Worth the Fight? The Role of Internal Competition on New CEOs' Compensation

Brian Blank

Mississippi State University

Brandy Hadley

Appalachian State University

Kristina Minnick

Bentley University

Mia L. Rivolta*

Xavier University

December 2017

Abstract

Using a comprehensive sample of CEO turnovers with internal successions at S&P 1500 firms, we evaluate CEO compensation by investigating how internal competition for the CEO position influences new CEOs' compensation. Although competitively selected CEO candidates expect a significant pay raise post promotion, this expectation is not realized. These new CEOs are compensated significantly less than departing CEOs. In addition to lower pay, CEOs hired through more competitive selection processes are associated with worse performance and shorter tenure. Our findings suggest competition for the CEO position influences compensation, as well as firm outcomes. These findings have important implications for CEO succession planning, compensation setting, and labor markets.

EFM Classification: 190; 150;

Key words: CEO Turnover; Executive Compensation; Tournaments; Board of Directors

---

*Corresponding author. Contact: Department of Finance, Williams College of Business, 227 Smith Hall, 3800 Victory Pkwy, Cincinnati, OH 45207, Email: rivoltay@xavier.edu. The authors would like to thank Andrew Karolyi, Renee Adams, Laurie Krigman, Lee Biggerstaff, Tracie Woidtke, Anand Venkateswaran, Jie Zhang, Yun Tang, and University of Tennessee seminar participants for their helpful comments.

1. Introduction

CEO compensation is important in aligning CEO incentives to those of shareholders. Much of the academic literature on CEO compensation seeks to identify and understand the determinants and variation of pay among executives. Yet, many questions remain on how compensation is determined and structured to induce effort and managerial performance. The tournament theory of CEO compensation posits that the potential prize (i.e., higher compensation) for the newly appointed CEO fosters competition among internal executives, which in turn, leads to better firm performance and ultimately higher firm value (Lazear and Rosen, 1981; Green and Stokey, 1983; Rosen, 1986). However, the tournament theory only serves as an effective motivation if the incoming CEO actually receives a raise, as implied by the high compensation of the departing CEO, both at the time of transition and when the departing CEO was first promoted.

Many empirical studies in the CEO compensation literature (Leonard, 1990; Lambert, Larcker, and Weigelt, 1993; Main, O'Reilly, and Wade, 1993; Eriksson, 1999; Bognanno, 2001; Conyon, Peck, and Sadler, 2001) evaluate the compensation setting and promotion process. However, without a direct measure of competition, it is unclear how the promotion process influences a newly appointed CEO's compensation, and the compensation outcome for the winning candidate remains an open empirical question. To our knowledge, no study has examined the role of competition in the compensation of the incoming CEO to determine whether the candidate receives the anticipated higher pay.

The purpose of this paper is to investigate how internal competition for the CEO position affects new CEO compensation and whether pre-promotion expectations set by tournament theory are justified. To this end, we use a proxy for competition that is new to the CEO compensation literature, but commonly used in CEO succession literature (Shen and Cannella, 2002a; 2002b; 2003; Zhang and Rajagopalan, 2004; Behn, Dawley, Riley, and Yang, 2006; Naveen, 2006). Specifically, we focus on CEO turnover events after the competition concludes to ascertain the relation between internal competition for the CEO position and compensation characteristics, controlling for potential endogeneity and sample selection bias. We also test the implications of the tournament theory of CEO compensation by examining the new CEO's pay structure. Finally, we ask whether competition for the CEO position relates to the new CEO's performance and tenure in the position. We focus on internal competition for the CEO position because most new CEOs are promoted from within a firm.[1]

[1] Masulis and Zhang (2014) observe that approximately two thirds of S&P 1500 CEOs are hired from within. In addition, a 2015 PwC *Strategy&* CEO success study states that firms promote CEOs internally in 80% of instances: "What are the world's largest companies looking for in their leaders?" PwC's Strategy&. https://www.strategyand.pwc.com/global/home/press/displays/ceo-success-study-2015

Using a comprehensive sample of 909 CEO turnover events with internal successions at S&P 1500 firms from 1999 to 2012, we first examine how internal competition impacts new CEO pay.[2] Prior research in CEO succession (Shen and Cannella, 2002a; 2002b; 2003; Zhang and Rajagopalan, 2004; Behn, et al., 2006; Naveen, 2006) classifies internal competition based on whether the new CEO is promoted through an heir apparent (i.e., a single manager being groomed for succession) or a horse race (i.e., multiple internal candidates competing in a tournament) succession process.[3] For example, General Electric (GE) and IBM both conducted horse race successions, allowing at least three internal executives to compete for the CEO position. In contrast, Microsoft selected a long time employee Steve Ballmer as Bill Gates' successor two years before Gates' retirement and 3M promoted a 30-year veteran Inge Thulin as the successor of George Buckley in 2012.[4] In addition to following prior literature, we review media coverage and SEC filings around CEO turnovers to manually verify succession methods and ensure the classification of heir apparent and horse race is accurate. Using this distinction, we analyze the impact of internal competition for the CEO position on new CEOs' compensation.

There are two competing theories on how competition for the CEO position may affect the CEO candidate's pay post promotion. The tournament theory of CEO compensation posits a positive relation between competition for the CEO position and the outgoing CEO's compensation. A higher level of compensation for the outgoing CEO encourages competition among executives vying for the CEO position (Lazear and Rosen, 1981; Bognanno, 2001; and Kale, Reis, and Venkateswaran, 2009). The increased competition is at least partially motivated by the expectation of receiving a compensation package similar to that of the outgoing CEO or a similar pay raise compared to when the outgoing CEO was first promoted. Labor market economists posit an alternative hypothesis. In situations when talent is scarce, companies seeking to hire top talent with a critical skill set expect to pay more for it when it is in short supply (Fulmer, 2009). However, when there is a surplus of capable internal CEO candidates, the surplus of talent and competition may drive down the final reward, resulting in lower pay upon promotion (Zhang and Rajagopalan, 2004). Additionally, CEO candidates may be more motivated by the utility generated from becoming the new CEO than by the prospect of higher financial compensation (Thomas, 2004).

[2] For the purpose of our study, we exclude forced CEO and unexpected CEO departures as well as turnover events in which an outside new CEO was promoted. In addition, we hand check all CEO turnover events covered in Execucomp and exclude all observations where the listed CEO was interim or without turnovers (i.e., executive name change).

[3] For instance, Naveen (2006) states that "a firm is defined as having a relay succession plan for a given year if it has a president or COO who is distinct from the CEO/chairman and is not older than the CEO/chairman."

[4] See e.g., Wall Street Journal article "IBM Crafts Succession Plan," June 12, 2011, and Pioneer Press article "New 3M CEO Inge Thulin signals he will continue Buckley's priorities for innovation," February 7, 2012.

Using our measure of internal competition, we provide insight into whether tournament theory or labor market theory correctly sets expectations for the post-promotion pay. Consistent with the tournament theory's proposition that larger pay differentials increase competition, we find that the outgoing CEO in horse race succession firms is paid $1.04 million more on average than their counterparts that use an heir apparent succession process. By contrast, we find no significant difference in pre-promotion compensation between horse race CEO candidates and heir apparent CEO candidates. Taken together, these findings support the notion that, prior to promotion, CEO candidates in horse race successions have high expectations regarding their potential future compensation (i.e., pay similar to the outgoing CEO upon promotion, based off not only the departing CEO's current pay, but also the pay the departing CEO received when first promoted).

However, this expectation is not realized in our analyses. We find that, compared to the departing CEO or a CEO selected through an heir apparent process, new CEOs selected through a more competitive internal process (i.e., horse race) do not receive higher financial compensation. Since these competitively hired CEOs are not rewarded with monetary gains, we also examine whether they are rewarded with reputational gains through increased access via external boards. We find that the horse race candidates hold fewer public and private board seats once they become CEOs, compared to their heir apparent counterparts. Although ex-ante, tournament theory sets expectations for the candidates, ex-post, labor market theory explains their actual pay. The competitive selection process actually reduces the size of the prize, leading to lower compensation upon promotion than anticipated.

Coles, Li, and Wang (2013) suggest that industries with steeper tournament structures (i.e., higher pay gap, pay ratio, and greater pay slices) influence CEO candidates' expectations for their compensation.[5] It is possible that although a CEO candidate may be in a horse race, they are not in an industry with a steep tournament structure. Therefore, their expectations for pay post promotion are low. Conversely, horse race candidates in steeper tournament environments may have higher expectations regarding their post promotion pay. To explore the role of industry tournament structure in setting CEO candidates' expectations for their pay post promotion as well as in the actual compensation outcome, we explore new CEOs' pay structure based on industry tournament structure, measured by the mean and median pay ratios. We find that although steeper tournaments prior to promotion suggest higher pay post promotion, this is not the actual outcome for new CEOs selected through a horse race. It is true, however,

[5] Steepness is the gradient of the difference between the CEO and the other executives . For instance, a CEO may be paid $2,000, which is not a large final prize, but if the other execs are only paid $1,000, the CEOs pay is 2x the others (i.e., steep). [5] CEO pay gap is the dollar difference between the pay of the CEO and that of the firm's next three highest paid executives, while the CEO pay slice is percentage of the total executive pay that the CEO receives. Finally, the CEO pay ratio is the ratio of the CEO's pay to the mean and median pay of the next four highest paid executives.

for new heir apparent CEOs. Heir apparent CEOs in high tournament industries are paid significantly more than their low tournament industry counterparts. These results suggest that, once again, although tournament structure may influence pre-promotion expectations, competition may actually reduce the size of the final prize.

Finally, we examine the impact of internal competition on subsequent firm performance. The tournament theory of CEO compensation suggests that competition is the catalyst for higher effort and greater payoffs for firms (e.g., Lazear and Rosen, 1981; Green and Stokey, 1983; and Kale, Reis, and Venkateswaran, 2009). The tournament theory literature shows that this higher effort from competitors is linked to better firm performance in certain cultures (Burns, Minnick, and Starks, 2017). Conversely, Qi (2011) finds that non-heir apparent successions are costly to the firm and the economy as a whole. We find that horse race CEO candidates experience long-run return-on-assets (ROA) that is approximately 9.3% lower than what their heir apparent peers experience. Additionally, the tenures of horse race CEOs with lower (i.e., below median) total compensation are significantly shorter than their heir apparent counterparts' tenure. We track the career paths of the new horse race CEOs who eventually leave their firms and find evidence that they depart to pursue better paying opportunities.

Asserting that new CEOs selected through horse race successions receive lower compensation and underperform, compared to new CEOs selected through an heir apparent succession, requires consideration of the endogenous nature of the CEO succession process. Indeed, because different firms in various industries can choose whether to carry out a horse race or heir apparent succession based on certain firm and industry characteristics, CEO succession strategy may not be exogenous. There is a possibility that our results are driven by a sample selection bias and the endogenous nature of succession, each entailing distinct solutions. In general, sample selection bias refers to problems where the dependent variable is observed only for a restricted, nonrandom sample, for instance firms that only use internal CEO candidates may be unique. In our empirical set-up, we only observe a CEO candidate's compensation within the firm if a firm has a CEO turnover and the incoming CEO is an employee of the firm. To test whether sample selection bias exists, we use a Heckman-two-stage estimation. We find that our results are not driven by a sample selection bias. Endogeneity refers to the fact that our horse race indicator is potentially a choice variable, correlated with unobservable traits relegated to the error term. To control for the endogenous nature of succession, we use a linear regression with endogenous treatment effects. In the first stage, we predict whether firms would use horse race succession based on instruments that determine competition but not compensation. Our results are stronger once we control for the endogenous nature of succession and compensation.

Our study makes several unique contributions to the literature on the compensation, labor market, and succession of CEOs. First, in a recent survey paper, Edmans, Gabaix, and Jenter (2017) review the

theoretical and empirical literature on CEO compensation and find that compensation is largely determined by three factors – shareholder value maximization by boards, rent extraction by executives, and institutional factors including regulation, taxation, and accounting policy, among others. Our paper is uniquely positioned in this literature. We are the first to bring a commonly used measure from the CEO succession literature to the CEO compensation literature. Our findings shed new light on another important factor that can influence CEO compensation — competition. While the literature presumes that competition exists among senior executives, there has not been a direct, *ex ante* measure used to quantify competition at the time of appointment when it is most closely tied to compensation. We investigate the sources of competition and provide evidence for how competition affects compensation by using our competition measure — horse race versus heir apparent succession planning.

Second, we test the key implication of tournament theory by examining whether the anticipated prize at the end of the competition is actually received. Using a comprehensive dataset of internal CEO successions, we show that competition for the CEO position, particularly those where the actual pay-off falls short of expectations, can be costly for the firm. Not only does competition affect the long-term performance of the firm, but it also leads to a higher likelihood of new CEO turnover, which further disrupts the firm. These findings, therefore, extend the tournament literature, which to date, only focuses on the relation between existing CEOs' pay differentials and competition for the CEO position and neglects the effects of competition on compensation and performance of the new CEOs subsequent to the turnover events.

Third, our study also advances the CEO succession literature in asking whether firms can potentially influence the compensation setting process of newly appointed CEOs by introducing competition in CEO selection. We find that horse race successions induce conflict. When firms adopt horse race successions, effectively increasing competition for the CEO position, the winners of the competition do not receive higher compensation. Although competition can result in less rent extraction and reduced agency problems in compensation contracting, the costs that arise from the competition (i.e., new CEO turnovers) can offset this benefit and hurt the long-run performance of the firm.

