOs receive more demanding performance evaluations relative to male CEOs throughout their careers.

2.5 DISCUSSION

The gender pay gap at the CEO level remains a highly contested issue, with varying reports on its magnitude and nature. However, much of the research has focused on gender inequalities in CEO compensation by examining differences in pay amounts. In this paper, we suggest that this approach may potentially overlook the processes that influence compensation outcomes and their distribution (Kanbur and Snell, 2019; Roemer and Trannoy, 2015). To gain a more complete understanding of gender disparities in CEO compensation, we argue that it is crucial to investigate the variations in the criteria used in performance evaluations, which are employed by boards to assess the CEO's eligibility for performance-based payments. By examining these additional features, this study aims to contribute to the literature by providing a more nuanced analysis of the factors driving gender disparities in CEO compensation.

To that end, we examine potential differences between female and male CEOs in two key performance evaluation criteria that influence the allocation of performance-based pay: the *number of performance goals* a CEO must meet to receive their payments in full and the *average performance evaluation period* of these goals. We examine the differences in these performance evaluation criteria using a dataset of CEO compensation from a sample of S&P 1200 U.S. public firms from 2009 to 2022, where we match female CEOs with comparable male CEOs based on firm and CEO level characteristics.

Our initial analyses reveal no gender differences in total compensation or the proportion of performance-based pay among CEOs. However, this apparent equal treatment in compensation masks important disparities in performance evaluation criteria. Specifically, when examining a matched sample of CEOs, we find that female CEOs are subject to a larger number of performance goals within their compensation packages and face shorter periods for

performance evaluation. Further analyses show that these performance evaluation criteria have important implications for the CEO's success in meeting performance targets. The number of performance goals is positively associated with the likelihood of failure in meeting performance targets and the proportion of goals with failed targets. Finally, we find evidence that gender differences in performance evaluation criteria are less pronounced among CEOs with higher general managerial ability or when there is female presence on the board.

Overall, the findings support the notion that female CEOs are disadvantaged by the design of their compensation packages, likely rooted in pervasive biases and structural inequalities within the corporate environment. Female leaders often encounter skepticism regarding their leadership abilities and perceive that they must repeatedly demonstrate their competence and provide considerably more evidence than men to be viewed as equally capable (Glass and Cook, 2020; Williams, 2014). Further, female leaders are more penalized for taking risks to achieve breakthrough performance, as they face greater scrutiny and criticism from organizational insiders for failures compared to their male counterparts (Vial, Napier, and Brescoll, 2016; Williams, 2014). The performance of female leaders is also frequently ascribed to external factors rather than their actual capabilities (Swim and Sanna, 1996; Rosette and Tost, 2010), and they often face increased board supervision and monitoring (Oliver et al., 2018). Combined, the increased scrutiny and the challenges female CEOs encounter in displaying their competency may contribute to an increased inclination for boards to impose more strict or demanding performance evaluation criteria on female CEOs.

Female CEOs may also face less favorable evaluations from investors and analysts, which can negatively affect the firm's stock prices (Eagly and Karau, 2002; Lee and James, 2007). Despite superior accounting performances, female-led firms are often associated with poorer market performance, reflecting broader market bias against women in leadership (Abdullah, Ismail, and Nachum, 2016). Female CEOs also attract more media attention during succession and are more susceptible to shareholder activism compared to their male counterparts (Smith,

Chown, and Gaughan, 2021; Gupta et al., 2018). This negative attention may pressure boards to enforce stricter performance evaluation criteria for female CEOs, who should quickly and comprehensively demonstrate their competencies across various aspects. Relatedly, negotiation processes for compensation may also present challenges for female CEOs, who are often penalized for appearing too assertive (Amanatullah and Tinsley, 2013). This double bind may result in less favorable terms when negotiating performance-based pay. Altogether, these factors may contribute to a setting where female CEOs may be systematically disadvantaged, impacting not only their compensation design but also broader efforts toward gender equity at the CEO level.

This study contributes to the strategic management literature on gender pay disparity (Gupta, Mortal, and Guo, 2018; Hill, Upadhyay, and Beekun, 2015). While existing literature has explored the gender pay disparity in various contexts (Gupta, Mortal, and Guo, 2018; Hill, Upadhyay, and Beekun, 2015; Joshi, 2014), it generally focuses on identifying variations in outcomes, with less attention paid to the processes influencing these outcomes (Kanbur and Snell, 2019). However, concentrating solely on outcomes might lead to the false assumption of fair treatment when no disparities are observed, even though differences in underlying processes may still exist (Sen, 2000). By exploring both pay outcomes and the evaluation criteria for performance-based pay, we uncover inequalities in processes related to pay allocation, providing a clearer picture of how gender subtly yet significantly influences executive pay practices.

Second, we contribute to the literature on performance-based pay schemes and performance evaluations in organizations. Firms increasingly rely on performance-based pay to incentivize CEOs, enhancing productivity and aligning the CEO’s interests with those of the firm (Cable and Vermuelen, 2016; Shi et al., 2019). Equally vital to performance-based pay is the performance evaluation used for the proper design and allocation of these performance-based payments within CEO compensation strategies. Despite growing studies on factors influencing performance evaluations (e.g., O'Connell and O'Sullivan, 2014), understanding the firm's

decision-making in structuring these evaluations and the effects of performance evaluation criteria on CEO and firm-level outcomes remains limited. This study enhances our understanding of performance evaluations by providing an account of how individual characteristics influence performance evaluation criteria and how they, in turn, affect firm outcomes, thus paving the way for further research.

Third, our research uniquely contributes to the literature by examining how multiple performance goals within a CEO's compensation package influence the likelihood of achieving firm performance targets. While previous studies have primarily focused on the effects of having multiple firm-level aspirations on organizational outcomes (Gaba and Greve, 2019; Hu and Bettis, 2018; Rowley, Shipilov, and Greve, 2017), our work specifically explores the direct impact of the number of performance goals assigned to CEOs. This distinct approach provides new insights into the strategic management of CEO compensation and its direct correlation with firm success.

Our study is not without limitations. First, although we use a variety of controls and employ matching methods, we cannot claim causality, as the firm's decision to appoint a female CEO may be endogenous to the firm's compensation schemes. Second, we focus on examining the gender differences in CEO performance evaluation criteria in a subsample of U.S. public firms. Therefore, the results may have limited generalizability in explaining processes related to the pay allocation of CEOs in private or international firms. Additionally, given the complex and multifaceted pay structures of CEOs, our study may cover comprehensively all aspects of CEO compensation. Investigating how individual differences among CEOs shape other features of compensation packages beyond pay amounts may be a promising avenue for future research. Finally, the results focus on differences in performance evaluation criteria among CEOs and may not be wholly applicable to explain the differences in pay packages among employees further down the organizational structure.

In conclusion, this study offers a different perspective on gender differences in CEO compensation. Our research sheds light on how CEO gender influences the number of

performance goals and the duration of performance evaluation periods, and how these performance evaluation criteria affect CEO and firm-level outcomes. This contributes a new perspective to the understanding of the role of performance evaluations in strategic management (e.g., Audia, Rousseau, and Brion, 2022). The disparities highlighted in this study underscore the need to reassess the structuring and allocation of compensation packages, especially performance-based pay, to reduce biases and create a more equitable corporate environment for all leaders.

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2.7 FIGURES AND TABLES

Figure 2.7.1 Illustration of the Operationalization of CEO Performance Periods

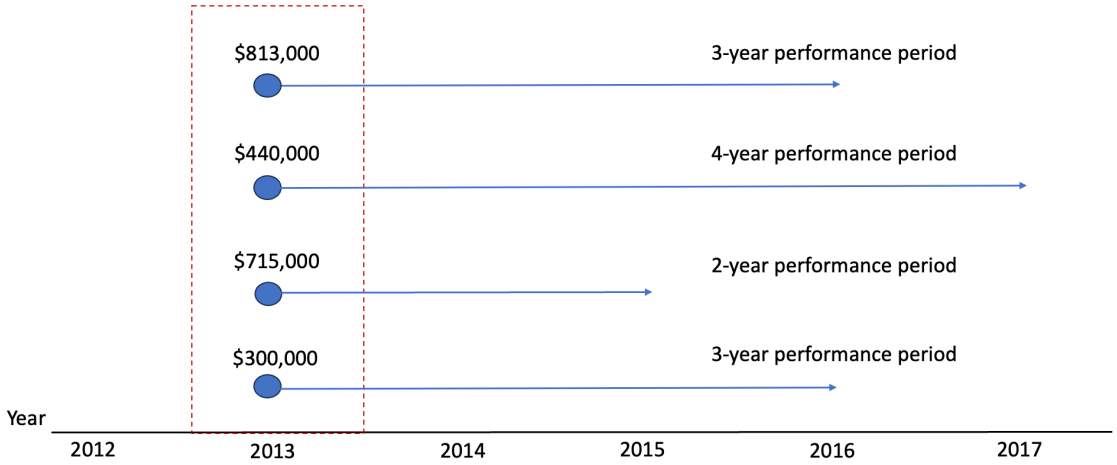

Table 2.7.1 Variable Descriptions

Variable Name	Definition
Number of Performance Goals	The sum of the number of performance goals within the CEO's pay package in a given year.
Performance Period	The (average) length of the performance periods the CEO is evaluated to determine their eligibility to receive performance-based awards granted at a given year.
Female CEO	The CEO's gender (equals to 1 if Female).
Tenure	The tenure of the CEO in their role in a given year.
Age	The age of the CEO in a given year.
Total Compensation	The (log) total compensation of the CEO as reported in proxy filings at a given year.
Performance Pay Ratio	The proportion of long-term pay granted to the CEO at a given year that is composed of performance-based pay.
Board Size	The number of directors in the board at a given year.
Female Board Presence	A dummy variable that indicates whether the firm has more than one female director on the board.
Board Independence	The proportion of independent directors in the board at a given year.
Equity Returns	Annual stock returns of the firm at a given year.
Firm Risk	Annualized standard deviation of the daily stock returns of the firm at a given year.
Firm Size	The firm's net sales at a given year, log-transformed for analyses only.
Firm Performance	Return on assets at a given year.
Accounting Performance Goal Failure	A dummy variable that takes the value of 1 if the CEO had failed to meet the target of at least one performance goal whose performance evaluation period ended a given year, and 0 otherwise
Accounting Performance Goal Failure Ratio	The percentage of goals whose evaluation ended at a given year which the CEO had failed to meet the target
General Ability	A composite measure of the CEO's general ability adopted from Custódio, Ferreira, and Matos (2013), which considers the number of positions held, firms worked for, industries engaged in, as well as experience in different firms and in conglomerate firms.

