Journal of
Risk and Financial Management

MDPI

Article

Insider Trading and CEO Pay-Gap Induced Turnover

Viet Le [1], Ann-Ngoc Nguyen [2,*], Andros Gregoriou [3] and William Forbes [4]

[1] School of Economics, Finance, and Accounting, Coventry University, Coventry CV1 5DD, UK; ad4586@coventry.ac.uk
[2] Department of Accounting, Finance, and Economics, Middlesex Business School, Middlesex University, London NW4 4BT, UK
[3] Liverpool Business School, Liverpool John Moores University, Liverpool L3 5UG, UK; a.gregoriou@ljmu.ac.uk
[4] School of Business, University of Dundee, Nethergate, Dundee DD1 4HN, UK; wforbes001@dundee.ac.uk
* Correspondence: n.nguyen@mdx.ac.uk

Abstract: We explore how insider trading returns, disparities in executive pay, and CEO turnover are interrelated. Our findings reveal both independent and interactive effects for insider trading returns, the CEO pay gap, and the likelihood of CEO turnover. First, an increase in abnormal returns from insider purchases lowers the probability of a CEO's turnover, while an increase in abnormal returns from insider sales increases the likelihood of a CEO's dismissal. Second, the CEO pay gap negatively affects the probability of CEO turnover for insider purchases, but it does not have a similar effect on insider sales. Third, the interaction between insider abnormal returns and any CEO pay disparity influences the impact of these returns on CEO turnover. Specifically, this interaction diminishes the positive effect of insider selling on the probability of a CEO's dismissal, offsets the negative effect of insider purchasing on CEO dismissal, and, finally, amplifies the negative impact of CEO pay disparity on the probability of a CEO's dismissal during periods witnessing insider purchases.

Keywords: insider abnormal returns; CEO pay-gap induced turnover; CEO entrenchment

JEL Classification: G14; G30; G41

check for updates

Citation: Le, Viet, Ann-Ngoc Nguyen, Andros Gregoriou, and William Forbes. 2024. Insider Trading and CEO Pay-Gap Induced Turnover. *Journal of Risk and Financial Management* 17: 483. https://doi.org/10.3390/jrfm17110483

Academic Editor: Ştefan Cristian Gherghina

Received: 19 September 2024
Revised: 20 October 2024
Accepted: 21 October 2024
Published: 27 October 2024

Copyright: © 2024 by the authors. Licensee MDPI, Basel, Switzerland. This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution (CC BY) license (https://creativecommons.org/licenses/by/4.0/).

1. Introduction

Setting relative pay gaps between the CEO and other senior executives in top management teams is one of the crucial decisions undertaken by firm boards. Executive pay disparity, sometimes referred to as the CEO pay gap or CEO pay slice, represents the share of total remuneration allocated to the CEO compared to other executives on the board. This disparity can significantly influence firm outcomes, particularly the likelihood of CEO turnover, while also impacting the behavior of non-CEO executives. For instance, it may incite them to leverage corporate insider information, thus amplifying or mitigating the chances of CEO turnover (Conyon et al. 2011; Frydman and Jenter 2010; Edmans et al. 2017).

Recent studies suggest two main theoretical perspectives to explain the effects of CEO pay disparity on turnover. Firstly, under the managerial power theory, a large CEO pay slice reflects a CEO's capacity to entrench themselves within a firm by exerting significant control over the pay-setting process, thereby insulating themselves from external competition (Bebchuk and Fried 2004; Vo and Canil 2016; Le et al. 2022). Anginer et al. (2020) defend new American legislation requiring the disclosure of CEO pay relative to median pay, given their finding that a high CEO pay slice lowers a company's cost of capital. Conversely, under tournament theory, a larger pay gap creates a substantial incentive for non-CEO executives to compete for the CEO role, thereby increasing the likelihood of CEO departure (Conyon et al. 2011; Chan et al. 2022).

Secondly, non-CEO executive behavior, particularly through insider trading, can also affect CEO turnover. Abnormal insider returns, defined as gains realized through

insider trading by senior executives, can signal the perceived performance of the CEO. For example, higher insider returns following stock purchases may indicate confidence in the CEO's leadership, reducing the probability of turnover. In contrast, higher insider returns from their sales than usual may indicate substandard CEO performance, increasing the probability of CEO turnover (Ye 2022; Kaplan and Minton 2012).

Thirdly, insider returns can interact with CEO pay disparity to either amplify or mitigate the likelihood of CEO turnover. For instance, if there are high insider purchasing returns and a small CEO pay gap, it could reinforce the belief that the CEO is performing well and so deserving of their position, leading to a decreased possibility of CEO turnover. On the other hand, if there are high insider selling returns and a significant CEO pay gap, it could strengthen the perception that the CEO is not performing satisfactorily and does not deserve high compensation, thereby increasing the likelihood of CEO turnover.

To the best of our knowledge, there is limited empirical research on the interaction between executive pay disparity and insider returns in predicting CEO turnover. Prior studies (Warner et al. 1988; Ye 2022) have touched upon this dynamic, but they omit a comprehensive exploration of how these two factors may jointly affect CEO dismissal. This paper aims to fill this gap by analyzing the interaction between non-CEO executives' insider returns and CEO pay disparity and how it influences the likelihood of CEO turnover. By doing so, we contribute to a deeper understanding of the determinants of CEO turnover, especially in contexts where executive pay structures and insider trading are prominent factors.

In summary, this paper makes several contributions to the literature on CEO turnover. First, we investigate the relationship between the insider abnormal returns of non-CEO executives and the probability of the CEO's dismissal by disentangling insiders' purchasing and sales, as this better signals the CEO's good or bad performance, reducing or increasing the likelihood of CEO turnover (as in insider purchases or sales, respectively). Second, we examine the relationship between executive pay disparity and CEO departures from two alternative theoretical perspectives. Under managerial power theory, the CEO's higher pay relative to non-CEO executives signifies their ability to influence the pay-setting process and obstruct effective CEO succession planning in order to maintain his/her position. In short, it reflects the "managerial power" of the CEO. In contrast, under tournament theory, a larger CEO pay slice motivates competition for the CEO position, thereby increasing the likelihood of CEO turnover. Third, we examine the interaction between insider returns and executive pay disparity on the likelihood of a CEO's dismissal. The difference in pay between the CEO and other executives can shape perceptions of the CEO's performance and the fairness of compensation. We posit that the combination of insider trading signals and pay disparity can either magnify or mitigate the likelihood of CEO turnover, depending on the context of the observed returns and pay structure.

The remainder of our paper is organized as follows. Section 2 discusses relevant literature and develops our hypotheses. Section 3 describes our data sample selection, variable definitions, and study methodology. Section 4 discusses our main empirical findings. Section 5 concludes the paper.

2. Literature Review and Hypotheses

2.1. The Independent Effect of Executive Pay Disparity on CEO Turnovers

Literature on CEO pay disparities reflects two different views on how CEO "power" influences CEO pay. Under the perspective of managerial power theory, a large CEO pay slice reflects greater CEO power, potentially leading to CEO entrenchment and a weak board (Bebchuk and Fried 2004; Lambert et al. 1993). In contrast, tournament theory proposes that a large CEO pay slice does not reflect managerial power but rather motivates other executives to work harder to attain the CEO's position (Lazear and Rosen 1981; Conyon et al. 2001).

2.1.1. Managerial Power Theory (Lambert et al. 1993)

According to the managerial power theory, CEO power is the CEO's ability to influence pay decisions made by the board of directors or the remuneration committee. Although firms may have independent directors on the compensation committee, CEO influence may still lead to decisions serving the CEO's interests, resulting in greater pay disparities. As such, CEO pay disparity reflects the CEO's managerial power and their ability to influence the pay setting. Recent studies (Vo and Canil 2016; Bebchuk et al. 2011) have confirmed that a larger CEO pay disparity can reduce the sensitivity of CEO turnover to performance. Bebchuk et al. (2011) show that a larger pay disparity between the CEO and other senior executives suggests a lower CEO turnover sensitivity to performance. In addition, Chen et al. (2013) report that higher CEO pay disparity implies a firm faces higher CEO succession risk. In order to maintain their position, the CEO may obstruct the development of an effective CEO succession plan and the career development of alternative CEO candidates. Consistent with this argument, Masulis and Mobbs (2011) suggest that firms with more entrenched CEOs rarely have high quality inside directors. As a result, the lack of a skilled replacement candidate in firms with higher CEO pay slices decreases the probability of CEO turnover for those firms.

This body of literature, however, lacks an in-depth exploration of how executive pay disparity, coupled with other organizational factors, influences CEO turnover in modern corporate governance structures. Our study seeks to fill this gap by investigating how executive pay disparity interacts with insider returns to influence CEO turnover, providing new insights into both managerial power and corporate decision-making processes. Based on this implication, we propose our first hypothesis:

Hypothesis 1: *Under a managerial power theory perspective, there exists a negative relationship between executive pay disparity and the likelihood of CEO turnover (H1).*

2.1.2. The Tournament Theory (Lazear and Rosen 1981)

Tournament theory argues that a large pay slice represents a huge incentive for those who compete for the CEO position (Lazear and Rosen 1981). The theory argues that since it is difficult to monitor individual abilities within the management team, it is efficient to pay individuals based on their ranked abilities, with larger pay at higher levels. Rosen (1986) suggests that in order to motivate the executives to stay in the game until the final round, pay must increasingly become larger as executives move up the hierarchy. Conyon et al. (2001) show that the CEO pay gap creates incentives for greater efforts from low-level executives and motivates them to raise their ranked position. Thus, rank-ordered pay represents a tournament prize that incentivizes other executives to win contests for promotion.

As such, under tournament theory, the compensation of the CEO is not directly tied to company performance; instead, executives are paid based on their ranked ability. If the CEO is paid significantly more than other executives in the company, this may be seen as unjustified by shareholders and stakeholders. In this scenario, shareholders and stakeholders may view the CEO pay gap as a reflection of poor corporate governance, and they may demand a change in leadership in order to align the CEO's interests with those of the company. This could lead to an increased likelihood of CEO turnover. Further, in order to compete in the CEO promotion tournament, contestants endeavor to make themselves look favorably to the board of directors. They may even engage in political sabotage to create a negative impression of the CEO's performance or that of a rival. Lazear (1989) documents that salary structures defined by organizational rank induce political sabotage amongst top- executives to increase their own chance of winning the contest. Bose et al. (2010) demonstrate that flatter pay profiles across the board can eliminate the incentive for sabotage and benefit the shareholders. Thus, if CEO pay is the top prize of the tournament, a positive association should exist between CEO pay disparity and CEO

turnover. Recently, Chan et al. (2022) documented that promotion tournaments weed out low-quality managers but also cause unintended turnover amongst high-quality managers.

This emerging literature highlights the dual effects of tournament structures on corporate performance, but it has not fully addressed how these dynamics interact with insider trading activities. The interaction between insider returns and executive pay disparity remains an underexplored area. Our research aims to address this gap by examining how tournament theory applies to the relationship between CEO turnover and insider returns. This leads to our second hypothesis.

