Do Chair Independence and Succession Planning Influence CEO Turnover?

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Abstract

There is widespread concern that corporate boards do not sufficiently punish chief executive officers (CEOs) for poor performance. Board effectiveness in ousting CEOs may be affected by chief executives who also chair the board or influence the succession planning process. This article explores how chair independence and succession planning influence CEO turnover. I address endogeneity issues using a trinomial probit regression system of CEO turnover that models chair independence and succession planning endogenously.

I find that succession planning has a larger positive effect on CEO turnover than suggested by previous research. I also find that chair independence actually reduces the probability of succession planning because it creates a friction with the common relay succession model. There is a negative overall effect of chair independence on CEO turnover.

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1 Introduction

There is widespread concern that corporate boards do not sufficiently punish chief executive officers (CEOs) for poor performance. This may be caused by CEO entrenchment where boards retain chief executives who shareholders would rather see fired. Board effectiveness in ousting CEOs may be affected by chief executives who also chair the board (CEO duality) or influence the succession planning process. Empirical research shows that CEO turnover is less sensitive to poor stock returns when firms have dual CEO-chairs (Dahya et al. (2002), Goyal and Park (2002)), and that the likelihood of turnover decreases when firms have no succession plan and no heir apparent is available (Naveen (2006)). Accordingly, corporate governance rules were established to encourage boards to separate the chief executive role from the chairperson[1] and to introduce succession planning procedures[2]. However, an important issue with these studies is that they generally rely on variation in corporate decision variables, which is unlikely to be random. In particular, endogeneity in chair independence and succession planning cannot be ruled out and standard regression results may be biased.

In this article, I explore how chair independence and succession planning affect CEO turnover by improving corporate governance and reducing entrenchment. I address concerns regarding simultaneity and omitted variables in chair independence and succession planning by using a

[1]On December 16, 2009, the SEC announced a rule (SEC Release No. 33-9089; 34-61175; http://www.sec.gov/rules/final/2009/33-9089.pdf) that requires listed companies to disclose the board leadership structure, including whether the firm has combined the CEO and chairperson position, and explain why such a leadership structure is appropriate.

[2]On October 27, 2009, the SEC eliminated the ordinary business exclusion defense (SEC Release No. 33-9089; 34-61175; http://www.sec.gov/rules/final/2009/33-9089.pdf) employed by firms unable or unwilling to disclose their CEO succession planning process to shareholders. In changing its prior view, the SEC recognized that inadequate CEO succession planning represents an important business risk and flags a firm's governance policy issue that goes beyond daily management of the firm. Succession planning is considered "a key board function and a significant policy (and governance) issue ... so that a company is not adversely affected by a vacancy in leadership."

trivariate probit system to estimate the effect on CEO turnover. Firms execute their succession plans by appointing an heir apparent to the board of directors, usually a separate President, Chief Operating Officer, or Vice Chair. I find that such succession planning increases the probability of CEO turnover by at least 20%. When there are no succession candidates some chief executives are retained even though shareholders may prefer to have them replaced. Succession planning therefore seems to reduce CEO entrenchment by eliminating a friction to turnover.

The trivariate probit system permits a chair independence effect on succession planning and I find a significantly negative correlation. This may be caused by the common relay succession model, where CEO duality (no independence) coincides with an heir apparent (succession planning). The overall effect of chair independence is therefore negative and reduces the likelihood of CEO turnover by 4%. This unexpected result may arise because the positive effect of improved monitoring by independent chairs is exceeded by the frictions arising from fewer relay successions. Chair independence does not seem to reduce CEO entrenchment enough to compensate for the reduction in heirs apparent by barring relay successions.

I address concerns regarding unobserved managerial ability by selecting samples of natural retirements and forced turnover. CEO ability cannot be directly observed, but corporate boards learn it over time until it becomes a known quantity (Taylor (2010)). CEOs who survive board scrutiny until retirement age are therefore likely to have high average ability while CEOs who are forced to leave earlier most likely have low average ability (Fee et al. (2010)). I find that coefficient estimates are consistent across these samples and conclude that a bias caused by unobserved CEO ability is unlikely.

This article supports corporate governance rule changes that enhance succession planning but provides no evidence for policies that promote chair independence.

The literature on CEO turnover is well established and rooted in corporate governance theory. According to Jensen and Meckling (1976), Fama (1980), and Jensen and Ruback (1983), agency theory predicts that the

separation of corporate ownership from control encourages managers to maximize private benefits and decrease shareholder value. Such managerial behavior is typically blamed on the unwillingness or inability of corporate boards to effectively exercise their role as shareholder representatives. Fama and Jensen (1983) show that ineffective corporate governance emerges from boards dominated by firm managers. Weisbach (1988) observes that manager-dominated boards are less likely to dismiss CEOs for poor firm performance. Chair independence has come under particular scrutiny. Agency theory suggests that chair and CEO roles be separated in order to increase board independence and enable better oversight. Consistent with agency theory, Goyal and Park (2002) and Dahya et al. (2002) show that chair independence increases the likelihood of turnover with respect to firm performance.

Parrino (1997) suggests that firms evaluate trade-offs in turnover and succession decisions. The potential benefit of replacing a chief executive with a successor increases with the expected improvement in match quality between firm requirements and executive characteristics, but decreases with uncertainty in measuring these characteristics and fixed costs of CEO turnover. Taylor (2010) shows that corporate boards learn unobservable CEO ability over time until it becomes a know quantity. Vancil (1987) focuses on CEO succession planning and finds that relay successions are a common pattern. The firm selects an heir apparent several years before the CEO's anticipated retirement date, the heir apparent and outgoing chief executive work together until the CEO leaves, and the retiring CEO remains chairperson for a few years before also transferring chairmanship to the successor. Dual CEO-chairs are therefore a normal stage during the common relay succession cycle. Naveen (2006) revisits succession planning and finds that many U.S. firms use a relay process for inside successions. The departing CEO's age also plays an important role in top executive changes. Murphy (1999) documents that most CEO turnover relates to natural retirements.

This article is organized as follows. Section 2 develops testable hypotheses. Section 3 discusses the empirical strategy. The sample and de-

scriptive statistics are presented in Section 4. Section 5 shows the main results, and Section 6 concludes.

2 Hypotheses

Corporate governance theory suggests that chair independence reduces CEO entrenchment and therefore has a positive effect on CEO turnover. Empirical research shows that succession planning also has a positive effect on CEO turnover. However, chair independence is related to succession planning and therefore has an indirect effect on CEO turnover as well: relay successions require both an heir apparent and a dual CEO-chair, who remains as dependent chair after the turnover event. Since chair independence rules out the relay succession model, there may also be fewer heirs apparent and less CEO turnover. Any positive direct effect of chair independence on CEO turnover could therefore be countered by a negative indirect effect from less effective succession planning.

I motivate the test hypotheses for the effect of chair independence and CEO succession planning on turnover as well as their interaction. There are three hypotheses for testing how chair independence and succession planning, both directly and indirectly, affect CEO turnover.