The remainder of the paper is organized as follows. Section 2 discusses the prior literature. Section 3 describes data and methodology. Section 4 presents univariate and multivariate results of the relations between competition and compensation, as well as the results of robustness tests. Section 5 summarizes and concludes.

1. The Impacts of Internal Competition and Hypothesis Development

1.1. Relations between internal competition and new CEOs' compensation

In recent years, large differentials in pay between CEOs and other executives have been subject to great scrutiny. The existing literature often justifies these large CEO pay packages using the tournament theory of compensation. In particular, tournament theory proposes that CEO compensation is often strategically set higher than what is justified by performance to induce greater effort among contenders for the position. When the prize is larger for "winning" the final stage of the tournament (higher CEO compensation in the case of the firm), candidates competing for the prize have greater incentive to seek the position, and firms benefit from the higher levels of effort the tournament induces (Lazear and Rosen, 1981; Green and Stokey, 1983; Rosen, 1986). The tournament theory of CEO compensation thus predicts that new CEOs selected through a more competitive process receive greater compensation, which encourages future competition for the position. If tournament theory holds, we would expect higher levels of internal competition to be associated with higher new CEO pay.

Alternatively, traditional economic theory views the labor market as the result of supply and demand, where the price (the wage rate for employment) and quantity (the size of the workforce) are jointly determined (Finkelstein and Hambrick, 1988). Similarly, the literature on the labor market for directors connects the price of directors (their wage) with the change in supply and demand around SOX (Linck, Netter, and Yang, 2009). Building on the labor market model, Zhang and Rajagopalan (2004) analyze the labor market for internal CEOs and use the pool of qualified candidates to proxy for firm-level supply conditions. These theories rely on the notion that higher (lower) competition for the CEO position can result in excess (deficit) supply of candidates for the CEO position, even within the firm, and force the compensation of CEOs to decline (rise) to establish equilibrium. If labor market theory holds, we hypothesize that less competition, such as scenarios where firms use succession planning and have an heir apparent are associate with higher new CEO pay.

1.2. Relations between internal competition and firm performance

In the framework of CEO-firm match theory, the CEO labor market is competitive and efficient, and the matching between CEOs and firms is optimal. Jenter, Matveyev, and Roth (2016) argue that in a frictionless CEO labor market, after one CEO departs, firms select the next best CEO. Hence, if firms utilize a tournament and induce competition to select the next CEO, competition to win the tournament is the catalyst for higher effort and greater payoffs for firms (e.g., Lazear and Rosen, 1981; Green and Stokey, 1983; and Kale et al., 2009). Thus, the tournament literature would predict that this higher effort from tournament competitors is linked to better firm performance in certain cultures (Burns, Minnick, and Starks, 2017. Existing literature examines the link between competitive CEO selection and firm performance before the turnover event. Although it has been established that higher pay differentials prior to a turnover improve firm performance, it is still unclear whether this holds following a turnover. We

hypothesize that if tournament theory holds and the CEO labor market is efficient and competition does indeed induce more managerial effort, CEOs selected via a more competitive process are associated with better performance.

Conversely, the CEO succession literature suggests that having a succession plan in place (i.e., grooming an heir apparent) helps firms maintain continuity and increases firm value. A lack of succession planning (i.e., non-heir apparent approach) is costly to the firm and economy as a whole (Shen and Cannela, 2003; Zhang and Rajagopalan, 2004; Behn et al., 2006; Qi, 2011). In reality, it is unclear whether tournaments (i.e., horse races) are a form of succession planning or a sign that firms have no succession in place, thus making suboptimal decisions to allow internal candidates to compete for the CEO position. In the latter case, a firm might be worse off in the future, not because competition is detrimental, but because it is costly to replace the mismatched CEO shortly after the turnover. Therefore, if the succession literature holds, we hypothesize that competitive CEO selections lead to poor performance after the turnover.

2. Data and Methodology

We first identify all CEO turnovers during the period 1999-2012 from ExecuComp, which covers current and former S&P 1500 firms. By ending the sample in 2012, we are able to examine CEO compensation and financial performance at the firm three years following the turnover event. We use Factiva, Lexis Nexis, and proxy statements to gather the following information about the incumbent, successor, and any interim CEOs: experience and background, dates of departure and takeover, and the cause of the turnover. Interim CEOs are identified using press releases and eliminated from our sample. We require executive compensation data for each of the new CEOs for at least two full years both before and after each turnover event. We fill in any observations where CEO appointment date is missing in ExecuComp to identify CEO tenure. Control variables, including stock returns, accounting information, and CEO characteristics and compensation, are collected from CRSP, Compustat, and ExecuComp. Board experience and corporate governance data are identified through the RiskMetrics board databases and supplemented with BoardEx. For the purpose of our analysis, we focus on internal successions and exclude externally hired CEOs. Our final sample includes 909 unique turnover events with internal CEO successions or 2,727 firm-year observations when we include the years before and after the turnover events.

2.1. Measure of internal competition

As we are interested in the relation between competition and CEO compensation, measures of competition serve as our primary independent variables of interest. Following prior CEO succession literature, we identify two types of internal succession methods used by firms: (1) horse race succession in which multiple executives compete for the position of CEO and (2) heir apparent succession in which a sole heir apparent is groomed for succession in advance of the turnover (Shen and Cannella, 2002a; 2002b; 2003; Zhang and Rajagopalan, 2004; Behn, et al., 2006, Naveen 2006). While all firms select a CEO from a pool of candidates, the timing of the selection varies, as do the associated incentives created (Prendergast, 1999; Gibbons and Murphy, 1992). Mobbs and Raheja (2012) argue that although all firms begin with some form of competition for the CEO position, some firms choose to end the competition and select an heir apparent in advance, while others continue until the time of succession. Following the CEO succession literature, we classify an executive as heir apparent if the candidate is promoted to president or chief operating officer prior to becoming CEO and is at least five years younger than the incumbent CEO is. We identify all other internal CEO successions as horse race, or tournament, successions. These two methods of succession result in different management incentives: a horse race incentivizes management to focus on competition, while appointing an heir apparent incentivizes management to focus on cooperation. In order to ensure the accuracy of our heir apparent and horse race classification, we verify succession type by reading press releases and firms' SEC filings around the CEO turnovers.

2.2. Measures of CEO compensation

We examine the impact of internal competition on the level of new CEOs' compensation, measured by the natural log of total CEO compensation. Total CEO Compensation (*TDC1*) is comprised of cash and equity and taken from ExecuComp. *Cash compensation* includes salary and bonus, while *equity compensation* includes the total value of restricted stock granted, the total value of stock options granted, and long-term incentive payouts. In addition to examining compensation levels around turnover events, we also utilize tournament structure variables to evaluate the implications of tournament theory and capture the effect of internal competition. We follow Burns et al. (2017) and focus on the mean and median pay ratio measures as they consider the effect of firm size when comparing the new CEO's compensation to the other executives. Pay ratios are calculated by dividing the CEO's compensation by the mean (median) compensation of the next four highest paid executives.

We focus on the three years around the turnover event and collect the departing CEO's compensation both at the time of transition and when she was first promoted, as well as the incoming CEOs compensation. This three-year window allows us to track the incoming CEO's compensation prior

to appointment at *t-1* as well as the compensation a full year after holding the CEO position at *t+1*, where *t* is the year of turnover. The heir apparent and horse race designations we assign at time t-1 stay with the incoming CEOs throughout this 3-year window.

2.3. Summary statistics

We classify internal successions and compare firms with heir apparent successions to those with horse race successions. Table 1 presents the number of turnovers each year by succession method. Of our 909 CEO turnovers, firms hire 535 (59%) new CEOs through heir apparent successions and 374 (41%) new CEOs through horse race successions. Heir apparent succession is more common than horse race succession in every year but 2012 (41%) and is most prevalent in 2006 (75%). Interestingly, 2012 represents the largest portion of turnovers in the sample (10%), while 2008 represents the lowest (5%).

—INSERT TABLE 1 HERE—

Table 2 summarizes firm and CEO characteristics during the year before turnover events for all firms in our sample. Panel A shows the mean and median comparison of firm financial corporate governance characteristics between heir apparent and horse race firms, while Panel B presents departing CEO characteristics, including compensation and tournament structure information. Overall, there are few differences in firm characteristics between firms with heir apparent successions and those with horse race successions. However, we do observe that heir apparent firms tend to be employed at older firms with boards composed of more inside directors.

—INSERT TABLE 2 HERE—

Corporate governance impacts CEO compensation through board control (Boyd, 1994), ownership characteristics (Core, Holthausen, and Larcker, 1999; Cyert, Kang, and Kumar, 2002; Hartzell and Starks, 2003), and board characteristics (Yermack, 1996; Core, Holthausen, and Larcker, 1999; Faleye, 2007). Specifically, Boyd (1994) finds that CEO compensation increases with CEO duality. In addition to duality, Core et al. (1999) show that increased CEO compensation is associated with larger boards and smaller percentages of independent directors.

Although board structure is similar in our sample, firms with heir apparent successions are more likely to have the CEO also act as the chair of the board (73% for Heir Apparent firms versus 61% for Horse Race Firms). Departing CEOs in firms with heir apparent successions are older and have longer tenures as CEO. This result indicates that firms with CEOs approaching retirement age may plan to groom an heir apparent.

We also examine departing CEOs' compensation levels and structure. We find that departing CEOs receive higher mean and median total compensation as well as equity compensation in firms with horse race successions. Specifically, the mean (median) total compensation for the departing CEO was

$6.72M ($4.25M) in firms with horse race successions, compared to $5.67M ($3.38M) for the departing CEOs in firms with heir apparent successions. The mean total compensation difference is statistically significant. In addition, firms with horse race successions also compensate CEOs with significantly greater equity but lower cash compensation. These results may relate to the tournament theory of CEO compensation in that departing CEOs' high compensation incentivizes other senior executives to exert effort and compete for the CEO position. We test the implications of tournament theory of CEO compensation in subsequent analysis.

3. Empirical Results

This section documents the effect of internal competition on new CEOs' compensation, on firm performance, and on the likelihood of new CEO departure within 3 years of their appointments. Section 4.1 first examines the determinants of competition, and then examines the impact of internal competition for the CEO position on inside successors' compensation. Section 4.2 investigates whether the implications of tournament theory hold for new CEOs' compensation levels, changes, and structure by comparing firms with varying levels of internal competition, while Section 4.3 shows the impact of internal competition on the firm's performance and the new CEO's career trajectory.

3.1. Determinants of internal competition and new CEOs' compensation

To evaluate how firms compensate new CEOs, we perform a series of regressions using turnover firms with internal successions. The main dependent variables of interest are compensation measures, including total compensation, equity compensation, and cash compensation. The main independent variable of interest is the binary variable *Horse race* (which is equal to one if the promotion is competitive and zero otherwise). We also control for other firm, corporate governance, and CEO characteristics consistent with the univariate analysis.

—INSERT TABLES 3 AND 4 HERE—

Before we ascertain any relation between internal competition and compensation, one potential concern is that unobservable differences between horse race and heir apparent firms may influence new CEOs' compensation. For example, skilled and motivated executives are more likely to earn higher compensation. At the same time, if the same characteristics can also relate to the likelihood these individuals become an heir apparent, then unobservable differences between horse race and heir apparent firms may be important. Econometrically, the ordinary-least-squares (OLS) estimation strategy assumes that the error term is uncorrelated with succession strategy and does not account for possible endogeneity or selection bias.

To address this concern, we use three different strategies and present the results of modeling non-random selection into succession methods in Table 4. First, we show the basic OLS estimation and control for whether firms use horse race successions (columns 1-3). Second, we use instrumental variables to account for the possibility that the choice of succession strategy may be endogenous and executives can self-select into horse race or heir apparent firms (columns 4-6). Specifically, horse race succession may be endogenous if the decision for a firm to use a horse race is correlated with unobservable characteristics that also affect compensation. To ensure that omitted variables are not driving our results, we use a two-stage linear regression with endogenous treatment effects, first examining the determinants of horse race successions (i.e., competition). In the second stage, we examine how the predicted likelihood of horse race succession affects compensation, controlling for other firm and governance characteristics. The first stage regressions are presented in Table 3. Our third approach, an endogenous switching regime model, does not require control variables to have the same effect for both heir apparent and horse race firms. Using a two-stage Heckman selection correction model (where in the first stage the same Probit model is used to predict the probability of horse race and in the second stage the inverse Mills ratio (*IMR*) is included as a regressor), we estimate compensation separately for firms that use horse race and heir apparent successions. A Chow test is used to test if the beta coefficients differ across horse race status. If the p-value on the Chow test is significant, then the beta coefficients from the estimation differ across succession methods (Main and O'Reilly, 1993).