Table 2.7.2 Descriptives for the Matched Sample

Variables	Mean	SD	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
(1) Number of Performance Goals	7.128	5.164	1.000								
(2) Performance Period	2.277	1.257	0.285	1.000							
(3) Female CEO	0.090	0.286	0.026	-0.018	1.000						
(4) Tenure	4.906	4.620	0.015	-0.069	-0.071	1.000					
(5) Board Independence	0.739	0.120	-0.030	0.004	0.047	0.005	1.000				
(6) Total Compensation (log)	15.946	0.716	0.209	0.229	-0.044	0.044	-0.310	1.000			
(7) Performance Pay Ratio	0.546	0.297	0.292	0.450	-0.005	0.038	0.030	0.103	1.000		
(8) Board Size	12.861	3.350	0.160	0.162	-0.048	-0.078	-0.523	0.434	0.118	1.000	
(9) Equity Returns	0.143	0.382	-0.035	0.010	0.004	0.067	-0.006	0.091	0.018	-0.059	1.000
(10) Firm Risk	2.281	0.598	-0.102	-0.130	0.009	-0.030	0.068	-0.152	-0.166	-0.195	-0.132
(11) Firm Performance	0.047	0.082	-0.032	0.058	-0.003	-0.001	-0.215	0.200	0.062	0.153	0.182
(12) Age	55.924	4.989	0.107	0.081	-0.004	0.279	-0.098	0.214	0.105	0.169	0.013
(13) Board Female Presence	0.841	0.365	0.156	0.187	-0.000	-0.036	-0.097	0.223	0.144	0.330	-0.005
(14) Firm Size (log)	8.481	1.344	0.185	0.231	-0.017	-0.128	-0.356	0.606	0.146	0.635	-0.030
(15) Accounting Performance Goal Failure	0.509	0.500	-0.001	0.030	0.007	-0.068	0.083	-0.006	0.018	0.013	-0.104
(16) Accounting Performance Goal Failure Ratio	0.360	0.408	-0.048	0.037	0.016	-0.068	0.084	-0.053	-0.005	-0.016	-0.124
(17) General Ability	0.322	1.047	0.022	0.025	0.107	-0.098	-0.048	0.156	-0.060	0.044	0.006

Variables	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)
(10) Firm Risk	1.000							
(11) Firm Performance	-0.181	1.000						
(12) Age	-0.135	0.098	1.000					
(13) Board Female Presence	-0.138	0.089	0.120	1.000				
(14) Firm Size (log)	-0.209	0.244	0.211	0.302	1.000			
(15) Accounting Performance Goal Failure	0.075	-0.183	-0.061	-0.039	0.045	1.000		
(16) Accounting Performance Goal Failure Ratio	0.102	-0.162	-0.068	-0.050	0.012	0.868	1.000	
(17) General Ability	0.032	-0.050	0.118	0.060	0.099	0.009	-0.016	1.000

Table 2.7.3 CEO's Gender and Total Compensation, Performance Pay Ratio, Number of Performance Goals and Performance Period

	Total Compensation (log)		Performance Pay Ratio		Number of Performance Goals		Performance Period	
	OLS				Poisson		OLS	
	Full Sample (1)	Matched Sample (2)	Full Sample (3)	Matched Sample (4)	Full Sample (5)	Matched Sample (6)	Full Sample (7)	Matched Sample (8)
Female CEO	0.010	0.026	-0.007	-0.039	0.102*	0.141*	-0.116	-0.266**
	(0.030)	(0.045)	(0.023)	(0.029)	(0.056)	(0.078)	(0.105)	(0.122)
	[0.735]	[0.555]	[0.752]	[0.175]	[0.067]	[0.069]	[0.272]	[0.030]
Tenure	0.017***	0.018***	0.004***	0.005**	0.007***	0.006	0.002	0.007
	(0.002)	(0.004)	(0.001)	(0.002)	(0.003)	(0.004)	(0.006)	(0.011)
	[0.000]	[0.000]	[0.002]	[0.011]	[0.009]	[0.136]	[0.759]	[0.499]
Board Independence	0.058	0.216*	-0.014	-0.035	0.065	0.413*	-0.057	-0.162
	(0.078)	(0.130)	(0.046)	(0.082)	(0.103)	(0.215)	(0.208)	(0.366)
	[0.456]	[0.097]	[0.764]	[0.674]	[0.527]	[0.054]	[0.784]	[0.658]
Board Size	0.001	0.009	0.002	0.004	0.004	0.002	-0.002	-0.040*
	(0.004)	(0.006)	(0.002)	(0.004)	(0.005)	(0.009)	(0.010)	(0.021)
	[0.786]	[0.132]	[0.319]	[0.253]	[0.398]	[0.831]	[0.817]	[0.059]
Equity Return	0.090***	0.087***	0.017***	0.029**	-0.012	0.005	0.041*	0.152***
	(0.014)	(0.024)	(0.005)	(0.013)	(0.011)	(0.029)	(0.022)	(0.056)
	[0.000]	[0.000]	[0.001]	[0.026]	[0.261]	[0.856]	[0.057]	[0.007]
Firm Risk	-0.022	-0.000	-0.028***	-0.031*	-0.020	-0.048	-0.033	-0.062
	(0.018)	(0.027)	(0.009)	(0.017)	(0.023)	(0.046)	(0.042)	(0.083)
	[0.221]	[0.992]	[0.002]	[0.071]	[0.364]	[0.293]	[0.437]	[0.453]
Firm Performance	0.100	0.068	-0.011	0.109	-0.088	-0.238	0.126	-0.050
	(0.067)	(0.139)	(0.032)	(0.079)	(0.084)	(0.240)	(0.155)	(0.309)
	[0.137]	[0.624]	[0.739]	[0.170]	[0.296]	[0.323]	[0.418]	[0.871]
Age	0.002	0.010**	-0.000	-0.003	-0.006**	-0.009**	-0.007	-0.009
	(0.002)	(0.004)	(0.001)	(0.002)	(0.003)	(0.004)	(0.004)	(0.010)
	[0.341]	[0.017]	[0.730]	[0.155]	[0.018]	[0.026]	[0.111]	[0.377]
Board Female Presence	0.024	-0.007	0.015*	0.030**	0.029	0.043	0.096**	0.140**
	(0.021)	(0.025)	(0.009)	(0.015)	(0.020)	(0.035)	(0.042)	(0.065)
	[0.247]	[0.786]	[0.094]	[0.043]	[0.149]	[0.217]	[0.021]	[0.033]
Firm Size	0.200***	0.163***	0.018**	0.045**	0.047**	0.074*	0.200***	0.360***
	(0.020)	(0.033)	(0.009)	(0.018)	(0.022)	(0.043)	(0.041)	(0.077)
	[0.000]	[0.000]	[0.032]	[0.010]	[0.033]	[0.087]	[0.000]	[0.000]
Fixed Effects	Firm and Year	Firm and Year	Firm and Year	Firm and Year	Firm and Year	Firm and Year	Firm and Year	Firm and Year
Observations	12356	4991	12378	5004	12299	4981	12379	5004
R-squared	0.716	0.789	0.592	0.662	0.300	0.345	0.540	0.593

* p<0.1, ** p<0.05, *** p<0.01 Standard errors are in parentheses, and p-values are in brackets. Constant is included, not reported. Models 5 and 6 use Poisson regression analyses, while the rest of the models use linear regression analyses. Firm and year fixed effects are included.

Table 2.7.4 CEO's Gender, Number of Performance Goals, Performance Period, Total Compensation and Performance Pay Ratio on Accounting Performance Goal Failure

	Accounting Performance Goal Failure = 1			Accounting Performance Goal Failure Ratio		
	OLS					
	Matched Sample					
	(1)	(2)	(3)	(4)	(5)	(6)
Female CEO	-0.276***		-0.267**	-0.231**		-0.224*
	(0.101)		(0.107)	(0.113)		(0.118)
	[0.006]		[0.013]	[0.042]		[0.058]
Number of Performance Goals		0.013***	0.013***		0.008**	0.008**
		(0.004)	(0.004)		(0.003)	(0.003)
		[0.002]	[0.002]		[0.020]	[0.024]
Performance Period		0.008	0.007		0.008	0.007
		(0.014)	(0.014)		(0.010)	(0.010)
		[0.552]	[0.601]		[0.418]	[0.463]
Tenure	-0.004	-0.006	-0.006	-0.007	-0.008	-0.008
	(0.007)	(0.007)	(0.007)	(0.005)	(0.005)	(0.005)
	[0.506]	[0.403]	[0.392]	[0.180]	[0.141]	[0.137]
Board Independence	-0.086	-0.087	-0.086	-0.117	-0.118	-0.117
	(0.181)	(0.179)	(0.180)	(0.155)	(0.153)	(0.154)
	[0.633]	[0.628]	[0.633]	[0.448]	[0.441]	[0.448]
Board Size	0.008	0.008	0.008	0.005	0.005	0.005
	(0.008)	(0.008)	(0.008)	(0.007)	(0.007)	(0.007)
	[0.344]	[0.345]	[0.333]	[0.467]	[0.473]	[0.460]
Equity Returns	-0.110***	-0.109***	-0.109***	-0.089***	-0.088***	-0.088***
	(0.024)	(0.024)	(0.023)	(0.023)	(0.023)	(0.023)
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
Firm Risk	0.092**	0.088**	0.095**	0.073**	0.070*	0.075**
	(0.043)	(0.043)	(0.043)	(0.036)	(0.036)	(0.036)
	[0.034]	[0.040]	[0.028]	[0.043]	[0.050]	[0.036]
Age	0.002	0.004	0.003	0.007	0.008	0.008
	(0.007)	(0.007)	(0.007)	(0.006)	(0.006)	(0.006)
	[0.802]	[0.564]	[0.624]	[0.254]	[0.161]	[0.192]
Board Female Presence	0.060	0.051	0.057	0.038	0.031	0.037
	(0.037)	(0.037)	(0.037)	(0.032)	(0.032)	(0.032)
	[0.105]	[0.171]	[0.120]	[0.240]	[0.341]	[0.258]
Fixed Effects	Firm and Year	Firm and Year	Firm and Year	Firm and Year	Firm and Year	Firm and Year
Observations	2858	2858	2858	2858	2858	2858
R-squared	0.520	0.521	0.523	0.500	0.500	0.502

* p<0.1, ** p<0.05, *** p<0.01 Standard errors are in parentheses, and p-values are in brackets. Constant is included, not reported. Firm and year fixed effects are included. Models 1 to 3 examine the effects of Female CEO, Number of Performance Goals and Performance Period on the Accounting Performance Goal Failure in the matched sample. Models 4 to 6 examine the effects of Female CEO, Number of Performance Goals and Performance Period on the Accounting Performance Goal Failure Ratio in the matched sample.