Direct Effects (DE)

Chair independence decreases entrenchment. The dual role of a CEO-chair creates conflicts of interest. Such conflict may arise because incentives to remain CEO are strong and can lead to entrenchment. As chairperson of the board, CEO-chairs may be able to influence the board in their own turnover decisions as well as influence the board's succession planning process. Chief executives usually have superior information regarding candidate ability. CEO entrenchment strategies to delay turnover and succession may include, for example, downplaying candidate ability or ousting an heir apparent. Separating the chairperson from the chief executive role eliminates these conflicts of interest.

DE1: Chair independence makes CEO turnover more likely.

Succession planning facilitates inside successions. Firms engage in succession planning in order to facilitate managerial successions. An heir apparent is typically a firm insider and designated successor to a retiring chief executive. The absence of an heir apparent leaves only other less suitable inside or unknown outside successors, which might be more costly and risky. Succession planning that produces an heir apparent should therefore increase the probability of turnover.

DE2: Succession planning makes CEO turnover more likely.

Indirect Effects (IE)

Relay successions require CEO duality. Relay successions are characterized by chief executives taking the chairperson role and by boards selecting an heir apparent prior to the management transition. The promotion of chief executives to dual CEO-chairs typically takes place before the appointment of the heir apparent. CEO duality usually precedes heir apparent in the relay succession cycle. Since chair independence rules out the relay succession model there may also be fewer heirs apparent.

IE: Chair independence makes succession planning less likely.

These three hypotheses provide tests for both the overall effect of chair independence on CEO turnover (DE1) and the indirect effect through the succession planning channel (IE and DE2). These tests can be used to disentangle the direct and indirect effect of chair independence on CEO turnover and show which dominates.

3 Empirical Strategy

Measuring the effect of chair independence and succession planning on CEO turnover is a challenge. The firm's decisions on chair independence, succession planning, and CEO turnover are made simultaneously. For

example, if a firm decides to use the common relay succession model (Vancil (1987)) then its succession planning, chair independence, and CEO turnover are affected at the same time: an heir apparent is selected, the incumbent becomes dual CEO-chair, and a target date is set to pass on the CEO title to the successor. Simultaneity can therefore lead to endogeneity and inconsistent estimates.

Unobserved variables may also create endogeneity problems. For example, CEO ability is difficult to observe but influences chair independence and succession planning: a low ability chief executive is more likely to face an independent chair and be replaced by an outside successor. Unobserved ability can therefore generate further inconsistency.

The empirical approach must therefore address endogeneity from both simultaneous and unobserved variables. This problem lends itself to simultaneous systems estimation. My empirical strategy is therefore to estimate a recursive and fully observed system of seemingly unrelated regression (SUR) equations.

Following this general approach, Naveen (2006) uses a bivariate probit regression to estimate the effect of one endogenous variable, succession planning, on CEO turnover. However, the relay succession model is also characterized by CEO duality, which is not part of her analysis. Therefore, I introduce a second endogenous variable, chair independence, in order to better incorporate the effect of relay successions.

The resulting recursive trivariate binary choice model can be specified as a system of SUR equations:

$$
\begin{aligned}
ChairInd_t &= \mathbf{1}[\delta_1 Z_{1t} + \delta_2 Z_{2t} + \mathbf{X}_t\boldsymbol{\gamma}_1 + \varepsilon_{1t} > 0] && (1)\\
HeirApp_t &= \mathbf{1}[\alpha_2 ChairInd_t + \delta_2 Z_{2t} + \mathbf{X}_t\boldsymbol{\gamma}_2 + \varepsilon_{2t} > 0] && (2)\\
Turnover_t &= \mathbf{1}[\alpha_3 ChairInd_t + \beta_3 HeirApp_t + \mathbf{X}_t\boldsymbol{\gamma}_3 + \varepsilon_{3t} > 0] && (3)\\
\boldsymbol{\varepsilon} &= (\varepsilon_1, \varepsilon_2, \varepsilon_3)' \sim \mathcal{N}(\mathbf{0}, \boldsymbol{\Sigma}) && (4)\\
\boldsymbol{\Sigma} &= \begin{bmatrix} 1 & . & . \\ \rho_{12} & 1 & . \\ \rho_{13} & \rho_{23} & 1 \end{bmatrix}, && (5)
\end{aligned}
$$

where $\mathbf{1}[\cdot]$ is the indicator function, $\mathbf{X}$ is a matrix of controls, ρ_{ij} reflects the correlation between the error terms ε_i and ε_j, and the dots refer to symmetrical elements in the lower matrix part.

Stage one (Eq. 1) defines the endogenous binary choice variable chair independence. If the chair of the board during year t is neither the current nor a former CEO of the firm, then the chairperson is independent and $ChairInd_t$ is set to 1. Z_1 and Z_2 are instruments.

Stage two (Eq. 2) defines the endogenous binary choice variable heir apparent. If the board of directors during year t includes a President, Chief Operating Officer (COO), or Vice Chair who is *not* the current CEO, then the firm has a succession plan and $HeirApp_t$ is set to 1. Z_2 is an instrument.

Stage three (Eq. 3) defines the endogenous binary choice variable CEO turnover. If the CEO changes during year t, then the firm experiences a CEO turnover event and $Turnover_t$ is set to 1.

The SUR system is recursive because in each stage the endogenous variables of previous stages appear on the RHS: chair independence is an explanatory variable for heir apparent, while both chair independence and heir apparent are explanatory variables for CEO turnover. The SUR system is also fully observed: the endogenous variables on the RHS (Eq. 2 and Eq. 3) are actual observations and not estimates. This system permits correlation between the error terms in each stage (Eq. 5).

The SUR system can be estimated consistently using limited information maximum likelihood (LIML). Consistency requires identically but not independently distributed errors in each stage, and homoskedasticity in the final stage. Wilde (2000) shows that recursive multi-equation limited dependent variable models do not require exclusion restrictions for parameter identification[3]. Therefore all stages, except the final one, do not need to be fully specified and can omit influential variables.

Wooldridge (2010)[4] cautions against relying solely on nonlinearity in multivariate probit models for parameter identification, and suggests to

[3]Wilde (2000) proves that a single varying exogenous regressor per equation is sufficient to eliminate problems with small variation identification in multi-equation probit models using endogenous indicator variables.

[4]p. 599

use exclusion restrictions. It is therefore conservative to use two instruments with three exclusion restrictions for the SUR system:

1. Post-SOX indicator. The Sarbanes-Oxley (SOX) act, enacted in July 2002, enhances the oversight role of public company boards. It strengthens non-executive director independence, particularly for audit committees. SOX also increases chair independence and can be considered an exogenous shock. However, the legislative scope does not cover succession planning and CEO turnover. The post-SOX indicator is therefore an instrument for chair independence and can be excluded from the succession planning and CEO turnover equations. Any SOX effect on succession planning and CEO turnover is thus attributed to the chair independence channel.

2. Conditional candidate age indicator. Executives promoted to the executive board are succession candidates well before their official selection as heir apparent (Naveen (2006)). Candidates for heir apparent are also usually younger than the incumbent CEO. Low candidate age increases the likelihood of succession planning (heir apparent) and can be considered exogenous, after controlling for candidate availability. However, it is not plausible that conditional candidate age has a direct effect on CEO turnover. Candidate age between 44 and 52, conditional on candidate availability, is therefore an instrument for succession planning and chair independence that can be excluded from the CEO turnover equation. Any candidate age effect on CEO turnover is accordingly attributed to the succession planning and chair independence channel.