When selecting instrumental variables for competition, we identify variables that are correlated with competition but not with compensation. We first explain the economic rationale used to identify instruments for our key regressors and then describe the results from tests of the statistical validity of the instruments. We follow a model similar to Masulis and Zhang (2014) to predict succession method in Table 3. Our instruments include the number of inside turnovers for a certain industry, the number of VPs at the firm, and industry homogeneity. To measure the number of inside turnovers by industry, we count the number of CEO turnovers where the incoming CEO is an employee in the firm. Aggregating at the Fama French 49 industry level (not counting the firm of interest), we create an annual count variable to capture the number of inside CEO replacements each year within an industry. Masulis and Zhang (2014) find that a firm is more likely to use a succession contest in industries that tend to appoint internal candidates as CEOs. Although the industry succession methods may influence an individual company's succession method, it is unlikely to influence the firm's CEO compensation. We measure the number of VPs in the firm by counting the number of executives listed for the firm in ExecuComp who have VP in their job title. A succession contest is more likely to take place when there are several qualified internal candidates, and a long serving CEO near retirement age. It is possible that more VPs may indicate more growth and higher performance in the firm, which would lead to higher compensation for the existing

CEO. However, it is unlikely that the number of VPs at *t-1* would directly influence the absolute compensation of the incoming CEO. Following Parrino (1997), we measure the industry homogeneity of the firm by calculating the mean partial correlation between firm's returns and an equally weighted industry index, for all firms in the same two-digit industry code. Firms are more likely to use horse race succession when it is difficult for boards to construct a peer group of comparable firms to benchmark executive performance against, such as those in highly heterogeneous industries in which the transfer of information is more difficult. Since they cannot accurately judge the quality of an heir apparent, boards are likely to utilize a competitive succession process.

In addition to providing the economic relevance of the instruments, we also test these instrumental variables for their statistical relevance (correlated with the endogenous variables) and validity (orthogonal to the residuals or exogenous to the dependent variable). Based on our analyses, these instruments satisfy the relevance and validity criteria necessary. First, we find that all of the instruments are statistically significant with the expected signs in the respective first-stage regressions. Second, the R^2 values and the F-statistic provide significant support for the joint relevance of all our instruments in the first stage. Moreover, the p-values from the Hansen-J test of over identification are all above 0.10, indicating that the instruments used to estimate the likelihood of horse race succession are valid. In addition, the p-values corresponding to the Sargan C statistics are less than 0.01. Collectively, the statistics from the first stage estimations indicate that the instruments are valid and that their exclusion from the main estimated equation is appropriate.

The first stage results are shown in Table 3. Consistent with Masulis and Zhang (2014), we find that horse race successions are more common in industries with more internal CEO candidates and in more complex industries (i.e., lower industry homogeneity). As Masulis and Zhang (2014) point out, this is due to the difficulty of comparing executive ability across firms, so companies need to rely on their own internal talent pool. We also find that family firms are less likely to use a competitive process and rely more on heir apparent appointments. This is consistent with the succession literature (Schulze, Lubatkin, Dino, and Buchholtz, 2001). We find that firms whose CEO is approaching retirement, either because they are over 62 or have had a long tenure at the firm, are more likely to appoint an heir apparent.

In Table 4, we examine the compensation of both the departing CEO and the incoming CEO. Specifically, in Panel A, we investigate whether competition for the CEO position and firms' succession method relate to the departing CEOs' compensation. Columns (1)-(3) provide the results of the base OLS estimations. We find that the departing CEOs' total compensation in horse race firms is higher than that of CEOs at heir apparent firms. These results are similar to our univariate analyses. Columns (4)-(6) present the results of a two-stage regression model where we use instruments in the first stage to predict whether a firm has a horse race or heir apparent succession, as shown in Table 3. Then in Table 4, the

Horse race variable in these estimations is the predicted value of horse race from the first stage in Table 3 Column (1) for Panel A and Column (3) for Panel B. We report the Hansen and Sargan p-values to confirm the validity of our instruments. Results are actually stronger when we use the two-stage instrumented model as compared to the OLS, which suggests that omitted variables are attenuating the OLS beta coefficients. The two-stage analysis alleviates this negative bias caused by the omitted variables because the instrumental variable contains new information about the endogenous regressor (succession method) that was diminishing the effect of selection method on compensation. The two-stage results show that the departing CEOs from firms who utilize a competitive selection process have higher compensation. This differential in compensation is driven by higher equity compensation. However, these firms provide lower cash based compensation compared to the heir apparent firms.

In columns (7) - (12), we control for a potential sample selection bias that may arise from the fact that horse race firms not only have an intercept effect on compensation but also have a slope effect on the beta coefficients. In other words, it is possible that certain unique characteristics of firms that use horse race successions may cause the independent variables in our compensation estimations to have different coefficients. For instance, if there is something unique that differentiates horse race firms from heir apparent firms and this unique characteristic would cause independent variables in the compensation estimation, such as firm size, to have a unique effect on compensation, then the beta coefficients on firm size would be different for horse race firms compared to heir apparent firms. By including the inverse mills ratio from Table 3, we can control for this sample selection bias. We estimate our model for heir apparent firms and horse race firms separately to determine if there is a sample selection bias that causes the beta coefficients to differ. We perform a Chow test and do not find any indication that there is a sample selection bias.

In Panel B, we empirically examine whether, upon promotion, firms pay horse race CEOs more than their heir apparent counterparts do. Columns (1)-(3) show the results of the OLS base estimation. We find that the type of internal competition relates to the total pay of the new CEO. CEOs selected through a competitive process receive less equity and less cash compensation. Specifically, their equity compensation is 9.7% lower than the new heir apparent CEOs is, while their cash compensation is 4.8% lower. Columns (4)-(6) use the two-stage model described in Panel A. Similar to the results in Panel A, we find that results are stronger when we control for the endogenous nature of competition. Column (4) shows that compared to heir apparent CEOs, newly hired horse race CEOs make less. The results are consistent across total compensation, equity compensation as well as cash compensation. This is in contrast to Panel A, where the horse race departing CEOs were paid more. Finally, we examine whether a sample selection bias exists in models (7)-(12). Similar to Panel A, the Chow test indicates that there is not a sample selection issue with our sample. Therefore, we will not use models (7)-(12) moving forward.

It is possible that the heir apparent CEOs are paid more before their appointment to CEO causing this result to be driven by their compensation prior to appointment. Next, we test this by investigating whether new horse race CEOs received a pay raise relative to the new heir apparent CEOs.

3.2. Do new horse race CEOs receive a pay raise?

3.2.1. Univariate results

Table 5 presents the univariate comparison of the new CEOs' traits and compensation levels, changes, and structure by succession method. We first examine the average age, tenure, and time on the board of the new incoming CEOs. Panel A shows the comparison. We find that the new horse race CEOs are older (54 versus 51 years old) but have served shorter terms on the board compared to the new heir apparent CEOs.

—INSERT TABLE 5 HERE—

Next, we explore whether new CEOs received a pay raise after promotion, compared to their own compensation before promotion, by succession method. Panel B shows the comparison of the new CEOs' compensation the year prior to the turnover (*t-1*, where *t* is the year of CEO turnover) and after the turnover (*t+1*). We find that compared to their compensation before the turnover, both new heir apparent CEOs and horse race CEOs receive higher total compensation and cash compensation. Heir apparent CEOs' mean total (cash) compensation prior to promotion was \$4.87M (\$0.99M) compared to \$5.29M (\$1.23M) after the promotion, which is a raise of \$415k. The mean difference in total compensation is significant at the 10% level and the mean difference in cash compensation is significant at the 1% level. In comparison, horse race CEOs received total compensation of \$4.07M prior to the promotion, versus \$5.43M after promotion, indicating a raise of \$1.36M in total compensation, although this raise is not statistically significant. However, horse race CEOs receive a significant increase in cash compensation. We further compare the new CEOs' compensation across the two subsamples (heir apparent versus horse race) before and after the turnover and find no significant differences in the mean values.

Finally, we want to understand whether new CEOs received a pay raise compared to the departing CEOs. Panel C shows the change in compensation between the new CEOs' compensation the year after the turnover (*t+1*) and the departing CEOs' compensation the year before the turnover (*t-1*) by succession method. We find that winning the competition does not guarantee a pay raise for horse race CEOs compared to the departing CEOs. On the contrary, these new CEOs receive less total, equity, and cash compensation than the departing CEOs in the same firms. The new horse race CEOs receive almost \$1.3M less than their departing CEOs. Despite having lower total compensation, heir apparent CEOs receive more equity compensation compared to their departing CEOs. An heir apparent likely has more

responsibilities than CEOs hired through competitive processes, which would also warrant higher compensation. Thus, when formally appointed to the CEO position, the pay increase is smaller.

Overall, by analyzing the CEOs' compensation around the actual turnover events, we find that a more competitive CEO selection process is not associated with higher compensation for the new CEOs compared to the departing CEOs, the new heir apparent CEOs, or even to themselves before the promotion. Controlling for potential unobservable endogeneity in firm characteristics, we follow Cheng and Farber (2008) and use a difference-in-differences approach around CEO departures to capture within-firm differences in CEO pay.

3.2.2. Multivariate results

In this section, we test whether new horse race CEOs receive a pay raise compared to new heir apparent CEOs and departing CEOs within the same firms in a multivariate setting. Table 6 shows the results. The dependent variables are the differences in total compensation, equity compensation, and cash compensation between the year after the turnover (*t+1*) and the year before the turnover (*t-1*). In Panel A, the dependent variable is the change in the new CEO's compensation from before promotion (*t-1*) to after promotion *(t+1*). Panel B measures the change in the compensation between the new CEO after promotion (*t+1*) and the departing CEO's compensation before promotion (*t-1)*. The main independent variable is the indicator variable *Horse race*. We also control for differences in firm, corporate governance, and CEO characteristics around the turnover event. In both Panel A and B, columns (1)-(3) show the difference-in-difference using an OLS model, while columns (4)-(6) show the results of a two-stage model where the first stage predicts the succession method of the firm using instruments discussed in Table 3.

Column (1) in Panel A shows that, in comparison to heir apparent CEOs, horse race CEOs receives a marginally higher pay raise upon promotion (significant at the 10% threshold). Upon promotion, the change in the new CEOs' total compensation is 1.719 times higher for horse race CEOs than that for heir apparent CEOs for our sample. Consistent with our findings in Table 4, this increase is partially driven by cash compensation (column 3). The change in cash compensation is 18.6% higher for CEOs who were promoted through a competitive process than those who were hired through an heir apparent succession. Columns (4)-(6) show similar results using the two-stage analysis, controlling for the likelihood of a horse race succession in the first stage. Again, cash compensation plays a prominent role in the change in overall compensation.

—INSERT TABLE 6 ABOUT HERE—

Panel B examines the difference in the compensation of the incoming CEO (*t+1*) compared to the outgoing CEO (*t-1*). Results in columns (1)-(3) are based on OLS estimations. Consistent with our earlier

results, we find that CEOs selected through horse races do not receive a monetary reward compared to the departing CEOs. Comparing the difference between the new CEOs and departing CEOs at heir apparent and horse race firms, we find horse race CEOs receive 114% lower total compensation compared to the departing CEOs. This is primarily driven by equity compensation. Although the new CEO receives a bump in cash compensation, the new equity compensation is still less than the departing CEO received. Columns (4)-(6) show the two-stage model. Our two-stage results are similar yet stronger. Overall, the results are consistent with labor market theory but not tournament theory and provide further evidence that winning the competition does not guarantee higher compensation levels for new horse race CEOs. One possible explanation why the competitively selected CEO pay does not fall in line with expectations is that the firm may not have had a high pay differential to begin with. In the next section, we test whether the implications of tournament theory of CEO compensation explain new CEOs' compensation.

3.3. The tournament theory of CEO compensation

Tournament theory proposes that CEO compensation is often strategically set higher than what is justified by performance to incentivize senior executives to exert more effort with the goal of winning the tournament for the CEO position (Kale et al, 2009). Ex ante, executives vying for the CEO position in firms with high tournament structure (i.e., greater pay differentials) expect that if they win the competition, their compensation will increase to levels near the current CEO. One would expect that this anticipation would be stronger in horse race tournaments due to the additional competition for the position. In addition, firms' reliance on tournament structure often varies by industry. In industries with higher tournament structure, the expected increase in compensation after winning may be greater than in industries where pay differentials are flatter. To understand the expectations of these executives in regards to pay, we create indicator variables for tournament pay structure. Following Burns et al. (2017), we define the tournament structure two ways: CEO total compensation/mean total compensation of top four other executives and CEO total compensation/median total compensation of top four other executives. Using the Fama French 49 industry classifications, we create quartiles of average tournament structure for each industry every year. Segmenting on the top 25^{th} and bottom 25^{th} percentiles of tournament structure industries, we then compare the heir apparent CEOs to the horse race CEOs to determine whether there is a difference in their compensation the year after they were appointed CEO. We also compare the compensation of CEOs in high tournament structure industries with those in low tournament structure industries.

—INSERT TABLE 7 ABOUT HERE—

Table 7 shows the univariate results. Contrary to what tournament theory predicts, horse race CEOs in high tournament industries are not generally paid significantly more relative to horse race CEOs in low tournament industries. Focusing on mean pay ratio as the measure of tournament, there is no difference in compensation for horse race CEOs in low tournament versus high tournament industries. We also find that the horse race CEOs in low median pay ratio industries are paid $173K more than their high tournament counterparts are paid ($5.489 million versus $5.316 million). This suggests that although steeper tournaments prior to promotion suggest higher pay post promotion, this award does not materialize. Additionally, heir apparent CEOs in high tournament industries are paid significantly more than their low tournament industry counterparts when we use both mean and median pay ratio as tournament structure measures.

In Table 8, we further investigate the new CEOs' actual pay after promotion based on the tournament structure of the firm prior to the promotion in a multivariate setting. If the implications of tournament theory apply to the new CEOs' actual compensation, when there is a horse race for the CEO position in firms with high tournament style of pay (i.e., high pay ratios), the winner would expect to receive a large prize – typically a significant increase in their compensation. In order to empirically test whether this occurs, we interact the indicator variable for horse race firms (i.e., *Horse race*) with the indicator variable for high tournament structure (i.e., *High pay ratio*$_{t-1}$).

