

# The Influence of Learning and Bargaining on CEO-Chair Duality: Evidence from Firms that Pass the Baton

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## Abstract

Considerable disagreement exists over merits of CEO-Chair duality. We show firms follow different duality strategies: some never or always combine CEO-chair positions while others follow a ‘pass-the-baton’ (PTB) strategy with promotion conditional on firm performance. We focus on PTB-firms and propose/test a learning model in which firms use the chair position to retain talented CEOs. As predicted, PTB-firms underperform following CEO-promotion though, compared to an appropriate counterfactual, there is no underperformance in stock-returns and overperformance in accounting returns. Counter to agency explanations, chair promotions are more likely with non-coopted boards. Overall, CEO-duality does not harm, and may promote shareholder interests.

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“The board should acknowledge that no single structure works in all cases. Boards must be pragmatic enough to adapt to the individuals involved rather than put a rigid structure in place.”<sup>1</sup>

## 1. Introduction

In the aftermath of the governance failures of the early 2000s and the financial crisis of 2008, governance activists and policy makers have increasingly called for separating the roles of CEO and chair of the board.<sup>2</sup> Despite the widespread opinions of governance activists and the normative implications of agency theory, empirical evidence on the influence of CEO-chair duality on firm performance is inconclusive.<sup>3</sup> In a survey of the literature, Krause, Semadeni, and Canella (2014) find that no consensus evidence emerges to suggest either a negative or positive influence.<sup>4</sup> The aggregate evidence lead Krause et al. to conclude that mandates that require separation of the two roles would be unwise, “... not because the issue of CEO duality is unimportant, because it is too important and too idiosyncratic for all the firms to adopt the same structure under the guise of best practices.... boards should be left free to adopt the structure they deem to be strategically beneficial for their firms.”<sup>5</sup>

Our approach to duality is motivated by the conceptual framework of Hermalin and Weisbach (1998, 2003), which argues that observed board structures are endogenous equilibrium outcomes that represent constrained optimal responses to agency problems. We posit that the inconclusive and context-specific evidence in the literature arises from endogenous self-selection that complicates empirical identification strategies and the ability to recognize the correct counterfactual firms. Moreover, most

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<sup>1</sup> “Board Governance depends on where you sit.” Bill George, McKinsey Quarterly, February 2013.

<sup>2</sup> They base their demands on the premise that combining the two roles exacerbates conflicts of interest between shareholders and the CEO since there is no arms-length monitoring of the CEO by an independent chair. In support of this viewpoint, agency theory suggests that boards, as proxy monitors for shareholders, should be independent from the management of the firm (Fama and Jensen, 1983a; 1983b).

<sup>3</sup> See Dey, Engel and Liu (2011), Grinstein and Valles (2008), Linck, Netter, and Yang (2008), Goyal and Park (2002), and Core, Holthausen, and Larcker (1999).

<sup>4</sup> In their summary of the results, 33.3% of the studies find no relation between firm performance and duality, 16.7% report an unambiguous negative relation, and 16.7% report an unambiguous positive relation. Other studies report that the influence of CEO-chair duality on firm performance is context specific. For instance, 19.4% of the performance studies reviewed by Krause, et al. report a positive influence only under certain situations while 13.9% find a negative influence only for specific firm environments.

<sup>5</sup> Based on a meta-analysis of 31 studies, Dalton, Daily, Johnson, and Ellstrand (1998) conclude that the duality of the firm leadership structure does not affect firm performance.

analyses rely primarily on predictions derived from basic agency theory and do not consider the importance to certain firms of using a governance structure that facilitates learning about the CEO (see Hermalin and Weisbach, 2014). Hermalin and Weisbach argue that such a learning perspective provides insight into phenomena such as executive selection and turnover. We propose a learning model of CEO-chair duality and implement an identification strategy that addresses sample selection issues to determine proper counterfactual firms. Our model and identification is based on the group of firms that initially separate the roles of CEO and chair, and combine them only after a probationary period during which the board of directors observe the new CEO's actions and the firm's performance. Brickley, Jarrell, and Coles (1997) and Vancil (1987) refer to this practice as "passing the baton" (henceforth, PTB).

To sharpen our intuition and develop testable implications, we posit a simple model in which the PTB process serves as a way to learn about the ability of a CEO. After learning about the ability of the CEO, the board will award the additional position of board chair if the CEO demonstrates sufficient talent. The chair position enhances the CEO's bargaining power relative to the board. Increasing CEO power is optimal in this case since it improves the retention of high-quality CEOs by mitigating concerns that the board will renege on compensation contracts. The model delivers several implications that we test in our empirical analysis. A key implication is that the post-award performance is expected to be lower than the strong performance prior to the CEO's appointment to chair. As we show, this is an artifact of the learning/selection process and the underperformance disappears when we use an appropriate counterfactual. Hence, our analysis explains why a research design that fails to control for selection issues can easily lead to opposite – and possibly biased – conclusions.

For our empirical analysis, we use an extensive sample of over 18,000 firm-year observations for the period 1995-2010 to investigate whether awarding the CEO the additional role of board chair is consistent with shareholder wealth maximization. An initial examination of the data reveals that many firms, at least over our 16-year sample period, never combine both roles or always combine both roles. These two groups of dichotomous firms have strikingly different firm characteristics, indicative of selection issues that would make it difficult to attribute causality in cross-sectional regressions. Thus, we focus on the third group -- the PTB firms -- that initially separate the roles of CEO and chair and combine them only after a probationary period during which the board of directors observe the new

CEO's actions and the firm's performance. In addition to the learning hypothesis that underlies our model, we consider alternative factors that could drive PTB and promotion decisions. For instance, boards could provide an incentive benefit prior to appointment by using the chair position as a reward for strong performance. Alternatively, a coopted, compromised board may hasten the promotion to chair and allow the CEO to further consolidate power and perquisites. Overall, we find that the PTB process is largely consistent with optimal learning and retention of high quality CEOs. We find no evidence to support the premise that combining the roles systematically results in poor performance.