Hypothesis 2: *Under the tournament theory perspective, there is a positive relationship between CEO pay disparity and the likelihood of CEO turnover (H2).*

2.2. The Independent Effect of Insider Returns on CEO Turnover

Research exploring the relationship between insider trading and CEO turnover is still relatively limited. While Niehaus and Roth (1999) provided early insights into this relationship in the context of equity issues, more recent studies, such as Ye (2022), have begun to investigate how insider trading events, like stock sales or purchases, can serve as indicators of CEO performance. Positive insider returns are often viewed as a signal of strong CEO performance, thereby reducing the likelihood of CEO turnover, while negative insider returns can indicate poor performance, increasing turnover likelihood (Edmans et al. 2017).

The information asymmetry hypothesis suggests that insider trading can be a factor contributing to CEO turnover. If earnings news is positive, higher insider returns may serve as a signal of the company's success, causing the CEO to retain their position. In such cases, positive insider returns may indicate that the CEO is making good decisions that benefit the company, suggesting less pressure for them to be removed. Conversely, if earnings news is negative, higher insider returns may signal poor CEO performance. This could increase the likelihood of CEO turnover. If insiders believe that the CEO is making poor decisions that are negatively impacting the company, they may push for a change in leadership. In both situations, insider returns affect the probability of CEO turnover.

The role of insider returns as a predictive factor for CEO turnover, particularly when considering interactions with executive pay disparity, remains largely unexamined. Our study aims to bridge this gap by investigating how insider returns interact with other governance mechanisms like executive pay disparity. We propose the following hypotheses:

Hypothesis 3: *Insider returns from insider purchases are negatively associated with CEO turnover (H3).*

Hypothesis 4: *Insider returns from insider sales are positively associated with CEO turnover (H4).*

2.3. The Impact of the Interaction Between Insider Returns and Executive Pay Disparity on the Likelihood of CEO Turnover

The impact of the interaction between insider returns and the CEO pay gap on CEO turnover is an interesting question that has not been extensively studied in the academic literature. It could potentially amplify or mitigate the independent effects that insider returns and the CEO pay gap can have upon CEO turnover, depending on the circumstances. For example, if the insider returns are high and the CEO pay gap is small, this could reinforce the perception that the CEO is doing a good job and deserves to keep their position, which could further reduce the likelihood of CEO turnover. In other words, the CEO is being fairly compensated for their performance, and the positive insider returns mean there is less pressure to remove the CEO. Conversely, smaller insider returns and a large CEO pay gap may lead to even higher CEO turnover. This could happen if insiders feel that the CEO is being overcompensated for their performance, creating tensions between the CEO and other insiders with lower insider returns, and thus, they may push stronger for a change in leadership.

On the one hand, having a large CEO pay slice suggests strong managerial power, thereby potentially reducing the ability of outside shareholders to monitor the firms (Bebchuk et al. 2011; Chen et al. 2013). This suggests that in the firms with larger CEO pay gaps, the lack of a quality board and ineffectiveness monitoring make CEOs more entrenched, thereby inducing other executives to exploit inside information in their stock trading to gain insider abnormal returns. An increase in insider purchase returns preceding any good news disclosures will offset the negative relationship between insider returns and CEO turnovers. An increase in insider selling returns preceding bad news disclosures will magnify the positive relationship between insider returns and CEO turnover. The above discussion leads to the following hypotheses.

Hypothesis 5: *Under a managerial power theory perspective, the interaction between the CEO pay slice and insider trading returns is positively associated with the likelihood of CEO turnover.*

On the other hand, the larger CEO pay disparity triggers other executives to compete for the CEO position; the more intense competition motivates executives to work harder, weed out low-quality managers, cause the unintended turnover of high-quality managers, improve the board quality, reduce the opportunism, reduce insider returns (Chan et al. 2022). This reduces the likelihood of CEO turnover. To compete in the CEO promotion tournament, contestants require firm-specific skills that are not beneficial if senior executives do not intend to stay for the long term. Therefore, these executives could seek other income sources rather than compete in the tournament to become CEO. Thus, a larger CEO pay disparity is conjectured to increase insider returns of non-CEO executives, as frustrated subordinates seek to gain advantage while remaining within a firm that frustrates their career ambitions. If CEO pay is the top prize of the tournament, we expect a relationship between CEO pay disparity and insider trading. A larger CEO pay disparity triggers other executives to compete for the CEO position, thereby increasing the probability of CEO turnover. This discussion leads to the following hypotheses:

Hypothesis 6: *Under a tournament theory perspective, the interaction between insider purchase returns prior to good earnings news and the CEO pay gap is positively associated with the likelihood of CEO turnover.*

3. Research Design

3.1. Analysis Framework

There might be several reasons for CEO turnover. Some CEO departures occur because of managerial behaviors that arise from managerial power, tournament perspectives, or the insider trading of executives, as analyzed in the previous section. Other CEOs are dismissed for reasons such as a CEO's low ability, personal scandals or violations of laws. Many CEOs depart voluntarily, e.g., accepting a better offer elsewhere or retiring. In reality, firms are not required to disclose the true reason for a CEO dismissal and are less likely to do so when firing a CEO. To distinguish between CEO departures induced by managerial pay disparity and other reasons, we introduce a concept of *pay-gap-induced turnover*, which refers to the replacement of top management motivated by either the level of the CEO's power or the scale of the tournament prize.

Conceptually, the probability of CEO turnover is modelled as the sum of two independent turnover probabilities, one of which is connected to the CEO pay slice and the other one is related to other determinants. Here, the CEO pay slice is calculated as the difference between the total pay of the CEO and the average pay of the other four senior executives, divided by the total pay of the top five executives. We denote this measure of CEO pay disparity as x_t ($x_t \geq 0$). The probability of CEO turnover is modelled as follows:

$$P(x_t) = G(x_t) + F(x_t) - G(x_t) * F(x_t) \quad (1)$$

where $P(x_t)$ is defined as the total probability of CEO turnover; $G(x_t)$ is the CEO *pay-gap-induced turnover*; and $F(x_t)$ is the probability of CEO turnover caused by other reasons.

The assumption, under the managerial power theorization, is that x_t reflects a CEO's ability to capture managerial power. Higher ability earns larger managerial power and, therefore, increases succession risk. We assume that when x_t is at or above a specific level of executive pay disparity, say $\mathcal{X}$, the CEO is more likely to entrench himself by obstructing the career development of other executives and not being willing to groom high-quality CEO, potential successors. We let $\boldsymbol{\kappa} = x_t - \mathcal{X}$ denote the incentive level at which any value of $\boldsymbol{\kappa} \geq 0$ is considered an incentive for the CEO to dominate other executives, behave opportunistically and entrench their CEO position. At a large enough level of CEO pay slice, such as the 80th percentile of the pay slice distribution, all turnovers observed at and above the $\mathcal{X}_{\text{large}}$ level are assumed to be unrelated to the managerial power of the CEO. Any higher turnover probability observed at the level below $\mathcal{X}_{\text{large}}$ is assumed to be caused by the lower level of managerial power of the CEO and, hence, their relative disposability. Therefore, the incentive level at $\mathcal{X}_{\text{large}}$ is defined as $\boldsymbol{\kappa}_{\text{large}} = x_t - \mathcal{X}_{\text{large}}$

We derive the empirical implications that arise in this framework from combining *pay-gap-induced turnover* with other sources of turnover.

Empirical implication 1

- The likelihood that CEO turnover is decreasing in the CEO incentive levels is given by the following constraint:

$$G(\boldsymbol{\kappa} \geq 0) + F(\boldsymbol{\kappa} \geq 0) - G(\boldsymbol{\kappa} \geq 0) * F(\boldsymbol{\kappa} \geq 0) < G(\boldsymbol{\kappa} < 0) + F(\boldsymbol{\kappa} < 0) - G(\boldsymbol{\kappa} < 0) * F(\boldsymbol{\kappa} < 0) \tag{2}$$

- The probability of *pay-gap-induced turnover* is zero at or above the large CEO pay slice $\mathcal{X}_{\text{large}}$ is given by the following constraint:

$$\mathrm{G}\left(\boldsymbol{\kappa}_{large} \geq 0\right) = \frac{\mathrm{P}\left(\boldsymbol{\kappa}_{large} \geq 0\right) - \mathrm{F}\left(\boldsymbol{\kappa}_{large} \geq 0\right)}{1 - \mathrm{F}\left(\boldsymbol{\kappa}_{large} \geq 0\right)} = 0 \tag{3}$$

The managerial power theory perspective predicts that for any level of CEO pay slice x_t, the returns to insider purchases are a credible signal of future CEO turnover. They are negatively associated with the probability of CEO departures; therefore, the likelihood of CEO turnover is decreasing in the returns to insider share purchases $\boldsymbol{r}_{purchases}$.

$$\mathrm{P}\left(\boldsymbol{r}_{purchases}\right) < \mathrm{P}(0) \tag{4}$$

The results derived in implication 1 (i) and (ii) follow immediately from the managerial power theory. Statement (i) establishes a negative relationship between the CEO pay slice and turnover. This is a standard prediction of the relationship between managerial power and CEO entrenchment. The result would hold true under the managerial power theory perspective when a higher pay disparity reflects the stronger power of the CEO (Bebchuk et al. 2011; Chen et al. 2013), thereby increasing CEO succession risk (Chen et al. 2013). The prediction carries over to our setup because the CEO is less likely to leave when the CEO pay slice remains high. Statement (ii) characterizes the abnormal returns to insiders' purchases as signals of CEO entrenchment. The prediction suggests that the CEO is less likely to depart after reaping high returns on their own purchases of their employer's stock.

In contrast to the managerial power theory perspective, x_t represents the tournament prize, which motivates other executives to work hard and compete for the CEO position. We denote $\boldsymbol{\kappa}' = x_t - \mathcal{X}'$ as an incentive prize. At any value of $\boldsymbol{\kappa}' \geq 0$, the other executives have an incentive to win the contest for promotion to higher levels. All the CEO exits observed below the level of $\mathcal{X}'$ are assumed to be unrelated to executive pay disparity. Any other turnover of our CEOs, observed at or above $\mathcal{X}'$, is assumed to be caused by the attempts of other executives to compete to attain the tournament prize. Hence, the

following empirical implication simplifies the theoretical predictions for the tournament theory perspective.