—INSERT TABLE 8 ABOUT HERE—

Results in column (1) suggest that new CEOs overall receive 10.6% higher total compensation if the firm has a high pay differential prior to their promotions. However, the interaction between high pay ratios and horse race CEOs is negative and significant at the 5% significance level. Specifically, horse race CEOs in firms with historically high pay ratios actually receive 24.4% lower compensation than heir apparent CEOs do. On average, since the new horse race CEOs are compensated $5.434 million after the promotion (Table 5 Panel B), this result suggests a $1.325 million dollars lower compensation was paid to the horse race new CEOs compared to new heir apparent CEOs. Column (2) shows qualitatively similar findings, although not as economically significant. These findings suggest that expectations for higher pay are not realized for the incoming horse race CEOs.

In columns (3)–(6), we look at the composition of the incoming CEO's pay. Consistent with the findings in Table 3, new horse race CEOs are paid more equity compensation than their heir apparent peers. Also noteworthy, the interaction between the company's pay differential (i.e., mean and median pay ratio) before promotion and the horse race indicator has a negative and significant effect on the new CEO's equity compensation. This suggests that horse race CEO candidates may not get the full amount of the expected monetary prize for becoming CEO primarily because of lower equity compensation. Their equity compensation ranges between 8% and 21% lower compared to their heir apparent peers. We find

similar results for cash compensation. If the firm is in a high mean pay differential industry, horse race CEOs receive lower cash compensation relative to CEOs appointed as heir apparent. Tournament theory proposes that CEO compensation is set higher to provide motivation amongst contenders for the position. These CEOs have greater impetus to be promoted (and receive the increased compensation), and firms benefit from the higher levels of effort which improves overall firm performance (Lazear and Rosen, 1981). Columns (7)-(12) show the same estimation model as (1)-(6) but use the predicted horse race from the two-stage model. The results are qualitatively similar to the OLS results, which show that even when controlling for endogeneity, the prize is not realized after the competition is over and the winning candidate is promoted. Similar to the results regarding new CEOs' compensation levels, the results for new CEOs' pay ratios also do not support the tournament hypothesis. Interestingly, the prediction by Coles et al. (2013) that steeper industry tournaments (i.e., higher pay gap, pay ratio, and greater pay slice) increase pay expectations for CEO candidates does prove true for heir apparent CEOs. One explanation is that regardless of the type of competition, CEO candidates in high tournament industries have higher post promotion pay expectations, however competition actually drives down the final compensation for horse race CEOs once they win the competition. Horse race CEOs may become so focused on beating out other candidates for the CEO role that they are willing to accept lower compensation just to secure the promotion.

It is possible that although the new CEOs are not rewarded with monetary gains, they do benefit from reputational gains. Yermack (2004) poses two motivations for an executive to perform well: reputation and compensation. He further suggests boards seats can be proxy for reputation: a manager with a better reputation will accrue additional board seats, which can also result in additional indirect compensation. In Table 8, we examine whether horse race CEOs may substitute compensation internally with alternative opportunities like board seats. We use BoardEx data and count the number of public and private boards on which new CEOs hold independent director positions both before and after their promotion.

—INSERT TABLE 9 ABOUT HERE—

We find that horse race CEOs gain significantly more total board seats post promotion. Specifically, the average board seats these CEOs hold increase from 1.75 before promotion to 2.00 afterwards. This increase largely results from a significant increase in public board seats. On the contrary, we do not observe the same board seat increase for heir apparent CEOs post promotion. Comparing the horse race to the heir apparent CEOs, we find that the heir apparent CEOs hold significantly more independent director positions pre-promotion. Therefore, the additional seats the horse race candidates accrue post promotion only reduce this difference. These results do suggest that horse race CEOs gain

some reputational benefit after their promotion, but that increase only makes them equivalent to the heir apparent CEOs and does not make up for the unrealized compensation.

3.4. Internal competition and firm performance

The link between CEO compensation and firm performance is well-established (Murphy, 1985). Similar to Palia (2001), using a two-stage least squares equations model with fixed effects to control for unobservable heterogeneity, we test whether horse race (i.e., competitive) CEO appointments are linked to better performance in the long-run. During a horse race, the executives have an incentive to work harder as they are vying for the CEO position. However, it is unclear whether that work ethic persists once the executive is appointed as CEO. Controlling for the predicted compensation of the new CEO after promotion, we analyze whether horse race candidates have better long-run performance than heir apparent CEOs do. Table 10 shows the results. In the first stage (which is unreported), we use a similar model to Palia (2001), and control for CEO experience (tenure at the firm), CEO quality of education (number of degrees), and CEO Age. We also include two instruments related to compensation but unlikely to influence firm performance. The first measure is the cost of living in the state where the company is headquartered. The cost of living influences how much employees need to be paid, but is unlikely to directly influence performance for these firms. We also use the peer level of compensation as an instrument, focusing on firms that are within the same size quartile and in the same industry (using Fama French 49 industry classifications). It is well known that companies reference peer firms when setting compensation. Using the 1993 compensation committee reports for a sample of 160 large US firms, Bannister and Newman (2003) find that the peer groups employed in determining executive compensation generally consist of companies of the same industry or size. Although the peer compensation is not directly linked to the company's performance, it relates to the CEO's compensation. As expected, we find a positive correlation between cost of living and CEO compensation. Additionally, higher compensation in the peer groups is related to higher CEO compensation. One important characteristic of an instrument is that the instrument relates to the endogenous variable (compensation) but not to the dependent variable of interest (long-run performance). In unreported tests, we examine the effect of the instruments on long-run firm value. We find that our instruments are not significantly related to long-run firm value (cost of living has a p-value of 0.771 and CEO peer pay has a p-value of 0.22), as well as a lower R^2 (0.088), compared to our reported second stage using predicted compensation. The coefficients on the control variables are also similar to Palia (2001).

While the above reasoning describes the economic relevance of the instruments, we also test these instrumental variables for their statistical relevance (correlated with the endogenous variables) and validity (orthogonal to the residuals or exogenous to the dependent variable). Based on our analyses, the

instruments satisfy the relevance and validity criteria necessary for appropriate instruments. First, we find that all of the instruments are statistically significant with the expected signs in the respective first-stage regressions. Second, the R^2 values and the F-statistic provide support for the joint relevance of all our instruments in the first stage. Moreover, the p-values from the Hansen-J test of over identification are all above 0.10, indicating the instruments are valid. In addition, the p-values corresponding to the Sargan C statistics are less than 0.01. Collectively, the statistics from the first stage estimations indicate that the instruments are valid and that their exclusion from the main estimated equation is appropriate.

—INSERT TABLE 10 ABOUT HERE—

In the second stage analysis, we use long-run accounting performance (ROA). We focus on the two- and three-year long-run performance following the year of the turnover. The primary independent variable is the predicted natural log of new CEOs' total compensation. From earlier analysis, we show horse race CEOs not only receive less total compensation than their heir apparent CEO peers, but the composition of the compensation is heavily focused on equity compensation. Therefore, it is possible that the performance results we find in earlier tables are not driven by whether the candidate was an heir apparent or a horse race candidate but rather by the compensation package they receive. In order to disentangle the effects of competition on long-run performance, we segment performance estimations on whether the new CEO was a horse race or heir apparent candidate. The results in Table 10 show that, although the compensation of the heir apparent is not related to long-run average ROA, the compensation of the horse race candidates is significantly related to performance. A one standard deviation higher predicted value of the horse race CEOs' total compensation is associated with a 8.9% and 9.3% lower ROA in the two to three years following the turnover, which is economically significant given the average two-year ROA of 8.7%. Overall, these results are consistent with succession theory. In the next section, we explore possible reasons why CEOs selected through horse race successions may be associated with worse firm performance.

3.5. Probability of new CEO departure

One explanation for our results is that appointing and grooming an heir apparent successor does a better job of preparing the new CEO for his role whereas the horse race candidate was concentrating on winning the position and was not prepared for actually fulfilling the role. This may explain the poor long-run performance of the horse race candidates following the turnover event. Additionally, if these CEOs did not receive the remuneration expected, nor the equivalent of their heir apparent peers, they may lack the motivation to continue exerting the effort needed as CEO. To test this possibility, we create quartiles of new CEOs' compensation the year after their promotion. Segmenting on the top 25th and bottom 25th percentiles of total compensation, we compare heir apparent CEOs to horse race CEOs to determine

whether there is a difference in the likelihood of their departure within three years of appointment. We also segment the compensation the new CEOs receive into whether their total compensation is above or below the median of their peer group.

—INSERT TABLE 11 ABOUT HERE—

Table 11 presents the univariate results. We find that new horse race CEOs with bottom quartile total compensation are almost twice as likely to leave compared to horse race CEOs with top quartile total compensation (21.74% versus 11.70%). This result is significant at the 10% level. In addition, compared to their heir apparent peers who also receive bottom quartile total compensation, new horse race CEOs are three times more likely to depart (21.74% versus 7.40%). This result is significant at the 1% level. When segmenting new CEOs' compensation based on the median, we find that 20.54% of the horse race candidates who are paid below median total compensation leave within three years while only 11.64% of the horse race candidates that are paid more than the median leave. Compared to heir apparent CEOs, where the below median pay group only has 9.25% turnover and the above median pay group has 9.05% turnover, these results suggest that the lower pay for the horse race CEOs may be a driver for their early departure.

However, if higher external compensation were the primary driver of the new CEO departure so soon after their appointment, then we would expect that they pursue other opportunities that pay more. We track the career path of those CEOs who left within three years of becoming CEO. Table 12 presents the results. Panel A shows the distribution of the executives who left and their subsequent career paths. We find that the main reason for an heir apparent CEOs' departure is retirement (53%), rather than leaving for greener pastures like jobs at other public firms, (39%). We also find that 22% of the departing horse race CEOs retire, while 27% of those that leave find new careers at public firms. The majority of the horse race CEOs take positions at private firms or investment groups. When we examine the subsample of departing horse race CEOs paid below median total compensation, we see that only 15% of those CEOs retired, compared to 33% of horse race CEOs who were paid above median compensation. For those executives who accepted positions at other public firms, we track their new compensation in their first year in the new job. We create a change variable that is equal to the difference between the CEO's compensation the first year in their new job and their last year as CEO before their departures and test whether the change is statistically significant as well as whether there is a statistical difference between horse race and heir apparent CEOs in Panel B.

—INSERT TABLE 12 ABOUT HERE—

Although our sample is small, the evidence suggests certain horse race CEOs find greener pastures (i.e., higher pay) when they leave the prior company. Horse race CEOs who receive below median pay

before they left receive $312K higher total compensation after leaving their prior firm. The increase is primarily driven by a $406K increase in equity compensation, whereas heir apparent CEOs below the median actually receive $96K lower total compensation, if they move to another publically traded company. This evidence might have two implications. First, it could suggest horse race CEOs' departures may be driven by monetary motivation, in that these executives did not receive the compensation expected during the race and are seeking greener pastures. Second, the monetary reward could be less important than the experience and utility of becoming the CEO. With this experience, these executives are able to find better paying jobs in the near future.

3.6. Robustness: Internal compensation structure and pay raises prior to promotion

In some cases, the incoming CEO may not be receiving a significant raise at appointment because she already received pay raises prior to the promotion. In addition, horse race candidates with superior talent and skills may have been awarded larger pay raises years before the appointment, which increases their pay relative to the heir apparent CEO candidates. In this section, we use all executives (both the winner and non-winners) with compensation data available and examine their pay level and structure before promotion as a robustness test. Table 13 shows the result.

—INSERT TABLE 13 ABOUT HERE—

We examine the difference in historic pay between heir apparent and horse race new CEOs three years prior to their appointments. We also measure the size of their annual raises (measured as the change in compensation year over year) and do not find any significant mean differences between the horse race and heir apparent candidates. This result suggests that both candidates receive similar raises in the years before their appointments. Overall, if there is a horse race succession, compensation prior to the appointment does not predict the result of the competition.

3.7. Robustness: Departing CEO pay raises when first promoted

In our above analysis, we imply that the horse race CEOs do not receive the pay they anticipated upon winning the CEO competition. One potential critique of this conclusion is that the outgoing CEO's compensation may not be the expectation held by the tournament competitors, as we assume. Although the horse race competitors should expect their pay to increase if they are selected as CEO, they may not expect it to be as high as the current CEO, who likely has served in that position for several years and is

established and presumably successful. Rationally, the incoming CEOs may eventually expect to reach the departing CEO's pay level as they gain experience in the CEO role. To investigate this possible explanation, we compare the departing CEO's pay before she was promoted to CEO to her pay her first full year in the role of CEO and measure how much of a raise the departing CEO received upon her promotion. We hand collect this data for departing CEOs (although we do not identify if these departing CEOs were horse race or heir apparent candidates). We are able to collect the historic compensation for the departing CEO for 76% of our sample firms. In Table 14, we compare the departing CEOs' pay raise upon promotion to the horse race and heir apparent candidates' pay raise when they are appointed as the CEO.

We first compare the pay raise the new heir apparent and horse race CEOs receive when appointed. We find that heir apparent CEOs in this subsample receive a $750K median raise while horse race candidates received a $673K median raise. Comparing these raises to the raises of the departing CEOs when they were first promoted reveals departing CEOs of the heir apparent firms received a median raise that was $1.1M when promoted, which is significantly higher than the raise received by the new heir apparent CEO at 10% level of significance. The departing CEO for horse race firms received a median raise of $1.4M, which is significantly higher than the raise the new horse race CEO received. These results suggest that no matter the benchmark (the departing CEO's current compensation or the raise she received when appointed CEO), the horse race incoming CEO receives lower compensation than anticipated after winning the competition.