These exclusion restrictions deliver an identified model. I estimate the SUR system using simulated maximum likelihood methods based on the GHK algorithm[5].

[5]The GHK algorithm was developed independently by Geweke (1989), Hajivassiliou and McFadden (1998), and Keane (1994). It is implemented in Stata for general conditional mixed processes with the user-written command cmp by Roodman (2011).

3.1 Unobserved Ability

The effect of managerial ability on board decisions could generally be eliminated by conditioning on it. However, it is difficult to directly observe executive ability and there are no good proxies or instruments. My empirical strategy is therefore to condition on managerial ability by selecting samples where executive ability is likely to be similar.

Corporate boards receive various public and private signals in order to learn unobservable managerial ability over time (Taylor (2010)). CEO survival is accordingly related to ability: chief executives surviving board scrutiny long enough to enter natural retirement should have high average ability, and those that are forced out sooner should have low average ability (Weisbach (1988), Fee et al. (2010)). I therefore select two samples that are likely to differ in CEO ability: natural retirements with high CEO ability, and forced turnover with low CEO ability. If the regression coefficients are robust for different levels of CEO ability then a bias caused by unobserved heterogeneity is unlikely.

4 Data

4.1 Sample Selection

The primary data source is BoardEx, which provides information on executive management and non-executive board members by firm for the fiscal years from 1999 to 2008. The data set is merged with Compustat for accounting and stock market information. The sample is restricted to non-financial U.S. firms[6] with a minimum of $10 million in total assets where the chief executive is known at the beginning and end of each fiscal year. Interim successors, identified by either the title interim or acting chief executive or by a CEO tenure of less than one year, are excluded. A turnover event occurs when the chief executive leaves the firm.

After selecting the initial sample I categorize CEO turnover further by

[6]SIC codes between 6000 and 6999 are excluded.

type. I select news articles from Factiva that contain the name of each departing chief executive during a two-year window around the turnover date to classify the likely cause of the departure. Forced turnover and natural retirements are identified according to the classification used by Parrino (1997). Forced turnover is selected with the following procedure: first, all turnover where a CEOs is reported to be fired is classified as forced. Second, all other turnover in which CEOs are under age 60 are reviewed further. If the report does not mention that: (i) the exit is health-related, (ii) the departing CEO either takes a new job in or outside the firm, leaves for personal or other reasons unrelated to the firm, or (iii) the chief executive departs in a natural retirement, then such turnover is also classified as forced. Retirement is natural when a CEO retires and announces it at least six months before leaving the firm.

Table 1 shows a panel data set with 25,622 firm-years, 2,250 firms, 4,665 chief executives, and 2,790 CEO turnover events. Of these, 690 are natural retirements and 1,090 are forced CEO turnover.

Each turnover event typically comes with a succession. A relay succession is a planned succession, characterized by an incoming CEO who was previously heir apparent and a departing CEO who stays on as chairperson. An heir apparent is a firm insider with a tenure of at least one year who is either president, chief operating officer, or vice chairperson of the firm prior to the transition. Chair independence is defined here as a chairperson who is neither the current nor a former chief executive. Relay succession and chair independence are mutually exclusive: relay successions by definition require a CEO who stays on as chairperson, and therefore the chair is not independent.

4.2 Descriptive Statistics

Since the BoardEx database is not widely used in CEO turnover research, I report several key descriptive statistics for the sample.

Table 2 reports the distribution of CEO turnover by year. The overall annual turnover rate is 10.9% and consistent with Parrino (1997), Naveen

(2006), and Fee et al. (2010). The average share of natural CEO retirements is 24.7% and the average share of forced CEO turnover is 39.1%, the latter displaying an upward trend.

Table 3 illustrates the industry distribution of CEO turnover using the Fama-French 12-industry classification system[7]. While the turnover rate varies little across industry sectors, the proportion of natural retirements and forced turnover varies considerably across sectors, this most likely reflects differences in industry maturity and competition.

Table 4 presents firm characteristics. Turnover events are preceded by low operating and stock returns. Firm size, age, and homogeneity, along with the proportion of non-executive board members are also correlated with CEO turnover.

Table 5 shows characteristics for incoming (Panel A) and outgoing CEOs (Panel B). The average CEO successor is 51.8 years old and replaces a 58.2 year-old predecessors after a tenure of 7.7 years. Overall 28.4% of outgoing chief executives have an independent chair of the board and 44.2% appoint an heir apparent. For natural retirements the average departure age is 59.4 years and CEO tenure is 7.2 years, 25.3% have an independent chairperson, and 44.9% have planned for their succession with an heir apparent. For forced turnover the average exit age is 54.8 years and tenure is 6.1 years, 34.2% have an independent chair, and 32.8% have an heir apparent.

Panel B also displays the succession type for departing chief executives. Relay successions account for 23.3%, other inside successions for 41.7%, and outside successions for 34.9% of all CEO turnover, respectively. Relay successions represent only 10.6% but outside successions account for 40.7% of forced turnover.

Table 6 presents the prior title of the incoming and subsequent tile of the outgoing CEO, respectively. Of the incoming CEOs 6.8% were CEO at another firm, while 7.6% were chairperson, 40.4% president, 7.8% chief operating officer, and 1.8% vice chair at the firm, respectively. Of the out-

[7]Definition of Fama-French 12-industry classification available at http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/

going CEOs 37.1% stay on as chairperson.

There is a close relationship between chair independence, succession planning and CEO turnover.

Figure 1 presents the proportion of firms that have an independent chairperson, i.e. a chair who is neither the current nor a former CEO. This figure shows that chair independence is strongly correlated with CEO turnover. The increase in chair independence around CEO turnover reflects the fact that departing dual CEO-chairs do not always become non-executive chairperson.

Figure 2 displays the share of firms that plan CEO successions by appointing an heir apparent. It shows that succession planning is strongly correlated with CEO turnover, particularly for natural retirements. The share of heirs apparent increases before the CEO turnover period and decreases afterwards. This reflects that most firms only install one heir apparent who either becomes the next chief executive or typically leaves.

5 Results

The multivariate results are presented in three parts. First, I present a standard probit regression of CEO turnover on exogenous covariates. Second, I display a "naïve" probit regression of CEO turnover that adds chair independence and succession planning but erroneously treats these endogenous variables as exogenous. Third, I show my main result: a trinomial probit regression system of CEO turnover that models chair independence and succession planning endogenously. These approaches produce significantly different results and show that treating endogenous variables as exogenous can lead to large errors.

5.1 Standard Probit Regression

Table 7 shows the marginal effects for a standard probit regression of CEO turnover on exogenous variables. Industry-adjusted operating and stock returns are significantly negative. This is consistent with the relative per-

formance evaluation hypothesis where firm performance measured relative to industry benchmarks reveals CEO ability and untalented chief executives are replaced. The post-Sarbanes-Oxley (SOX) dummy is also significant, indicating that after 2002 CEO turnover increased.