Empirical implication 2

- The probability of CEO turnover is increasing in the managerial incentive prize. So

$$G(\kappa\prime \geq 0) + F(\kappa' \geq 0) \pm G(\kappa' \geq 0) * F(\kappa' \geq 0) > G(\kappa\prime < 0) + F(\kappa' < 0) \pm G(\kappa' < 0) * F(\kappa' < 0) \quad (5)$$

- The probability of *pay-gap-induced turnover* is assumed to be zero at the level below the tournament prize $\mathcal{X}'_{\text{prize}}$, which is considered a starting point of the prize to induce other executives to enter the contest. $\boldsymbol{\kappa}'_{\text{prize}}$ is defined as the level of incentive prize equal to $x_t - \mathcal{X}'_{\text{prize}}$.

$$G(\boldsymbol{\kappa}'_{prize} < 0) = \frac{P(\boldsymbol{\kappa}'_{prize} < 0) - F(\boldsymbol{\kappa}'_{prize} < 0)}{1 - F(\boldsymbol{\kappa}'_{prize} < 0)} = 0 \quad (6)$$

- The likelihood of CEO turnover is increasing in the returns of insider sales $\boldsymbol{r}_{sales}$.

$$P(\boldsymbol{r}_{sales}) > P(0) \quad (7)$$

The first two statements in Empirical Implication 2 follow immediately from the tournament theory perspective. Statement (i) establishes a positive association between CEO turnover and the tournament prize measured by CEO pay disparity. Specifically, the model predicts that firms with a larger pay disparity tend to motivate other executives to compete for higher positions, thereby increasing the likelihood of CEO turnover. Statement (ii) predicts that at, or above, some high pay disparity level, contestants can attempt to pursue the CEO position by all means, even engaging in political sabotage to smear the CEO's reputation. Statement (iii) characterizes the abnormal returns of insiders' sales as the signals of forthcoming CEO dismissals. This prediction suggests that a CEO is more likely to be dismissed after large insider sales returns.

In order to investigate the impact of managerial pay disparity and insider trading on CEO turnover in a panel data environment, the likelihood of CEO turnover can be expressed by a modification of the standard probit model, which is stated below.

$$P(turnover_{i,t} = 1) = \phi[\alpha + \beta_1\, ARET_{i,t-1} + \beta_2\, CPS_{i,t-1} + \delta\, \mathbf{X}_{i,t}] \quad (8)$$

where the dependent variable is 1 if the CEO turnover occurs in year t and 0 otherwise. ϕ is the standard normal cumulative distribution function, i denotes each firm, and t represents the calendar year. The independent variable $ARET_{i,t-1}$ is average insider abnormal returns of firm i in year $t-1$, pay with respect to the total pay of the top five executives. **X** denotes a vector of control variables. The definitions and measurements of the various variables are introduced in the next section.

3.2. Sample Selection

We gather information on insider transactions, managerial pay disparity, and CEO demographics (e.g., ages, tenures, CEO duality) from the Bloomberg database (Bloomberg L.P. 2020). Data pertaining to the firms' specifics, such as firm size and stock price, are collected from Refinitiv DataStream (Refinitive DataStream 2020). CEO turnovers are manually collected from firms' annual reports.

Our sample represents the largest companies listed on major indices from eight countries: FTSE 100 (UK), DJIA (US), TSX 60 (Canada), ASX 50 (Australia), DAX (Germany), CAC 40 (France), AEX (Netherlands), and BEL 20 (Belgium). The sample period is between 2008 and 2019, which coincides with the most severe global financial crisis, 2008–2010, since the Great Depression. This crisis had a profound impact on the global economy, including on executive compensation and CEO turnover rates. Moreover, this period witnessed an increasing awareness and activism around social justice issues, specifically the diversity

and equity inclusion agenda. Particularly, income inequality and calls for social justice may have contributed to a heightened focus on the CEO pay gap. Furthermore, significant shifts in business models towards digitalization, and globalization occurred during this time, leading to increased competition that may have impacted CEO turnover rates.

Our final sample size is determined by specific criteria. Firstly, we require compensation data for the top five executives to be available. In cases where information on compensation is missing for any executive in a particular year, the data for that year will be excluded. Secondly, if firms are listed on multiple markets, we only retain the data from their primary listing market and remove the data from alternative markets. Finally, firms that were listed, or delisted from the indices after the study period commenced are also excluded. Through this screening process, our final sample comprises 2655 firm-year observations, derived from 23,310 insider transactions within 295 firms over an eleven-year period from 2008 to 2019. This dataset is further divided into 7377 insider purchases and 15,933 insider sales sub-samples.

3.3. Models and Measurements of Variables

We employ a probit model to examine the relationship between CEO turnover and several key independent variables. The dependent variable in our model is a binary variable that takes a value of 1 if the CEO left the firm in a fiscal year and 0 otherwise. Our key independent variables are the CEO pay slice, defined as the managerial pay disparity of the top five executives in the management team, and insider returns of the non-CEO executive in the top management team. In addition, we include three commonly used CEO characteristics that are known to influence CEO turnover: CEO age, tenure and CEO/Chair position duality. We also incorporate various firm fundamental variables as control variables, including firm size, accruals, free cash flow per-share, and the Tobin Q ratio. In order to calculate the average insider returns of non-CEO executives, we conduct an initial test using an event-day-study methodology. This allows us to analyse the stock price movements surrounding insider transactions and to evaluate the behaviour of insiders based on insider returns.

Insider abnormal returns

To measure insider abnormal returns, we use the market model (as described in (Brown and Warner 1985; MacKinlay 1997) and many subsequent studies) as it is widely accepted in the research literature. We estimate insider returns over five different event horizons: 60-day, 90-day, 120-day, 150-day and 180-day periods between day $t + 1$ and $t + 180$. The insider return of each transaction is defined as the abnormal return (RET_{it}) for sample firm i on the day t, which is measured as follows:

$$RET_{it} = [R_{it} - (\alpha + \beta * \ MR_t)] * \theta \tag{9}$$

where R_{it} is the actual returns of firm i on day t. MR_t is the market return on day t. θ is a binary variable for the direction of trade, which takes the value of +1 if the trade is a "Buy" and -1 if it is a "Sell". The insider abnormal returns for sales are multiplied by -1 due to the fact that insiders make abnormal profits when share prices fall after insider sales. The average insider returns ($ARET_{it}$) is calculated as the weighted average of total returns, RET_{it}, insiders made in a given year.

$$ARET_{it} = \sum_{t=1}^{n} \frac{[R_{it} - (\alpha + \beta * \ MR_t)] * \theta}{n} \tag{10}$$

where ARET60, ARET90, ARET120, ARET150 and ARET180 denote average insider abnormal returns for a horizon of 60, 90,120, 150 and 180 days, respectively.

CEO pay disparity

We measure executive pay disparity as total CEO compensation divided by the total compensation of the top five executives. We focus on cash compensation for several reasons.

First, cash compensation is used in previous studies (Eriksson 1999; Bognanno 2001; Shen et al. 2010). Second, it is easy to calculate. Third, cash compensation is robust to future movements in the share price and earnings that will influence stock options and long-term incentive plan payouts, which could induce a correlated error in the pay slice metric, inducing an unwanted endogeneity in reported tests.

CEO characteristics variables

We control for CEO characteristics using three wide measures—CEO age, tenure and duality. Coates and Kraakman (2010) and Jarva et al. (2019) document that CEO age is more important in explaining CEO turnover than measures of firm performance. These studies suggest that the probability of a CEO leaving office is positively associated with the CEO's age. Jarva et al. (2019) also find evidence of a negative association between CEO age and enforced CEO turnover and a positive association between the age of a CEO and voluntary turnover. Regarding CEO tenure, Coates and Kraakman (2010) and Jenter and Kanaan (2015) argue that long-tenure CEOs should have proven their ability in both good and bad times; thus, tenure should be negatively related to the probability of CEO turnover. Finally, we include a dummy variable of duality indicating whether the CEO is also the board Chair. It takes a value of 1 when the CEO holds the board chair position and 0 otherwise. Zajac and Westphal (1996) and subsequent literature find that CEOs who hold the chair position concurrently tend to have more subsequent appointments to boards due to their greater control over management. Consistent with prior literature, we expect the CEO who holds the chair position to display a higher level of entrenchment.

Firm characteristics variables

Following extensive empirical literature on corporate finance, we use a number of control variables that have been documented to influence CEO turnover, including accounting accruals, operating cash flow per share, Tobin's Q ratio, tenure and firm size (Anderson et al. 2018; Jenter and Kanaan 2015; Jenter and Lewellen 2014; among others).

Earnings management, proxied by accruals, represents the earnings portion that the managers can discretionally exercise under an auditor's supervision. Earnings management suggests that CEOs take action by increasing accounting earnings, thereby entrenching their position. If CEOs are dismissed for poor firm performance and have discretion over the performance measures used by the board in termination decisions, then the CEOs who face a high probability of being dismissed will have incentives to adjust accounting accruals in their favor. As such, an increase in accounting accruals is evidence of the amount of managerial discretion of the CEO.

To control for firm performance, we include the operating cash flow per-share, denoted as OCFPS. We include Tobin's Q ratio to capture the firm's growth prospects. CEO tenure is included in our model to reflect the impact of firm performance on CEO turnover. Finally, we measure firm size using the natural logarithm of market capitalization. We expect that the CEO of a larger firm has a lower probability of entrenchment due to a higher level of supervision through a larger board.

Probit Model Specification

We employ the probit model to assess the impact of the CEO pay disparity and insider trading returns of non-CEO executives on the probability of a CEO's exit from the firm. CEO turnover is identified when the CEO of a firm is different from the CEO in the preceding year. To avoid the incidental parameters problem, which arises in the context of nonlinear panel models, we do not include fixed effects in the probit models (Kaplan and Minton 2012; Jenter and Lewellen 2014). It is noteworthy that Chung et al. (2024) report that the CEO pay slice and firm performance may have a U-shaped relationship. Our main regression model can be expressed as follows:

$$P(turn_{i,t} = 1) = \phi\left[\alpha + \beta_1\, ARET_1_{i,t-1} + \beta_2\, CPS_1_{i,t-1} + \beta_3\,(ARET_1_{i,t-1} - mean\ ARET_1_{i,t-1}) * (CPS_{1\,i,t-1} - meanCPS_{1i,t-1}) + lnAGE_{i,t} + lnTENURE_{i,t} + DUAL_{i,t} + ACCRUALS_1_{i,t-1} + OCFPS_1_{i,t-1} + Qratio_{i,t} + SIZE_1_{i,t-1} + e_i\right] \quad (11)$$

where ϕ is the standard normal cumulative distribution function, i indicates a particular firm and t denotes the financial year. The dependent variable of the model is CEO turnover, which takes a value of 1 if the CEO left the firm in a fiscal year and 0 otherwise. The independent variables are defined as follows: $ARET_1_{i,t-1}$ is the average abnormal returns of non-CEO executives of firm i at year $t-1$, $CPS_1_{i,t-1}$ is defined as a CEO pay slice of firm i at year $t-1$ and $(ARET_1_{i,t-1} - mean\ ARET_1_{i,t-1}) * (CPS_{1\,i,t-1} - meanCPS_{1i,t-1})$ is the interaction of the first two independent variables. $lnAGE_{i,t}$ is the natural logarithm of CEO age, $lnTENURE_{i,t}$ is the natural logarithm of CEO tenure, measured as the number of years that the CEO has held the CEO position, $DUAL_{i,t}$ is CEO duality that takes a value of 1 if the CEO also serves as board Chair at the same time and 0 otherwise. The variables $ACCRUALS_1_{i,t-1}$, $OCFPS_1_{i,t-1}$ and $SIZE_1_{i,t-1}$ are defined as accounting accruals, operating cash flow per share and firm size of firm i at year $t-1$, respectively. $Qratio_{i,t}$ is measured by Tobin's Q ratio of firm i at year t. The variable definitions are summarized in Table 1 below.