Table 2.7.5 Potential Moderators on the Relationship between CEO's Gender on the Number of Performance Goals and Performance Period

	Number of Performance Goals			Performance Period		
	Poisson			OLS		
	Matched Sample					
	(1)	(2)	(3)	(4)	(5)	(6)
Female CEO	0.204*	0.049	0.102	-0.437***	-0.674***	-0.202
	(0.117)	(0.112)	(0.098)	(0.138)	(0.222)	(0.187)
	[0.081]	[0.663]	[0.298]	[0.002]	[0.002]	[0.282]
General Ability	0.025			-0.051		
	(0.030)			(0.050)		
	[0.412]			[0.311]		
Female CEO	-0.045			0.197**		
# General Ability	(0.063)			(0.099)		
	[0.478]			[0.047]		
Board Female Presence	0.044	0.035	0.040	0.120**	0.103	0.139**
	(0.039)	(0.037)	(0.035)	(0.060)	(0.067)	(0.066)
	[0.263]	[0.332]	[0.259]	[0.044]	[0.125]	[0.036]
Female CEO		0.099			0.452**	
# Board Female		(0.098)			(0.211)	
Presence						
		[0.310]			[0.033]	
Tenure	0.010**	0.006	0.007*	0.000	0.007	0.007
	(0.004)	(0.004)	(0.004)	(0.011)	(0.011)	(0.011)
	[0.022]	[0.138]	[0.085]	[0.992]	[0.508]	[0.539]
Female CEO			-0.014			0.009
# Tenure			(0.013)			(0.030)
			[0.267]			[0.768]
Board Independence	0.252	0.416*	0.419*	0.064	-0.144	-0.166
	(0.235)	(0.214)	(0.215)	(0.327)	(0.365)	(0.365)
	[0.284]	[0.052]	[0.051]	[0.845]	[0.693]	[0.649]
Board Size	0.001	0.002	0.002	-0.014	-0.039*	-0.040*
	(0.010)	(0.009)	(0.009)	(0.014)	(0.021)	(0.021)
	[0.959]	[0.825]	[0.842]	[0.343]	[0.060]	[0.060]
Equity Return	-0.029	0.006	0.005	0.104*	0.154***	0.153***
	(0.032)	(0.029)	(0.029)	(0.061)	(0.056)	(0.056)
	[0.362]	[0.839]	[0.875]	[0.089]	[0.006]	[0.006]
Firm Risk	-0.053	-0.049	-0.047	-0.046	-0.064	-0.063
	(0.053)	(0.046)	(0.046)	(0.084)	(0.083)	(0.083)
	[0.316]	[0.286]	[0.300]	[0.583]	[0.436]	[0.448]
Firm Size	0.079	0.074*	0.075*	0.368***	0.362***	0.361***
	(0.055)	(0.043)	(0.043)	(0.081)	(0.077)	(0.077)
	[0.152]	[0.087]	[0.083]	[0.000]	[0.000]	[0.000]
Firm Performance	-0.239	-0.238	-0.234	0.020	-0.047	-0.052
	(0.305)	(0.240)	(0.240)	(0.334)	(0.309)	(0.308)
	[0.434]	[0.321]	[0.331]	[0.953]	[0.880]	[0.867]
Age	-0.013***	-0.009**	-0.009**	-0.008	-0.009	-0.009
	(0.005)	(0.004)	(0.004)	(0.010)	(0.010)	(0.010)
	[0.006]	[0.025]	[0.030]	[0.401]	[0.351]	[0.371]
Fixed Effects	Firm and Year	Firm and Year	Firm and Year	Firm and Year	Firm and Year	Firm and Year
Observations	4041	4981	4981	4053	5004	5004
R-squared	0.345	0.345	0.346	0.658	0.594	0.595

* p<0.1, ** p<0.05, *** p<0.01 Standard errors are in parentheses, and p-values are in brackets. Constant and controls are included, not reported. Models 1 to 3 utilize Poisson regression analyses, while models 4 to 6 utilize linear regression models. Firm and year fixed effects are included. Model 1 examines the effects of Female CEO and its interactions with General Ability on the Number of Performance Goals in the matched sample. Model 2 examines the effects of Female CEO and its interactions with Board Female Presence on the Number of Performance Goals in the matched sample. Model 3 examines the effects of Female CEO and its interactions with the CEO's tenure on the Number of Performance Goals in the matched sample. Models 4 to 6 replicate Models 1 to 3, however, the dependent variable is the Performance Period.

CHAPTER 3

TAKING STOCK OF STOCKS: CEO LONG-TERM PAYMENTS AND CORPORATE LITIGATION LENGTH

3.1 INTRODUCTION

Corporate lawsuits can incur sizeable legal fees and have detrimental effects on the firm's financial health, business operations, and reputation, which can compound as legal processes drag on (Arena and Ferris, 2018; Deng et al., 2014; Koh, Qian, and Wang, 2014; Malm, Soyeh, and Kanuri, 2023; Qing, 2011). To mitigate the long-term consequences of a drawn-out lawsuit, firms may opt for early settlements (e.g., Armour et al., 2009; Crutchley, Minnick, and Schorno, 2015; Jones and Wu, 2010). However, this decision often involves significant financial outlays and can result in short-term drops in stock prices (e.g., Beck and Bhagat, 1997). Managers, therefore, encounter a trade-off: they must choose between avoiding lengthy legal battles with their associated costs or deferring the legal process to maintain present stock values.

Despite the importance of this choice on a company's future outcomes, the factors influencing CEO decision-making in this context are less understood. One critical factor is likely the structure of managerial compensation schemes, particularly long-term payments such as restricted stocks and stock options. These components are integral to CEO decision-making and risk preferences, as their value is intricately tied to the outcomes of the strategies pursued by CEOs (e.g., DesJardine and Shi, 2021; Wowak, Gomez-Mejia, and Steinbach, 2017). Research on CEO compensation has predominantly emphasized the benefits of these long-term payments, highlighting their role in alleviating managerial 'short-termism,' thereby aligning the CEO's interests with the firm's long-term success and enhancing organizational commitment (Cadman, Rusticus, and Sunder, 2013; Flammer and Bansal, 2017; Flammer, Hong, and Minor, 2019; Zhang and Gimeno, 2016). However, recent findings challenge the uniformly positive view

of these incentives, suggesting that while long-term payments can be effective before vesting, their vesting can mitigate or even negate their intended advantages (Aldatmaz, Ouimet, and Van Wesep, 2018; Jochem, Ladika, and Sautner, 2018).

This paper aims to explore this query by examining how CEOs who receive long-term compensation shortly before their firms face lawsuits from other parties may impact the legal proceedings. The Behavioral Agency Model (BAM) suggests that CEOs with vested long-term compensation, such as exercisable options and accumulated restricted stock, tend to protect existing wealth and demonstrate myopic loss aversion where they prefer to avoid short-term losses at the expense of potential long-term gains (Devers et al., 2008; Martin et al., 2016). Consequently, when faced with choices involving uncertain outcomes, CEOs are said to be more inclined to favor strategies with potential losses in the distant future rather than those posing more immediate risks of loss (DesJardine and Shi, 2021). Given this, in cases where the firm faces lawsuits, we hypothesize that CEOs who were recently vested with long-term compensation may prolong the legal procedures to avoid immediate stock price drops (e.g., Beck and Bhagat, 1997; Rappaport and Sirower, 1999), despite potential long-term cost savings from an earlier resolution (e.g., Crutchley, Minnick, and Schorno, 2015).

We also consider how a CEO's propensity to retain vested long-term compensation may moderate the impact of their compensation on lawsuit durations. We posit that CEOs inclined to retain high-value stock options would be vulnerable to potential losses for longer periods and experience heightened myopic loss aversion. Further, holding long-term compensation, such as stock options, at high values can be indicative of managerial overconfidence (Campbell et al., 2011; Malmendier and Tate, 2005). As overconfident CEOs are characterized by their overly optimistic beliefs of success (Galasso and Simcoe, 2011; Gutierrez, Åstebro, and Obloj, 2020), we argue that they may resist concessions and concluding legal disputes early, opting instead to prolong lawsuits in pursuit of lawsuit wins and enhancing future stock value. Therefore, we

expect CEOs with vested long-term compensation to prolong the duration of the lawsuits further if they display a proclivity for retaining their vested long-term pay.

To test our hypotheses, we use the Incentive Lab database from Institutional Shareholder Services (ISS), which provides detailed information on executive compensation, including grant dates, fair values, and precise vesting dates of each long-term grant (Carter et al. 2022, Chu et al. 2018). We analyze data from 574 U.S. public firms listed in the S&P 1200 from 2006 to 2019. To alleviate potential concerns that the vesting schedules of the CEO's compensation may be decided alongside the firm's legal strategies, our analyses focus on the civil lawsuits held against the firms. We further narrow our analyses on instances where long-term pay vests near lawsuit dates to isolate the effects of long-term payments on legal outcomes and to minimize the interference from longer-term factors influencing CEO preferences.

Consistent with our expectations, we find that in the instances where CEOs were vested with long-term compensation shortly before their firms faced a lawsuit, CEOs with higher value of vested pay were associated with longer lawsuits. We also find that the CEO's tendency to hold onto high-value stock options moderated this association, such that CEOs with higher value of vested pay were associated with even longer lawsuits if they displayed a tendency to hold onto their options. Further analyses provide some evidence that long-term payments granted shortly before the initiation of lawsuits may, instead, mitigate myopic loss aversion and reduce the duration of lawsuits filed against firms. Additional findings show that the duration of recently concluded lawsuits has a negative effect on the firm's performance and earnings. Overall, the findings highlight that the timing and structure of long-term compensation play a crucial role in shaping CEO behavior and legal outcomes, influencing decision-making processes beyond immediate financial performance. This underscores the need for boards to consider the timing and structure of long-term incentives, as strategic grant timing or avoiding lumpy vesting may mitigate the impact of legal disputes. Furthermore, the negative effects of

prolonged lawsuits on firm outcomes emphasize the broader implications of these compensation strategies on overall corporate health.