5.2 Naïve Probit Regression

Next, I analyze a naïve regression that ignores the endogeneity in chair independence and succession planning. Firms most likely determine chair independence and succession planning simultaneously but ignoring simultaneity usually leads to inconsistent estimates. In order to explore the severity of this issue it is instructive to compare these results with the more robust methods further on.

Table 8 displays the marginal effects for a probit regression of CEO turnover on several exogenous variables, as well as on the endogenous variables succession planning and chair independence. Succession planning (heir apparent) seems to have a highly significant effect that increases the probability of CEO turnover by 19.3% for natural retirements, 13.2% for forced turnover, and 8.7% overall. Chair independence also appears to have a highly significantly effect that increases the likelihood of CEO turnover by 6.7% for natural retirements, 7.0% for forced turnover, and 2.6% overall.

The naïve regression results rely on the assumption that succession planning and chair independence are exogenous, which is not plausible. If these variables are functions of other variables then these estimates could be inconsistent. It is therefore better to use a model that is flexible enough to deal with endogenously determined variables.

5.3 Trivariate Probit Regression System

I use a system of recursive, fully observed, and seemingly unrelated regressions (SUR) in order to estimate a model with endogenous variables. The SUR model includes three stages: the first stage is a standard probit

regression for chair independence (Eq. 1); the second stage is a bivariate probit for succession planning (heir apparent) on chair independence (Eq. 2); and the third stage is a trivariate probit for CEO turnover on chair independence and succession planning (Eq. 3). For better identification I impose one exclusion restriction on the second stage and two on the third stage.

Table 9 shows the first stage, reporting the marginal effects of a probit regression for chair independence on exogenous covariates. Firm size has a significantly negative correlation with chair independence since larger firms are less likely to have an independent director chairing the board. Operating return has a significantly negative correlation with chair independence because underperforming firms are more likely to have an independent chair. The insignificant coefficient for the natural retirement sample may reflect upward earnings management by retiring CEOs. Candidate age between 44 and 52 (after controlling for candidate existence) has a significantly positive correlation with chair independence. Executive board members within that age group are more likely to serve under an independent chairperson. Chair independence also increases significantly during the post-SOX years.

The candidate age dummy (after controlling for candidate existence) and the post-SOX dummy serve as instruments in the SUR model. Table 9 shows that both are significantly correlated with chair independence and therefore relevant instruments for the first stage.

Table 10 presents the second stage, displaying the marginal effects of a bivariate probit regression for succession planning (heir apparent) on chair independence and exogenous variables. Firm size is positively correlated with succession planning; the larger a firm, the larger its internal talent pool and the higher the likelihood of an internal heir apparent. Tobin's Q is positively correlated with succession planning; the higher the marginal value of the firm, the higher the return to talent and the higher the likelihood of an internal heir apparent.

Chair independence is weakly negatively correlated with succession planning since independent chairs are less likely to appoint an heir appar-

ent from inside the firm. Chair independence is structurally incompatible with relay successions where the departing dual CEO-chair remains on the board as a (dependent) chairperson. The test result is consistent with hypothesis **IE** that chair independence makes succession planning less likely.

The candidate age dummy (after controlling for candidate existence) is an instrument in the SUR model. Table 10 shows that it is significantly correlated with succession planning and therefore a relevant instrument for the second stage.

The SUR model uses fully observed dependent variables in all stages and estimates the correlation between the respective error terms. This property makes it robust to omitted variable problems in all stages except the final. The regression estimates are consistent even if influential variables are omitted in the first stage. The correlation between the error terms for the first (chair independence) and second (heir apparent) stage is reported as $atanh(\rho_{12})$ and significantly negative. This shows that there is an endogenous relationship between succession planning and chair independence.

Table 11 presents the third and final stage. It presents the marginal effects for a trivariate, recursive probit regression of CEO turnover on succession planning (heir apparent), chair independence and exogenous variables.

Succession planning (heir apparent) is significantly correlated with CEO turnover, increasing the likelihood of CEO turnover by 32.3% for natural retirements, 22.0% for forced turnover, and 20.4% overall. Firms that have an heir apparent are much more likely to fire a chief executive. Without an heir apparent in place, firms show a greatly reduced willingness to dismiss the CEO, possibly due to the higher cost and risk of using an untested successor from inside or outside the company. These results are consistent with hypothesis **DE2** that succession planning makes CEO turnover more likely.

Chair independence is significantly correlated with CEO turnover, *decreasing* the likelihood of CEO turnover by 4.0% overall (the coefficient estimates are similar for both natural retirements and forced turnover but

less significant). Independent chairs are less likely to fire a CEO. These test results are not consistent with hypothesis **DE1** because chair independence makes CEO turnover *less* likely.

The explanation seems to be as follows: A relay succession always comes with both an heir apparent and a dependent chair. Chair independence therefore rules out relay successions, and CEO turnover is negatively affected by fewer (relay) heirs apparent. Any positive effect for chair independence on CEO turnover seems to be exceeded by the negative effect from the succession planning (heir apparent) channel.

Industry-adjusted operating and stock returns are significantly negative. This is again consistent with the relative performance evaluation hypothesis.

The correlation between the error terms for the first (chair independence) and second (heir apparent) stage is again $atanh(\rho_{12})$, for the first (chair independence) and third (CEO turnover) stage is $atanh(\rho_{13})$, and for the second (heir apparent) and third (CEO turnover) stage is $atanh(\rho_{23})$. The correlation is in all cases highly significant and shows that there is an endogenous relationship between chair independence, succession planning, and CEO turnover.

When comparing these results with the naïve regressions above it seems that endogeneity indeed greatly influences the estimates for chair independence and the existence of an heir apparent. The correlation between succession planning (heir apparent) and CEO turnover is approximately twice that suggested by the single-equation model. The correlation between chair independence and CEO turnover changes sign and becomes significantly negative. Clearly there is a substantial bias in the naïve single-equation regressions and renders them useless when endogeneity is present.

Succession planning seems to have an even larger effect on CEO turnover than suggested by previous research. Chair independence does not seem to sufficiently improve corporate governance. Instead, chair independence rules out the common relay succession model and appears to cause frictions that exceed its potential benefits.

6 Conclusion

There is extensive literature on the individual determinants of CEO turnover. However, only a few articles have examined more complex systems of corporate decision making and address endogeneity issues in observational data.

This paper analyzes how chair independence and succession planning influence CEO turnover. I use a recursive SUR system in order to provide consistent estimates of decision variables that are determined simultaneously with omitted variables. A new comprehensive data set permits the selection of a large sample.

The analysis shows that succession planning has an even larger effect on CEO turnover than suggested by previous research. Chair independence has a significantly negative effect on succession planning due to frictions with the common relay succession model. Overall, chair independence makes CEO turnover less likely.

Subsamples of natural CEO retirements and forced turnover show that these results are not driven by unobserved hetherogeneity in CEO ability.

These results differ markedly from a naïve regression that ignores endogeneity in chair independence and succession planning, as well as demonstrating that great care must be exercised when analyzing the effect of endogenous corporate decision variables.