Table 1. Variable definitions.

Variables		Definitions
Dependent variable:		
$Turn_{i,t}$	CEO turnover	The variable takes 1 if the CEO left the firm i in a fiscal year t and 0 otherwise.
Independent variables:		
$ARET_1_{i,t-1}$	Abnormal return	The average abnormal return of non-CEO executives of firm i at year $t-1$
$CPS_1_{i,t-1}$	CEO pay slice	a CEO pay slice of firm i at year $t-1$
$(ARET_1_{i,t-1} - mean\ ARET_1_{i,t-1}) * (CPS_{1\,i,t-1} - meanCPS_{1i,t-1})$	Interaction term	The interaction of the first two independent variables.
$lnAGE_{i,t}$	CEO age	The natural logarithm of CEO age
$lnTENURE_{i,t}$	CEO tenure	The natural logarithm of CEO tenure, measured as the number of years that the CEO has held the CEO position.
$DUAL_{i,t}$	CEO duality	Equals 1 when the positions of CEO and Chairman are held by the same person, and zero otherwise.
$ACCRUALS_1_{i,t-1}$	Accounting accruals	The difference between accounting earnings and cash flows of firm i and year $t-1$
$OCFPS_1_{i,t-1}$	Operating cashflow	Operating cash flow-per share of firm i at year $t-1$
$SIZE_{i,t-1}$	Board size	Firm size of firm i at year $t-1$
$Qratio_{i,t}$	Tobin's Q ratio	Tobin's Q ratio of firm i at year t

4. Empirical Results

4.1. Descriptive Statistics

4.1.1. Insider Cumulative Abnormal Returns

Our total sample contains 23,310 insider transactions executed by non-CEO executives. The sample is split into two separate subsamples based on the type of transaction: purchases and sales. Specifically, there are 7377 purchase transactions and 15,933 sales transactions. Table 2 reports the cumulative abnormal returns of non-CEO executives (denoted as RETs) and provides differences in mean tests over five different horizons between 0 and 180 days. In general, mean RETs for most event periods are significantly different from zero. The average RETs calculated from our sale sample of 15,933 events are significantly larger

than those for the purchase sample of 7377 events. We also find that the mean ARETs are significantly different for the Buy and Sell samples.

Table 2. RETs of insider trading activities for different event periods.

Event Period	BUY		SELL		Mean Difference Test
	Total Sample (N = 7377)		Total Sample (N = 15,933)		
	RET	t-Value	RET	t-Value	t-Value
[0 to 60]	0.891 ***	5.19	1.952 ***	17.83	−11.99 ***
[0 to 90]	1.295 ***	5.99	3.042 ***	21.27	−14.05 ***
[0 to 120]	2.071 ***	7.11	4.07 ***	22.99	−16.22 ***
[0 to 150]	2.545 ***	8.08	5.168 ***	25.80	−17.80 ***
[0 to 180]	2.889 ***	8.59	5.872 ***	26.57	−18.00 ***

Notes: This Table reports the cumulative abnormal returns (RETs) by insiders for the Buy and Sell sample. The Buy/Sell sample includes the events with insider purchases. The mean difference in returns test shows the t-value for the mean difference in RETs between insider buy and sell samples. A positive (negative) value in the difference in the mean test indicates that there is a higher (lower) value for the buy sample compared to that of the sell sample. Here, *** denotes significance at the 1% level of significance.

4.1.2. CEO Turnovers

In line with previous literature (Anderson et al. 2018; Jenter and Kanaan 2015; Jenter and Lewellen 2014), we define a turnover event if the CEO in year t is not the same as the CEO in year $t-1$.

4.1.3. Other Independent Variables

Abnormal returns for insider transactions are averaged across years using Equation (10). We observe 2360 and 2344 firm-year average abnormal returns for purchase and sale samples, respectively. Panel A of Table 3 presents the descriptive statistics of average cumulative abnormal returns of non-CEO executives (denoted as ARETs) over our five different horizons between 0 and 180 days. Panel B reports summary statistics for CEO pay disparity, age, tenure and other independent variables. Columns (1) to (3) display summary statistics for the Buy subsample, while columns (4) to (6) show those of the Sell subsample. Columns (7), (8) and (9) report the minimum, average and maximum values for the whole sample, respectively.

Panel A illustrates that the mean ARETs increase as the event horizon expands. The average insider returns of the buy sample for a period of 60 days [0 to 60], denoted ARET60, is recorded at 0.69%. This value increases to 2.03% as the event period extends to 180 days (ARET180). Meanwhile, the mean value of ARET60 for the sell sample is recorded at 1.07% for the horizon [0 to 60] and increases to −2.93% for the full horizon [0 to 180]. This indicates that the market reacts positively to insider purchases and negatively to insider sales as the event window lengthens, suggesting that equity markets see insider trading as signaling emergent corporate value. On average, cumulative abnormal returns of insiders' sales are higher than those of the buy sample, implying that markets react to negative inside information more strongly than the positive information heralded by purchases.

Panel B presents summary statistics of the other eight independent variables included in the probit model. To minimize the effect of outliers, we winsorize all continuous variables at the 1st and 99th percentiles. The mean CEO pay disparity proxied by the CEO pay slice, CPS, of our purchase sample is slightly lower than that of the sale sample. The lowest-paid CEO receives 1.2% of the total cash payment to the top management team, while the best-paid is recorded as earning a salary equal to the sum of the top five executives' combined pay. The data for CEO age lies between 32 and 81 with an average age of 54. CEO tenure varies, with the shortest duration being 1 year while the longest is nearly 30 years, and the average period that a CEO remains in office is 5.7 years, which is consistent with this value recorded in subsamples. Panel B reports that 15.9% of CEOs also hold the Chair

of their boards on average. This ratio is 16.3% and 15.4% for insider purchase and sale samples, respectively.

Table 3. Descriptive Statistics.

PANEL A: Average abnormal returns									
	Buy Sample			**Sell Sample**			**Full Sample**		
	N	**Mean**	**St. Dev.**	**N**	**Mean**	**St. Dev.**	**Min**	**Mean**	**Max**
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**	**(9)**
ARET60	2360	0.695	8.82	2344	1.07	7.695	−54.835	−0.185	82.229
ARET90	2360	1.056	11.647	2344	1.634	10.225	−79.963	−0.284	122.337
ARET120	2360	1.65	15.186	2344	2.128	13.529	−121.966	−0.233	175.345
ARET150	2360	1.833	18.127	2344	2.707	15.798	−163.54	−0.429	199.956
ARET180	2360	2.031	20.369	2344	2.935	18.411	−199.974	−0.444	265.564
PANEL B: Other independent variables									
Ind. Variables	**Buy Sample**			**Sell Sample**			**Full Sample**		
	N	**Mean**	**St. Dev.**	**N**	**Mean**	**St. Dev.**	**Min**	**Mean**	**Max**
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**	**(9)**
CPS	2050	0.468	0.215	2058	0.474	0.22	0.012	0.471	1
CEOAGE	2056	54.126	5.904	2062	54.133	5.885	32	54.129	81
TENURE	2093	5.698	4.855	2098	5.717	4.855	1	5.708	29.7
DUAL	2208	0.163	0.37	2213	0.154	0.361	0	0.159	1
ACCRUALS	2541	0.007	0.075	2546	0.006	0.074	−0.93	0.007	0.576
OCFPS	2518	1.749	4.833	2518	1.771	4.59	−38.085	1.76	87.763
QRATIO	2215	1.667	0.978	2220	1.677	0.977	0.557	1.672	13.856
SIZE	2460	9.507	1.344	2464	9.483	1.348	4.44	9.495	13.381

Notes: This Table reports descriptive statistics (i.e., mean, median, and standard deviation) for a sample of insider transactions executed by non-CEO directors between 2008 and 2016. Panel A presents a summary of ARETs in 5 event periods in percentage terms; Panel B reports summary statistics of other independent variables; CPS is a proxy of CEO pay disparity, the CEO's pay slice, measured as a ratio of the total CEO pay divided by the total pay of top five executives. CEOAGE is the CEO's age in year t; TENURE is CEO tenure, equals the number of years the CEO has taken the position; DUAL is CEO duality, coded 1 if the CEO has also taken the position of Chair of the Board, and 0 otherwise. ACCRUALS is the difference between earnings and cash flows; OCFPS is operating cash flow per-share. QRATIO is measured by the Tobin Q ratio of a firm. SIZE is defined as the firm size as measured by the natural logarithm of the total market capitalization of a firm.

Table 3 provides summary statistics of the firm-specific variables. There are slight differences in the mean and standard deviation between the two subsamples. Specifically, the mean values of ACCRUALS and SIZE are recorded at 0.007 and 9.507 for the buy sample, compared to 0.006 and 9.485 for the sell sample. The average values of OFCPS and QRATIO of the buy sample are 1.749 and 1.667. These are slightly lower than those of the sell sample, which are 1.771 and 1.677, respectively.

4.1.4. Correlation Between Variables

Figures 1 and 2 report correlation coefficients of Buy and Sell samples between the main independent variables and control variables. To simplify, we use ARET90 (the average insider abnormal returns of the 90-day event period) as a representation of the average insider returns of non-CEO executives. At a glance, it is clear that the highest correlation coefficient in Figures 1 and 2 is 0.31, implying that there is no multicollinearity in our models. This coefficient is observed for the association between CEO age and duality for both subsamples, indicating that older CEOs are more likely to hold the board chair. Lagged CPS and firm size exhibit a significant and negative association with a correlation coefficient of −0.17 and −0.18 for the buy and sell samples, respectively. This suggests that larger firms tend to have a smaller pay disparity between the CEO and other executive directors. Similar results are observed in the correlation between firm size and each of the variables, CEOAGE, DUAL and lagged OCFPS. In particular, CEOAGE and SIZE have a

correlation coefficient of 0.28, suggesting that larger firms tend to hire more experienced CEOs. The coefficient of 0.27 between firm size and CEO duality indicates that more CEOs Chair boards for larger companies. The positive correlation between SIZE and OCFPS_1 reveals that larger firms usually generate higher amounts of operating cash flow.