4. Conclusion

We examine CEO compensation around turnover events to determine the impact that competition for the CEO position has on compensation and, ultimately, on firm performance. Using the horse race succession as a measure of competition, we find that departing CEOs receive higher mean and median total compensation as well as equity compensation in firms with horse race successions compared to those in firms with heir apparent successions. We extend this investigation to determine whether new horse race CEOs who won the competition are paid more than the departing CEO and their heir apparent counterparts upon promotion. We find that winning the competition does not guarantee a pay raise for horse race CEOs compared to the departing CEOs as well as to the heir apparent new CEOs. On the contrary, new CEOs selected through a more competitive process receive less total, equity, and cash compensation than the departing CEOs in the same firms. When comparing the pay expectations of the CEO candidates based on their departing CEOs' compensation, we find that new horse race CEOs receive lower total pay raises (114% less than the heir apparent CEOs do).

We further investigate the new CEOs' actual pay after promotion based on the tournament structure (i.e., pay ratio) of the firm prior to the promotion. If tournament theory applies to the new CEOs' actual compensation, when there is a horse race for the CEO position in firms with historically high pay ratios, the winner would expect to receive a large prize. However, we show that the expectation is not realized after the competition is over and the winning candidate is promoted. It is possible that although the new CEOs are not rewarded with monetary gains, they benefit from reputational gains, such as board seats. Indeed, these competitively placed CEOs do gain additional outside board positions, but that increase only makes them equivalent to the heir apparent CEOs and does not make up for the unrealized compensation.

We then analyze whether horse race candidates have better long-run performance than heir apparent CEOs. We find that, unlike heir apparent CEOs, higher expected values of horse race CEOs' total compensation are associated with an economically significant lower ROA in the two to three years following the turnover. This suggests that firms can suffer with underpaid horse race CEOs. We also find that new horse race CEOs are almost twice as likely to leave within three years of their appointments compared to heir apparent CEOs. Following the career path of the departing new CEOs, we find that certain horse race CEOs seek and find greener pastures when they leave the prior company. Our results remain significant through several robustness tests.

Collectively, we observe that CEOs competing for the CEO position are not rewarded in the manner suggested by tournament theory of CEO compensation. As a result, we conclude that tournament theory does not fully explain executive compensation and instead, competition is an important determinant of labor market dynamics, even for CEOs. Our findings also suggest that perhaps new CEOs are not solely driven by the prospect of higher financial compensation, but more so by the utility generated from being the new CEO. Horse race CEOs may become so focused on beating out other candidates for the CEO role that they are willing to accept lower compensation just to secure the promotion. Therefore, it is possible that monetary reward is not the only target for the new CEOs. Rather, the experience of being a CEO may serve as a stepping-stone and allow them to pursue better opportunities in the near future.

References

Bannister, J. W., Newman, H. A. (2003). Analysis of corporate disclosures on relative performance evaluation. *Accounting Horizons*, 17(3), 235-246.

Bebchuk, L. A., Cremers, K. J. M., and Peyer, U. C. (2011). The CEO pay slice. *Journal of Financial Economics* 102(1), 199-221.

Behn, B. K., Dawley, D. D., Riley, R., Yang, Y. W. (2006). Deaths of CEOs: Are Delays in Naming Successors and Insider/Outsider Succession Associated with Subsequent Firm Performance? *Journal of Managerial Issues*, 32-46.

Bognanno, M. L. (2001). Corporate tournaments. *Journal of Labor Economics*, 19(2), 290-315.

Boyd, B. K. (1994). Board control and CEO compensation. *Strategic Management Journal*, 15(5), 335-344.

Burns, N., Minnick, K., Starks, L. T. (2017). CEO tournaments: a cross-country analysis of causes, cultural influences and consequences. *Cultural Influences and Consequences (Journal of Financial and Quantitative Analysis, forthcoming*.

Cheng, Q., Farber, D. B. (2008). Earnings restatements, changes in CEO compensation, and firm performance. *The Accounting Review*, 83(5), 1217-1250.

Coles, J., Li, Z., and Y. Wang. "Industry Tournament Incentives." Working Paper, Arizona State University (2013).

Conyon, M. J., Peck, S. I., Sadler, G. V. (2001). Corporate tournaments and executive compensation: Evidence from the UK. *Strategic Management Journal*, 22(8), 805-815.

Core, J. E., Holthausen, R. W., Larcker, D. F. (1999). Corporate governance, chief executive officer compensation, and firm performance. *Journal of Financial Economics*, 51(3), 371-406.

Cyert, R. M., Kang, S. H., Kumar, P. (2002). Corporate governance, takeovers, and top-management compensation: Theory and evidence. *Management Science*, 48(4), 453-469.

Edmans, A., Gabaix, X., Jenter, D., (2017). Executive compensation: a survey of theory and evidence. Working paper.

Eriksson, T. (1999). Executive compensation and tournament theory: Empirical tests on Danish data. *Journal of Labor Economics*, 17(2), 262-280.

Faleye, O. (2007). Classified boards, firm value, and managerial entrenchment. *Journal of Financial Economics*, 83(2), 501-529.

Finkelstein, S., Hambrick, D. C. (1988). Chief executive compensation: A synthesis and reconciliation. *Strategic Management Journal*, 9(6), 543-558.

Fulmer, I. S. (2009). The elephant in the room: Labor market influences on CEO compensation. Personnel Psychology, 62(4), 659-695.

Gibbons, R., Murphy, K. J. (1992). Optimal incentive contracts in the presence of career concerns: Theory and evidence (No. w3792). *National Bureau of Economic Research.*

Green, J., Stokey, N. (1983). A Comparison of Tournaments and Contracts, *Journal of Political Economy*, 91, 349–64.

Hartzell, J. C., Starks, L. T. (2003). Institutional investors and executive compensation. *The Journal of Finance*, 58(6), 2351-2374.

Jenter, D., Matveyev, E., Roth, L. (2016). Good and Bad CEOs. *Working paper*. London School of Economics.

Kale, J. R., Reis, E., Venkateswaran, A. (2009). Rank-Order Tournaments and Incentive Alignment: The Effect on Firm Performance. *Journal of Finance*, 64(3), 1479-1512.

Lambert, R. A., Larcker, D. F., Weigelt, K. (1993). The structure of organizational incentives. *Administrative Science Quarterly*, 438-461.

Lazear, E. P., Rosen, S. (1981), Rank-Order Tournaments as Optimum Labor Contracts. *Journal of Political Economy*, 89(5), 841-864.

Leonard, J. S. (1990). Executive pay and firm performance. *Industrial and Labor Relations Review*, 13S-29S.

Linck, J. S., Netter, J. M., Yang, T. (2009). The effects and unintended consequences of the Sarbanes-Oxley Act on the supply and demand for directors. *Review of Financial Studies*, 22(8), 3287-3328.

Main, B. G., O'Reilly III, C. A., Wade, J. (1993). Top executive pay: Tournament or teamwork? *Journal of Labor Economics*, 606-628.

Masulis, R. W., Zhang, S. (2014). Compensation gaps among top corporate executives. *Working Paper.*

Mobbs, S., Raheja, C. G. (2012). Internal managerial promotions: Insider incentives and CEO succession. *Journal of Corporate Finance*, 18(5), 1337-1353.

Murphy, K. J. (1985). Corporate performance and managerial remuneration: An empirical analysis. *Journal of Accounting and Economics*, 7(1-3), 11-42.

Naveen, L. (2006). Organizational Complexity and Succession Planning, *Journal of Financial and Quantitative Analysis*, 41(3), 661-683.

Palia, D. (2001). The endogeneity of managerial compensation in firm valuation: A solution. *Review of Financial Studies*, 14(3), 735-764.

Parrino, R. (1997). CEO turnover and outside succession a cross-sectional analysis. *Journal of Financial Economics*, 46(2), 165-197.

Prendergast, C. (1999). The provision of incentives in firms. *Journal of Economic Literature*, 7-63.

Qi, Q. (2011). The role of board of directors in CEO succession: theory and evidence. *Working paper*.

Rosen, S. (1986). Prizes and Incentives in Elimination Tournaments, *American Economic Review*, 76, 701–15.

Schulze, W. S., Lubatkin, M. H., Dino, R. N., Buchholtz, A. K. (2001). Agency relationships in family firms: Theory and evidence. *Organization Science*, 12(2), 99-116.

Shen, W., Cannella, A. A. (2002a). Power dynamics within top management and their impacts on CEO dismissal followed by inside succession. *Academy of Management Journal*, 45(6), 1195-1206.

Shen, W., Cannella, A. A. (2002b). Revisiting the performance consequences of CEO succession: The impacts of successor type, post succession senior executive turnover, and departing CEO tenure. *Academy of Management Journal*, 45(4), 717-733.

Shen, W., Cannella, A. A. (2003). Will succession planning increase shareholder wealth? Evidence from investor reactions to relay CEO successions. *Strategic Management Journal*, 24(2), 191-198.

Thomas, R. S. (2004). Explaining the international CEO pay gap: Board capture or market driven. *Vand. L. Rev.* 57, 1171.

Yermack, D. (1996). Higher market valuation of companies with a small board of directors. *Journal of Financial Economics*, 40(2), 185-211.

Yermack, D. (2004). Remuneration, retention, and reputation incentives for outside directors. *The Journal of Finance*, 59(5), 2281-2308.

Zhang, Y., Rajagopalan, N. (2004). When the known devil is better than an unknown god: An empirical study of the antecedents and consequences of relay CEO successions. *Academy of Management Journal*, 47(4), 483-500.

Appendix – Variable Definitions

Variable	Measurement	Data Source
Above 62	Binary equal to one if the CEO's age is greater than 62 years	ExecuComp
Age	The age of the CEO	ExecuComp
Annual stock return	The cumulative return over the year immediately preceding the annual meeting	CRSP
Board size	A count of the board of directors at the firm	RiskMetrics
Book-to-market ratio	The ratio of total assets to the sum of market capitalization and total debt	Compustat Annual
Cap ex ratio	The ratio of firm capital expenditures to sales	Compustat Annual
Cash compensation	The sum of salary and bonus compensation the CEO receives in thousands of dollars	ExecuComp
CEO duality	Binary equal to 1 if the CEO also serves as chairman of the board of directors	ExecuComp
Equity compensation	The total value of the CEO's equity compensation for the year	ExecuComp
Firm age	The length of time the firm has been listed as a publically traded firm	CRSP
Founder family	Binary equal to 1 for firms led by family members of the firm's founder	Factiva, Lexis Nexis, and SEC proxy statement filings
Heir apparent	Binary equal to 1 following a CEO turnover event if the firm appointed an heir apparent (i.e., a sole heir is groomed for succession in advance) such that she/he is promoted to president and/or chief operating office and is at least five years younger than the incumbent CEO (Shen and Cannella, 2002a, 2002b, 2003; Zhang and Rajagopalan, 2004; Behn, et al., 2006)	Factiva, Lexis Nexis, and SEC proxy statement filings
High median pay ratio	Indicator for Top Quartile of Median Pay Ratio, the ratio of the CEO's pay to the median pay of the next four highest paid executives	ExecuComp
High pay ratio	Indicator for Top Quartile of Pay Ratio, the ratio of the CEO's pay to the mean pay of the next four highest paid executives	ExecuComp
Horse race	Binary equal to 1 following a CEO turnover event if the firm used an inside succession without appointing an heir apparent, allowing all internal candidates to compete for the position	Factiva, Lexis Nexis, and SEC proxy statement filings
Independence (%)	The percentage of directors on the board who do not depend upon the firm for additional financial compensation	RiskMetrics

Variable	Measurement	Data Source
Industry homogeneity	Following Parrino (1997), we measure the industry homogeneity of the firm by calculating the mean partial correlation between firm's returns and an equally weighted industry index, for all firms in the same two-digit industry code, holding market return constant, using 60 monthly returns the year before the sample year	CRSP
Inverse Mills' ratio (IMR)	The ratio of the probability density function to the cumulative distribution function of the distribution of the probability of a firm using horse race succession, which is predicted using a probit model (Table 3)	Compustat Annual, CRSP, ExecuComp, Factiva, Lexis Nexis, RiskMetrics, and SEC proxy statement filings
Leverage	The ratio of the firm long term debt to total assets	Compustat Annual
Market capitalization	The product of shares outstanding and stock price listed in thousands of USD	Compustat Annual
Median pay ratio	Ratio of the CEO's pay to the median pay of the next four highest paid executives	ExecuComp
Number of industry inside replacements	The number of internally hired CEOs of the industry as defined by the Fama French 49 classification	Factiva, Lexis Nexis, and SEC proxy statement filings
Number of VPs	The number of vice presidents at the firm	Factiva, Lexis Nexis, and SEC proxy statement filings
Pay ratio	Ratio of the CEO's pay to the mean pay of the next four highest paid executives	ExecuComp
Predicted - Ln (TDC1)	Predicted total compensation paid to the CEO in thousands of dollars (TDC1) following Palia (2001), with instruments in the first stage including CEO experience (tenure at the firm), CEO quality of education (number of degrees), CEO Age, and firm volatility (12-month standard deviation of stock returns), in addition to two instrumental variables: cost of living in the state where the firm is headquartered and the peer level of compensation of firms in the same size quartile and Fama French 49 industry classification.	BoardEx, CRSP, ExecuComp, and the Bureau of Labor Statistics
Private boards	The total number of board seats held by the CEO at privately held firms	BoardEx
Public boards	The total number of board seats held by the CEO at publicly traded firms	BoardEx
R&D ratio	The ratio of firm research and development expenses to sales	Compustat Annual
Return-on-assets (ROA)	The ratio of EBITDA to total assets	Compustat Annual
Sales	Firm sales, in millions of USD	Compustat Annual
Tenure	The CEO's tenure at the current firm	ExecuComp
Time in company	The executive's years with the firm	BoardEx
Time on board	The executive's years on the firm's board	BoardEx
Total boards	The total number of public and private board seats the CEO holds	BoardEx
Total compensation (TDC1)	Total compensation paid to the new or departing CEO in thousands of dollars (TDC1)	ExecuComp

Table 1: Internal CEO Succession Distribution

Table 1 presents the annual details of our sample's internal succession distribution. Using a sample of CEO turnovers from 1999-2012 where the replacement CEO was internal to the firm, we hand collect whether the new CEO was the heir apparent, or whether they won the role through a horse race. We search for news around a CEO turnover through Lexis-Nexis and Factiva to classify the cause of turnover and succession methods. CEOs hired through a competitive process are labeled as horse race CEOs, while other CEOs who are hired through succession planning are identified as heir apparent CEOs. We follow Shen and Cannella (2002a, 2002b) and define heir apparent as an indicator variable that is equal to one if the CEO successor is an officer who held the COO and/or President title and is at least 5 years younger than the incumbent CEO is. *Horse race* is an indicator variable that is equal to one if the firm used an inside succession but did not appoint an heir apparent, such that all internal candidates can compete for the CEO position.