As the first step in our empirical analysis, we examine differences between firms that always combine both roles, pass the baton, or always separate the roles. Of particular note, we find that PTB firms are more likely to be present in industries that are less homogenous than firms that always combine or never combine the two roles. In less homogenous industries, CEO performance is difficult to benchmark to industry peers (Parrino (1997)), which is consistent with the notion of there being a greater benefit to use PTB to learn about CEO ability in these industries. The difficulty in benchmarking also likely leads to contracts that are more incomplete, which imposes greater risk on the CEO. We also use a hazard model to analyze the determinants of awarding both titles as opposed to keeping them separate. Supporting the premise that firms award both titles after a probationary period in which the CEO proves her ability, we find that CEOs that exhibit superior industry-adjusted performance receive the chair title more quickly. However, we also find that good industry performance hastens the award of both titles. This result suggests that firms combine the two roles to retain CEOs when industry conditions create better outside employment opportunities, in line with the model's retention rationale for awarding the chair.<sup>6</sup> *Ceteris paribus*, older firms take longer to award the title of Chair, while firms with multiple segments combine both titles more quickly. The latter result suggests that more complex organizations may be better served by combining the roles of the CEO and the chair, which is consistent with the conclusions of other studies (Faleye (2007), Dey, Engel, and Liu (2011), and Palmon and Wald (2002)).

Our model suggests that, *ceteris paribus*, talented CEOs in a weaker bargaining position relative to the board will tend to be promoted to chair more quickly. CEOs that are more vulnerable to future

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<sup>6</sup> This interpretation is in the spirit of Oyer (2004), who argues that firms optimally pay CEOs for good luck to retain CEOs when industry performance is good and competitors have the resources to hire away talented CEOs.

actions by the board would be more likely to pursue outside opportunities. This prediction is supported by evidence that when the board is not coopted – the promotion to chair occurs more quickly. This finding is also counter to the notion that agency considerations and influence are central to the CEO being appointed chair.

To study the consequences of combining the two roles on firm performance, we estimate CEO-firm pair fixed effect regressions in which the effect of the decision to combine the roles is captured by dummy variables for the year of the combination and the subsequent years. Our results indicate positive abnormal returns prior to the award. The learning/selection process in our model implies that post-appointment performance will appear worse than the strong performance that preceded the chair award. Indeed, a naïve analysis of the post-chair appointment performance, one that fails to control for selection issues and mean reversion in performance data, indicates a significant drop in firm performance relative to the pre-chair period. However, to properly specify a test to discern whether the drop in performance can be attributed to the promotion or to conditions under which promotions tend to occur, we need to benchmark the post-promotion performance appropriately. Since the pre-chair appointment period is characterized by strong performance, we use propensity score matching to construct a matched sample of firms where the matching criteria includes the pre-appointment performance and firm attributes that predict a high propensity for using a PTB succession strategy. The matched sample is drawn from the set of firms that always or never award the chair to the CEO. We find that relative to the matched sample, there is no evidence of post-appointment underperformance in stock-price returns, and positive outperformance in accounting returns. These results are consistent with predictions of our model and with appointment to chair being made optimally.

We turn next to the board's decision of when (and whether) to award the title of chair to the CEO and what this implies in terms of the learning hypothesis relative to alternative factors – incentives and agency -- that could impact the promotion process. If the main purpose of the PTB policies is to learn about managerial quality, good performance in the initial years may be sufficient to persuade the board of the CEO's quality. An incentive rationale for PTB would not generally imply an early promotion: since a promotion would tend to weaken incentives after the award, it could be sub-optimal to award the chair relatively early. Similarly, if the promotion exacerbates agency problems and CEO entrenchment, an early promotion might have worse implications for firm value. For our test, we separate our sample

into two groups. The first (second) group consists of CEOs that are awarded (are not awarded) their additional title within four years of becoming the CEO, which is the median in our sample. Our results for these two groups are similar to those for the full sample: we document no underperformance in stock-price performance relative to a sample of firms matched on pre-chair performance and other firm attributes, and positive outperformance in accounting returns. Thus, our analysis of early and late promotions confirms our conclusion that CEO incentives do not decline following the combination of roles, nor does there appear to be a worsening of agency frictions.

The stock market's response to the CEO being appointed chair provides additional evidence that is consistent with the learning hypothesis. If the PTB process is intended to provide ex-ante incentives or indicates greater CEO entrenchment and agency problems, we would expect a negative reaction to the chair appointment. Similarly, if the pre-appointment process is perceived by the market as a lucky outcome rather than ability, we would expect a muted or even negative reaction to the appointment. On the other hand, if the promotion is regarded as the board's vote of confidence on CEO ability, we expect a positive response. We find that the market responds positively (CAR =1.31%) to early promotions, which suggests that early promotions reveal directors' private information about the quality of the CEO to the market. On the other hand, the market response to late promotions is statistically insignificant from zero. The lack of a response to late promotions suggests there is little surprise at the announcement since the market (like the board) has observed the CEO's performance over a relatively long period.

The CEO's total compensation and sensitivity of compensation to performance increase significantly following the award of the additional title. Our model suggests that this could be the intended outcome in terms of bargaining power and compensation, if the objective is to retain a high quality CEO and to mitigate potential agency problems. Relative to the matched counterfactual, we observe no change in annual compensation. However, both the unmatched and match-adjusted sensitivity of the CEO's portfolio to performance continues to increase after combination of both roles. Further analysis also reveals that the change in annual compensation is not sensitive to whether the boards have been coopted by the CEO (see Coles, Daniel, and Naveen, 2014), which suggests the increase in compensation is more likely to derive from the board having learned about the CEO's ability rather than managerial power over the board. In fact, the total sensitivity to performance of the CEO's portfolio actually increases marginally more when the board is coopted than when it is not. The finding

that portfolio incentives continue to increase post-appointment suggests that the CEO-Chairs continue to hold the firm's stock or stock options as opposed to cashing out.