This study enhances our understanding of the implications of long-term CEO compensation, contributing to several strands of literature. First, while existing research predominantly emphasizes the benefits of long-term incentives on CEO behavior and organizational commitment (e.g., Flammer and Bansal, 2017), our findings introduce potential drawbacks, offering a more balanced view of these incentives. Second, the strategies followed by firms led by CEOs with wealth at risk of downward shifts in stock prices during legal processes have not been extensively explored despite the significant financial implications of legal challenges (Arena and Ferris, 2017). Our study provides valuable insights into how CEO compensation affects the firm's legal proceedings and, in turn, impacts the firm's financial outcomes. Lastly, we extend the discourse on CEO overconfidence, a well-recognized psychological bias that can influence a firm's risk profile and decision-making, leading to actions that may undermine firm value (Malmendier and Tate, 2005; Tang, Mack, and Chen, 2018; Park et al., 2018). Specifically, we document how overconfident CEOs' preferences for retaining high-value stock options may prolong litigation, illustrating a complex consequence of managerial overconfidence not thoroughly examined in previous research.

3.2. THEORY

3.2.1 Long-term Compensation and Myopic Loss Aversion

Long-term compensation mechanisms, such as restricted stocks and stock options, can have an important role in shaping managerial decision-making and preferences. Traditional agency theory has argued that managers are predominantly risk averse, and long-term compensation, in particular stock options, can be used to alleviate this tendency. By tying the CEO's wealth to the firm's outcomes, long-term payments were said to encourage CEOs to shy

away from incremental strategies and seek investments through which the firm can obtain breakthrough performance (Devers et al., 2008).

Later, scholars amended the agency theory with the Behavioral Agency Model (BAM) and suggested that managers are loss rather than risk-averse, motivated by the desire to protect their wealth at the expense of seeking larger potential gains. The CEO's equity wealth was further distinguished in its capacity to exacerbate or alleviate managerial loss aversion. Namely, Martin et al. (2013) argued that the value of a CEO's long-term compensation could be categorized as either part of the CEO's 'prospective' wealth or their 'current' wealth.

The CEO's prospective wealth represented "the potential future gains to wealth that might be realized over and above the current accumulated value" (Martin et al., 2013, p. 454) and was indicated to rely primarily on the value of unvested and newly granted stock options (DesJardine and Shi, 2021). CEOs with considerable prospective wealth were expected to overcome their loss aversion, as the allure of potential gains in the future would alleviate their fears of short-term losses and incentivize them to pursue strategies with higher potential payoffs.

In contrast, the CEO's current wealth represented the accumulated value of long-term payments and was better associated with the value of vested stocks and options held by the CEO (DesJardine and Shi, 2021). According to the Behavioral Agency Model (BAM), given equivalent current and prospective wealth, CEOs tend to prioritize preserving their current wealth over seeking further prospective gains, as losses are perceived as more impactful than gains. However, the CEO's current wealth was also deemed more vulnerable to short-term stock price declines resulting from risky managerial decisions. Consequently, the CEO's current wealth was said to amplify their loss aversion, leading them to prioritize conservative strategies aimed at preserving stock prices and safeguarding their accumulated wealth as opposed to riskier strategies geared towards maximizing potential gains.

In a recent expansion of the theory, Martin et al. (2016) contended that accumulated long-term payments may also heighten the CEO's myopia – denoting a focus on short-term outcomes. This perspective suggests that CEOs with a substantial accumulation of long-term payments would be more inclined to focus on immediate outcomes related to their current wealth rather than those in the distant future. This notion has received considerable empirical support from the finance and economic literature, where newly vested stock and option payments were correlated with managerial short-termism, while unvested stock and option payments were related to managerial focus on long-term value creation (e.g., Edmans, Fang, and Lewellen, 2017; Kolasinski and Yang, 2018).

Importantly, when considered with the loss aversion highlighted in earlier research, CEOs with vested long-term compensation were indicated to experience 'myopic loss aversion,' denoting their attention to investments that shield against immediate losses while downplaying those that entail potential long-term gains *or* losses (Martin et al., 2016). Thus, a higher value of vested long-term payments was argued to increase the CEO's preferences for strategies focused on avoiding short-term losses, even if said strategies entailed substantial losses in the future.

Additionally, recent research indicates that although long-term payments are effective before vesting, their vesting can diminish or even negate the intended benefits (Aldatmaz, Ouimet, and Van Wesep, 2018; Jochem, Ladika, and Sautner, 2018). Namely, the finance research suggests that the vesting of long-term payments can not only diminish their ability to mitigate myopic loss aversion but also intensify it in the periods immediately following vesting, potentially shifting the focus towards short-term gains rather than long-term value creation. Empirical studies indicate that after options vest, CEOs are more likely to engage in short-term behaviors at the expense of long-term value creation. For instance, Edmans, Fang, and Lewellen (2017) found that managers often cut long-term investments in the same quarter that long-term payments vest, reallocating the firm's resources to boost current earnings and

increase their short-term payoff from stock sales. Further research by Ladika and Sautner (2020) supports this by demonstrating that CEOs whose stock options have recently vested are more likely to reduce corporate investments, such as R&D and capital expenditures, in favor of actions that will quickly elevate stock prices and personal wealth.

Taken together, vested long-term payments may exacerbate myopic loss aversion for CEOs and skew the CEO's decision-making, especially for decisions and events that directly follow the vesting instances of long-term payments.

3.2.2 Trade-offs in the Setting the Duration of Corporate Litigations

Corporate lawsuits can inflict substantial financial and operational damage on a firm. The financial aspect is readily apparent, as these legal battles often result in sizeable legal fees that can profoundly impact a company's overall survival and financial health (Arena and Ferris, 2018; Hutton, Peterson, and Smith, 2014). Further, as lawsuits drag on, the legal fees can accumulate further (Crutchley, Minnick, and Schorno, 2015), and the firm could be exposed to the obligation of paying considerably larger settlement fees once the lawsuits are finalized (Beck and Bhagat, 1997; Bhagat, Bizjak, and Coles, 1998; Jones and Wu, 2010). Moreover, the expenditure on legal proceedings represents a direct drain on the company's resources (Malm, Soyeh, and Kanuri, 2023; Qing, 2011), diverting funds that could otherwise be invested in growth, innovation, or other strategic initiatives.

However, the repercussions extend beyond mere monetary considerations. Corporate litigation disrupts regular business operations by diverting the attention of key personnel and resources away from core activities (Lowry and Shu, 2002; Bennett et al., 2018). This diversion can impede productivity and hinder the pursuit of strategic initiatives, delaying progress and potentially impacting the company's competitive position in the market. Further, prolonged lawsuits may tarnish a company's reputation, erode public trust, and diminish brand equity (Deng et al., 2014; Koh, Qian, and Wang, 2014). The negative publicity associated with legal

battles can create a perception of instability and untrustworthiness, which may drive away customers, financers, and investors (Arena, 2018; Karpoff, Lee, and Martin, 2008; Yuan and Zhang, 2015). Compounding this, safeguarding and rebuilding a damaged reputation can be a formidable task that requires substantial time and effort (e.g., Fauchart and Cowan, 2014).

In an attempt to mitigate the long-term consequences of protracted legal conflicts, companies may opt for early settlements (e.g., Armour et al., 2009; Crutchley, Minnick, and Schorno, 2015; Jones and Wu, 2010). However, this strategic decision comes with its own challenges, as settling early often involves significant financial concessions. For instance, as significant lump-sum expenditures can temporarily reduce the stock value (e.g., Rappaport and Sirower, 1999), settlements might have the potential to decrease stock value soon after their commencement (e.g., Beck and Bhagat, 1997). In an extreme case, Boeing reached settlements with airlines affected by the 737 Max grounding following fatal crashes in 2019. Boeing's stock price experienced volatility during this period, and there were notable declines, especially during critical announcements related to the settlements starting in 2019 (Gandel, 2019; Shivdas, 2019). Thus, corporate managers are confronted with a challenging trade-off: they must weigh the immediate financial burden of legal battles against the potential long-term consequences of legal costs and damaged reputations.

In this scenario, we argue that the CEO's decision-making would depend on whether they were vested with long-term compensation recently. In particular, we posit that CEOs who were recently vested with long-term compensation may be guided by myopic loss aversion and display heightened concern for immediate loss events compared to those in the distant future. In the context of corporate litigation, we argue that such CEOs would be averse to the idea of early settlements or conclusions, fearing a short-term decline in stock prices more than the potential costs of prolonged legal battles. Consequently, CEOs who were recently vested with long-term compensation just before their firms faced lawsuits are likely to protract legal proceedings in an attempt to avoid short-term stock value losses. Formally, we predict that:

Hypothesis 1: Firms with CEOs who were vested with long-term compensation shortly before the firm faces a lawsuit will have longer litigation processes.

3.2.3 Amount of Vested Long-term Pay and Duration of Corporate Litigation

The amount of long-term compensation vested onto the CEO is likely to be a crucial factor influencing the legal process that follows. As noted, CEOs with vested long-term compensation are expected to be loss-averse and to have a preference for protecting their current wealth over seeking risky strategies that can increase their wealth further. However, this tendency will likely be more pronounced if the amount of vested long-term compensation is more sizeable. Indeed, as argued by Devers et al. (2008), CEOs with higher levels of compensation that are at risk of downward shifts in the stock value become increasingly concerned with maintaining their current wealth, while they place less value on the prospect of further increasing their wealth. Moreover, with a higher amount of vested long-term compensation, the CEO is projected to be increasingly myopic in their loss aversion, and "the stronger will be their incentive to push uncertainty and thus the firm's investment horizons into the future" (Martin et al. 2016, p. 2467). In the case of lawsuits, CEOs with higher levels of recently vested long-term compensation can be expected to be more aversive toward potential legal defeats or concessions and associated downward shifts in stock value. Hence, compared with CEOs who were vested with lower amounts of long-term compensation soon before the firm faced a lawsuit, CEOs who were vested with higher amounts can be expected to lengthen the lawsuit further. Formally, we make the following prediction:

Hypothesis 2: The value of vested long-term compensation shortly before the firm faces a lawsuit is positively related to longer litigation processes.