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7 Figures and Tables

Figure 1: Chair Independence by Period

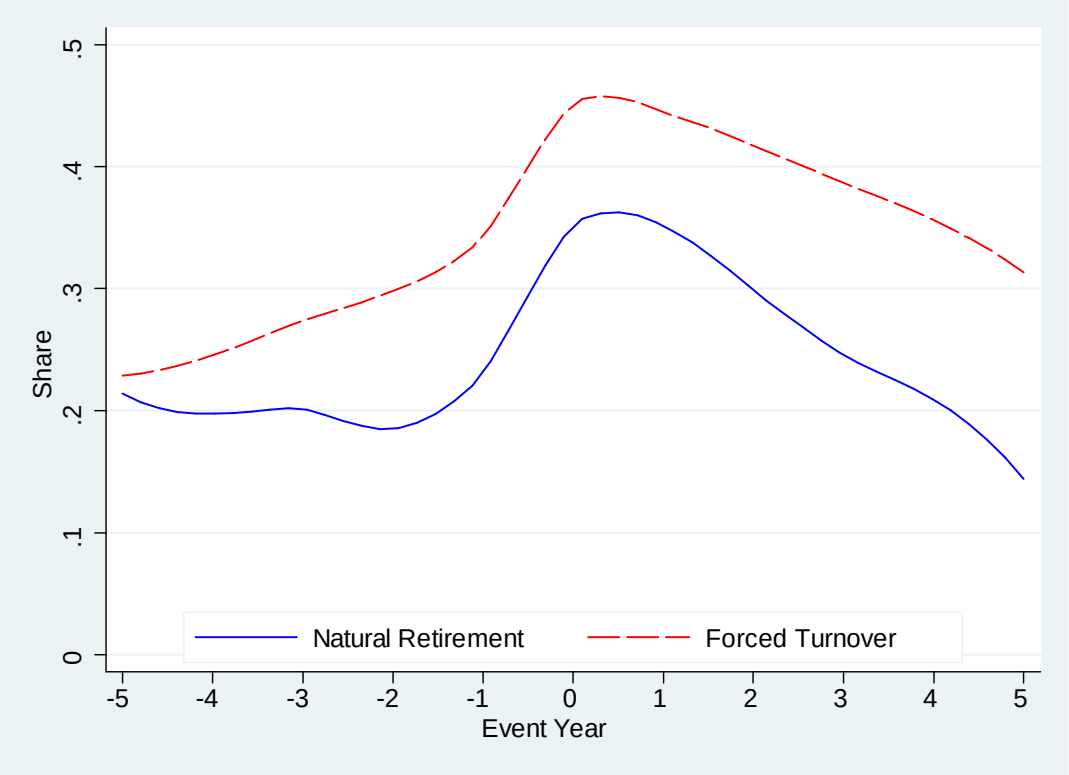

Figure 2: Heir Apparent by Period

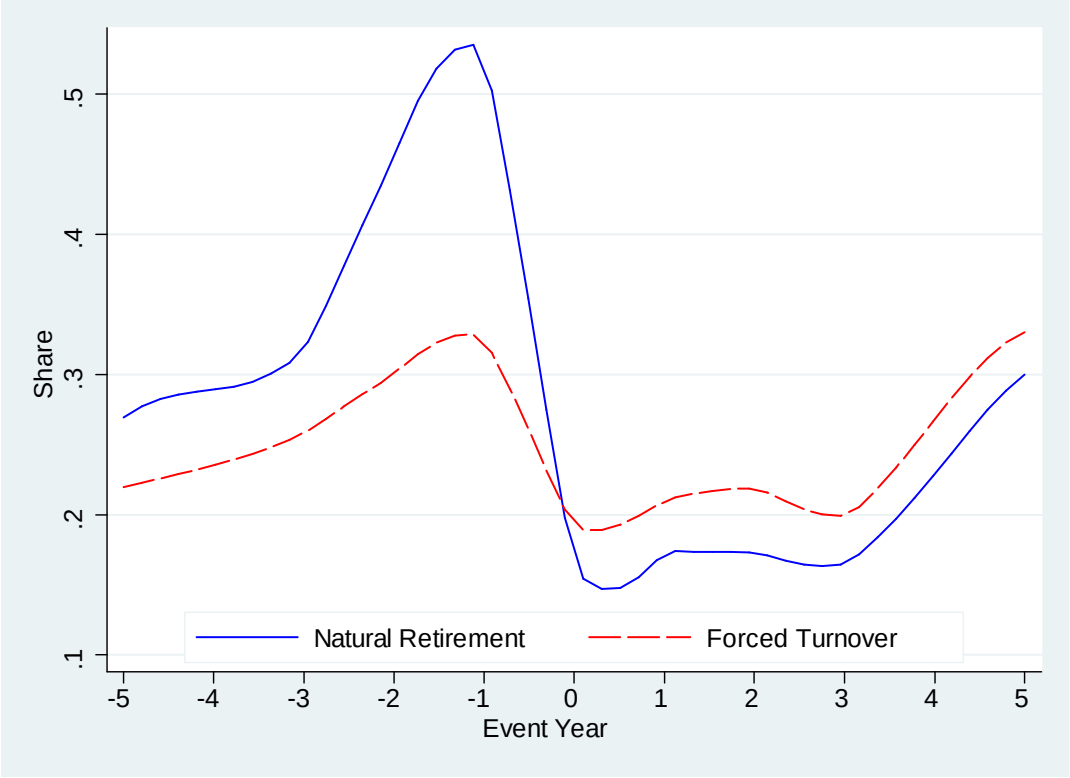

Table 1: Sample Statistics

The sample includes all CEOs identified from BoardEx between 1999 and 2008. This data is then merged with Compustat for accounting and stock price information. The dataset is restricted to non-financial firms incorporated in the U.S. with a minimum of US$10 million in total assets where the identity of the CEO is known at the beginning and end of each fiscal year. Interim successors, identified by either the title interim or acting chief executive, or by a CEO tenure of less than one year, are excluded. A turnover event has occurred when the identity of a chief executive at fiscal year-end differs from that at the beginning of a fiscal year. The natural retirement and forced exit subsamples are categorized according to a method described in Parrino (1997).

	No.	Share
All firm-years	25,622	
All companies	2,250	
All CEOs	4,665	
CEO Turnover Samples		
All events	2,790	1.000
Natural retirement	690	0.247
Forced turnover	1,090	0.391

Table 2: Event-Years

CEO turnover events are classified by CEO turnover sample. The set of observations in each sample are defined in the first table. The number of CEO turnover events and share of firm-years are reported by year in the column designated "All Events". The number of events and relative share of all events are reported by year in the remaining columns.

Variables	All Events		Natural Retirement		Forced Turnover	
	No.	Share	No.	Share	No.	Share
1999	166	0.090	33	0.199	55	0.331
2000	197	0.096	43	0.218	64	0.325
2001	241	0.103	49	0.203	90	0.373
2002	244	0.094	53	0.217	96	0.393
2003	294	0.107	62	0.211	124	0.422
2004	295	0.104	71	0.241	107	0.363
2005	347	0.121	88	0.254	139	0.401
2006	344	0.120	97	0.282	144	0.419
2007	319	0.115	105	0.329	131	0.411
2008	343	0.127	89	0.259	140	0.408
Total	2,790	0.109	690	0.247	1,090	0.391

Table 3: Industry Groups

CEO turnover events are classified by CEO turnover samples. The set of observations in each sample are defined in the first table. The number of events and share of firm-years are reported by industry sector in the column designated "All Events". The number of events and relative share of all events are reported by industry sector in the remaining columns. Firms in FF industry sector eleven (Finance) are excluded.