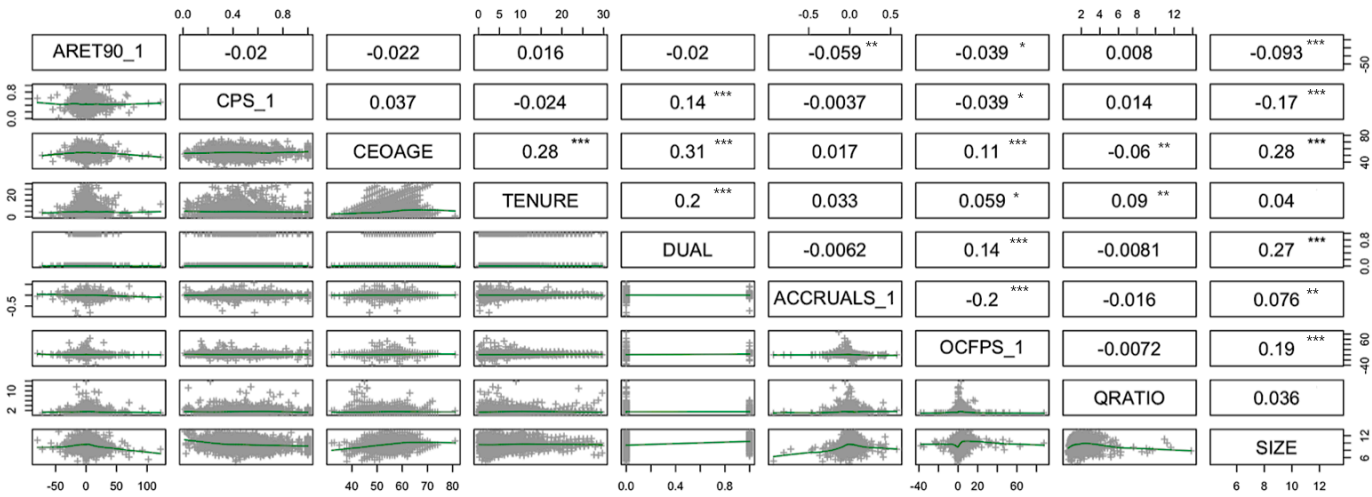

Figure 1. Correlations coefficients of the insider buy sample. Notes: This Figure displays the correlation coefficients between our independent variables and their scatter plots with a fitted line. A star indicates the test is significant at the 10% confidence interval, ** significant at the 5% confidence interval and finally, *** significant at the 1% confidence interval.

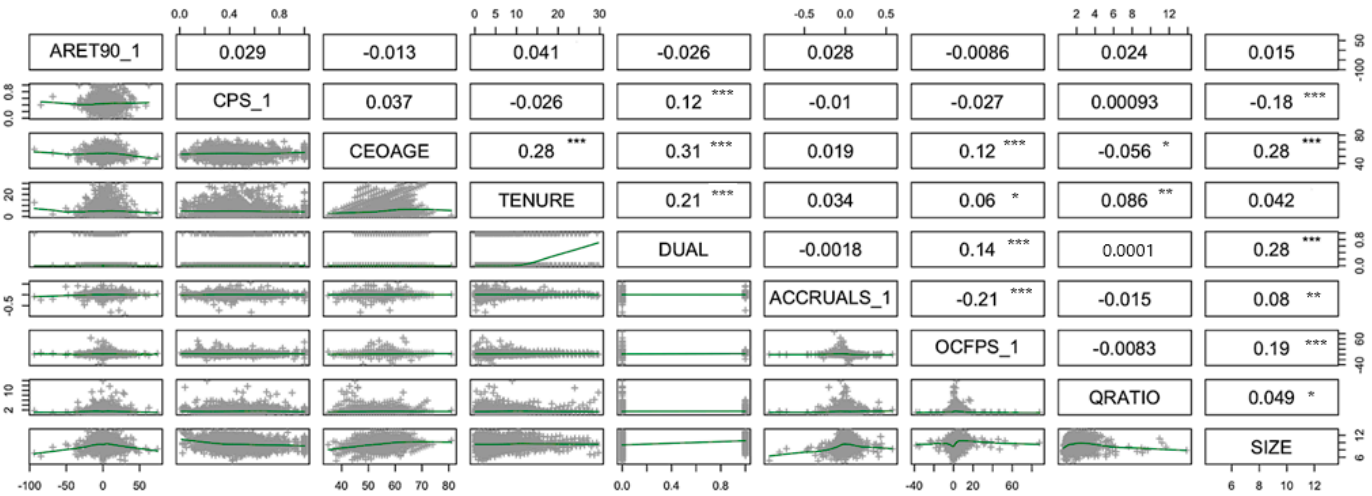

Figure 2. Correlations coefficients of insider sell sample. Notes: This Figure displays the correlation coefficients between our independent variables and their scatter plots with a fitted line. A star indicates the test is significant at the 10% confidence interval, ** significant at the 5% confidence interval and finally, *** significant at the 1% confidence interval.

The correlation coefficients between lagged average insider returns and the other variables differ significantly between the two Figures. Figure 1 reports a significant and negative relationship between lagged average insider returns denoted as ARET90_1, ACCRUALS_1 and SIZE, whereas we find no significant associations between ARET90_1 and the other variables. Figures 1 and 2 document low correlation coefficients between the variables. This mitigates any multicollinearity concerns that could affect our regression results.

4.2. Main Analysis

4.2.1. Insider Purchases

Table 4 presents the results of our probit regression analysis examining the relation between CEO turnover and our variables of interest for the insider purchase subsample. The first five columns of the Table display the regression results for five event horizon periods from [0–60] days to [0–180] days. The numbers in square parentheses show the length of the event period, corresponding to each of the average insider abnormal returns (ARETs) in different models. For instance, [0–60] and [0–180] denote the corresponding ARET of 60-day and 180-day event periods for models (1) and (5), respectively. Columns (6) to (10) report the implied marginal effects, which give the impact upon the probability of a CEO departing of a one-unit increase in an explanatory variable when other variables are held at their mean values. To account for potential heteroscedasticity and serial correlation for individual firms over time, robust standard errors are calculated. The Table shows evidence of a negative and significant association between CEO turnover and the CEO pay slice. CPS, in all the regression models, suggests that an increase in pay disparity between the CEO and other board executives in the top management team leads to greater entrenchment of the CEO. This result is consistent with the managerial power theory that argues executive pay disparity reflects the concentration of the CEO's power. A larger pay disparity represents a greater ability of the CEO to capture managerial power, thereby cementing their position (Bebchuk et al. 2011; Chen et al. 2013). For instance, the marginal effects in model (3), summarized column (7), imply that an increase of 1% in CPS can cause a decrease of 7.7% in the probability of CEO turnover.

The results in Table 4 also demonstrate a significant and negative correlation between ARETs of the 60-day and 90-day event periods and CEO turnover, supporting hypothesis H3. This negative coefficient implies that the returns of non-CEO executive stock purchases in the previous year are a credible signal of the likelihood of CEO departure each year. In other words, the firms with greater insider buying returns are less likely to experience CEO turnover, and vice versa. For example, the results in model (2) suggest that a decrease of 1% in insider returns is a signal of a 0.4% increase in the probability that a CEO exits the firm (estimated marginal effects reported in model (2). These results confirm our conjecture in the first hypothesis that insider returns from stock purchases by non-CEO executives reduce the likelihood of CEO turnover. However, this relation is only significant in models (1) and (2), suggesting that the insider returns of longer event windows are not predictive of CEO turnover.

Although both CPS and insider returns have a significant negative effect on the probability of CEO turnover, support our hypotheses H1 and H3, the interaction term between these two variables is positive and significant at the 5% confidence level for models (1) and (2), support our hypothesis H6. This finding indicates that the higher the CPS, the more positive the effect of insider returns is on the probability of CEO turnover. The positive coefficient on the interaction term implies that CEOs in firms with larger CEO pay disparity and higher informative insider purchases are more likely to depart from their positions. CEOs in higher pay disparity firms may neglect their main duties and opportunistically focus on capturing the pay process of the firm to pursue their own agendas, potentially reducing their firms' performance and damaging corporate governance structures (Bebchuk et al. 2011; Park 2017). Furthermore, CEOs within high CPS firms have a greater tendency to obstruct effective CEO succession planning by obstructing the career development of rivals for their job. This constrained competition for the CEO position may lead other executives to look for alternative income streams by exploiting inside information for personal gains. Dai et al. (2016) argue that insiders in poorly governed firms are more likely to exploit inside information. Therefore, we can conclude that the probability of CEO turnover in firms with uncertain growth prospects increases with the returns of insider purchases when there is a positive effect of the CPS of that firm.

The positive coefficient of ln CEOAGE indicates that older CEOs are more likely to leave, often via retirement. This result concurs with the results reported by Coates

and Kraakman (2010). Furthermore, the positive relation between CEO tenure and CEO turnover suggests that CEOs with longer tenure are more likely to be dismissed, potentially due to their weakness becoming more apparent to boards over time. Alternatively, it is possible that departing is simply less troublesome for longer-tenure CEOs (who may often just retire). These results differ from those of Jenter and Kanaan (2015). Another CEO characteristic worth examining is CEO duality (DUAL), which exhibits a significantly negative relationship with CEO departure, implying that CEOs who simultaneously hold the position of a Board chair possess greater managerial power, making them less likely to be dismissed. This finding intuitively supports the notion that duality empowers the CEO and hinders the initiation of CEO turnover by the board.

Table 4. Insider returns, executive pay disparity and CEO turnover—Results from the main regression model—buy sample.

| | Dependent Variable: CEO Turnover | | |

For an inspection of CEO characteristics variables, our results show that the likelihood of CEO turnover is significantly and positively associated with CEO age and tenure, both at the 1% confidence level. The positive coefficient of lnCEOAGE indicates that older CEOs have a greater tendency to be replaced. This discovery is consistent with the results reported by Coates and Kraakman (2010). Furthermore, the positive relation between CEO tenure and CEO turnover suggests that CEOs with longer tenure are more likely to be dismissed, potentially due to their weakness becoming more apparent to boards over time. Alternatively, it is possible that departing is simply less troublesome for longer-tenure CEOs. These results differ from those of Jenter and Kanaan (2015). Another CEO characteristic is CEO duality (DUAL). The results in Table 4 report a significantly negative relationship between CEO departure and DUAL. This finding intuitively supports the notion that duality empowers the CEO and hinders the initiation of CEO turnover by the board.

Regarding the firm characteristics, our results provide evidence supporting our above conclusions in relation to CEO turnover. The coefficients of lagged earnings management (ACCRUALS_1) are positive and significant at the 1% level for all event windows, while lagged operating cash flow per share (OCFPS_1) is negatively associated with CEO turnover at the 10% level of significance for all cases for except model (3). The evidence of the negative relationship between ACCRUALS_1 and CEO turnover suggests that CEOs may attempt to increase reported earnings via accruals management to secure their reputation and retain their CEO positions. A negative coefficient on OCFPS_1 indicates that a firm's bad performance may induce a CEO dismissal. With respect to firm size and growth, we find no evidence of the relationship between these two variables and the likelihood of CEO departure, suggesting that the probability of CEO dismissal is broadly equal among firms, varying by size or growth prospects.