3.2.4 Moderating Effects of the Preference to Hold Vested Long-term Pay

Moreover, the effect of the amount of vested long-term compensation on litigation processes is likely to be moderated by the CEO's tendency to hold onto their vested pay. First,

compared to CEOs who liquidate their long-term pay shortly following vesting, CEOs who hold onto their high-value stocks and options would be vulnerable to potential losses for longer periods. In turn, these CEOs would be influenced by myopic loss aversion for longer periods and may continue to lean towards strategies that maintain short-term stock values while discounting the future costs such strategies may bring even further. As a result, they may have greater inclinations to delay the legal processes than CEOs with a lower propensity to hold onto their long-term pay.

Secondly, when CEOs hold long-term compensation, such as stock options, at high values, it may signal managerial overconfidence (Campbell et al., 2011; Malmendier and Tate, 2005). Overconfidence is a cognitive bias reflecting an exaggerated perception of one's competence or knowledge (Galasso and Simcoe, 2011; Gutierrez, Åstebro, and Obloj, 2020). Overconfident CEOs may have overly positive expectations about their likelihood of success, impacting their approach to legal challenges. They may exhibit optimism regarding the firm's prospects and believe they can navigate litigation without compromise. Consequently, overconfident CEOs might be more prone to overestimate the likelihood of winning legal disputes, leading them to resist settling for terms they consider unfavorable. Additionally, overconfident CEOs may view settling as a concession, and their aversion to admitting mistakes or seeking advice might influence them to pursue a more aggressive legal strategy, even when a settlement could be a pragmatic and cost-effective solution in the long run (e.g., Lewis, 2018; Ludwig and Nafziger, 2011). This aversion to settlement could prolong legal processes, driven by their optimism that the firm could secure a favorable outcome, thereby mitigating losses or enhancing stock value in the future. As such, CEOs with higher values of vested long-term compensation may have a greater tendency to prolong the lawsuit duration if they display a tendency to hold onto their options, as CEOs with such tendencies may be driven by their optimism that the firm could attain a more favorable outcome and enhance the value of their accumulated stocks even further in the future. Formally, we predict the following:

Hypothesis 3: The CEO's tendency to hold stock options at high values positively moderates the association between the value of vested long-term compensation and litigation length.

3.3 METHOD

3.3.1 Data and Sample

Our sample includes CEOs within S&P 1200 from 2006 to 2019. We use the database Incentive Lab by ISS to obtain detailed information on executive compensation, including the grant date, fair value, and precise vesting date for each long-term grant (Chu, Faasse and Rau, 2018). We use Compustat to obtain firm-level control variables as well as Execucomp to obtain CEO characteristics such as age and tenure (Messersmith et al., 2011). Further, we obtain stock return information from CRSP.

We restrict the sample to firms that could be consistently matched across Compustat, Incentive Lab, CRSP, and the Federal Judicial Center database on firm civil lawsuits. We further remove CEOs with incomplete demographic and financial information from the sample – such as compensation, grant dates, vesting dates, and vesting periods of long-term awards. Likewise, we exclude observations with incomplete lawsuit information – such as filing date, termination date, and plaintiff and defendant identifiers. We further exclude firms with multiple CEOs during the same period, as our theory and operationalization generally pertain to single-CEO firms. Moreover, to alleviate concerns about potential simultaneous causality, where the reasons for boards to structure the CEO's pay and decide lawsuit processes may be correlated, we focus on observations where firms are defendants in civil lawsuits. We consider class actions and lawsuits that share the same filing date and termination dates as a single unit. Additionally, we exclude from our sample the firms that experienced an exceptionally high (top 5%) frequency of litigations within the same month to alleviate oversampling bias.[28] Finally, we

[28] Our results are robust for analyses when these firms are included.

lag our variables at year and quarterly levels, depending on the granularity of the information we could acquire. Following this, we obtained a sample of 29833 observations of lawsuits involving 538 firms.

We narrow our analyses on the instances where long-term pay is vested in close proximity (in the prior month and quarter) to the filing dates of lawsuits to isolate the effects of financial incentives on legal outcomes and to reduce the noise from other factors that may influence CEO behavior over longer timeframes.[29]

3.3.2 Dependent Variables

Our main dependent variable is the length of the litigation period. We operationalize the length of the litigation period as the difference in days between the filing date and the termination date of a lawsuit. As this variable was skewed and kurtotic, we utilized a log transformation of it (e.g., Crutchley, Minnick, and Shorno, 2015). However, our results are similar if we forgo this transformation.

3.3.3 Independent Variables

To test Hypothesis 1, we created a set of variables that captured the instances in which the CEO was vested with long-term pay shortly before the filing date or the start of the lawsuit. Accordingly, our first set of independent variables consists of CEO Vested Month, a dummy indicating if the CEO has been vested long-term pay in the month prior to the filing date of a lawsuit, and CEO Vested Quarter, a dummy indicating if the CEO has been vested long-term pay in the quarter prior to the filing date.[30] [31]

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[29] Our results are robust for analyses when we consider awards vested in the year prior to the filing date of the lawsuit.

[30] Long-term pay consists of restricted stock and stock options for our initial analyses. We have run further analyses looking at stock options alone, as they are identified to be better predictors of managerial risk tendencies relative to restricted stocks (e.g., Lim, 2017).

[31] We focus solely on time-contingent vested long-term pay and exclude performance-based long-term pay. This exclusion is due to the difficulty in accurately determining whether the CEO has achieved performance goals and ascertaining whether they qualified for threshold, target, or maximum level payoffs.

To test Hypothesis 2, we created a set of variables that captured the total value of long-term pay vested to the CEO in the periods before the start of a lawsuit. Therefore, our second set of independent variables are Vested Month Value, denoting the grant date fair value of long-term pay for cases where the CEO has been vested long-term pay in the month prior to the filing date, and Vested Quarter Value, denoting the grant date fair value of long-term pay for cases where the CEO has been vested long-term pay in the quarter prior to the filing date.[32] [33]

Finally, to test Hypothesis 3, we have created the dummy variable Holder CEO, which equals 1 if, during the sample period and until the prior year, the CEO continued to hold stock options with greater than 100% moneyness (the stock price was more than 100% greater than the exercise price) at least twice, and 0 otherwise (Campbell et al. 2011; Pavićević and Keil, 2021).

3.3.4 Control Variables

Following prior research, we control for various CEO-level and firm-level that may affect the CEO's decision-making (e.g., Hutton, Jiang, and Kumar, 2015; Martin et al., 2016). For the CEO-level variables, we control for the CEO's age, tenure, and total compensation as listed in the firm proxy filings, based on the CEO's salary, bonus, and long-term pay granted in the prior year. The CEO-level variables are measured at the yearly level. For the firm-level variables, we control for the firm's stock returns, total assets as a proxy for size, return of assets (ROA) as a proxy for performance, leverage, and stock return volatility in the prior quarter. The firm-level variables are measured at the quarterly level, as we were unable to obtain more granular information from our data. Table 3.7.1 summarizes the names and descriptions of the variables used in the main analyses.

[32] For long-term awards with a cliff vesting schedule, we consider the vesting of the entirety of the award. For long-term awards with a graded vesting schedule, we consider each instance of partial vesting as well as the final instance of vesting.
[33] We scale the value of vested long-term awards and total pay by 100000 dollars for our analyses.

Insert Table 3.7.1 about here.

To address any unobserved heterogeneity at the firm and year levels, we incorporate firm- and year-fixed effects. Furthermore, to account for potential correlations in the error term across observations, we cluster our standard errors at the firm level in all analyses.

3.4. Matching Process

We run our first round of analyses to examine the effects of the vesting of long-term payments in order to test Hypothesis 1 on the full sample. However, using OLS regression with an unbalanced sample such as ours, where the vesting of long-term payments shortly before the commencement of lawsuits constitutes a small percentage of our observations, may lead to biased interpretations as the results may be disproportionately influenced by the majority of instances where these payments were not vested. Therefore, we use matching techniques to alleviate these potential biases and create a more balanced sample with comparable firms with and without long-term awards vested onto the CEO shortly before lawsuit commencements on observable criteria.

Specifically, we use coarsened exact matching (CEM) to match these firms on our control variables, as well as by year and industry. We opted for a one-to-many matching technique to avoid excessive loss of information (Maoret, Moriera, and Sabanci, 2024). Further, we use CEM for the matching processes, as it is said to be more efficient compared to alternative matching techniques like Propensity Score Matching (PSM) because it makes more effective use of the available data and reduces reliance on the model (Khanna and Guler, 2022; Iacus et al., 2011).

3.4 RESULTS

Table 3.7.2 reports descriptive statistics and correlations of variables used in the main analyses.[34] Overall, there is no excessive multicollinearity present in the data.[35]

Insert Table 3.7.2 about here.

3.4.1 Long-Term Pay Vested Shortly Before Lawsuits and Duration of Corporate Litigation

Table 3.7.3 reports the results of a series of linear regressions of CEO Vested Month (columns 1a, 1c and 2a, 2c) and CEO Vested Quarter (columns 1b, 1d and 2b, 2d) on litigation length. All analyses in Table 3.7.3 and further tables include firm and year-fixed effects, and standard errors are clustered at the firm level to account for potential correlations in the error term across observations.

Insert Table 3.7.3 about here.

In Hypothesis 1, we expected that in the instances where CEOs are vested with long-term compensation shortly before their firms face a lawsuit, the CEOs would have a greater tendency to prolong the legal process to avoid potential downward shifts (such as from an early settlement) to the stock price in the short-term. Looking at the results in columns 1a,1b, 2a, and 2b in Table 3.7.3, we observe both CEO Vested Month and CEO Vested Quarter to be

[34] For Vested Month Value and Vested Quarter Value, we report the descriptive statistics and correlations conditional on the CEO being vested long-term pay in the month (or quarter) prior to the filing date.
[35] The VIF values for key independent variables are below the threshold criterion of 10 (e.g., Gruber et al. 2010).

unrelated to the litigation length within the unmatched sample. Instead, we observe CEO Vested Quarter to be positively related to litigation length both when the vesting of restricted stocks and stock options are considered (p=.007 in column 1d) and when the vesting of only stock options (p=.091 in column 2d) are considered within the matched sample.

Overall, our results provide weak evidence to support Hypothesis 1. Rather, the results largely indicate that merely vesting long-term payments may not strongly extend legal processes by themselves, warranting an examination of the relationship between the value of vested long-term pay and lawsuit duration.