Variables	All Events		Natural Retirement		Forced Turnover	
	No.	Share	No.	Share	No.	Share
1 Consumer Non-Durables	175	0.113	46	0.263	60	0.343
2 Consumer Durables	85	0.118	25	0.294	20	0.235
3 Manufacturing	362	0.105	102	0.282	120	0.331
4 Energy	80	0.076	15	0.188	23	0.287
5 Chemicals	83	0.111	25	0.301	30	0.361
6 Business Equipment	748	0.123	159	0.213	328	0.439
7 Telecoms	74	0.099	19	0.257	26	0.351
9 Utilities	93	0.102	37	0.398	27	0.290
9 Retail	358	0.108	100	0.279	145	0.405
10 Healthcare	366	0.107	76	0.208	154	0.421
12 Other	366	0.101	86	0.235	157	0.429
Total	2,790	0.109	690	0.247	1,090	0.391

Table 4: Firm Characteristics

The reported statistics are sample means for the indicated set of observations. The set of observations in each sample as defined in the first table. The statistics are calculated as of the end of the fiscal year prior to the CEO turnover event. Operating return absolute is operating income (Compustat data item 13) divided by average book assets (average of start and end of year item 6). Operating return is relative and equals the firm's operating return absolute less the median for all firms in the same 2-digit SIC industry sector in the same period. Stock return absolute is the firm's stock return in the fiscal year prior to the CEO turnover event. Stock return is relative and equals stock return absolute less the median for all firms in the same 2-digit SIC industry sector in the same period. Tobin's Q is the sum of book assets (item 6), plus market value of equity (share price, item 24, times number of shares outstanding, item 25), minus deferred taxes (item 74), minus book value of equity (item 60) divided by book assets. Firm size is book assets (item 6) reported in $ million. Firm homogeneity is the Hirshman-Herfindahl index of the firms business segment revenues. Non-executive board is the percentage of board directors that are not firm executives. Non-executive equity is the percentage of ordinary shares outstanding held by non-executive directors. Employees (item 146) is in thousands. Firm age is the current fiscal year less the first fiscal year of available accounting data on Compustat. Asterisks refer to a two-sample mean-comparison test between the all firm-years sample and the indicated set of observations. The indicated set of observations is excluded from the all firm-years sample when conducting the test. Standard errors are reported in parentheses. ∗∗∗Different means at 1% significance level, ∗∗different means at 5% significance level, ∗different means at 10% significance level.

	All Firm-Years	All Events	Natural Retirement	Forced Turnover
Operating return absolute	0.0333	0.00506***	0.0401	-0.00495***
	(0.00122)	(0.00402)	(0.00703)	(0.00642)
Operating return relative	-0.0216	-0.0479***	-0.0157	-0.0532***
	(0.00113)	(0.00375)	(0.00659)	(0.00603)
Stock return absolute	-0.00682	-0.124***	-0.0912***	-0.219***
	(0.00382)	(0.0122)	(0.0217)	(0.0203)
Stock return relative	0.000456	-0.112***	-0.0942***	-0.194***
	(0.00347)	(0.0111)	(0.0195)	(0.0185)
Tobin's Q	2.109	2.103	2.090	2.163
	(0.0106)	(0.0333)	(0.0659)	(0.0542)
Firm size	2275.5	2730.4***	5598.8***	3923.1***
	(36.19)	(122.9)	(368.1)	(247.0)
Firm homogeneity	0.766	0.746***	0.680***	0.747**
	(0.00177)	(0.00559)	(0.0118)	(0.00913)
Non-executive board	0.761	0.772***	0.805***	0.788***
	(0.000848)	(0.00241)	(0.00393)	(0.00367)
Non-executive equity	0.0406	0.0412	0.0282***	0.0395
	(0.000455)	(0.00140)	(0.00215)	(0.00215)
Employees	8.737	10.84***	20.07***	14.89***
	(0.133)	(0.461)	(1.272)	(0.906)
Firm age	21.29	21.90**	27.87***	22.00
	(0.0931)	(0.292)	(0.666)	(0.474)

Table 5: CEO Characteristics

The reported statistics are sample means for the indicated set of observations. The set of observations in each sample as defined in the first table. The statistics are calculated as of the end of the fiscal year prior to the CEO turnover event (unless stated otherwise). Panel A shows statistics for the CEO successor and Panel B for the predecessor. Age is in years at fiscal year-end. College is share of CEOs with graduate degree. MBA is share of CEOs with MBA degree. Organizational tenure is years in same firm at fiscal year-end. Industry tenure is years in public U.S. firm in same 2-digit SIC industry sector at fiscal year-end. Leadership tenure is years as CEO or as heir apparent at fiscal year-end. Chair independence is the share of chairs who are not the current or a former CEO. Heir apparent is share of CEOs who have at least one heir apparent. Asterisks refer to a two-sample mean-comparison test between the all firm-years sample and the indicated set of observations. The indicated set of observations is excluded from the all firm-years sample when conducting the test. Standard errors are reported in parentheses. $***$ Different means at 1% significance level, $**$ different means at 5% significance level, $*$ different means at 10% significance level.

	All Firm-Years	All Events	Natural Retirement	Forced Turnover
Panel A: CEO Successor				
Age	55.05	51.78***	52.41***	52.29***
	(0.0512)	(0.142)	(0.269)	(0.238)
College	0.799	0.842***	0.883***	0.861***
	(0.00250)	(0.00691)	(0.0123)	(0.0105)
MBA	0.273	0.324***	0.367***	0.339***
	(0.00278)	(0.00886)	(0.0184)	(0.0143)
Organizational tenure	13.31	7.008***	7.515***	6.335***
	(0.0657)	(0.163)	(0.357)	(0.255)
Panel B: Predecessor				
Age	61.07	58.23***	59.35***	54.84***
	(0.0867)	(0.168)	(0.302)	(0.227)
CEO tenure	7.992	7.664***	7.230***	6.136***
	(0.0704)	(0.138)	(0.264)	(0.170)
Organizational tenure	15.98	13.86***	15.19*	11.56***
	(0.117)	(0.219)	(0.459)	(0.304)
Chair independent	0.257	0.284***	0.253	0.342***
	(0.00276)	(0.00871)	(0.0168)	(0.0147)
Heir apparent	0.289	0.442***	0.499***	0.328***
	(0.00283)	(0.00940)	(0.0190)	(0.0142)
Relay succession	0.0254	0.233***	0.229***	0.106***
	(0.000983)	(0.00801)	(0.0160)	(0.00931)
Other inside succession	0.0454	0.417***	0.401***	0.487***
	(0.00130)	(0.00934)	(0.0187)	(0.0151)
Outside succession	0.0381	0.349***	0.370***	0.407***
	(0.00120)	(0.00903)	(0.0184)	(0.0149)

Table 6: CEO Titles

Prior and subsequent CEO titles are classified by CEO turnover samples. The set of observations in each sample as defined in the first table. Prior and subsequent CEO titles are reported by number and share of all CEOs. Panel A shows the prior job title of the CEO successor. For multiple titles, only the first in the list of titles is considered. Panel B displays the subsequent title of the predecessor CEO.