Our study builds on Brickley, Coles, and Jarrell (1997), who argue that separation has both potential costs and potential benefits. They conclude that the costs of separation are larger than benefits for most large firms. Additionally, they argue that if the CEO is not awarded both titles, she would be less motivated to work hard, and that firms that perform well reward the CEO with the additional title. Using a sample of 661 large publicly traded U.S. firms in 1988, they find that firms with separate CEO and board chairs do not perform any better than the firms that have these roles combined. Their event study evidence suggests that market response is insignificant when the firms combine or split the two roles. The authors suggest that their results are best characterized by the "passing the baton" (PTB) process proposed by Vancil (1987), in which the new CEO serves a probationary period under a separate chair who is generally the prior CEO. If the new CEO clears this hurdle, then she earns the additional title of board chair and the old chair resigns. Also consistent with the PTB argument, Fahlenbrach, Minton, and Pan (2011) find that firms with the old CEO on the board monitor the new CEO more intensely and achieve better performance. Palmon and Wald (2002), however, document that the market reaction to combining or splitting the roles of CEO and chair is negative for small firms, positive for large firms, and unrelated to proxies for PTB progression.

Our findings also relate to Dahya, McConnell, and Travlos (2002), who study the implications of the Cadbury Committee report on the *Code of Best Practices* on British firms. One of the important features of the *Code* was its recommendation that the position of the board chair and CEO be held by different individuals.<sup>7</sup> They report that the negative relationship between CEO turnover and performance became stronger following the issuance of the *Code*. They also report that the sensitivity of turnover to performance was concentrated among the firms that adopted the *Code*. However, Dahya and McConnell (2007) find that performance improvements related to adoption of the *Code* result from additions of independent directors to the board; they find no influence of separating the roles of CEO and chair on firm performance. More recently, Yang and Zhao (2014) report that firms with combined titles of CEO and chair are valued 6% higher than firms with separate titles.

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<sup>7</sup> Unlike in the U.S., the U.K. Corporate Governance Code sets out a clearer role for the board chair. It has also been noted in the press and the academic literature that the chair plays a more visible role among U.K. firms.

Our research provides three main contributions. First, our analysis offers evidence on the importance of learning in governance structures by proposing and testing the predictions of a learning model of CEO-chair duality. Second, we implement an identification strategy that addresses sample selection issues to determine proper counterfactual firms. Third, our research design allows us to reconcile the conflicting evidence in the existing literature about whether or not CEO-chair duality adds to firm value. From a policy perspective our findings indicate that the CEO-chair combination is not necessarily against the interests of shareholders and that a single governance structure is not appropriate for all firms. More broadly, our results support the conceptual arguments in Hermalin and Weisbach (1998, 2003) that observed that persistent board structures are likely to be equilibrium outcomes. Thus, our evidence suggests that we should exercise caution in the rush to separate the role of board chair from that of the CEO. Indeed, forcing separation by fiat may push many firms away from their optimal equilibrium structure.

## **2. A Simple Model of Learning and Duality**

### *2.1 The model*

We propose a simple learning model of the decision to award the board chair position to corporate CEOs. We show that it may be optimal to award the chair contingent on the performance of the CEO. Among the implications of the model, post-award performance is expected to be lower than the strong performance prior to appointment. We argue that an important reason to award the chair position might be to increase the CEO's bargaining power relative to the board: This could mitigate CEO concerns about renegeing by the board, given the inherently incomplete nature of compensation contracts (e.g., Hart and Moore, 1986). However, the award, which increases the CEO's bargaining power, is also likely to increase CEO compensation. We also attempt to characterize conditions in which firms are more likely to adopt PTB strategies and discuss tests to distinguish between learning and alternative factors that could affect the appointment process.

We consider a two-period set-up in which a new CEO is hired on date  $t=0$ . The first output is produced on date  $t=1$  and a second output is delivered on date  $t=2$ . All agents risk-neutral and there is no



discounting between time periods. Agents (including the CEO) are symmetrically informed and update their beliefs about the CEO's ability, denoted by  $\alpha$ , upon observing the firm's output.<sup>8</sup>

The firm's output on date  $t$  is denoted by  $y_t$ , such that:

$$y_t = \alpha + \epsilon_t, \quad (1)$$

Equation (1) indicates that the output is equal to the manager's ability  $\alpha$  plus random noise  $\epsilon_t$ . Manager's ability is not directly observed. However, agents have a common prior on the manager's ability at the time of hiring ( $t = 0$ ), and will update their beliefs based on firm performance. The common prior on manager's ability is a normal distribution  $\alpha \sim N(\alpha_0, \sigma_0^2)$ , where  $\alpha_0, \sigma_0^2$  represent the mean and variance of manager's ability as of  $t = 0$ . The noise term is assumed to be drawn from a normal distribution with zero mean and variance  $\sigma_\epsilon^2$  i.e.,  $\epsilon_t \sim N(0, \sigma_\epsilon^2)$ .

The timing of events is as follows. After being hired, the manager delivers his first output  $y_1$  at  $t=1$ . From standard results, if the manager produces an output  $y_1$  the posterior distribution  $N(\alpha_1, \sigma_1^2)$  will be such that:

$$\alpha_1 = w_1 (\alpha_0) + (1 - w_1)y_1, \quad (2)$$

where  $w_1 = \frac{\sigma_\epsilon^2}{\sigma_0^2 + \sigma_\epsilon^2}$ . The conditional variance is given by:  $\sigma_1^2 = \left(\frac{1}{\sigma_0^2} + \frac{1}{\sigma_\epsilon^2}\right)^{-1}$ . We note that new CEOs may differ in terms of their perceived ability: for instance, a board may have less uncertainty regarding the ability of CEOs hired from within the firm, relative to external hires. Additionally, in some industries, the CEO's impact on firm performance may be more consequential and uncertain than in other industries.

There are four possible outcomes contingent on the outcome  $y_1$ : (i) a sufficiently poor performance could lead to the CEO being replaced by the board; (ii) the CEO could leave the current firm for outside opportunities; (iii) CEO could continue with the firm without being awarded the chair and, finally, (iv) he could continue with the firm and be awarded the chair. To discuss outcomes, we first

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<sup>8</sup> We follow Harris and Holmstrom (1982), Murphy (1986) and other papers in assuming that learning about managerial ability occurs in a setting with symmetric information i.e., the CEO learns of his ability along with other agents.

characterize the compensation process. We assume that the CEO's compensation is determined as the outcome of a Nash bargaining game between the CEO and a board that acts in the interests of shareholders. When the CEO is initially hired, his bargaining power is denoted by  $\beta_0$ , where  $1 > \beta_0 \geq 0$ . The initial bargaining power may reflect, for instance, the nature of CEO's connections with the board e.g., if he is an inside appointment or if the board is coopted.