Table 3.7.4 reports the regression analyses investigating the effect of Vested Month Value (columns 1a-1c) and Vested Quarter Value (columns 2a-2c) on litigation length. We narrow our analyses to the cases where the CEO was vested with long-term pay a month or quarter before their firm faced a lawsuit. Table 3.7.5 replicates the analyses in Table 3.7.4, looking at the vesting of stock options only.

Insert Table 3.7.4 about here.

Insert Table 3.7.5 about here.

In Hypothesis 2, we proposed that CEOs with higher vested long-term pay would show greater myopic loss aversion. Consequently, when these CEOs receive long-term compensation just before their firms face litigation, those with higher vested pay values are expected to be more inclined to prolong the legal process. The results in Table 3.7.4 provide evidence to support Hypothesis 2, as both Vested Month Value (p=.001 in column 1a) and Vested Quarter Value (p=.041 in column 2a) are positively associated with litigation length. We observe similar results in Table 3.7.5 when looking at the value of vested stock options alone for instances

where stock options were vested shortly before the filing date (Vested Month Value, p=.048 in column 1a; Vested Quarter Value, p=.004 in column 2a). Thus, rather than the mere vesting of long-term payments, the value of the vested pay appears to be a more important determinant in the decision-making process of CEOs regarding the lengthening of legal proceedings, supporting our earlier rationalization.

In Hypothesis 3, we argued that CEOs inclined to hold their high-value stock options would experience prolonged myopic loss aversion. Consequently, the value of the long-term pay vested shortly before the filing date of the lawsuit is at higher levels, and these CEOs were expected to be more likely to prolong the legal process further. The results in Table 3.7.4 lend evidence to support Hypothesis 3, as the interaction between the Holder CEO and Vested Month Value (p=.017 in column 1c) and that between the Holder CEO and Vested Month Value (p<.001 in column 2c) are statistically significant and indicate a positive moderation effect. The effects of the interactions are similar in Table 3.7.5 when we examine the value of vested stock options alone for instances where stock options were vested shortly before the filing date (p=.027 in column 1c; p=.001 in column 2c). Combined with earlier findings, the results underscore the need for firms to consider both the value of long-term payments and the CEO's attitude toward these payments, as CEOs with a greater tendency to retain their high-value stock options were associated with longer lawsuit durations.

3.4.2. Long-term Pay Granted Shortly Before Lawsuits and Duration of Corporate Litigation

While CEOs with vested long-term compensation tend to prioritize actions aimed at safeguarding their existing wealth rather than risking it for potential gains (Martin et al., 2013), unvested long-term compensation can make it more likely that the CEO would "…accept risk to current wealth in pursuing potential increases to wealth" (Martin et al., 2016, p.2467). That is, in contrast to vested long-term pay, unvested long-term pay may incline the CEO toward

preserving stock prices over the long term, potentially mitigating their myopic loss aversion and reluctance to take actions that could lower short-term stock prices. Further, while early conclusions or settlements may relate negatively to short-term stock prices, these downward shifts would have minimal impact on the value of long-term payments that are yet to vest in the future. Rather, the potential financial losses the firm can accrue through a prolonged legal battle may have a greater influence on the future value of unvested long-term payments. In other words, CEOs with unvested long-term pay may show greater preference in finalizing the legal processes early to avoid long-term losses that can diminish the value of their pay that would be vested in the future. Hence, we may expect the instances where the CEO is granted long-term compensation shortly before the filing date and the value of these unvested long-term payments to be negatively related to the litigation length.

To test these arguments, we created two new independent variables: Granted Month Value, denoting the grant date fair value of long-term pay for cases where the CEO has been granted long-term pay in the month prior to the filing date, and Granted Quarter Value, denoting the grant date fair value of long-term pay for cases where the CEO has been granted long-term pay in the quarter prior to the filing date.[36] Further, grants that are scheduled to vest in short periods may contribute less to the CEO's propensity to accept short-term risks (DesJardine and Shi, 2021; Edmans et al., 2017; Kolasinski and Yang, 2018; Martin et al., 2013; 2016). Therefore, to isolate the effects of unvested pay on the CEO's long-term preferences more clearly, we focus on grants that have at least 1 year vesting periods.[37] Finally, similar to the approach in Tables 4 and 5, we restrict our analyses to instances where the CEO received long-term payments a month or quarter before the firm faced a lawsuit, to address potential concerns that the timing of long-term grants could be coordinated with the firm's legal strategies.

[36] For consistency, we again focus solely on time-contingent vested long-term pay and exclude performance-based long-term pay.
[37] Our results are robust when we focus on grants with longer vesting periods.

Insert Table 3.7.6 about here.

The results provide some evidence to suggest that unvested long-term payments are effective in mitigating the CEO's myopic loss aversion. Looking at Table 3.7.6, we observe the Granted Month Value to be negatively related to litigation length at a statistically significant level ($p<.001$ in column 1a). Hence, long-term grants that have sufficiently long vesting periods may increase the CEO's preferences to finalize legal processes early. While the results are consistent when only the stock options are considered (and $p=.003$ in column 2a), we do not observe that the Granted Quarter Value has a statistically significant relationship with litigation length. Hence, we reason that unvested pay is most effective when they are granted in close proximity to lawsuits. However, given that only Granted Month Value was statistically significant in its relationship to litigation lengths, we conclude that our expectations were only partially supported.

4.3. Duration of Corporate Litigation and Firm's Outcomes

Thus far, we have argued that CEO long-term compensation would be positively associated with corporate litigation length and indicated that this association might have adverse effects on the firm – citing literature that outlines the costs of prolonged legal battles. To strengthen our arguments, we run further analyses to examine the potentially adverse effects of litigation length on the firm's outcomes.

Specifically, we examine the effects of litigation length on return on assets (ROA) and earnings per share (EPS). We utilize firms as our unit of analysis for our models. For our main independent variable, we use the logarithm of the average length of lawsuits that were finalized in the prior year. As our operationalization is tied to the years when lawsuits were finalized, we

limit our sample to the 309 firms in our sample where we could observe these instances, [38] and we obtain 1891 firm-year observations from this specification. [39] We utilize firm and year-fixed effects in our analyses and cluster our standard errors on the firm.

Insert Table 3.7.7 about here.

Table 3.7.7 reports our analyses examining the effect of litigation length on firm performance and earnings per share. Overall, the results provide some evidence to suggest that litigation length can have adverse effects on a firm's outcomes. We observe that litigation length is negatively associated with ROA at a marginal statistical significance (p=.057 in column 1). We similarly find that litigation length is negatively related to EPS (p=.042 in column 2). Therefore, our argument was partially supported regarding the negative consequences of CEO long-term compensation stemming from prolonged lawsuits.

3.5 DISCUSSION

Corporate lawsuits can incur significant financial and non-financial costs that can accumulate as they drag on. To mitigate the costs of a prolonged lawsuit, managers may opt to seek an early conclusion. However, doing so may risk potential short-term stock price drops. Hence, the CEOs are provided with a choice between avoiding lengthy legal battles and associated costs or deferring the legal process to maintain present stock values. The factors influencing CEO decision-making in this regard, particularly the role of long-term compensation schemes like restricted stocks and stock options, are not well understood. Considering the significant impact these long-term compensation mechanisms can have on managerial decision-making and risk and temporal preferences, they are likely to play a role in the legal strategies

[38] We drop from our sample singleton observations corresponding to 121 firms. Our results are consistent when these firms are retained.
[39] All variables used in the models are measured yearly. Variables that were previously measured on shorter intervals were converted to yearly observations.

adopted by firms. This study aims to explore the impact of CEO long-term compensation on the duration of legal proceedings.

The Behavioral Agency Model (BAM) posits that CEOs with vested long-term compensation, such as exercisable options and accumulated restricted stock, prioritize protecting their current wealth and exhibit myopic loss aversion, preferring to avoid short-term losses even at the expense of potential long-term gains (Devers et al., 2008; Martin et al., 2016). Consequently, CEOs with vested long-term pay are inclined to favor strategies that entail potential losses in the distant future over those posing immediate risks (DesJardine and Shi, 2021), with this tendency intensifying for decisions and events occurring directly after the vesting of long-term payments (Edmans, Fang, and Lewellen, 2017; Ladika and Sautner, 2020). Citing these findings, we argued that CEOs with vested long-term compensation may be aversive to the prospect of a short-term decrease in the stock price resulting from early settlements. Based on this, we expected that CEOs who were vested with long-term compensation shortly before their firms faced lawsuits would extend the duration of the lawsuit in an effort to avoid short-term decreases in stock value, despite the potential long-term costs associated with prolonged legal battles. Moreover, we argue that CEOs who tend to hold onto their high-value stock options would be exposed to a greater risk of loss, and they may harbor overly optimistic beliefs about the prospects of their firm's success in a prolonged legal battle. Therefore, we expected the association between long-term compensation vested to the CEO and lawsuit duration to be even stronger for CEOs with a marked preference towards retaining their high-value stock options.

To test our hypotheses, we analyzed executive compensation data from a subsample of public firms within the S&P 1200 list from 2006 to 2019. Our findings reveal that in the instances where the CEO is vested with long-term compensation shortly before their firm faces a lawsuit, the value of vested pay is positively associated with longer lawsuits. We also observe that the CEO's preference to hold high-value stock options has a moderating effect on this relationship,

such that the link between the value of the vested long-term pay and lawsuit duration is shown to be more pronounced for CEOs with a greater tendency to hold onto their stock options. Moreover, we provide some evidence to suggest that longer lawsuits can have detrimental effects on the firm performance. We similarly provide some evidence to indicate that long-term compensation granted in proximity to lawsuit dates can help overcome managerial myopic loss aversion. Finally, we observe that the length of recently concluded lawsuits negatively impacts the firm's performance and earnings. Overall, the findings indicate that the vesting of long-term payments alone may not necessarily extend the duration of legal proceedings. Instead, the value of vested compensation and managerial tendencies regarding vested compensation appear to play a more significant role in influencing corporate litigation strategies, potentially to the detriment of the firm's outcomes.