Overall, the regression results for the insider buying sample support the managerial power theory perspective and are consistent with our first hypothesis that insider returns credibly signal future CEO departures. The results also report the significance of interaction terms, suggesting that an increase in CEO managerial power, driven by the CPS, is likely to deepen the CEO's entrenchment. Interestingly, a positive coefficient on the interaction term of these two variables suggests that an increase in insider buying returns, with a positive effect of the CPS, may worsen a firm's prospects, hence increasing the likelihood of the CEO's dismissal.

4.2.2. Insider Sales

To investigate whether the impact of insider sales returns on CEO turnover differs from those of insider purchasing returns, we repeat our empirical analysis for the sell subsample across the five horizons. The results of our investigations are reported in Table 5. The first five columns of Table 5 display the estimates for five event windows from [0–60] days to [0–180] days, corresponding to five average abnormal returns from ARET60 to ARET180. Our results provide no evidence of the direct relationship between CEO pay disparity (CPS_1) and the probability of CEO turnover for the sell sample, rejecting hypothesis H2. In contrast to the results for insider returns for the buy sample, the significant and positive coefficients on insider return variables of the five models demonstrate that returns of insider stock sales are significantly and positively associated with an increasing likelihood of CEO dismissal. This supports Hypothesis 4, which conjectures a positive association between CEO turnover and returns of insider sales. The positive coefficients on ARETs imply that insider selling returns are also a credible signal of impending future CEO turnover, indicating that insiders may exploit their insider information about the poor performance of CEOs before turnover events.

Despite the lack of evidence on the direct impact of CEO pay disparity on CEO dismissals within the insider sales sample, the interaction term $\left(ARET_1_{i,t-1} - mean\ ARET_1_{i,t-1}\right) * \left(CPS_{1\,i,t-1} - meanCPS_{1i,t-1}\right)$, shows that CPS has a negative impact on the relation be-

tween insider selling returns and the probability of CEO turnover, consistent with our hypothesis H5. A negative coefficient on the interaction term in all five models suggests that a decrease compared to the previous year's CEO pay slice (CPS_1) leads to a stronger positive association between insider stock sale returns and the probability of a CEO dismissal. For instance, the coefficient of (ARET90_1*CPS_1) in model (2) [marginal effects estimation reported in model (6)] reports a negative association between returns of insider sales for the 90-day window and CEO turnover. This relationship is statistically significant at the 1% level for all four models. This means that an increase of 1% in insider selling return can increase the probability of a CEO being dismissed by 0.1% when the CPS of the firm falls by 1%. This probability only increases by 0.5% when there is no effect of CPS.

Table 5. Insider returns, executive pay disparity and CEO turnover—Results from the main regression model—sell sample.

	Dependent Variable: CEO Turnover									
	Coefficients					Marginal Effects				
	[0–60]	[0–90]	[0–120]	[0–150]	[0–180]	[0–60]	[0–90]	[0–120]	[0–150]	[0–180]
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
CPS_1	−0.339	−0.32	−0.339	−0.343	−0.349	−0.055	−0.052	−0.055	−0.056	−0.058
	(0.121)	(0.144)	(0.120)	(0.117)	(0.110)	(0.119)	(0.142)	(0.118)	(0.114)	(0.108)
ARET60_1	0.036 **					0.005 **				
	(0.018)					(0.017)				
INTERACTION60	−0.075 **					−0.012 **				
	(0.013)					(0.012)				
ARET90_1		0.032 ***					0.005 ***			
		(0.005)					(0.004)			
INTERACTION90		−0.066 ***					−0.010 ***			
		(0.004)					(0.003)			
ARET120_1			0.019 **					0.003 **		
			(0.011)					(0.010)		
INTERACTION120			−0.040 **					−0.006 **		
			(0.011)					(0.010)		
ARET150_1				0.016 **					0.002 **	
				(0.021)					(0.019)	
INTERACTION150				−0.029 **					−0.004 **	
				(0.037)					(0.036)	
ARET180_1					0.012 **					0.002 **
					(0.033)					(0.032)
INTERACTION180					−0.022 *					−0.003 *
					(0.057)					(0.059)
lnCEOAGE	3.168 ***	3.213 ***	3.214 ***	3.239 ***	3.228 ***	0.520 ***	0.525 ***	0.528 ***	0.534 ***	0.534 ***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
lnTENURE	0.262 ***	0.259 ***	0.258 ***	0.253 ***	0.253 ***	0.043 ***	0.042 ***	0.042 ***	0.041 ***	0.041 ***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
DUAL	−0.666 ***	−0.661 ***	−0.656 ***	−0.657 ***	−0.657 ***	−0.082 ***	−0.081 ***	−0.081 ***	−0.081 ***	−0.082 ***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
ACCRUALS_1	−1.945 ***	−1.993 ***	−2.024 ***	−2.014 ***	−2.016 ***	−0.319 ***	−0.325 ***	−0.332 ***	−0.332 ***	−0.333 ***
	(0.003)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.001)	(0.001)	(0.001)	(0.001)
OFCPS_1	−0.018	−0.020 *	−0.020 *	−0.019	−0.018	−0.002	−0.003 *	−0.003 *	−0.003	−0.003
	(0.140)	(0.095)	(0.088)	(0.116)	(0.131)	(0.138)	(0.094)	(0086)	(0.115)	(0.129)
Qratio	0.015	0.014	0.014	0.015	0.014	0.002	0.002	0.002	0.002	0.002
	(0.743)	(0.761)	(0.763)	(0.745)	(0.763)	(0.743)	(0.760)	(0.762)	(0.744)	(0.762)
SIZE_1	−0.011	−0.01	−0.007	−0.009	−0.01	−0.001	−0.001	−0.001	−0.001	−0.001
	(0.766)	(0.795)	(0.854)	(0.809)	(0.793)	(0.765)	(0.794)	(0.853)	(0.808)	(0.792)
Constant	−13.937 ***	−14.135 ***	−14.153 ***	−14.229 ***	−14.169 ***					
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)					
Observations	1591	1591	1591	1591	1591					

Notes: This Table reports the probit and marginal effects estimations for CEO turnover for the five different horizons of insider purchases. Columns (1) to (5) report the probit coefficients and columns (6) to (10) report the marginal effects; CPS_1 is a proxy of one year lagged CEO pay disparity, measured as a ratio of the total CEO pay divided by the sum of top five executives pay; ARETs with suffix [60_1 to 180_1] are the lagged average abnormal returns of non-CEO executives for different horizons from 60 to 180-day period, respectively; lnCEOAGE is the natural logarithm of the CEO age in the year t; lnTENURE, proxies for CEO tenure, is the natural logarithm of the number of years that CEO have taken the position; DUAL is CEO duality, coded 1 when the CEO also held the board chair position, 0 otherwise. The variable ACCRUALS_1 is lagged accruals defined as the difference between earnings and cash flows; OCFPS_1 is the lagged operating cash flow per-share. QRATIO is measured by the Q-ratio of a firm. SIZE_1 is the firm size in year $t-1$, measured as the natural logarithm of the total market capitalization of a firm. p values are reported in parentheses below the coefficient estimates. The symbols ***, ** and * indicate statistical significance at the 1%, 5% and 10% levels, respectively.

Our results of ARETs estimations provide supportive evidence for how the presence of a tournament prize influences managerial pay. A negative coefficient on the interaction term of CPS and insider selling returns shows that within-board pay disparity incentivizes the potential replacement of the CEO within the current board. Lower pay disparity may demotivate CEOs to work hard to retain their place, discouraging other executives from competing for promotion. As a result, a lower incentive prize effectively increases other executives' impatience, leading them to seek other income streams earned by exploiting their inside information regarding their firms' poor performance. When this occurs at the same time, as a higher threat of CEO dismissal following poor performance increases, the likelihood of CEO turnover increases.

Our results in Table 5 also provide similar signs, statistical significance, and magnitudes of CEO and firm characteristics as previously reported for the insider purchase sample in Table 4. Positive coefficients on CEO age and tenure suggest firms with older and longer tenure CEOs have a higher likelihood of their CEO departing the firm. A negative coefficient on DUAL implies that firms with CEOs who are also the board chair are less likely to be dismissed than other CEOs. The negative associations between CEO turnover and two other variables, ACCRUALS_1 and OCFPS_1, support our conclusion on the impact of the interaction term.

Overall, the results of our insider sale sample support our hypotheses H4 and H6. The positive relation between insider trading and the probability of CEO turnover suggests that non-CEO executives tend to exploit insider bad news about their firms prior to a CEO's dismissal, whereas the interaction between CEO pay disparity and insider returns provides evidence of pay disparity's role in setting the incentive prize. This implies that firms with a lower CPS demotivate a CEO to remain in the post and lessen the incentives to other executives to compete for the CEO position. The CEO's demotivation may cause a higher probability of CEO exit, while an increase in impatience incentivizes other executives to exploit inside information.

4.3. Further Analysis

First, in order to check whether the pay disparity can cause changes in CEOs, we examine the relationship between turnover and different levels of CPS. We employ the two-sample Kolmogorov–Smirnov test (K-S test) between the top and bottom deciles of CEO tenure lengths ranked by CPS in both buy and sell subsamples. High and low CPS are defined respectively for the top and bottom deciles of CPS at different levels of 10%, 20%, 30% and 40% sample deciles. By employing different two-sample K-S tests at various sample deciles, we found only significantly different means between the 10% upper and bottom CEO tenure length, ranked by CPS for the buy sample. This implies that CEOs in high CPS firms have shorter tenures than those of low CPS firms.

Figure 3 depicts the cumulative distribution of CEO tenure length, conditional upon high and low CPS. The solid line plots the kernel estimate of the distribution for the upper 10% of CEO episodes ranked by CPS, whereas the dashed line corresponds to the bottom 10%. The two-sample Kolmogorov–Smirnov test confirms the visual impression that the two samples are drawn from different distributions. The cumulative distribution for the high CPS subsample is significantly above the distribution for the low CPS sample. This implies that the likelihood of a CEO having a tenure length of less than any number of years is higher for CEOs of firms with a higher CPS than for the CEOs leading firms with low CPS.

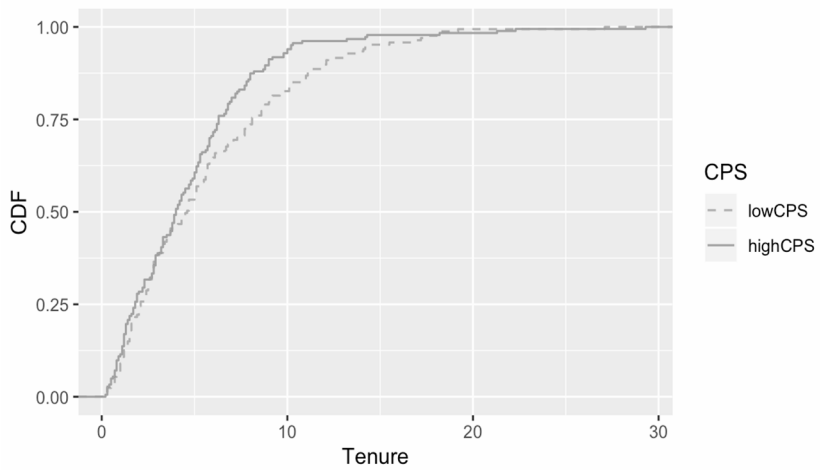

Figure 3. Distribution of CEO tenure conditional on CEO pay disparity (CPS). The Figure depicts the kernel estimate of the empirical cumulative distribution of CEO tenure length (TENURE) for two subsamples conditional on the CEO pay slide. The first subsample (lowCPS) consists of the bottom decile of CEO tenure sorted by CPS; the corresponding distribution is plotted as a dashed/red line. The second subsample (highCPS) consists of the top decile of CEO tenures when sorted by CPS rankings; the corresponding distribution is plotted as a solid line.