We assume that the CEOs receive their compensation at some stage after the period begins but before the realization of the output.<sup>9</sup> Wage contracts are inherently incomplete and the compensation that the CEO receives is subject to renegotiation on these dates (see e.g., Hart and Moore, 1990). Hence, the compensation that the CEO receives is not constrained by prior wage agreements.

The CEO's compensation is determined by his bargaining power, his reservation wage and the value he is expected to generate. To conserve on notation, we normalize the CEO's reservation wage to 0. Further, we assume that if a CEO is fired on an intermediate date, the output produced in the period is expected to be zero, consistent with a replacement CEO having expected ability 0. Under these assumptions, the outside options of both the CEO and board are equal to zero. Hence, the surplus the CEO produces in the first period is  $\alpha_0$ , relative to the zero value of outside options. As a result of bargaining, the CEO receives a fraction  $\beta_0$  of the surplus and his period-1 wage is:  $W_1 = \beta_0 \alpha_0$ . In the second period, if the CEO's bargaining power remains at  $\beta_0$  (and he remains with the firm), his expected compensation will be  $W_2 = \beta_0 \alpha_1$ . The CEO's bargaining power is not fixed however and can be enhanced by promotion to chair. The benefit to the firm is that by yielding more power to the CEO, it dissuades the CEO from exploring outside opportunities prior to the second period – since the CEO is more reassured about future treatment by the board.

Although not important for analyzing the promotion decision, we can easily characterize the conditions under which the firm chooses to dismiss the CEO. Under the assumption that it is virtually costless to find a new CEO and dismiss the current CEO,<sup>10</sup> the decision will depend on the posterior assessment of the CEO's ability  $\alpha_1$  and the expected ability of the replacement CEO. If the prior on a replacement CEO is  $\alpha_R \sim N(0, \sigma_R^2)$ , the current CEO will be dismissed after the first period if:  $\alpha_1 < 0$ .

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<sup>9</sup> This is for simplicity but is without loss of generality since the CEOs are risk-neutral and incentives do not affect the output.

<sup>10</sup> Dismissal and search costs can be introduced easily but would contribute little to the discussion.

More interesting for our purposes is the decision to increase the likelihood of retaining a talented CEO by promoting him to chair. We model the retention decision as follows: After market participants have observed  $y_1$ , the CEO may choose to explore outside opportunities. In particular, we assume that with probability  $f(\alpha_1)$  the CEO can locate another firm that is seeking a CEO and where his perceived ability is valued more than at his current firm. The probability  $f(\alpha_1)$  is increasing in  $\alpha_1$ , since a strong performance makes the CEO more attractive to other firms. We take  $f(0) = 0$  and  $f(\alpha_1) \rightarrow 1$  as  $\alpha_1 \rightarrow \infty$ . His search comes at a personal cost of  $k$ .

If the CEO does find such an external position, we assume that his current firm competes with the new firm in trying to retain/attract the CEO. We take the outcome of bidding between the firms to be resemble an English auction. Hence, the CEO switches to the new firm (since the CEO is assumed to be more valuable in the new firm) and his compensation is driven up to the highest value his current firm is willing to pay. We take this to be the entire value ( $\alpha_1$ ) that the CEO could have brought to his current firm.

On the other hand, if the CEO fails to find an alternative position, we assume he is retained at his current firm. To capture the notion that the CEO has a limited time to decide whether to remain with the firm or leave, we assume that he can engage in such a search only once prior to the start of the second period. If his search fails, the firm has no incentive to offer him more than what he would receive with his current bargaining power. Hence, if the search fails, the CEO can expect to receive  $\beta_0 \alpha_1$ . Given his personal search cost of  $k$ , his expected compensation from searching can be expressed as:  $f(\alpha_1)\alpha_1 + (1 - f(\alpha_1))\beta_0 \alpha_1 - k$ . This represents a gain of  $f(\alpha_1)\alpha_1(1 - \beta_0) - k$  over his expected compensation  $\beta_0 \alpha_1$  in the absence of a search. Hence, the CEO will search if:

$$f(\alpha_1)\alpha_1(1 - \beta_0) - k \geq 0 \quad (3)$$

Let us denote by  $\alpha_1^*$  the value of  $\alpha_1$  such that equation (3) is just satisfied as an equality. In other words, for  $\alpha_1 > \alpha_1^*$ , the CEO is expected to engage in a search for outside opportunities, unless he is offered an alternative arrangement at his current firm. By our assumption about the ability of replacement CEOs (i.e.,  $\alpha_R \sim N(0, \sigma_R^2)$ ), it is in the interest of the current firm to retain the CEO as long as it can offer him compensation that is less than the surplus  $\alpha_1$  he is expected to produce. We have assumed that contracts are always subject to renegotiation, so that unless there is a change in the CEO's

bargaining power, he expects to receive  $\beta_0 \alpha_1$ . Hence, if the CEO's perceived ability  $\alpha_1 \geq \alpha^*$ , he will search unless there is some means of committing to compensate him at least as much as he expects to receive from searching. Our contention is that appointing the CEO to chair serves as a way to commit to a better subsequent treatment by the board and can, therefore, be used to retain the CEO.

The notion that yielding greater power to the CEO can be beneficial and reduce CEO concerns has been made elsewhere.<sup>11</sup> We denote the bargaining power after promotion to be  $\beta_1 > \beta_0$ .<sup>12</sup> As a result of bargaining power  $\beta_1$ , the expected compensation to the CEO in the next period is  $\beta_1 \alpha_1$ . Hence, if the CEO is promoted to chair (conditional on not searching) he will accept the chair and not search as long as:

$$\beta_1 \alpha_1 \geq f(\alpha_1) \alpha_1 + (1 - f(\alpha_1)) \beta_0 \alpha_1 - k. \quad (4)$$

We next turn to the model's testable implications that we investigate in our subsequent empirical analysis.

## 2.2 Model Implications and testable hypotheses

The model has several implications that we test in our empirical analysis. Our first prediction is that firms adopting PTB strategies will tend to be ones in which CEO ability is not easily discerned and significant learning may occur over time. It is likely, therefore, that these firms are somewhat more complex than other firms, as has been suggested by the literature. The literature indicates that firm attributes such as a larger board and firm size, higher levels of financial leverage, and greater R&D intensity create complexity in the firm. In addition to learning issues, complexity might suggest the need for a more unified decision-making structure in the firm.