Our findings contribute to several research streams. First, long-term compensation, including stock options and restricted stocks, constitutes a substantial portion of executives' pay schemes, accounting for over 60% of the top 3,000 U.S. firms (Groysberg et al. 2021). Research in executive compensation suggests that CEO long-term compensation can have important implications for firm strategy and performance (Martin et al., 2013; Martin et al., 2016; Souder and Shaver, 2010; Souder and Bromiley, 2012). While increasing long-term compensation has been associated with positive outcomes like R&D investments, CSR activities, and increased retention (Cadman, Rusticus, and Sunder, 2013; Flammer and Bansal, 2017; Flammer, Hong, and Minor, 2019; Zhang and Gimeno, 2016), less is known about their potential negative effects. Studies have begun to reveal negative effects, such as impacts on product safety, earnings manipulation, and harmful risk-taking behaviors (Wowak et al., 2015; Zhang et al., 2008; Hou et al., 2020; Lim, 2017); however, the broader detriments of these incentives are not well understood. Our research contributes to this area by examining how CEO long-term compensation can delay the firm's legal proceedings, potentially increasing the associated long-term costs.

Second, we contribute to the literature by examining the determinants of corporate lawsuit durations, an area often overlooked despite the significant costs and consequences associated with legal actions (Gande and Lewis, 2009; Deng et al., 2014; Humphery-Jenner, 2012; Hutton et al., 2014). While past research has identified various predictors of litigation risk, including industry affiliation, firm-specific variables, and behavioral factors, little attention has been given to factors influencing lawsuit durations (Arena and Ferris, 2018; Armour et al., 2009; Crutchley et al., 2015; Jones and Wu, 2010). Our study fills this gap by demonstrating the relationship between CEO compensation mechanisms and lawsuit durations, shedding light on the dynamics that shape firms' legal strategies and outcomes. By focusing on instances where long-term pay is vested shortly before lawsuits, we provide highly granular results that offer insights into the temporal relationship between executive compensation decisions and legal actions, contributing to a more nuanced understanding of the dynamics at play.

Third, our study contributes to the literature on CEO overconfidence by examining its consequences on firm outcomes, specifically in the context of litigation duration. Overconfidence, a psychological bias recognized for its significant influence on managerial decision-making (Gutierrez, Åstebro, and Obloj, 2020), has been associated with both positive and negative outcomes for firms. Overconfident CEOs have been associated with fostering innovation and growth (Galasso and Simcoe, 2011; Coad, Segarr, and Teruel, 2016), as well as enhancing perceived competence in leadership (Anderson et al., 2012; Von Hippel and Trivers, 2011). However, they may also lead managers into making suboptimal decisions such as value-destroying investments and acquisitions, reducing the firm’s CSR efforts, and diminishing firm performance (Malmendier and Tate, 2005, 2008; Tang, Mack, and Chen, 2018; Park et al., 2018). Our study extends this understanding by demonstrating how a CEO's propensity to retain high-value stock options can moderate the duration of corporate litigation, offering insights into the intricate relationship between executive compensation structures and firms' legal strategies.

Further, while long-term payments are predominantly associated with executive compensation, they are increasingly used at other organizational levels. For instance, a growing number of U.S. public firms are observed to award their middle managers with stock options as a means to sort talent and retain employees with desirable characteristics (Oyer and Schaefer (2005). Similarly, long-term incentives are frequently used by start-ups as they allow firms to compensate employees without needing to provide an immediate cash outlay (Aran and Murciano-Goroff, 2023; Harroch, 2016; Somerville, 2017). Thus, investigating how the vesting of these long-term pay components may influence employees and firm operations within legal contexts may be a promising avenue for future research.

Finally, our study provides important managerial implications, underscoring the influence of CEO compensation package design in shaping the firm's legal strategy. Our findings indicate that the association between vested CEO long-term compensation and litigation duration is contingent on the value of the vested pay and the CEO's behavioral tendencies. Hence, our results suggest that the firm can strategically design the CEO pay packages to vest in aggregate or in a more spread-out manner to influence the course of future lawsuits. Similarly, our results highlight the importance of taking into account the CEO's inclinations with regard to their pay in structuring compensation packages.

Our study is not without limitations. First, we focus on a subsample of U.S. public companies, and the effects we uncover may differ in other countries, as individual reactions to compensation schemes can vary across cultures (Guimond et al., 2007; Lee, Ribbink and Eckerd, 2018). Further, our analysis only involves civil lawsuits and does not cover other corporate litigation. Moreover, although we provide evidence of empirical patterns consistent with our suggested mechanism, and the time of vesting of long-term payments can be largely considered independent of the time at which a firm faces a lawsuit, we cannot fully claim causality.

In conclusion, this study highlights a novel relationship between long-term CEO compensation and corporate legal strategy. While long-term compensation has been recognized as an effective tool to enhance CEO decision-making, it could have unintended consequences on the firm. Indeed, we find that the value of long-term payments vested to the CEO shortly before their firms faced lawsuits is positively associated with the duration of these lawsuits, which can, in turn, exacerbate the firm's outcomes. Moreover, the CEO's behavioral tendencies appear to have an important role in the strength of this relationship, as CEOs who prefer to hold onto their high-value stock options were associated with even longer legal battles. This underscores the importance of recognizing long-term pay components as critical factors in understanding corporate litigations.

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3.7 FIGURES AND TABLES

TABLE 3.7.1

Variable Definitions

Variable Name	Definition
Litigation Length	The (logged) difference in days between the filing date and the termination date of a lawsuit.
CEO Vested Month	Dummy indicating if the CEO has been vested long-term pay in the month prior to the filing date of a lawsuit.
CEO Vested Quarter	Dummy indicating if the CEO has been vested long-term pay in the quarter prior to the filing date of a lawsuit.
Vested Month Value	The grant date fair value (aggregate) of long-term pay for cases where the CEO has been vested long-term pay in the month prior to the filing date.
Vested Quarter Value	The grant date fair value (aggregate) of long-term pay for cases where the CEO has been vested long-term pay in the quarter prior to the filing date.
Holder CEO	Dummy that equals 1 if, during the sample period and until the prior year, the CEO continued to hold stock options with greater than 100% moneyness (the stock price was more than 100% greater than the exercise price) at least twice, and 0 otherwise.
Total Pay	The total compensation of the CEO as reported in proxy filings in prior year.
Age	The age of the CEO in prior year.
Tenure	The tenure of the CEO in their roles within the firm in prior year.
Firm Size	Total assets of the firm in the prior quarter.
Firm Performance	ROA in the prior quarter.
Stock Returns	Sum of daily stock returns in the prior quarter.
Stock Volatility	Standard deviation of the daily stock returns in the prior quarter.
Leverage	Ratio of the sum of current and long-term debt with total assets in the prior quarter.
Earnings Per Share (EPS)	Ratio of the net income with the total number of outstanding shares.

TABLE 3.7.2

Descriptive Statistics

Variables	Mean	SD	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
(1) Litigation Length (log)	5.401	1.401	1.000													
(2) CEO Vested Month	.074	.261	-0.025	1.000												
(3) CEO Vested Quarter	.195	.396	-0.014	0.334	1.000											
(4) Vested Month Value	30.609	31.966	0.066	NA	0.070	1.000										
(5) Vested Quarter Value	34.285	32.636	0.038	0.017	NA	0.933	1.000									
(6) Holder CEO	.265	.441	0.081	0.030	0.041	0.068	0.130	1.000								
(7) Total Assets	10.699	1.562	-0.053	-0.028	-0.086	0.271	0.388	-0.191	1.000							
(8) ROA	.012	.031	-0.080	0.018	0.026	0.215	0.265	0.226	0.061	1.000						
(9) Leverage	-66.838	2687.196	0.001	0.007	0.013	-0.022	-0.051	0.002	-0.063	0.010	1.000					
(10) Stock Returns	.03	.161	0.008	0.005	0.019	-0.054	-0.031	-0.027	-0.074	0.061	-0.058	1.000				
(11) Stock Volatility	.139	.084	0.025	0.049	0.063	-0.265	-0.253	-0.124	-0.186	-0.212	0.023	-0.056	1.000			
(12) Total Pay	147.331	153.066	-0.014	-0.002	0.003	0.517	0.543	0.062	0.300	0.101	0.018	-0.017	-0.156	1.000		
(13) Age	56.957	5.548	-0.021	0.005	-0.009	0.302	0.289	0.043	0.047	-0.001	-0.023	0.036	0.006	0.059	1.000	
(14) Tenure	5.899	6.409	-0.028	0.032	0.079	0.057	0.012	0.052	-0.126	0.055	0.024	0.007	0.100	-0.040	0.385	1.000

As Vested Month (Quarter) Value was examined within the subsamples where CEO Vested Month (Quarter) equaled to 1, the correlations between Vested Month (Quarter) Value and CEO Vested Month (Quarter) are listed as NA.

TABLE 3.7.3

Effect of the Vesting Stock and Option Pay on Litigation Length

	Litigation Length (log)							
	Restricted Stocks and Stock Options				Stock Options			
	Unmatched Sample		Matched Sample		Unmatched Sample		Matched Sample	
	(1a)	(1b)	(1c)	(1d)	(2a)	(2b)	(2c)	(2d)
CEO Vested Month	-.071		.084		-.05		.094	
	(.264)		(.188)		(.443)		(.186)	
CEO Vested Quarter		-.039		.177***		-.062		.124*
		(.379)		(.007)		(.208)		(.091)
Firm Size	-.241	-.243	.337	.344	-.238	-.242	.63	.655
	(.425)	(.421)	(.496)	(.458)	(.432)	(.424)	(.172)	(.136)
Firm Performance	-1.778	-1.77	.165	-9.97**	-1.783	-1.756	2.265	-8.241
	(.111)	(.113)	(.951)	(.037)	(.111)	(.119)	(.504)	(.129)
Leverage	.002**	.002**	.000	-.008	.002**	.002**	.005	-.009
	(.018)	(.02)	(.935)	(.528)	(.019)	(.019)	(.49)	(.551)
Stock Returns	-.009	-.006	-.353	-.002	-.01	-.005	-.281	.096
	(.908)	(.936)	(.331)	(.995)	(.894)	(.947)	(.566)	(.763)
Stock Volatility	-1.196	-1.183	-1.31	-.12	-1.187	-1.179	-3.457**	-1.695
	(.156)	(.164)	(.335)	(.946)	(.161)	(.165)	(.011)	(.168)
Total Pay	.000	.000	.002*	.002*	.000	.000	.000	.001
	(.249)	(.248)	(.094)	(.07)	(.249)	(.248)	(.953)	(.126)
Age	.008	.008	.045*	.075**	.008	.008	.047	.076**
	(.535)	(.539)	(.093)	(.033)	(.542)	(.55)	(.23)	(.045)
Tenure	-.008	-.008	-.025**	-.029**	-.008	-.008	-.012	-.031**
	(.441)	(.453)	(.026)	(.017)	(.435)	(.466)	(.596)	(.019)
Observations	29833	29833	8497	8562	29833	29833	6147	6586
R-squared	.186	.186	.333	.278	.186	.186	.269	.270
Fixed Effects	Year and Firm	Year and Firm	Year and Firm	Year and Firm	Year and Firm	Year and Firm	Year and Firm	Year and Firm

***p<.01, **p<.05, *p<.1. p-values are in parentheses. Standard errors are clustered on the firm. Constant is included, not reported. Firm and Year fixed effects included. Model 1a examines the effects of the instances of restricted stocks and stock options vesting in the month prior to the filing date of a lawsuit (CEO Vested Month) on the litigation length in the unmatched sample. Model 1b examines the effects of the instances of restricted stocks and stock options vesting in the quarter prior to the filing date of a lawsuit (CEO Vested Quarter) on the litigation length in the unmatched sample. Model 1c examines the effects of the instances of restricted stocks and stock options vesting in the month prior to the filing date of a lawsuit (CEO Vested Month) on the litigation length in the matched sample. Model 1d examines the effects of the instances of restricted stocks and stock options vesting in the quarter prior to the filing date of a lawsuit (CEO Vested Quarter) on the litigation length in the matched sample. Models 2a-2d replicate models 1a-1d, but consider only the instances of stock options vesting.