	All Events		Natural Retirement		Forced Turnover	
	No.	Share	No.	Share	No.	Share
Panel A: Prior Title of CEO Successor						
CEO	189	0.068	40	0.058	92	0.084
Chair	211	0.076	40	0.058	122	0.112
President	1,128	0.404	311	0.451	329	0.302
COO	222	0.080	35	0.051	78	0.072
Vice chair	56	0.020	23	0.033	27	0.025
Vice president	344	0.123	83	0.120	145	0.133
Other	640	0.229	158	0.229	297	0.272
Panel B: Subsequent Title of Predecessor						
Chair	1,036	0.371	248	0.359	194	0.178
Total	2,790	1.000	690	1.000	1,090	1.000

Table 7: Probit of CEO Turnover

The table reports marginal effects using a pooled maximum likelihood probit model. The dependent variable is set to one if the firm has a CEO turnover event before fiscal year-end and zero otherwise. The columns contain the turnover samples and cover the firm-years for each CEO whose tenure ends with the specified turnover event. For continuous variables, the marginal effect is for a one unit change in that variable, keeping all other variables at their means. For dummy variables, the marginal effect is a change from zero to one, keeping all other variables at their means. Independent variables include lagged firm size (log of book assets), Tobin's Q is lagged market value of assets divided by book value of assets. Stock return is the firm's lagged 2-digit SIC industry-adjusted stock return. Operating return is the firm's lagged 2-digit SIC industry-adjusted operating return. Heir Apparent is set to one if the firm has at fiscal year-end a chief operating officer/president/vice chair who is not also CEO, and zero otherwise. Chair independent is set to one if the firm has an independent chair at fiscal year-end and zero otherwise. Candidate exists dummy is a variable that is set to 1 if there is at least one excutive board member other than the CEO. Candidate age dummy is set to 1 if, other than the CEO, there is an executive board member aged between 44 and 52. Post SOX dummy is 1 for each fiscal year after the Sarbanes-Oxley act was passed in July 2002. All regressions include FF 12 industry group fixed effects. Standard errors are clustered by firm i and reported in parentheses. $*$, $**$, $***$ indicate statistical significance of point estimates at the 10%, 5%, and 1% levels, respectively.

Variables	All Events	Natural Retirement	Forced Turnover
Firm size	0.0109***	0.00443	0.00793**
	(0.00111)	(0.00510)	(0.00385)
Tobin's Q	0.00264**	-0.00217	-0.00423
	(0.00120)	(0.00537)	(0.00399)
Operating return	-0.0992***	-0.135**	-0.155***
	(0.0111)	(0.0573)	(0.0442)
Stock return	-0.0342***	-0.0603***	-0.0786***
	(0.00373)	(0.0165)	(0.0131)
Candidate exists dummy	-0.0206	-0.204*	-0.0618
	(0.0163)	(0.119)	(0.0617)
Candidate age dummy	-0.00454	-0.0147	-0.0215
	(0.00543)	(0.0291)	(0.0198)
Post SOX dummy	0.0196***	0.170***	0.162***
	(0.00383)	(0.0148)	(0.0125)
Firm-years	25,622	2,997	4,208
Pseudo R^2	0.017	0.040	0.042

Table 8: Naïve Probit of CEO Turnover

The table reports marginal effects using a pooled maximum likelihood probit model. The dependent variable is set to one if the firm has a CEO turnover event before fiscal year-end and zero otherwise. The columns contain the turnover samples and cover the firm-years for each CEO whose tenure ends with the specified turnover event. For continuous variables, the marginal effect is for a one unit change in that variable, keeping all other variables at their means. For dummy variables, the marginal effect is a change from zero to one, keeping all other variables at their means. Independent variables include lagged firm size (log of book assets), Tobin's Q is lagged market value of assets divided by book value of assets. Stock return is the firm's lagged 2-digit SIC industry-adjusted stock return. Operating return is the firm's lagged 2-digit SIC industry-adjusted operating return. Heir Apparent is set to one if the firm has at fiscal year-end a chief operating officer/president/vice chair who is not also CEO, and zero otherwise. Chair independent is set to one if the firm has an independent chair at fiscal year-end and zero otherwise. Candidate exists dummy is a variable that is set to 1 if there is at least one excutive board member other than the CEO. Candidate age dummy is set to 1 if, other than the CEO, there is an executive board member aged between 44 and 52. Post SOX dummy is 1 for each fiscal year after the Sarbanes-Oxley act was passed in July 2002. All regressions include FF 12 industry group fixed effects. Standard errors are clustered by firm i and reported in parentheses. $*$, $**$, $***$ indicate statistical significance of point estimates at the 10%, 5%, and 1% levels, respectively.

Variables	All Events	Natural Retirement	Forced Turnover
Heir apparent	0.0867***	0.193***	0.132***
	(0.00510)	(0.0209)	(0.0183)
Chair independent	0.0264***	0.0668***	0.0704***
	(0.00476)	(0.0257)	(0.0163)
Firm size	0.00923***	-0.00159	0.00488
	(0.00113)	(0.00563)	(0.00415)
Tobin's Q	0.00175	-0.00693	-0.00700*
	(0.00121)	(0.00540)	(0.00411)
Operating return	-0.0938***	-0.159***	-0.153***
	(0.0111)	(0.0570)	(0.0455)
Stock return	-0.0317***	-0.0557***	-0.0765***
	(0.00366)	(0.0166)	(0.0134)
Candidate exists dummy	-0.0127	-0.200	-0.0419
	(0.0158)	(0.122)	(0.0648)
Candidate age dummy	-0.00209	-0.00809	-0.0232
	(0.00535)	(0.0300)	(0.0205)
Post SOX dummy	0.0203***	0.167***	0.163***
	(0.00372)	(0.0147)	(0.0124)
Firm-years	25,155	2,938	4,081
Pseudo R^2	0.070	0.091	0.092

Table 9: Probit of Chair Independence

The table reports marginal effects using a pooled maximum likelihood probit model. The dependent variable is set to one if the firm has an independent chair at fiscal year-end and zero otherwise. The columns contain the turnover samples and cover the firm-years for each CEO whose tenure ends with the specified turnover event. For continuous variables, the marginal effect is for a one unit change in that variable, keeping all other variables at their means. For dummy variables, the marginal effect is a change from zero to one, keeping all other variables at their means. Independent variables include lagged firm size (log of book assets), Tobin's Q is lagged market value of assets divided by book value of assets. Stock return is the firm's lagged 2-digit SIC industry-adjusted stock return. Operating return is the firm's lagged 2-digit SIC industry-adjusted operating return. Heir Apparent is set to one if the firm has at fiscal year-end a chief operating officer/president/vice chair who is not also CEO, and zero otherwise. Chair independent is set to one if the firm has an independent chair at fiscal year-end and zero otherwise. Candidate exists dummy is a variable that is set to 1 if there is at least one excutive board member other than the CEO. Candidate age dummy is set to 1 if, other than the CEO, there is an executive board member aged between 44 and 52. Post SOX dummy is 1 for each fiscal year after the Sarbanes-Oxley act was passed in July 2002. All regressions include FF 12 industry group fixed effects. Standard errors are clustered by firm i and reported in parentheses. $*$, $**$, $***$ indicate statistical significance of point estimates at the 10%, 5%, and 1% levels, respectively.