Year	Heir apparent CEOs	Horse race CEOs	Total
1999	34	20	54
2000	48	28	76
2001	42	33	75
2002	29	24	53
2003	44	17	61
2004	31	23	54
2005	43	24	67
2006	38	13	51
2007	42	30	72
2008	33	15	48
2009	43	26	69
2010	32	31	63
2011	37	34	71
2012	39	56	95
Total	**535**	**374**	**909**

Table 2: Summary Statistics

Table 2 presents summary statistics for our sample based on the presence of a turnover and subsequent CEO selection method. We follow prior literature (Bebchuk et al., 2011; Burns et al., 2017) and define tournament structure as the CEO pay ratio (ratio of the CEO's pay to the mean and median pay of the next four highest paid executives). All variables are defined in the Appendix. The significance tests examine whether there is a significant difference between heir apparent and horse race firms. Significance at the 1%, 5%, and 10% levels is denoted as ***, **, and *, respectively.

Panel A: Firm Characteristics

	Heir apparent CEO firms		**Horse race CEO firms**		**Difference**	
	Mean	Median	Mean	Median	Mean	Median
Ln (Sales)	7.92	7.87	7.96	7.77	(0.04)	0.10
Market capitalization $_{t-1}$	12,392.36	2,545.05	14,384.24	2,779.55	(1,991.88)	234.50)
Book-to-market ratio $_{t-1}$	0.69	0.73	0.70	0.74	(0.01)	(0.01)
Annual stock return $_{t-1}$	0.13	0.08	0.08	0.07	0.04	0.01
Return-on-assets (ROA) $_{t-1}$	0.04	0.04	0.04	0.04	0.01	0.01
Firm age $_{t-1}$	32.64	34.00	30.06	27.00	2.58**	7.00**
R&D ratio $_{t-1}$	0.03	0.00	0.02	0.00	0.01	0.00
Leverage $_{t-1}$	0.24	0.24	0.23	0.21	0.00	0.03
Board size $_{t-1}$	10.29	10.00	10.15	10.00	0.14	0.00*
Independence (%) $_{t-1}$	0.71	0.75	0.72	0.75	(0.02)	0.00*
CEO duality $_{t-1}$	0.73	1.00	0.61	1.00	0.11***	0.00***

Panel B: Departing CEO Characteristics

	Heir apparent CEO firms		**Horse race CEO firms**		**Difference**	
	Mean	Median	Mean	Median	Mean	Median
Age $_{t-1}$	62.24	63.00	57.77	58.00	4.47***	5.00***
Tenure $_{t-1}$	10.76	8.84	8.60	7.38	2.16***	1.46***
Total compensation $_{t-1}$	5,676.52	3,382.68	6,721.17	4,253.22	4.65)*	(870.54)
Equity compensation $_{t-1}$	2,831.31	1,199.99	3,555.54	1,664.27	(724.23)*	(464.28)*
Cash compensation $_{t-1}$	1,517.92	1,096.05	1,501.71	964.50	16.21	131.55*
Pay ratio $_{t-1}$	2.32	2.15	2.48	2.21	(0.16)	(0.06)
Median pay ratio $_{t-1}$	2.69	2.45	2.72	2.41	(0.03)	0.04

Table 3: Determinants of Horse Race Succession

Table 3 presents multivariate Probit regressions that estimate firms' probability of using horse race succession. The dependent variable is a binary variable that equals one if the firm uses a competitive CEO process (i.e., horse race) and zero if the firm uses an heir apparent. Columns (1)-(3) are for sample periods t=-1, t=0 and t=1, respectively, where t is the year of CEO turnover. Robust p-values are reported in the parentheses. Significance at the 10%, 5%, and 1% levels is indicated as *, **, and ***, respectively. All variables are defined in the Appendix.

	(1) T=-1	(2) T=0	(3) T=1
Number of industry inside replacements	0.003*	0.001*	0.001**
	(0.06)	(0.10)	(0.03)
Number of VPs	0.047*	0.019*	0.030**
	(0.07)	(0.06)	(0.04)
Industry homogeneity	-0.145*	-0.077*	-0.085*
	(0.07)	(0.07)	(0.05)
Founder family	-0.284*	-0.311*	-0.370**
	(0.11)	(0.07)	(0.03)
Above 62	-0.501***	-0.397***	-0.772***
	(0.00)	(0.00)	(0.00)
Ln (Tenure)	-0.297***	-0.244*	-0.388*
	(0.00)	(0.09)	(0.08)
Ln (Sales)	0.031	-0.001	0.013
	(0.38)	(0.98)	(0.71)
R&D ratio	-1.525*	-1.324	-1.779**
	(0.08)	(0.11)	(0.05)
Leverage	0.017	-0.035	-0.061
	(0.94)	(0.87)	(0.79)
Book-to-market ratio	0.011	-0.194	-0.211
	(0.96)	(0.33)	(0.32)
ROA	0.516	-0.735	-0.820
	(0.46)	(0.21)	(0.23)
Board size	0.005	0.431	0.428
	(0.99)	(0.16)	(0.18)
Independence (%)	-0.024	-0.001	-0.006
	(0.19)	(0.94)	(0.78)
Constant	0.672	-0.478	-0.771*
	(0.12)	(0.23)	(0.10)
Observations	909	909	909
Pseudo R-squared	0.161	0.130	0.130

Table 4: Succession and Compensation

Table 4 presents regressions exploring new and departing CEOs' compensation based on succession methods. The dependent variables are the natural logs of CEO total, equity, and cash compensation. The *Horse race* indicator is equal to 1 if a firm uses a competitive CEO process and 0 if a firm has an heir apparent. Panel A (B) uses the departing (new) CEO compensation at time t-1 (t+1) as the dependent variable. Columns (1)-(3) use an OLS to estimate compensation. Columns (4)-(6) use a two-stage method where the first stage is shown in Table 3, and *Horse race* is the predicted likelihood of a horse race succession from the first stage in Table 3. To show the validity of the instruments, we report the Hansen and Sargan p-values. In columns (7)-(12), we use an endogenous switching regime technique with Heckman's selection correction model (using the two-step estimation where in the first stage the same Probit model is used to predict the probability of a horse race succession and in the second stage, the inverse Mills' ratio (*IMR*) is included as a regressor). A Chow test is used to test if the beta coefficients differ across horse race status. Columns (7-9) are for Heir Apparent Firms and (10-12) are for Horse Race firms. Variable definitions are located in the Appendix. Standard errors are clustered at the firm level. Robust p-values are reported in the parentheses. Significance at the 10%, 5%, and 1% levels is indicated as *, **, and ***,

Panel A: Departing CEO Compensation Prior to Turnover (t=-1)

							Heir apparent			Horse race		
	(1) TDC1	(2) Equity	(3) Cash	(4) TDC1	(5) Equity	(6) Cash	(7) TDC1	(8) Equity	(9) Cash	(10) TDC1	(11) Equity	(12) Cash
Horse race	0.177***	0.021	-0.111*	0.615***	2.343***	-0.585***						
	(0.00)	(0.79)	(0.09)	(0.01)	(0.00)	(0.00)						
Age	-0.667***	-1.460***	0.107	-0.253	-0.944	-0.020	-0.796**	-4.344***	-0.467	-0.213	-0.872*	0.160
	(0.00)	(0.00)	(0.69)	(0.30)	(0.35)	(0.94)	(0.01)	(0.00)	(0.16)	(0.59)	(0.10)	(0.75)
Ln (Tenure)	0.036	-0.028	0.012	0.148***	0.098	-0.019	0.099*	0.211	0.016	0.097	0.041	-0.160
	(0.36)	(0.64)	(0.82)	(0.00)	(0.62)	(0.71)	(0.07)	(0.31)	(0.79)	(0.24)	(0.72)	(0.12)
Ln (Sales)	0.414***	0.536***	0.227***	0.407***	0.575***	0.218***	0.438***	0.639***	0.248***	0.341***	0.470***	0.202***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
R&D ratio	2.014***	3.058***	1.065	2.994***	9.164***	0.194	3.477***	6.592***	0.605	2.478**	4.309***	0.428
	(0.00)	(0.00)	(0.16)	(0.00)	(0.00)	(0.74)	(0.00)	(0.00)	(0.35)	(0.01)	(0.00)	(0.75)
Leverage	0.172	0.120	0.362**	-0.052	0.712	0.278*	0.049	1.018	0.453**	-0.108	0.033	0.257
	(0.16)	(0.53)	(0.02)	(0.69)	(0.19)	(0.07)	(0.81)	(0.16)	(0.03)	(0.56)	(0.90)	(0.26)
Firm age	-0.003*	-0.001	0.002	-0.008***	-0.001	0.001	-0.006***	0.003	-0.001	-0.011***	-0.009**	0.002
	(0.09)	(0.80)	(0.47)	(0.00)	(0.89)	(0.69)	(0.01)	(0.74)	(0.70)	(0.00)	(0.03)	(0.69)
Book-to-market ratio	-0.725***	-1.057***	-0.314*	-0.748***	-1.731***	-0.523***	-0.687***	-2.526***	-0.193	-0.834***	-0.744***	-0.338
	(0.00)	(0.00)	(0.06)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.30)	(0.00)	(0.01)	(0.20)
ROA	0.342	0.536	0.374	0.028**	0.071	0.040***	-0.003	0.021	0.050***	0.066***	0.038	0.023
	(0.37)	(0.36)	(0.40)	(0.02)	(0.14)	(0.00)	(0.82)	(0.67)	(0.00)	(0.00)	(0.13)	(0.31)
Board size	0.002	-0.022	0.032**	0.252	2.751***	-0.072	-0.081	1.559*	-0.351	0.838***	2.038***	0.236
	(0.85)	(0.20)	(0.02)	(0.16)	(0.00)	(0.73)	(0.70)	(0.06)	(0.13)	(0.01)	(0.00)	(0.55)
Independence (%)	-0.007	0.631**	-0.183	-0.085	2.642	-0.912*	0.346	-0.445	0.421	-0.705	1.440	0.340
	(0.97)	(0.02)	(0.38)	(0.83)	(0.12)	(0.05)	(0.49)	(0.80)	(0.44)	(0.31)	(0.13)	(0.64)
CEO duality	0.077	0.201**	0.197***	0.022	0.320	0.178***	0.021	0.432*	0.215***	0.051	0.255*	0.119
	(0.16)	(0.02)	(0.00)	(0.70)	(0.18)	(0.01)	(0.77)	(0.09)	(0.01)	(0.60)	(0.06)	(0.34)
IMR							-0.294	-0.797	0.314	-0.338	-0.795*	1.219***
							(0.14)	(0.40)	(0.14)	(0.32)	(0.09)	(0.00)
Constant	7.423***	9.179***	4.464***	5.302***	1.735	5.439***	8.383***	18.569***	6.262***	5.603***	6.583***	3.562*
	(0.00)	(0.00)	(0.00)	(0.00)	(0.69)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.06)
Observations	909	909	909	909	909	909	535	535	535	374	374	374
Adjusted R^2	0.504	0.449	0.205	0.473	0.427	0.195	0.479	0.279	0.268	0.325	0.344	0.122
Hansen				0.522	0.212	0.224						
Sargan				0.057	0.005	0.075						
Chow Test										0.1667	0.1289	0.4467

Panel B: New CEO Compensation Following Promotion (t=1)