After a CEO has been assessed as high quality, our model suggests that boards give CEOs the additional position of chair to enhance the CEO's bargaining power and improve retention, in environments in which contracting may be difficult. Hence, under the learning-retention hypothesis we expect duality to be more prevalent when there is sufficient uncertainty about the investment

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<sup>11</sup> See, e.g., Hermalin and Weisbach (1998), Almazon and Suarez (2003), Adams and Ferreira (2007), and Williamson (2008).

<sup>12</sup> The bargaining level  $\beta$  is not necessarily unique to duality and may be determined by a host of factors such as the ease of replacing the CEO, the committees to which the CEO is appointed, the number of insiders and the relationship of board members to the CEO among other considerations.

opportunities available and it is difficult to write an effective incentive contract based on common accounting and stock performance measures. Providing incentives solely through stock and options may not be appropriate when, for instance, the stock price does not fully capture the CEO's effort or ability. As we have argued, awarding the position of chair also adds a layer of protection for the successful CEO who is concerned about future treatment at the hands of the board. These concerns are likely to be greater if the CEO also needs to develop considerable firm-specific human capital.

We expect that CEOs that have a weaker relationship with the board will be more concerned about acquiring power relative to the rest of the board. Hence, if the CEO faces a more independent board that is not coopted, we expect that CEO to be promoted more rapidly. Further, there may be a greater benefit to use PTB to learn about CEO ability in less homogenous industries (Parrino (1997)), since CEO performance is difficult to benchmark to industry peers. Hence, we would expect PTB firms to be less prevalent in homogenous industries. Finally, when the board has greater information about CEO ability e.g., when the CEO is an internal appointment, we would expect promotions to occur over a shorter horizon. We can state:

*Prediction-1-A: Firms that are more complex and less transparent are more likely to follow a PTB strategy in appointing CEOs to chair positions. These firms are less likely to belong to homogenous industries*

*Prediction 1-B: In firms following the PTB strategy, CEOs will be more rapidly promoted to chair positions when the board is more independent and not coopted and when the CEO is internally sourced.*

The above predictions provide a way to test against a CEO-entrenchment and agency explanation for promotion to chair. For instance, if agency problems play a primary role in the promotion to chair, we expect CEOs to be more rapidly promoted in firms with boards that are coopted. An alternative hypothesis is that the possibility of being promoted to chair can provide the CEO with strong tournament-type incentives. The tournament-incentive hypothesis would be consistent with more complex and less transparent firms adopting PTB since contracting and incentives are difficult to provide. Later, we develop other predictions that will allow us to test the learning-retention hypothesis against the tournament-incentive hypothesis.

Our model suggests that if learning about managerial quality is an important factor underlying the PTB strategy, then promotion to board chair is likely to be preceded by strong firm performance. As we show below, our model also suggests that the post-promotion performance will tend to be lower than the CEO's performance in the periods leading up to the promotion. However, this is an artifact of the conditions under which promotions are likely to occur – rather than an indication of duality affecting firm performance. We can state:

Prediction 2: *In the period prior to the CEO being appointed chair, the firm's performance is expected to be strong ( $y_t$  will exceed  $a^*$ ). The prior performance ( $y_t$ ) is expected to be greater than the average subsequent performance exhibited by the firm. Hence, the average performance post-chair promotion will tend to decline.*

*Proof:* The above implication follows from the updating equation (2). Suppose that the manager's expected ability at  $t - 1$  is  $a_{t-1}$ . We expect  $a_{t-1} < a^*$ , otherwise the CEO would already be chair. Now, if the CEO is appointed chair following date  $t$  performance, it must be because  $a_t \geq a^*$  and  $y_t > a^*$  since:

$$a_t = w_t a_{t-1} + (1 - w_t)y_t \geq a^* \text{ iff } y_t > a^*$$

Since  $a_t \geq a_{t-1}$ , the updating equation above implies  $y_t > a_t$ . Hence, the average subsequent performance (since  $a_t$  represents expected ability and expected subsequent performance) will tend to be below  $y_t$ . ■

Prediction 2 indicates that constructing the appropriate counterfactual is critical to assessing the value implications of CEO duality. In a setting with learning about managerial ability, a finding that firm performance drops subsequent to chair promotion does not imply that duality has negative value consequences. In our empirical analysis, we test for the performance effects of duality by carefully matching the post-promotion performance of PTB firms to a control group of non-PTB firms (i.e., always or never have duality) and that exhibit a performance similar to the pre-appointment performance of PTB firms. The control sample is one in which there is no promotion to chair, but the implications in terms of CEO future performance are likely to be similar.

Prediction-2 provides us with a way to test between the learning-retention hypothesis and alternative hypotheses. Unlike the learning hypothesis, if ex-ante promotion (or prize-type) incentives are strong, we would expect to observe a drop in firm performance, relative to an appropriate matched sample of non-PTB firms. Further, given the anticipated decline in performance, it is not obvious that it would be optimal for CEOs to be promoted following a strong performance or promoted relatively early in their tenures. Similarly, if the promotion was hastened by agency considerations and worsened CEO entrenchment, we would expect there to be a drop in firm performance.

We turn to the anticipated change in CEO compensation and incentives following promotion to chair. As we have argued, a change in compensation could be the intended result of optimally promoting the CEO to chair. Promoting the CEO to chair in our model has the desired effect of giving the CEO additional bargaining power and inducing the CEO to forgo the search for alternative opportunities. Our learning model does not have clear predictions with regard to a change in incentive compensation, since there is no decline in CEO incentives (as there would be if the PTB provided strong ex-ante incentives).

If agency factors are an important aspect of the change in CEO compensation, we expect to find increases to be larger in firms in which the boards are more dependent and coopted (i.e., boards for which a larger percentage of directors have less tenure than the CEO). A finding that there is no relation (or negative relation) between compensation change and more dependent and coopted boards, would suggest that agency issues are not central to the compensation change. In particular, a lack of correlation between board cooption and compensation would be consistent with our learning-retention hypothesis. The alternative hypothesis that PTB provides strong ex-ante incentives would suggest a substantial increase in incentive pay to offset the drop in tournament incentives following the promotion.