TABLE 3.7.4

Effect of Value of the Vested Stock and Option Pay and Holder CEO on Litigation Length

	Litigation Length (Log)					
	Restricted Stocks and Stock Options					
	(1a)	(1b)	(1c)	(2a)	(2b)	(2c)
Vested Month Value	.007***	.005**	.003			
	(.001)	(.028)	(.112)			
Vested Quarter Value				.005**	.005**	.000
				(.041)	(.031)	(.744)
Holder CEO		.535***	.286*		.432**	-.032
		(.000)	(.072)		(.016)	(.86)
Vested Month Value # Holder CEO			.005** (.017)			
Vested Quarter Value # Holder CEO						.01*** (.000)
Firm Size	-.038	.054	.05	.114	.139	.13
	(.892)	(.823)	(.836)	(.623)	(.508)	(.522)
Firm Performance	-.308	-.406	-.361	.636	.181	-.125
	(.889)	(.851)	(.866)	(.701)	(.925)	(.948)
Leverage	-.002***	-.002***	-.002***	-.001	-.001	-.001
	(.003)	(.001)	(.001)	(.227)	(.403)	(.291)
Stock Returns	.135	.001	.013	.023	.076	.061
	(.59)	(.999)	(.955)	(.788)	(.423)	(.513)
Stock Volatility	-.482	-.079	.158	-.233	.114	.429
	(.538)	(.917)	(.837)	(.699)	(.826)	(.399)
Total Pay	-.000	-.065	-.078	.001**	.047	.033
	(.74)	(.566)	(.5)	(.044)	(.544)	(.668)
Age	.033	.032*	.03*	.026	.02	.017
	(.139)	(.059)	(.076)	(.121)	(.115)	(.177)
Tenure	-.023*	-.031***	-.03***	-.018*	-.024***	-.022***
	(.073)	(.000)	(.000)	(.068)	(.000)	(.003)
Observations	2203	2075	2075	5955	5739	5739
R-squared	.282	.269	.271	.234	.241	.246
Fixed Effects	Year and Firm	Year and Firm	Year and Firm	Year and Firm	Year and Firm	Year and Firm

***p<.01, **p<.05, *p<.1. p-values are in parentheses. Standard errors are clustered on the firm. Constant and controls are included, not reported. Firm and Year fixed effects included. Model 1a examines the effects of the fair value of restricted stocks and stock options vested in the month prior to the filing date of a lawsuit (Vested Month Value) on the litigation length. Models 1b and 1c examine the effects of the CEOs with a high tendency to hold onto their stock options (Holder CEO), Vested Month Value and the effect of their interactions on litigation length, respectively. Model 2a examines the effects of the fair value of restricted stocks and stock options vested in the quarter prior to the filing date of a lawsuit (Vested Quarter Value) on the litigation length. Models 2b and 2c examine the effects of the CEOs with a high tendency to hold onto their stock options (Holder CEO), Vested Quart Value and the effect of their interactions on litigation length, respectively.

TABLE 3.7.5

Effect of Value of the Vested Option Pay and Holder CEO on Litigation Length

	Litigation Length (Log)					
	Stock Options					
	(1a)	(1b)	(1c)	(2a)	(2b)	(2c)
Vested Month Value	.007**	.006*	.001			
	(.048)	(.063)	(.922)			
Vested Quarter Value				.008***	.008***	.001
				(.004)	(.001)	(.851)
Holder CEO		.445***	.123	.	.362**	-.046
		(.001)	(.481)		(.049)	(.828)
Vested Month Value # Holder CEO			.009** (.027)			
Vested Quarter Value # Holder CEO						.011*** (.001)
Firm Size	.27	.237	.221	.283	.304	.293
	(.445)	(.453)	(.478)	(.307)	(.217)	(.226)
Firm Performance	-.073	-1.109	-1.01	-.649	-.952	-.738
	(.978)	(.673)	(.694)	(.752)	(.676)	(.742)
Leverage	-.001*	-.001*	-.001*	-.000	-.000	-.000
	(.08)	(.061)	(.085)	(.75)	(.74)	(.976)
Stock Returns	.143	.199	.254	.007	.054	.031
	(.689)	(.558)	(.458)	(.943)	(.613)	(.767)
Stock Volatility	-.705	-.37	-.22	.043	.565	.684
	(.534)	(.696)	(.813)	(.941)	(.346)	(.211)
Total Pay	-.002	-.298*	-.289*	-.000	-.196**	-.192*
	(.192)	(.083)	(.097)	(.615)	(.048)	(.05)
Age	.023	.056	.047	.019	.033	.026
	(.611)	(.138)	(.212)	(.591)	(.268)	(.372)
Tenure	.013	-.033	-.025	.018	-.004	.005
	(.78)	(.464)	(.581)	(.601)	(.881)	(.846)
Observations	1446	1392	1392	4402	4291	4291
R-squared	.301	.310	.312	.260	.273	.277
Fixed Effects	Year and Firm	Year and Firm	Year and Firm	Year and Firm	Year and Firm	Year and Firm

***p<.01, **p<.05, *p<.1. p-values are in parentheses. Standard errors are clustered on the firm. Constant and controls are included, not reported. Firm and Year fixed effects included. Model 1a examines the effects of the fair value of stock options vested in the month prior to the filing date of a lawsuit (Vested Month Value) on the litigation length. Models 1b and 1c examine the effects of the CEOs with a high tendency to hold onto their stock options (Holder CEO), Vested Month Value and the effect of their interactions on litigation length, respectively. Model 2a examines the effects of the fair value of stock options vested in the quarter prior to the filing date of a lawsuit (Vested Quarter Value) on the litigation length. Models 2b and 2c examine the effects of the CEOs with a high tendency to hold onto their stock options (Holder CEO), Vested Quart Value and the effect of their interactions on litigation length, respectively.

TABLE 3.7.6

Effect of Value of the Granted Stock and Option Pay on Litigation Length

	Litigation Length (log)			
	Grants with >1 Year Vesting Period			
	Restricted Stocks and Stock Options		Stock Options	
	(1a)	(1b)	(2a)	(2b)
Granted Month Value	-.01***		-.034***	
	(.000)		(.003)	
Granted Quarter Value		-.001		-.002
		(.71)		(.855)
Firm Size	-.822	-.122	-2.182	.879*
	(.165)	(.8)	(.354)	(.06)
Firm Performance	1.856	5.245	-2.862	11.904
	(.33)	(.146)	(.738)	(.115)
Leverage	.012	.003	.026	.041**
	(.708)	(.602)	(.447)	(.024)
Stock Returns	-1.274*	-.178	-.966	-2.075*
	(.086)	(.653)	(.657)	(.056)
Stock Volatility	.176	-1.377	4.09	-.901
	(.934)	(.459)	(.311)	(.723)
Total Pay	.006***	.005***	.001	-.001
	(.001)	(.000)	(.71)	(.8)
Age	-.027	.01	.17***	.053
	(.196)	(.674)	(.000)	(.524)
Tenure	-.022***	-.023***	-.148***	.078
	(.007)	(.000)	(.001)	(.25)
Observations	1207	3601	612	1831
R-squared	.329	.261	.396	.315
Fixed Effects	Year and Firm	Year and Firm	Year and Firm	Year and Firm

***p<.01, **p<.05, *p<.1. p-values are in parentheses. Standard errors are clustered on the firm. Constant and controls are included, not reported. Firm and Year fixed effects included. Models 1a and 1b examine the effects of the fair value of restricted stocks and stock options granted in the month (Granted Month Value) and quarter (Granted Quarter Value) prior to the filing date of a lawsuit on the litigation length, respectively. Models 2a and 2b examine the effects of the fair value of stock options granted in the month (Granted Month Value) and quarter (Granted Quarter Value) prior to the filing date of a lawsuit on the litigation length, respectively. Only grants with vesting periods larger than a year are considered.

TABLE 3.7.7

Effect of Litigation Length on Firm Performance and Earnings Per Share

	Firm Performance (ROA)	Earnings Per Share (EPS)
	(1)	(2)
Mean Litigation Length	-.003*	-.174**
	(.057)	(.042)
Total Pay	.001***	.000
	(.000)	(.728)
Stock Volatility	-.055***	-2.608***
	(.003)	(.004)
Firm Size	-.031***	.569
	(.000)	(.359)
Age	.001	.018
	(.672)	(.481)
Tenure	.001	.008
	(.566)	(.714)
Leverage	-.000	-.000
	(.981)	(.978)
Observations	1891	1891
R-squared	.573	.627
Fixed Effects	Year and Firm	Year and Firm

***p<.01, **p<.05, *p<.1. p-values are in parentheses. Standard errors are clustered on the firm. Constant and controls are included, not reported. Firm and Year fixed effects included. Model 1 examines the effects of the mean litigation length of cases that were finalized in the prior year on the firm's performance (ROA) in the current year. Model 2 examines the effects of the mean litigation length of that were finalized in the prior year on the firm's earnings per share (EPS) in the current year.