							Heir apparent			Horse race		
	(1) TDC1	(2) Equity	(3) Cash	(4) TDC1	(5) Equity	(6) Cash	(7) TDC1	(8) Equity	(9) Cash	(10) TDC1	(11) Equity	(12) Cash
Horse race	-0.025	-0.097*	-0.048**	-0.653***	-3.418***	-0.182*						
	(0.56)	(0.08)	(0.03)	(0.00)	(0.00)	(0.06)						
Age	-0.297*	-0.500*	-0.301	-0.142	-1.101	-0.258	-0.299	-0.279	0.257	0.054	-0.636*	-0.862**
	(0.10)	(0.05)	(0.13)	(0.48)	(0.14)	(0.20)	(0.26)	(0.45)	(0.24)	(0.87)	(0.11)	(0.03)
Ln (Tenure)	0.248**	-0.001	0.017	0.244**	-0.402	0.153	0.665***	0.170	0.477***	-0.104	-0.163	-0.212
	(0.01)	(0.96)	(0.30)	(0.04)	(0.41)	(0.17)	(0.00)	(0.43)	(0.00)	(0.55)	(0.44)	(0.30)
Ln (Sales)	0.440***	0.464***	0.182***	0.393***	0.613***	0.172***	0.402***	0.467***	0.199***	0.389***	0.453***	0.129***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
R&D ratio	1.631***	3.141***	-0.300	1.479***	2.528	-0.364	1.358**	3.508***	0.005	0.221	2.335**	0.685
	(0.00)	(0.00)	(0.50)	(0.00)	(0.13)	(0.42)	(0.02)	(0.00)	(0.99)	(0.82)	(0.04)	(0.52)
Leverage	0.059	-0.109	0.028	0.054	0.071	0.040	-0.105	-0.451*	0.080	0.083	0.123	-0.024
	(0.61)	(0.49)	(0.82)	(0.65)	(0.87)	(0.74)	(0.54)	(0.06)	(0.57)	(0.64)	(0.56)	(0.91)
Firm age	-0.002	-0.005**	-0.002	-0.003**	-0.004	-0.002	-0.002	-0.003	-0.001	-0.005**	-0.008***	-0.003
	(0.35)	(0.01)	(0.22)	(0.03)	(0.46)	(0.22)	(0.35)	(0.34)	(0.74)	(0.03)	(0.01)	(0.28)
Book-to-market ratio	-0.935***	-1.098***	-0.483***	-0.848***	-1.633***	-0.511***	-0.946***	-1.412***	-0.192*	-0.853***	-0.922***	-0.089
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.08)	(0.00)	(0.00)	(0.66)
ROA	-1.217***	-1.042**	-1.178***	0.043***	0.092**	0.047***	0.042***	0.020	0.042***	0.045**	0.044**	0.058***
	(0.00)	(0.02)	(0.00)	(0.00)	(0.05)	(0.00)	(0.00)	(0.27)	(0.00)	(0.01)	(0.04)	(0.01)
Board size	0.016	0.032**	0.045***	1.128***	2.787***	0.325*	1.039***	0.870***	-0.311*	1.485***	1.147***	1.224***
	(0.15)	(0.02)	(0.00)	(0.00)	(0.00)	(0.05)	(0.00)	(0.01)	(0.08)	(0.00)	(0.00)	(0.00)
Independence (%)	0.607***	1.298***	0.327*	-1.051***	-2.184*	-1.094***	-1.230***	-1.024*	0.505	-1.522**	-1.417*	0.260
	(0.00)	(0.00)	(0.05)	(0.00)	(0.10)	(0.00)	(0.00)	(0.10)	(0.11)	(0.02)	(0.07)	(0.68)
CEO duality	0.009	0.006	0.087*	-0.086*	-0.340**	0.091*	-0.032	0.123	0.097**	-0.166**	0.037	0.115
	(0.86)	(0.92)	(0.07)	(0.07)	(0.05)	(0.05)	(0.58)	(0.16)	(0.04)	(0.04)	(0.69)	(0.22)
IMR							0.604*	-0.124	0.284	0.646*	-0.336	-0.317
							(0.10)	(0.81)	(0.34)	(0.10)	(0.48)	(0.49)
Constant	4.684***	5.502***	6.336***	5.069***	6.450**	6.171***	4.479***	4.920***	3.404***	3.706**	6.643***	8.390***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.03)	(0.00)	(0.00)	(0.00)	(0.00)	(0.02)	(0.00)	(0.00)
Observations	909	909	909	909	909	909	535	535	535	374	374	374
Adjusted R^2	0.637	0.470	0.229	0.604	0.496	0.212	0.568	0.509	0.353	0.461	0.427	0.125
Hansen				0.167	0.178	0.193						
Sargan				0.011	0.0057	0.005						
Chow Test										0.1581	0.3798	0.2421

Table 5: CEO Compensation Characteristics Around Turnovers by Succession Method

Table 5 presents a comparison of CEO characteristics based upon internal succession methods. Variable definitions are provided in the Appendix. Differences in means and medians are tested between heir apparent CEOs and horse race CEOs in Panel A. Panel B tests differences in means for heir apparent and horse race firms before versus after the turnover. Panel C tests whether there are differences in mean and median values of the change in compensation between the new CEO (*t+1*) and the departing CEO (*t-1*) between heir apparent CEOs and horse race firms. Significance at the 1%, 5%, and 10% levels is indicated by ***, **, and *, respectively.

Panel A: New CEO Characteristics

	Heir apparent firms		**Horse race firms**		**Difference**	
	Mean	Median	Mean	Median	Mean	Median
Age	51.10	51.00	53.76***	54.00***	2.66***	3.00***
Time in company	12.60	11.00	12.83	10.00	0.23	-1.00
Time on board	3.59	2.00	3.31*	1.00**	-0.28	-1.00**

Panel B: New CEO Compensation: Pay Raise around Promotion

	Heir apparent firms		**Horse race firms**		**Difference**	
	Pre turnover	Post turnover	Pre turnover	Post turnover	Pre turnover	Post turnover
Total compensation $_{t+1}$	4,879	5,295*	4,072	5,434	808	(140)
Equity compensation $_{t+1}$	3,329	3,117	2,657	3,195	672	(78)
Cash compensation $_{t+1}$	998	1,239***	923	1,319*	74	(81)

Panel C: Difference between CEO Compensation around Turnover Event: New CEO Compensation less Departing CEO Compensation

	Heir apparent firms		**Horse race firms**		**Difference**	
	Mean	Median	Mean	Median	Mean	Median
Δ Total compensation $_{t+1 - t-1}$	(472)	19	(1,324)	(86)	852**	105***
Δ Equity compensation $_{t+1 - t-1}$	286	80	(360)	0	647**	80**
Δ Cash compensation $_{t+1 - t-1}$	(279)	(100)	(182)	(42)	(97)*	(58)**

Table 6: Difference-In-Difference in Compensation Around Turnovers

Table 6 presents a difference-in-difference analysis of CEO compensation around turnover events. The dependent variables are the changes in the natural logs of CEOs' total compensation, cash compensation, and equity compensation. Panel A uses the change in the new CEO's compensation after promotion (*t+1*) versus before promotion (*t-1*). Panel B measures the change in the compensation between the new CEO at time *t=1* (after promotion) and the departing CEO's compensation at time *t-1* (before promotion). Variable definitions are located in the Appendix. Standard errors are clustered at the firm level. Robust p-values are reported in the parentheses. Significance at the 10%, 5%, and 1% levels is indicated as *, **, and ***, respectively.

Panel A: New CEO's compensation after promotion (t+1) versus before promotion (t-1)

	OLS			Two-Stage		
	(1)	(2)	(3)	(4)	(5)	(6)
	Δ TDC1	Δ Equity	Δ Cash	Δ TDC1	Δ Equity	Δ Cash
Horse race	1.719*	1.403	0.186**	1.912**	1.581	1.924***
	(0.09)	(0.17)	(0.05)	(0.04)	(0.60)	(0.00)
Δ Age	-0.056	-0.049	0.001	-0.054	-0.047	0.005
	(0.34)	(0.40)	(0.88)	(0.35)	(0.41)	(0.31)
Δ Ln (Tenure)	0.020	0.015	-0.003	0.018	0.011	0.002
	(0.76)	(0.82)	(0.66)	(0.78)	(0.86)	(0.66)
Δ Ln (Sales)	0.071	-0.342	0.426***	0.525	0.206	0.266**
	(0.97)	(0.83)	(0.00)	(0.73)	(0.89)	(0.03)
Δ R&D ratio	1.464	1.908	-0.602	6.578	7.019	0.273
	(0.92)	(0.90)	(0.65)	(0.64)	(0.62)	(0.81)
Δ Leverage	-12.640***	-12.279***	-0.801*	-11.635**	-11.677**	-0.155
	(0.01)	(0.01)	(0.07)	(0.01)	(0.01)	(0.70)
Firm age	0.049*	0.029	0.008***	0.050*	0.030	0.006***
	(0.09)	(0.31)	(0.00)	(0.07)	(0.28)	(0.00)
Δ Book-to-market ratio	-9.185***	-7.725***	-0.332	-7.122***	-5.450**	-0.483**
	(0.00)	(0.01)	(0.20)	(0.01)	(0.03)	(0.02)
Δ Board size	-0.331	-0.294	-0.034	-0.385	-0.350	-0.017
	(0.30)	(0.35)	(0.24)	(0.22)	(0.26)	(0.50)
Δ Independence (%)	-2.414	-2.698	0.250	-1.982	-2.081	0.245
	(0.61)	(0.57)	(0.57)	(0.67)	(0.65)	(0.50)
Δ ROA	4.197	3.219	-0.206	5.435	4.221	-0.309
	(0.43)	(0.54)	(0.67)	(0.30)	(0.42)	(0.45)
Δ CEO duality	1.152	1.098	-0.090	0.959	0.961	0.057
	(0.26)	(0.28)	(0.34)	(0.31)	(0.31)	(0.45)
Constant	-1.568	-0.899	0.061	-2.348	-2.184	0.886***
	(0.52)	(0.71)	(0.78)	(0.21)	(0.23)	(0.00)
Observations	909	909	909	909	909	909
Adjusted R^2	0.245	0.236	0.281	0.215	0.207	0.247
Hansen				0.353	0.355	0.582
Sargan				0.004	0.005	0.012

Panel B: New CEO's compensation (t+1) versus Departing CEO's compensation (t-1)

	OLS			Two-Stage		
	(1)	(2)	(3)	(4)	(5)	(6)
	Δ TDC1	Δ Equity	Δ Cash	Δ TDC1	Δ Equity	Δ Cash
Horse race	-1.144*	-0.921**	0.023	-2.987***	-2.476**	1.164
	(0.07)	(0.05)	(0.80)	(0.00)	(0.02)	(0.11)
Δ Age	3.409*	3.614**	0.003	3.653*	3.803**	-0.036
	(0.09)	(0.02)	(0.63)	(0.07)	(0.02)	(0.91)
Δ Ln (Tenure)	-0.061	-0.071**	0.006	-0.061	-0.072**	0.006
	(0.12)	(0.02)	(0.35)	(0.11)	(0.02)	(0.32)
Δ Ln (Sales)	3.013***	1.466*	0.398***	2.994***	1.446*	0.427***
	(0.00)	(0.06)	(0.01)	(0.00)	(0.05)	(0.00)
Δ R&D ratio	-2.573	0.703	-1.489	-2.418	0.807	-1.541
	(0.77)	(0.92)	(0.27)	(0.78)	(0.91)	(0.25)
Δ Leverage	2.498	0.876	-0.340	1.977	-0.037	0.021
	(0.39)	(0.70)	(0.44)	(0.49)	(0.99)	(0.96)
Firm age	0.002	-0.004	-0.003	0.001	-0.005	-0.002
	(0.93)	(0.75)	(0.30)	(0.97)	(0.70)	(0.40)
Δ Book-to-market ratio	-4.192**	-2.892**	-0.481*	-4.253**	-2.946**	-0.444*
	(0.01)	(0.03)	(0.06)	(0.01)	(0.02)	(0.08)
Δ Board size	-0.520***	-0.403***	-0.035	-0.517***	-0.399***	-0.037
	(0.01)	(0.01)	(0.24)	(0.01)	(0.01)	(0.20)
Δ Independence (%)	-0.550	-1.127	0.572	-0.523	-1.101	0.555
	(0.85)	(0.62)	(0.19)	(0.86)	(0.62)	(0.20)
Δ ROA	2.306	0.365	-0.111	2.162	0.191	-0.019
	(0.48)	(0.89)	(0.82)	(0.50)	(0.94)	(0.97)
Δ CEO duality	-0.562	0.029	-0.200**	-0.561	0.032	-0.196**
	(0.37)	(0.95)	(0.03)	(0.36)	(0.95)	(0.03)
Constant	-1.317	-0.894	0.067	-0.480	-0.194	-0.471*
	(0.37)	(0.44)	(0.76)	(0.75)	(0.87)	(0.05)
Observations	909	909	909	909	909	909
Adjusted R^2	0.249	0.239	0.289	0.223	0.209	0.264
Hansen				0.886	0.678	0.816
Sargan				0.004	0.003	0.004

Table 7: Tournament Theory and New Appointed CEO Compensation

Table 7 presents the new CEO's compensation segmented by whether the companies are in industries that historically have high pay ratio or low pay ratio. We follow Burns et al. (2017) and use the mean and median pay ratio as measures of tournament structure. Pay ratios are calculated by dividing the CEO's compensation by the mean (median) compensation of the next four highest paid executives. Using the Fama French 49 industry classification, we denote the top quartile of industries by tournament pay as high pay ratio and industries in the bottom quartile as low pay ratio industries. Significant differences between high and low pay ratio industries for the 1%, 5%, and 10% levels are indicated as ***, **, and *, respectively. Significant differences between heir apparent and horse race firms at the 1%, 5%, and 10% levels are indicated as a, b, and c, respectively. Variable definitions are provided in the Appendix.