Our learning hypothesis does not have clear predictions with regard to changes in firm risk policies following CEO's appointment to chair. However, if tournament-prize incentives are strong, CEOs have the incentive to increase firm risk in order to boost their chances of promotion. This argument suggests that we might expect the firms to reduce risk following CEO promotion.

Prediction 3: *Subsequent to a CEO being awarded chair:*

(i) *We expect there to be an increase in CEO compensation.*

- (ii) *To the extent compensation increases reflect agency problems -- rather than retention pay -- we expect compensation to increase more when the board is coopted.*
- (iii) *A reduction in firm risk, relative to matched firms, would be consistent with CEOs increasing risk (pre-award) to boost promotion chances*

Empirical studies suggest that overall there is little market reaction to the appointment of a CEO to the chair position. If the objective of the PTB is to learn about managerial ability, then the chair appointment may communicate positive news about the board's evaluation of CEO ability to the market. In our model, all participants are symmetrically informed. However, if the board has more precise information about CEO's ability, this would be consistent with a positive market reaction as investors updated their beliefs about the CEO's ability and likelihood of retention. At the same time, there may be little surprise or market reaction if the CEO has been in position for a relatively long period.

Alternative hypotheses would not predict a positive stock market reaction. The tournament-incentive hypothesis, for instance, would imply a drop in CEO incentives and a negative market reaction. Further, if there are concerns about an increase in agency costs the market reaction could be negative as well.

Prediction 4: *The stock market's reaction to the announcement of CEO appointment to chair will tend to be positive if it is relatively early in the CEOs tenure. We expect the market reaction to be more muted when it occurs later in the CEO's tenure. Announcement effects are expected to be less positive when there is concern about agency problems or a drop in incentives following the chair award.*

### **3. Sample and Data**

We obtain an initial sample of all firms in the ExecuComp database from 1995 through 2010. We read proxy statements from 1995 through 2002 to obtain CEO/chair duality status, board characteristics, and CEO characteristics. These data come from the Corporate Library database after 2010. The initial sample comprises 2,960 firms and 22,283 firm years. For our analysis, we remove financial firms (SIC 6000 – 6799) and regulated utility firms (SIC 4910-4949), which results in a sample of 18,023 firm years, 2,092 firms and 3,972 CEO-firm pairs. We obtain financial data from Compustat and stock return data from CRSP.



In Table 1, we present descriptive statistics on the prevalence of CEO-chair duality. During our sample period of 1995-2010, there is a declining trend of dual CEO-chairs. In 1995, the percentage of CEOs having the additional title of chair was about 69%. That percentage has steadily declined over the sixteen year period to 55%. Average firm age increased from 23.91 years to 27.02 years, while there was a small decline in average CEO tenure from 8.65 to 8.01 years over this period. In the second panel of the same table, we provide industry distributions. The substantial differences across industries, suggests that part of the trend in dual CEO-chairs could be due to changes in industry composition over time. Finally, the third panel shows that CEO tenure when the CEO-chair is separate is 4.66 years, substantially less than the 9.86 years for the full sample. The substantially lower CEO tenure when chair is separate comes from the fact that these firms tend to be younger and, in several cases that the CEO is in the pre-appointment phase of the PTB process.

Table 2, presents descriptive statistics for the firms in our sample. Industry-adjusted statistics are based on a firm's 3-digit historical SIC code. We winsorize all our data at the 1% level to limit the influence of outliers. Variable definitions are provided in the Appendix. The sample return data are skewed with an average (median) annual industry-adjusted stock return of 8.2% (.34%). Firms in our sample have an average asset size of \$5,363 million and an average board size of nine. For each industry, we construct an industry homogeneity measure using the methodology proposed by Parrino (1997). This proxy measures the correlation between common stock returns within two-digit SIC industries. We classify an industry as homogeneous if its homogeneity measure is above the sample median. We use the percentile rank of a firm's foreign tax to total tax as a proxy for the extent of its foreign operations. The median number of business segments for an average firm in our sample is 2. The average tenure of a CEO in our sample is 7.96 years.

As the first step in our analysis, we compare firm characteristics by looking at the firm's history of combining the CEO and chair roles. We divide the sample into three groups: (i) firms that always combine the two roles, (ii) firms that always separate the two roles, and (iii) firms that follow a PTB strategy. To ensure a clean comparison, we remove 303 firms comprised of 2,994 firm years and 758 CEO-firm pairs that, over our sample period, combined or separated the two roles at different times, but did not follow PTB in awarding both roles after a period of observation. However, the results of our

comparison are qualitatively unaffected if we assign these firms to any of the three categories. The comparative statistics are presented in Table 3.

For many firm attributes such as firm size (by assets and by sales), leverage, firm age, number of segments, the pass-the-baton firms (column 2) tend to fall between the always-combined firm (column 1) and the never-combined firms (column 3). These results seem reasonable in light of the Coles, Daniel, and Naveen (2008) argument that firm attributes such as size and leverage reflect firm complexity and explain why these firms might choose particular governance structures such as board size. Hence, the pattern indicated in Table 3 appears largely consistent with the notion that some types of firms benefit substantially from CEO-chair duality and will always combine the CEO-chair roles. These firms tend to be more complex in terms of having a larger size, more segments, and greater leverage. On the other hand, there is an intermediate group of firms that appears to benefit from combining the positions, but for either learning or incentive motives finds it beneficial to rely on the PTB process. There is also a third group for which the costs of duality appear to outweigh the benefits.

There are some revealing attributes for the PTB firms that do not fall between the other two groups. In particular, PTB firms are much less likely to be in a homogeneous industry and are less likely to have a coopted board. In a homogeneous industry, it is easier to benchmark CEOs against other CEOs in the industry. In a less homogeneous industry such benchmarking is more difficult, which may create greater concerns about giving the CEO more power as chair without first obtaining greater confidence in her ability. Hence, as discussed in developing our predictions, it seems reasonable to conjecture that the boards of firms in less homogenous industries are more likely to want to assess the ability of the CEO before awarding her the additional title of chair. Incentive effects of using the award of chair as a tournament prize may also be more useful in heterogeneous industries since it is more difficult to effectively benchmark performance-based incentive contracts.