Variables	All Events	Natural Retirement	Forced Turnover
Firm size	-0.0276***	-0.0515***	-0.0423***
	(0.00383)	(0.00890)	(0.00762)
Tobin's Q	-0.00240	-0.00432	-0.00984
	(0.00318)	(0.00747)	(0.00683)
Operating return	-0.165***	-0.0390	-0.123*
	(0.0304)	(0.0768)	(0.0696)
Stock return	-0.00311	-0.00971	-0.0176
	(0.00486)	(0.0132)	(0.0119)
Candidate exists dummy	0.00429	-0.242*	0.0616
	(0.0339)	(0.146)	(0.0638)
Candidate age dummy	0.0325***	-0.00794	-0.0199
	(0.0121)	(0.0342)	(0.0295)
Post SOX dummy	0.0932***	0.0961***	0.0999***
	(0.00703)	(0.0190)	(0.0189)
Firm-years	25,622	2,997	4,208
Pseudo R^2	0.036	0.082	0.060

Table 10: Bivariate Probit of Heir Apparent

The table reports marginal effects using a pooled maximum likelihood bivariate probit model. The dependent variable is set to one if the firm has an heir apparent at fiscal year-end and zero otherwise. The columns contain the turnover samples and cover the firm-years for each CEO whose tenure ends with the specified turnover event. For continuous variables, the marginal effect is for a one unit change in that variable, keeping all other variables at their means. For dummy variables, the marginal effect is a change from zero to one, keeping all other variables at their means. Independent variables include lagged firm size (log of book assets), Tobin's Q is lagged market value of assets divided by book value of assets. Stock return is the firm's lagged 2-digit SIC industry-adjusted stock return. Operating return is the firm's lagged 2-digit SIC industry-adjusted operating return. Heir Apparent is set to one if the firm has at fiscal year-end a chief operating officer/president/vice chair who is not also CEO, and zero otherwise. Chair independent is set to one if the firm has an independent chair at fiscal year-end and zero otherwise. Candidate exists dummy is a variable that is set to 1 if there is at least one excutive board member other than the CEO. Candidate age dummy is set to 1 if, other than the CEO, there is an executive board member aged between 44 and 52. Post SOX dummy is 1 for each fiscal year after the Sarbanes-Oxley act was passed in July 2002. atanh(ρ_{12}) is the atanh of the correlation between the error terms of first stage (chair independence, equation 1) and the second stage (heir apparent, equation 2). The corresponding standard error is denoted by se. All regressions include FF 12 industry group fixed effects. Standard errors are clustered by firm i and reported in parentheses. $*$, $**$, $***$ indicate statistical significance of point estimates at the 10%, 5%, and 1% levels, respectively.

Variables	All Events	Natural Retirement	Forced Turnover
Chair independent	-0.0252*	0.0305	0.00575
	(0.0132)	(0.0357)	(0.0245)
Firm size	0.0200***	0.0405***	0.0372***
	(0.00332)	(0.00930)	(0.00666)
Tobin's Q	0.00918***	0.0118	0.0147***
	(0.00302)	(0.00781)	(0.00547)
Operating return	0.0546*	0.0981	0.0450
	(0.0300)	(0.0840)	(0.0653)
Stock return	-0.00359	-0.0226	-0.0118
	(0.00502)	(0.0158)	(0.0117)
Candidate exists dummy	-0.0274	0.177***	-0.0423
	(0.0371)	(0.0630)	(0.0897)
Candidate age dummy	-0.0416***	-0.0451	-0.00596
	(0.0127)	(0.0384)	(0.0252)
atanh(ρ_{12})	-0.194	-0.207	-0.236
se	0.024	0.053	0.047
Firm-years	25,155	2,938	4,081
Pseudo R^2	0.034	0.068	0.062

Table 11: Trivariate Probit of CEO Turnover

The table reports marginal effects using a pooled maximum likelihood trivariate probit model, which is specified as a recursive, fully observed, seemingly unrelated regression (SUR). The dependent variable is set to one if the firm has a CEO turnover event before fiscal year-end and zero otherwise. The columns contain the turnover samples and cover the firm-years for each CEO whose tenure ends with the specified turnover event. For continuous variables, the marginal effect is for a one unit change in that variable, keeping all other variables at their means. For dummy variables, the marginal effect is a change from zero to one, keeping all other variables at their means. Independent variables include lagged firm size (log of book assets), Tobin's Q is lagged market value of assets divided by book value of assets. Stock return is the firm's lagged 2-digit SIC industry-adjusted stock return. Operating return is the firm's lagged 2-digit SIC industry-adjusted operating return. Heir Apparent is set to one if the firm has at fiscal year-end a chief operating officer/president/vice chair who is not also CEO, and zero otherwise. Chair independent is set to one if the firm has an independent chair at fiscal year-end and zero otherwise. Candidate exists dummy is a variable that is set to 1 if there is at least one excutive board member other than the CEO. Candidate age dummy is set to 1 if, other than the CEO, there is an executive board member aged between 44 and 52. Post SOX dummy is 1 for each fiscal year after the Sarbanes-Oxley act was passed in July 2002. atanh(ρ_{12}) is the atanh of the correlation between the error terms of first stage (chair independence, equation 1) and the second stage (heir apparent, equation 2). atanh(ρ_{13}) is the atanh of the correlation between the error terms of first stage (chair independence, equation 1) and the third stage (CEO turnover, equation 3). atanh(ρ_{23}) is the atanh of the correlation between the error terms of second stage (heir apparent, equation 2) and the third stage (CEO turnover, equation 3). The corresponding standard errors are denoted by se. All regressions include FF 12 industry group fixed effects. Standard errors are clustered by firm i and reported in parentheses. $*$, $**$, $***$ indicate statistical significance of point estimates at the 10%, 5%, and 1% levels, respectively.

Variables	All Events	Natural Retirement	Forced Turnover
Heir apparent	0.204***	0.323***	0.220***
	(0.00862)	(0.0196)	(0.0184)
Chair independent	-0.0404***	-0.0429	-0.0413*
	(0.00933)	(0.0341)	(0.0246)
Firm size	0.00499***	-0.0185***	-0.00901**
	(0.00129)	(0.00635)	(0.00435)
Tobin's Q	0.000385	-0.0155***	-0.0140***
	(0.00135)	(0.00544)	(0.00415)
Operating return	-0.114***	-0.178***	-0.171***
	(0.0127)	(0.0625)	(0.0468)
Stock return	-0.0317***	-0.0576***	-0.0734***
	(0.00388)	(0.0161)	(0.0131)
atanh(ρ_{12})	-0.212	-0.227	-0.262
se	0.030	0.061	0.054
atanh(ρ_{13})	0.339	0.339	0.318
se	0.036	0.064	0.052
atanh(ρ_{23})	-0.541	-0.665	-0.387
se	0.024	0.048	0.042
Firm-years	25,155	2,938	4,081
Pseudo R^2	0.052	0.082	0.068