Panel A: Heir Apparent Firms New CEO Compensation Structure

	Pay ratio			**Median pay ratio**		
Industry Tournament Structure:	Low	High	Difference	Low	High	Difference
Total compensation $_{t+1}$	4,844	5,541	697*	4,892	5,498	606*
Equity compensation $_{t+1}$	2,890	3,330	440*	2,873	3,347	473*
Cash compensation $_{t+1}$	1,105	1,364	259***	1,117	1,353	236***

Panel B: Horse Race Firms New CEO Compensation Structure

	Pay ratio			**Median pay ratio**		
Industry Tournament Structure:	Low	High	Difference	Low	High	Difference
Total compensation $_{t+1}$	5,287	5,512	225	5,489	5,316*	(173)*
Equity compensation $_{t+1}$	3,205	3,185	(21)	3,206	3,183*	(23)*
Cash compensation $_{t+1}$	1,278 [a]	1,361	83	1,279 [b]	1,364	85

Table 8: New CEOs' Compensation Based on Tournament Structure

Table 8 shows the estimations of CEO compensation based on the tournament structure variable pay ratio. We follow Burns et al. (2017) and use the mean and median pay ratio as measures of tournament structure. Pay ratios are calculated by dividing the CEO's compensation by the mean (median) compensation of the next four highest paid executives. The dependent variable is the natural log of new CEO's compensation the year after the turnover event. We include an indicator that is equal to one if the candidate participated in a horse race for promotion. We also interact the horse race variable with the indictor variable for high mean (median) pay ratio determined by the departing CEOs' compensation. Columns (1), (3), (5), (7), (9), and (11) use the mean pay ratio. Columns (2), (4), (6), (8), (10), and (12) use the median pay ratio. We use the same control variables as Table 4 but do not report them. Columns (1)-(6) use an OLS model and (7)-(12) use a 2-stage model where the first stage is shown in Table 3. We control for industry and year fixed effects with robust standard errors. P-values are shown in parentheses. Significance is denoted as ***, **, * for the 1%, 5%, and 10% levels, respectively. Variable definitions are provided in the Appendix.

	OLS						Two-Stage					
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	$TDC1_{t+1}$	$TDC1_{t+1}$	$Equity_{t+1}$	$Equity_{t+1}$	$Cash_{t+1}$	$Cash_{t+1}$	$TDC1_{t+1}$	$TDC1_{t+1}$	$Equity_{t+1}$	$Equity_{t+1}$	$Cash_{t+1}$	$Cash_{t+1}$
Horse race	0.070	0.004	0.137**	0.080**	-0.007	-0.015	-0.197*	-0.087*	0.160	0.159	-0.193*	-0.084**
	(0.16)	(0.93)	(0.04)	(0.04)	(0.83)	(0.68)	(0.05)	(0.08)	(0.23)	(0.24)	(0.06)	(0.03)
High pay $ratio_{t-1}$	0.106*		0.012		0.088*		1.775		1.882		0.284	
	(0.04)		(0.90)		(0.08)		(0.16)		(0.16)		(0.82)	
High median pay $ratio_{t-1}$		0.071		0.117		0.070*		5.149		1.049		5.975**
		(0.30)		(0.20)		(0.09)		(0.14)		(0.18)		(0.05)
High pay $ratio_{t-1}$ * Horse race	-0.244**		-0.210*		-0.111*		-7.115**		-7.378**		-2.240*	
	(0.03)		(0.07)		(0.06)		(0.02)		(0.03)		(0.08)	
High med pay $ratio_{t-1}$ * Horse race		-0.084*		-0.084*		-0.063		-3.529*		-3.219*		-5.249**
		(0.10)		(0.06)		(0.39)		(0.08)		(0.05)		(0.04)
Constant	5.755***	5.800***	5.553***	5.546***	5.483***	5.465***	5.135***	5.376***	5.472***	5.403***	5.944***	5.386***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Observations	909	909	909	909	909	909	909	909	909	909	909	909
Adjusted R-squared	0.543	0.543	0.463	0.463	0.408	0.410	0.524	0.551	0.470	0.470	0.231	0.417

Table 9: New CEO Directorships Around Turnovers by Succession Method

Table 9 presents a comparison of new CEOs' directorships before and after the promotion based on internal succession methods. Directorships information is collected from BoardEx. Variable definitions are provided in the Appendix. We test the differences in average private and public board seats for heir apparent and horse race new CEOs before and after the turnover, as well as the differences between the two subsamples. Significance at the 1%, 5%, and 10% levels is indicated by ***, **, and *, respectively.

	Heir Apparent New CEOs			**Horse Race New CEOs**			**Difference**	
	Pre Turnover	Post Turnover	Difference	Pre Turnover	Post Turnover	Difference	Pre Turnover	Post Turnover
Public boards	1.41	1.55	0.14*	1.23	1.44	0.21*	0.18***	0.11*
Private boards	0.66	0.59	(0.07)	0.52	0.56	0.04	0.14*	0.03
Total boards	2.06	2.15	0.09	1.75	2.00	0.25**	0.31**	0.15

Table 10: Compensation and Long-Run Performance by Succession Methods

Table 10 uses a two-stage least squared approach that is similar to Palia (2001). The instruments in the first stage include CEO experience (tenure at the firm), CEO quality of education (number of degrees), CEO Age, and firm volatility (12-month standard deviation of stock returns). We also include two instruments: the cost of living in the state where the company is headquartered and peer level of compensation, focusing on firms within the same size quartile and Fama French 49 industry. The second stage uses the predicted compensation from the first stage analysis. Columns (1) and (3) are for firms that have heir apparent CEOs. Columns (2) and (4) are for firms that have horse race CEOs. We control for industry and year fixed effects with robust standard errors. P-values are shown in parentheses. Significance is denoted as ***, **, * for the 1%, 5%, and 10% levels respectively. Variable definitions are provided in the Appendix.

	Heir Apparent	Horse Race	Heir Apparent	Horse Race
	(1)	(2)	(3)	(4)
	ROA_{t+2}	ROA_{t+2}	ROA_{t+3}	ROA_{t+3}
Predicted – Ln (TDC1)	-0.001	-0.089***	0.001	-0.093***
	(0.62)	(0.00)	(0.81)	(0.00)
Ln (Sales)	0.011	0.047***	0.009	0.049***
	(0.22)	(0.00)	(0.33)	(0.00)
Board size	-0.001	-0.001	-0.001	-0.001
	(0.73)	(0.68)	(0.77)	(0.62)
Independence (%)	-0.002	0.057	-0.001	0.051
	(0.94)	(0.11)	(1.00)	(0.16)
Leverage	-0.095***	-0.027	-0.091***	-0.025
	(0.00)	(0.25)	(0.00)	(0.29)
R&D ratio	0.126*	0.199*	0.084	0.187*
	(0.10)	(0.08)	(0.27)	(0.10)
Firm age	-0.001	-0.001***	-0.001	-0.001***
	(0.14)	(0.00)	(0.24)	(0.00)
Cap ex ratio	0.139**	0.188**	0.128**	0.179**
	(0.03)	(0.03)	(0.05)	(0.04)
Constant	0.035	0.419***	0.049	0.437***
	(0.68)	(0.00)	(0.55)	(0.00)
Observations	535	374	524	367
Adjusted R^2	0.124	0.191	0.199	0.195
Hansen	0.741	0.487	0.691	0.496
Sargan	0.001	0.000	0.002	0.000

Table 11: Turnover following Appointment to CEO

Table 11 shows the comparison in the percentage of new CEOs whom turnover within three years of appointment based on total compensation between the heir apparent and horse race successors. Panel A summarizes heir apparent and horse race CEOs by total compensation (TDC1) quartiles, such that the first quartile includes the 25% of CEOs with the lowest compensation, while Panel B summarizes CEOs by above and below median total compensation. Significance at the 1%, 5%, and 10% levels is indicated as ***, **, and *, respectively.

Panel A: Quartile Analysis

	Heir apparent (N=535)		**Horse race (N=374)**		**Difference**
	Mean	Q1 - Q4 (p-value)	Mean	Q1 - Q4 (p-value)	(HA) - (HR) (p-value)
First quartile (lowest TDC1)	0.074	(0.373)	0.217	(0.066)*	(0.001)***
Second quartile	0.104		0.194		(0.058)*
Third quartile	0.083		0.116		(0.406)
Fourth quartile (highest TDC1)	0.105		0.117		(0.781)

Panel B: Median Analysis

	Heir apparent (N=535)		**Horse race (N=374)**		**Difference**
	Mean	Below - Above (p-value)	Mean	Below - Above (p-value)	(HA) - (HR) (p-value)
Below median TDC1	0.093	(0.935)	0.205	(0.019)**	(0.000)***
Above median TDC1	0.091		0.116		(0.369)

Table 12: CEOs and Greener Pastures

Table 12 presents summary statistics of job trajectory and compensation for the subsample of new CEOs who received below-median total compensation and subsequently left the company within three years of appointment. We track the career paths of the departing CEOs. Panel A provides the percentage of new CEOs who left that retired, were employed by another public firm, or went to work at a private firm or investment group following their departure from the firm. For those CEOs who joined new public firms, we collect their total compensation, equity compensation, and cash compensation in the first year of their new placement. In Panel B, we create a change variable that is equal to the difference between the CEO's compensation the first year in their new job and their last year as CEO before departing from the firm. We test whether there is a significant difference between heir apparent and horse race firms. Significance at the 1%, 5%, and 10% levels is indicated as ***, **, and *, respectively.

Panel A: Summary of Departing CEOs' Subsequent Positions by Succession Type

	All departing CEOs	
	Heir apparent CEOs	Horse race CEOs
CEOs Departing	(N=49)	(N=60)
Retired	53%	22%
New job at public firm	39%	27%
New job at private firm or investment group	8%	51%
	Below median pay CEOs	
	Heir apparent CEOs	Horse race CEOs
CEOs Departing	(N=24)	(N=39)
Retired	46%	15%
New job at public firm	54%	23%
New job at private firm or investment group	0%	62%
	Above median pay CEOs	
	Heir apparent CEOs	Horse race CEOs
CEOs Departing	(N=25)	(N=21)
Retired	60%	33%
New job at public firm	24%	33%
New job at private firm or investment group	16%	33%

Panel B: Summary of Changes in CEO Compensation by CEO Succession Type

	All departing CEOs		
	Heir apparent CEOs (N=19)	Horse race CEOs (N=16)	Difference
Δ TDC1	(3,685)	(2,625)	(1,060)**
Δ Equity	(1,795)	(839)	(956)*
Δ Cash	(820)	(870)	50
	Below median pay CEOs		
	Heir apparent CEOs (N=13)	Horse race CEOs (N=9)	Difference
Δ TDC1	(96)	312	(408)**
Δ Equity	97	406	(309)**
Δ Cash	(61)	(94)	32
	Above median pay CEOs		
	Heir apparent CEOs (N=6)	Horse race CEOs (N=7)	Difference
Δ TDC1	(6,197)	(5,562)	(635)
Δ Equity	(4,444)	(2,083)	(2,360)
Δ Cash	(1,351)	(1,646)	295

Table 13: Analysis of Executive Pay Raises Prior to Promotion by Succession Method

Table 13 presents the comparison of compensation and pay raises between the heir apparent and horse race successors leading up to their appointments as CEO. Due to data constraints, we have a smaller sample of historic pay for these executives. We provide historical data when available. Significance at the 1%, 5%, and 10% levels is indicated as ***, **, and *, respectively.

	Heir apparent CEOs (N=535)		**Horse race CEOs** (N=374)		**Difference**	
	Mean	Median	Mean	Median	Mean	Median
$TDC1_{t}$	5,528	3,551	5,538	3,642	(10)	(91)
$TDC1_{t-1}$	4,879	2,490	4,059	2,360	820	130
$TDC1_{t-2}$	4,073	1,912	3,000	2,030	1,073	(118)
$TDC1_{t-3}$	2,801	1,829	2,708	1,629	94	200
Δ $TDC1_{t-1 \text{ to } t}$	649	707	1,479	867	(830)	(160)
Δ $TDC1_{t-2 \text{ to } t-1}$	841	329	1,169	235	(328)	94
Δ $TDC1_{t-3 \text{ to } t-2}$	1,332	185	286	172	1,046	13
Δ $Cash_{t-1 \text{ to } t}$	224	169	241	175	(17)	(6)
Δ $Cash_{t-2 \text{ to } t-1}$	128	89	79	66	48	22**
Δ $Cash_{t-3 \text{ to } t-2}$	101	55	100	40	1	15

Table 14: CEO Compensation Characteristics Around Turnovers by Succession Method

Table 14 presents a comparison of CEO compensation based upon internal succession methods. We trace the compensation of the departing CEO before she was appointed CEO and measure the difference between her compensation the year prior to promotion versus her first full year after the CEO promotion (i.e., pay raise). Differences in means and medians are tested between departing CEOs in firms using heir apparent and horse race succession methods. We also test the differences in pay raises between the new CEOs and the departing CEOs. Significance at the 1%, 5%, and 10% levels is indicated by ***, **, and *, respectively.

	Heir Apparent Firms (N=374)		**Horse Race Firms (N=319)**		**Difference (HA – HR)**	
	Mean	Median	Mean	Median	Mean	Median
New CEO Compensation After Appointment $_{t+1}$ - Pre-Promotion Compensation $_{t-1}$ (000)	347.16	750.89	310.58	673.98	36.58**	76.91**
Old CEO Compensation After Appointment $_{t+1}$ - Pre-Promotion Compensation $_{t-1}$ (000)	1,918.24	1,099.16	2,220.25	1,439.40	(302.01)*	(340.24)*
Difference between New CEOs and Old CEO Changes	(1,571.08)*	(348.27)*	(1,909.67)**	(765.42)**		