To effectively evaluate the CEO for promotion to chair likely requires a board in which directors have a diverse set of skills and appropriate incentives. Research suggests that larger boards possess a wider array of skills and are more appropriate for firms that have greater advising needs (Coles, Daniel, and Naveen (2008)) and that coopted boards are likely to be less independent and subject to influence by the CEO (Coles, Daniel, and Naveen (2014)). Thus, our comparative results are consistent with the premise that firms that follow PTB do so because it is optimal in their situation. Altogether, the

comparison strongly indicates that firms that always combine the CEO and chair positions, firms that award the chair position via a pass-the-baton approach, or firms that always separate the two positions possess significantly different firm, board, and industry characteristics.

#### **4. Determinants of Passing-the-Baton**

To further examine the differences between firms with alternative leadership structures, we estimate multinomial logistic models. Table 4 presents the results of our analysis. We present the coefficient estimates from a multinomial logit model of the propensity to reward the CEO with both functions after a period of evaluation on the vector of performance, firm, CEO, and industry characteristics. To allow for a comparison of PTB firms against all other firms, we present estimates with both “always separate” and “always combined” as the base case. For each base case model, we present results with and without year and industry dummy variables. .

The results of the multivariate analysis largely confirm the univariate comparisons that suggest that PTB firms have characteristics that typically fall between those of firms that always combine both positions and firms that always separate both positions. However, for PTB firms, the coefficient on firm age is positive and statistically significant, and the coefficient on homogeneous industry is negative and significant for both base cases of “always separate” and “always combined.”<sup>13</sup> Together, these findings suggest that, as indicated by univariate comparisons, older firms in more heterogeneous industries are more likely to adopt the PTB strategy. The coefficient on the number of segments confirms the univariate evidence that more complex firms are likely to always combine both roles. More generally, the results are consistent with the argument that the choice of dual structure depends on the complexity and the scope of the organization (Fama and Jensen (1983)). Firms with more business segments are likely to be more complex than firms with fewer segments. CEOs of such organizations are likely to have firm-specific knowledge that makes it valuable for them to assume the additional role of chair of the board. The coefficients on CEO tenure also suggest that CEOs that always have both roles tend to amass longer tenures. Overall, these findings support Hypothesis 1, which states that firms that are more complex and less transparent are likely to follow PTB.

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<sup>13</sup> Industry dummy variables will partially subsume the influence of the homogeneous industry dummy.

Next we use a hazard model to estimate the propensity to combine the CEO and chair roles. We focus on PTB firms and exclude the firms that always separate or always combine the CEO-chair roles during the sample period. We add a dummy variable that indicates whether the CEO is an outsider in order to test our prediction that outsiders will receive both positions less quickly. Since longstanding insider CEOs tend to have long tenures that are mechanically related to their insider status, we create an orthogonal transformation of CEO tenure by regressing CEO tenure on the CEO outsider status. We then use the residuals from this regression as our control for CEO tenure. As expected, CEO tenure has a strong negative relation to CEO outsider status (the coefficient is -0.338, significant at the 0.001 level).

Table 5 presents the results of our hazard model using different proxies for firm performance. Two of the models use industry-adjusted stock returns and industry median stock returns. The third model includes both industry-adjusted stock returns and industry median stock returns. The next three models use return on assets instead of the stock returns. The last model includes both stock returns and accounting returns in the same specification. In support of the learning hypothesis (Prediction 2), the performance of the CEO in the previous two years is a significant predictor of whether or not she is rewarded with the additional title of chair. Older firms are slower to reward CEOs with the additional title. Firms with multiple segments are more likely to reward the CEO with the additional title of chair. Insider dominated boards are also more likely to reward the CEO with the additional title, which could suggest an agency problem or underscore the importance of firm-specific human capital. However, coopted boards are less likely to combine the two roles, which is inconsistent with the agency interpretation and consistent with our prediction that more independent boards will promote CEOs to chair earlier. Also consistent with our prediction, inside CEOs are more likely to be promoted earlier (Prediction 1-B). Firms with larger capital expenditures as a percentage of sales and higher leverage ratios are more likely to reward the CEO with the additional titles. These results support the argument that more complex organizations are better served by combining the roles of the CEO and the chair.

To gain additional insight, we also include the previous two-year's industry performance. Interestingly, both the industry-adjusted performance and the industry performance positively influence the likelihood that the firm combines the two roles. One interpretation of these results is that both "luck" and "skill" influence the outcome. Alternatively, these results may indicate that the board learns about the ability of the CEO to operate effectively in the current industry environment. Recent evidence

suggests that industry performance matters for CEO dismissal, which suggests that boards assess a CEO's ability to adapt to industry dynamics (Kaplan and Minton (2012), Eisfeldt and Kuhnen (2013), and Jenter and Kanaan (2015)). Qualitatively, the statistical significance levels of the coefficients of other main variables are very similar to the significance levels presented in models 1 & 2.

We use ROA as a proxy for performance in models 4, 5, and 6. The results in models 4 and 6 support the hypothesis that a firm's performance relative to its industry peers as measured by ROA, has a significant effect on the likelihood of CEO being awarded the chair. When we include both stock returns and ROA in the same specification (Model 7), it appears that both prior firm-specific performance and superior industry performance increase the likelihood of the CEO being rewarded with the additional title. Stock-price performance tends to be a relatively more important determinant than accounting performance. Altogether, the results in Table 5 suggest that CEOs receive both titles more quickly following superior firm-specific performance and superior industry performance.

In untabulated results, we also estimate the hazard model on a sample that includes the firms that always separate or always combine the CEO-Chair roles during the sample period, allowing for a different baseline probability for each category. The results are qualitatively similar to those presented in Table 5. These findings suggest that our results are robust to alternative specifications of the hazard function. Overall, it appears that both performance relative to industry (Prediction 2) and industry performance play a role in the CEO's elevation to chair.

## **5. Consequences of Passing the Baton**

### *5.1 Investor Reactions to Combination of CEO and Chair Roles*

As the first step in our analysis of the consequences of combining the two roles, we examine the valuation impact of the announcement to award the title of board chair to the CEO. For the sample of firms for which we can identify the news releases associated with the award of the additional title, we examine the stock price reaction to the announcement. We follow the event study method of Patell (1976) based on the market model and use the value-weighted CRSP index as the proxy for the market.