Second, we retest our implications by computing probit models, including dummy variables classifying CPS for the buy transactions and age and tenure for both the buy and sell samples. To examine whether the impact of high CPS on CEO turnover is different to that of the low CPS/buy sample, we include a dummy variable called HighCPS. This is coded 1 if the CPS lies in the top 10% decile of the subsample. The dummy variable mid-CPS is defined as the medium CPS, which is coded 1 if CPS lies between 10% of the top and 10% of the bottom deciles within the buy subsample. Low CPS lies in the bottom 10% decile, which acts as a comparator group in the analysis. Voluntary turnover is often presented as retirements induced by poor health or death, while forced turnover occurs when the CEO is forced out of their position or departs due to policy differences. To determine whether the CEO turnover was forced or voluntary, we follow prior studies (see, among others, Jarva et al. 2019) in defining forced turnover if the CEO's age is less than 60 and voluntary if the CEO's age is at or above 60. We also include a dummy variable capturing cute CEO tenure. In order to control for different CEO tenures, we classify the CEOs as old CEOs if their tenure is at or above the sample median and as new CEOs if their tenure is below the sample median.

Results for our buy and sell samples are reported in Tables 6 and 7, respectively. For brevity, we only report the coefficients on the main variables ARETs and CPS and the mentioned additional variables. Table 6 shows the coefficients of insider buying returns ARETs and CEO pay disparity CPS_1 and the interaction between them across the five horizons. These findings are similar to corresponding values documented in Table 4 in terms of both their sign and statistical significance. Similarly, CPS_1 is significantly and negatively associated with CEO turnover, while the significant relations between CEO turnover and insider returns and the interaction terms are recorded for only models (1) and (2). The coefficients on the dummy variable for high CEO pay disparity, HighCPS, are significant and positive at the 10% level for the four models, indicating that CEOs in the firms with high CEO pay disparity are more likely to be dismissed than those in the firms with low pay disparity. The results show further evidence to confirm the previous findings that insider buying returns and CEO pay disparity have a negative impact on CEO turnover. An increase in insider returns may be positively related to CEO turnover when the CEO pay disparity is higher.

Table 6. Insider returns, executive pay disparity and CEO turnover—Additional analysis—buy sample.

	Dependent Variable: CEO Turnover									
	Coefficients (*p*-Value)					Marginal Effects (*p*-Value)				
	[0–60]	[0–90]	[0–120]	[0–150]	[0–180]	[0–60]	[0–90]	[0–120]	[0–150]	[0–180]
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
CPS_1	−1.004 **	−0.984 **	−0.965 **	−0.972 **	−0.985 **	−0.162 *	−0.159 **	−0.157 **	−0.158 **	−0.160 **
	(0.011)	(0.013)	(0.014)	(0.013)	(0.012)	(0.051)	(0.011)	(0.013)	(0.012)	(0.011)
ARET60_1	−0.026 *					−0.004 **				
	(0.053)					(0.011)				
INTERACTION60	0.061 **					0.009 **				
	(0.026)					(0.025)				
ARET90_1		−0.025 **					−0.004 **			
		(0.018)					(0.016)			
INTERACTION90		0.049 **					0.008 **			
		(0.023)					(0.022)			
ARET120_1			−0.01					−0.0016		
			(0.229)					(0.228)		
INTERACTION120			0.019					0.0031		
			(0.255)					(0.254)		
ARET150_1				−0.01					−0.0016	
				(0.150)					(0.149)	
INTERACTION150				0.019					0.00309	
				(0.157)					(0.156)	
ARET180_1					−0.009					−0.001
					(0.123)					(0.122)
INTERACTION180					0.02					0.003
					(0.105)					(0.103)
HighCPS	0.590 *	0.597 *	0.589 *	0.584	0.588 *	0.127 *	0.129 *	0.128 *	0.126 *	0.127 *
	(0.099)	(0.095)	(0.099)	(0.101)	(0.100)	(0.097)	(0.883)	(0.087)	(0.094)	(0.098)
MidCPS	0.117	0.121	0.108	0.109	0.112	0.018	0.018	0.016	0.0169	0.017
	(0.512)	(0.501)	(0.545)	(0.541)	(0.532)	(0.490)	(0.470)	(0.520)	(0.521)	(0.51)
AGE60	0.597 ***	0.600 ***	0.607 ***	0.607 ***	0.606 ***	0.123 ***	0.124 ***	0.012 ***	0.126 ***	0.125 ***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
HighTENURE	0.658 ***	0.643 ***	0.635 ***	0.642 ***	0.643 ***	0.105 ***	0.102 ***	0.102 ***	0.103 ***	0.103 ***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
CONTROLS	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Constant	−0.409 ***	−0.342 ***	−0.343 ***	−1.338 ***	−1.345 ***					
	(0.002)	(0.003)	(0.003)	(0.003)	(0.003)					
Observations	1582	1582	1582	1582	1582					

Notes: This Table reports the probit and marginal effects estimations for CEO turnover for the five different horizons for insider purchases. Columns (1) to (5) report the probit coefficients, and columns (6) to (10) report the marginal effects; CPS_1 is a proxy of one year lagged CPS, measured as a ratio of the total CEO pay divided by the sum of total pay for the top five executives; ARETs with suffix [60_1 to 180_1] are the lagged average abnormal returns of non-CEO executives for different horizons from 60 to 180-day period, respectively; HighCPS is High CEO pay disparity coded 1 if the CPS lies in the top 10% sample deciles. MidCPS is medium CEO pay disparity coded 1 if the CPS lies between the top and bottom 10% of sample deciles. AGE60 is coded 1 if the CEO's age is at or above 60. HighTENURE is coded 1 if the CEO's tenure is at or above the sample median. CONTROLS is a shorthard for other control variables, being coded"Yes"/"No" if the estimations are similar/dissimilar to the main regression results. *p*-values are reported in parentheses below the coefficient estimates. The symbols ***, ** and * indicate statistical significance at the 1%, 5% and 10% levels, respectively.

The coefficients on the dummy variables AGE60 and HighTENURE provide further evidence that CEOs who are older than 60 with longer tenure have a greater tendency to depart than their younger peers. With regards to CEO age, the results of our sample suggest that the probability of a voluntary CEO turnover (e.g., retirements, poor health or death, etc.) is larger than forced CEO turnover. A positive coefficient on the high tenure dummy variable confirms our findings that a more entrenched CEO with longer tenure has often exposed their weakness to boards, hence increasing the likelihood of dismissal.

Table 7 presents the results for the insider sale subsample of probit and marginal effects estimations with the inclusion of the dummy variables for the CEO's age and tenure. The Table shows results similar to those of the CPS_1, ARETs_1, and control variables reported in Table 5 in terms of both sign and statistical significance. Similar to the results of our buy sample, the coefficients on the dummy variables AGE60 and HighTENURE are significant and positive in relation to the probability of CEO turnover. The results also confirm our findings from the previous section.

Table 7. Insider returns, executive pay disparity and CEO turnover—Additional analysis—sell sample.

	Dependent Variable: CEO Turnover									
	Coefficients					Marginal Effects				
	[0–60]	[0–90]	[0–120]	[0–150]	[0–180]	[0–60]	[0–90]	[0–120]	[0–150]	[0–180]
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
CPS_1	−0.003	−0.003	−0.003	−0.003	−0.003	−0.0004	−0.0004	0.0005	−0.0005	−0.0005
	(0.182)	(0.200)	(0.164)	(0.161)	(0.152)	(0.180)	(0.198)	(0.167)	(0.158)	(0.15)
ARET60_1	0.036 **					0.006 **				
	(0.019)					(0.017)				
INTERACTION60	−0.001 **					−0.0001 **				
	(0.014)					(0.0126)				
ARET90_1		0.029 ***					0.0048 ***			
		(0.009)					(0.008)			
INTERACTION90		−0.001 ***					−0.0001 ***			
		(0.007)					(0.006)			
ARET120_1			0.016 **					0.0027 **		
			(0.031)					(0.036)		
INTERACTION120			−0.0004 **					0.0002 **		
			(0.024)					(0.0239)		
ARET150_1				0.013 **					0.0021 **	
				(0.047)					(0.046)	
INTERACTION150				−0.0003 *					−0.0004 *	
				(0.061)					(0.059)	
ARET180_1					0.010 *					0.0016 *
					(0.080)					(0.079)
INTERACTION180					−0.0002					0.0015
					(0.102)					(0.102)
AGE60	0.602 ***	0.607 ***	0.603 ***	0.606 ***	0.606 ***	0.126 ***	0.127 ***	0.126 ***	0.127 ***	0.127 ***
	(0.000)	(0.000)	(0.00)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
HighTENURE	0.660 ***	0.653 ***	0.655 ***	0.661 ***	0.660 ***	0.0107 ***	0.106 ***	0.106 ***	0.108 ***	0.108 ***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
CONTROLS	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Constant	−1.554 ***	−1.574 ***	−1.582 ***	−1.564 ***	−1.548 ***					
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)					
Observations	1591	1591	1591	1591	1591					

Notes: This Table reports the probit and marginal effects estimations for CEO turnover for the five different event windows of insider purchases. Columns (1) to (5) report the probit coefficients, and columns (6) to (10) report the marginal effects; CPS_1 is a proxy of one year lagged CEO pay disparity, measured as a ratio of the total CEO pay divided by the total pay of the top five executives; ARETs with suffix [60_1 to 180_1] are the lagged average abnormal returns of non-CEO executives for different event windows from 60 to 180-day period, respectively; HighCPS is High CEO pay disparity coded 1 if the CPS lies in the top 10% sample deciles. MidCPS is medium CEO pay disparity coded 1 if the CPS lies between the top and bottom 10% of sample deciles. AGE60 is coded 1 if the CEO's age is at or above 60. HighTENURE is coded 1 if the CEO's tenure is at or above the sample median. CONTROLS is shorthand for other control variables, coded "Yes"/"No" if the estimations are similar/dissimilar to the main regression results. *p*-values are reported in parentheses below the coefficient estimates. The symbols ***, ** and * indicate statistical significance at the 1%, 5% and 10% levels, respectively.

5. Conclusions

This paper discusses the impact of CEO pay disparity and insider trading on CEO turnover, focusing on turnover driven by either managerial power or tournament incentives. The findings presented in this study contribute significantly to enhancing its overall persuasiveness. Under the managerial power theory, the pay disparity between CEO and non-CEO executives reflects the CEO's power to influence the pay-setting process and obstruct/frustrate effective CEO succession planning in order to maintain his position. Under tournament theory, the CEO pay disparity represents a huge incentive for other executives who compete for the CEO position, thereby increasing the likelihood of CEO turnover in favour of a rival within the board. The assumption is that non-CEO executives in firms with excessive managerial power in setting CEO pay tend to have greater returns from insider stock purchases. However, these executives in firms with high CEO pay disparity, reflecting an attractive tournament prize, are more likely to earn higher returns from their stock sales.

Using a dataset of the firms listed on eight major indices of the most developed markets over an eleven-year period, we provide compelling evidence on the relation between the insider returns of non-CEO executives and the probability of CEO dismissal and the consequent impact of the CEO pay gap on this relationship. Our findings highlight several key insights.

First, in the insider purchases sample, we establish a close linkage between CEO turnover and the pay disparity between the CEO and other executives in the top management team. Notably, in the insider purchase sample, CEOs in firms with a large pay disparity exhibit a reduced likelihood of being dismissed. However, in the insider sales sample, we find no significant relationship between the managerial pay gap and turnover.

Second, our analysis reveals that an increase in insider purchase returns serves as a credible signal of CEO entrenchment. Conversely, an increase in insider selling returns among non-CEO executives acts as a credible signal for an impending CEO departure.

Furthermore, we uncover interesting results when examining the coefficients on the interaction term of CEO pay disparity and non-CEO executive returns. Although *insider buying returns* individually exhibit a negative association with CEO turnover, an increase in these returns, coupled with a positive effect on CEO pay, may worsen the firm's prospects, thereby increasing the likelihood of CEO dismissal. In addition, lower pay disparity can lead to the CEO's demotivation to remain and lessen the incentives of other executives to compete in the tournament, thereby encouraging them to seek out other incomes by exploiting inside information.

We believe that our study is the first to provide empirical evidence on the association between the probability of CEO turnover and insider returns of non-CEO executives. Furthermore, we demonstrate a significant impact of the interaction between the CEO pay gap and insider returns on the likelihood of CEO turnover. By elucidating the determinants of CEO turnover, a key variable in corporate finance and firms' managerial decisions, our research enriches the existing body of knowledge in the field. Importantly, our results remain robust even after controlling for the influence of the CEO characteristics often considered the most relevant to CEO turnover.

From a policy perspective, our study underscores the importance of transparent compensation practices and effective board oversight in mitigating CEO entrenchment and ensuring alignment with shareholder interests. Policymakers should consider regulations that promote equitable pay structures and accountability mechanisms, which can ultimately enhance organizational performance and stakeholder confidence. Additionally, organizations should cultivate a culture of open communication and fair competition to encourage talented executives to remain within the company while also addressing potential conflicts of interest that may arise from insider trading practices.

While our findings offer significant contributions, several limitations should be acknowledged. The reliance on data from developed markets may restrict the generalizability of our results to emerging markets with different corporate governance structures and cultural contexts. Future research should aim to explore these dynamics across diverse regulatory environments to enhance the applicability of our conclusions.

Author Contributions: Conceptualization, V.L. and A.-N.N.; Methodology, V.L.; Formal analysis, V.L. and A.-N.N.; Investigation, V.L. and A.-N.N.; Writing—original draft, V.L.; Writing—review & editing, V.L., A.-N.N., W.F. and A.G. All authors have read and agreed to the published version of the manuscript.

Funding: This research received no external funding.

Data Availability Statement: The data that support the findings of this study are available from the corresponding author upon reasonable request.

Conflicts of Interest: The authors declare no conflict of interest.

References

Anderson, Ronald W., Maria Cecilia Bustamante, Stephane Guibaud, and Mihail Zervos. 2018. Agency, firm growth, and managerial turnover. *Journal of Finance* 73: 419–64. [CrossRef]

Anginer, Deniz, Jinjing Liu, Cindy A. Schipani, and Hasan Nejat Seyhun. 2020. Should the CEO Pay Ratio be Regulated? *Journal of Corporation Law* 2: 471–514.

Bebchuk, Lucian, and Jesse Fried. 2004. *Pay Without Performance: The Unfulfilled Promise of Executive Compensation*. Cambridge, MA: Harvard University Press.

Bebchuk, Lucian A., Martijn Cremers, and Urs Peyer. 2011. The CEO pay slice. *Journal of Financial Economics* 102: 199–221. [CrossRef]
Bloomberg L.P. 2020. Insider Transactions, CEO Demographics, Corporate Governance Variables. Subscription Service from Middlesex University. Available online: https://www.bloomberg.org (accessed on 30 June 2020).
Bognanno, Michael L. 2001. Corporate tournaments. *Journal of Labor Economics* 19: 290–315. [CrossRef]
Bose, Arup, Debashis Pal, and David E. M. Sappington. 2010. Equal Pay for Unequal Work: Limiting Sabotage in Teams. *Journal of Economics and Management Strategy* 19: 25–53.
Brown, Stephen J., and Jerold B. Warner. 1985. Using daily stock returns: The case of event studies. *Journal of Financial Economics* 14: 3–31. [CrossRef]
Chan, Eric W., John H. Evans, and Duanping Hong. 2022. Losers of CEO Tournaments: Incentives, Turnover, and Career Outcomes. *The Accounting Review* 97: 123–48. [CrossRef]
Chen, Zhihong, Yuan Huang, and K. C. John Wei. 2013. Executive pay disparity and the cost of equity capital. *Journal of Financial Quantitative Analysis* 48: 849–85. [CrossRef]
Chung, Richard Yiu-Ming, Jed DeVaro, and Scott Fung. 2024. *Do Big Inequalities in Executive Pay Hurt Firm Performance?* Discussion Paper 17346. Bonn: Institute of Labor Economics.
Coates, John C., and Reinier Kraakman. 2010. CEO Tenure, Performance and Turnover in S&P 500 Companies. ECGI—Finance Working Paper No. 191/2007; Harvard Law and Economics Discussion Paper No. 595. Available online: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=925532 (accessed on 18 September 2024).
Conyon, Martin J., Simon I. Peck, and Graham V. Sadler. 2001. Corporate Tournaments and Executive Compensation: Evidence from the U.K. *Strategic Management Journal* 22: 805–15. [CrossRef]
Conyon, Martin J., Simon I. Peck, and Graham V. Sadler. 2011. New perspectives on the governance of executive compensation: A review. *Journal of Management and Governance* 15: 29–58. [CrossRef]
Dai, Lili, Renhui Fu, Jun-Koo Kang, and Inmoo Lee. 2016. Corporate governance and the profitability of insider trading. *Journal of Corporate Finance* 40: 235–53. [CrossRef]
Edmans, Alex, Xavier Gabaix, and Dirk Jenter. 2017. Executive Compensation: A Survey of Theory and Evidence. In *Handbook of the Economics of Corporate Governance*. Amsterdam: Elsevier, vol. 1, pp. 383–539.
Eriksson, Tor. 1999. Executive compensation and tournament theory: Empirical tests on Danish data. *Journal of Labor Economics* 17: 262–80. [CrossRef]
Frydman, Carola, and Dirk Jenter. 2010. CEO Compensation. *Annual Review of Financial Economics* 2: 75–102. [CrossRef]
Jarva, Henry, Juha-Pekka Kallunki, and Gilad Livne. 2019. Earnings performance measures and CEO turnover: Street versus GAAP earnings. *Journal of Corporate Finance* 56: 249–66. [CrossRef]
Jenter, Dirk, and Fadi Kanaan. 2015. CEO Turnover and Relative Performance Evaluation. *Journal of Finance* 70: 2155–84. [CrossRef]
Jenter, Dirk, and Katharina Lewellen. 2014. *Performance-Induced CEO Turnover*. Research Papers 3054. Stanford: Stanford University, Graduate School of Business.
Kaplan, Steven N., and Bernadette A. Minton. 2012. How Has CEO Turnover Changed? *International Review of Finance* 12: 57–87. [CrossRef]
Lambert, Richard A., David Larcker, and Keith Weigelt. 1993. The structure of organizational incentives. *Administrative Science Quarterly* 38: 438–61. [CrossRef]
Lazear, Edward P., and Sherwin Rosen. 1981. Rank-order tournaments as optimum labor contracts. *Journal of Political Economics* 89: 841–64. [CrossRef]
Lazear, Edward. P. 1989. Pay equality and industrial politics. *Journal of Political Economics* 97: 561–80. [CrossRef]
Le, Viet Phuong, Ann-Ngoc Nguyen, and Andros Gregoriou. 2022. Insider trading, gender diversity within the board room, CEO pay gap, and stock price crash risk. *International Journal of Finance & Economics* 29: 1378–400.
MacKinlay, A. Craig. 1997. Event Studies in Economics and Finance. *Journal of Economic Literature* 35: 13–39.
Masulis, Ronald W., and Shawn Mobbs. 2011. Are All Inside Directors the Same? Evidence from the External Directorship Market. *Journal of Finance* 66: 823–72. [CrossRef]
Niehaus, Greg, and Greg Roth. 1999. Insider Trading, Equity Issues, and CEO Turnover in Firms Subject to Securities Class Action. *Financial Management* 28: 52–72. [CrossRef]
Park, KoUn. 2017. Pay disparities within top management teams and earning management. *Journal of Accounting and Public Policy* 36: 59–81. [CrossRef]
Refinitive DataStream. 2020. Firm Financial Variables. Subscription Service by Middlesex University. Available online: https://www.lseg.com/en/data-analytics (accessed on 30 January 2020).
Rosen, Sherwin. 1986. Prizes and incentives in elimination tournaments. *American Economics Review* 76: 701–15.
Shen, Wei, Richard J. Gentry, and Henry L. Tosi. 2010. The impact of pay on CEO turnover: A test of two perspectives. *Journal of Business Research* 63: 729–34. [CrossRef]
Vo, Thi Thanh Nha, and Jean Milva Canil. 2016. CEO pay disparity: Efficient contracting or managerial power? *Journal of Corporate Finance* 54: 168–90. [CrossRef]
Warner, Jerold B., Ross L. Watts, and Karen H. Wruck. 1988. Stock Prices and Top Management Changes. *Journal of Financial Economics* 20: 461–92. [CrossRef]

Ye, Xiao. 2022. What Do Insiders Know? The Informational Content of Insider Trading Around Three Corporate Events. Ph.D. dissertation, University of London, London, UK.

Zajac, Edward. J., and James D. Westphal. 1996. Director Reputation, CEO-Board Power, and the Dynamics of Board Interlocks. *Administrative Science Quarterly* 41: 507–29. [CrossRef]

Disclaimer/Publisher's Note: The statements, opinions and data contained in all publications are solely those of the individual author(s) and contributor(s) and not of MDPI and/or the editor(s). MDPI and/or the editor(s) disclaim responsibility for any injury to people or property resulting from any ideas, methods, instructions or products referred to in the content.