We present the results of our event study analysis in Table 6. For the full sample, the cumulative abnormal returns for the three-day window of -1 to +1, is 0.35%, which is not statistically different from zero. However, the market response to sample firms that promote their CEOs within three years is

1.09% and is statistically significant at the 1% level. This result suggests that early promotions reveal directors' private information about the quality of the CEO to the market. This evidence is consistent with Prediction 4 of our model. The market response to late promotions is statistically insignificant from zero, which suggests the market has already assessed the quality of these longer-serving CEOs and anticipated any incentive effects of combining both roles.

We also segregate the sample based on (i) whether the board is coopted or not coopted (ii) whether the combination occurred before or after the implementation of Sarbanes Oxley and (iii) whether the CEO is an insider or outsider. Our analysis of coopted and non-coopted boards provides no support for the agency explanation. In fact, there is weak evidence of a positive market reaction when boards are coopted. Whether the CEO is an insider or outsider or whether the combination occurs before or after the implementation of Sarbanes Oxley does not appear to influence the market reaction.

### *5.2 Univariate Comparison of Firm Performance and Policies Before and After Combining the Roles*

The results presented in Table 3 through Table 5 strongly reveal that firms that choose different leadership structures are significantly different along many other dimensions. These differences suggest that we should carefully construct our research design to consider these sample selection issues and identify a counterfactual that allows us to draw causal inferences.

We draw our counterfactual firms from the set of firms that either always combine or separate the roles of CEO and chair, and use a two-step process to identify the matching firm as of the year prior to the combination of the two positions. First, we require that the matching firm be in the same decile of stock return (return on assets) as the treated firm in the year prior to combining the two positions to control for mean reversion in performance. An abnormally strong performance – as occurs prior to the chair award – would be expected to be followed by a reversion to the mean. Second, we estimate propensity scores for the likelihood of a firm choosing the PTB strategy based on the predictors in Table 4, and then use the nearest neighbor approach to identify a matched sample.

Table 7 presents a comparison of characteristics for PTB and matched firms. Panel A compares characteristics for firms matched based on the stock-return decile and Panel B compares characteristics for firms matched based on the return on assets decile. In stark contrast to the univariate comparisons in Table 3, the PTB and matched firms have very similar characteristics that are not statistically

different. For firms matched based on the stock-return decile, we note that the homogeneous industry and coopted board dummy variables are marginal ( $p$ -values range from 0.09 to 0.13). For firms matched based on the return on assets decile, R&D as a fraction of sales is marginal for the mean ( $p$ -value of 0.13) and the percentage of CEO ownership is significant for the median. Both these variables are skewed, which creates different outcomes for the mean and the median. We present robustness tests along these four dimensions in Table 10 and find no influence on our reported findings.

In Panel A of Table 8, we present univariate results for firm performance before and after receiving both CEO and chair positions. Without adjusting for the matched firms, results based on mean stock returns suggest a statistically significant performance decline from 20.03% to 14.66%. However, when we focus on the results based on match-adjusted stock returns, we do not observe a statistically significant decline in performance. For accounting performance, we find no difference for unmatched returns, but match-adjusted returns actually improve from 0.35% to 1.20%, which is statistically significant at the 5% level. Thus, the univariate comparisons suggest that the data are more consistent with the learning hypothesis.

One could argue that there is an optimum time frame by which time the CEO is rewarded with the additional title. If the board delays the award of the title, the CEO could threaten to quit.<sup>14</sup> On the other hand awarding the additional title too soon could result in a mediocre performance subsequently. To test the implications of timing, we separate our sample into two groups. The first group consists of CEOs that receive the additional title of board chair in less than four years of becoming the CEO. The other group consists of CEOs that get the additional title in four years (sample median) or more. In untabulated univariate results, we find no material differences in the post-award firm performance following early or late combinations.

In Panel B of Table 8, we provide univariate results of firm financial policies before and after combining the CEO and the board positions. We present results for capital expenditures as a fraction of sales, R&D expense as a fraction of sales, financial leverage and the number of business segments. For policies, we follow a similar matching process as described above, but we required the PTB firm and the matched firm to be in the same decile by policy level. We focus our attention on match-adjusted results

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<sup>14</sup> The CEO of HSBC, Michael Geoghegan, threatened to quit if he was not promoted to board chair (Sunday Times, 9/26/2010)

as discussed above. As a fraction of sales, the data suggest that match-adjusted capital spending increases and that match-adjusted R&D decreases. Moreover, firms tend to rely more on leverage to finance investment. Taken together, these results suggest that firms move into relatively safer investment following the combination of the two positions, consistent with the notion that CEOs take more risk to improve performance and receive both roles.

We directly examine evidence on the risk-taking behavior of the CEO in Panel C of Table 8 by comparing total stock return risk, market risk, and firm-specific risk in the pre- and post-combination periods. We find that match-adjusted total risk declines significantly on both an unadjusted and match-adjusted basis. This decline is driven by a significant reduction in firm-specific risk -- CAPM market risk actually increases slightly, consistent with the use of greater leverage. Combined with the changes in the investment policy, we interpret these results to support Prediction 3. However, we note that this inference is based on univariate comparisons. Later, we will use our fixed-effects specifications with matched benchmark firms to further examine these results.

### 5.3 *Multivariate fixed-effects analysis of firm performance and policies*

Ideally, we would like to compare the ex post financial performance of the firms that combine the two roles relative to otherwise identical firms that do not combine the two roles. We broadly follow the empirical strategy used by Pagano, Panetta, and Zingales (1998) to examine the decision by the firm to go public. We investigate the ex post consequences by estimating fixed effect regressions in which the effect of the decision to combine the two roles is captured by dummy variables for the year of the combination and the three subsequent years. By using firm fixed effects, each CEO-firm pair prior to the CEO receiving both roles serves as its own control for the period after the CEO assumes both roles. We also carry out the analysis using a match-adjusted CEO-firm pair. The analysis of unadjusted data provides a test of differences and the analysis of match-adjusted data provides a test of differences in differences. Specifically, we estimate the following specification for each performance or policy variable:

$$y_{it} = \sum_{t=1}^4 \beta_t \text{Combined}_t + \beta_4 \text{Combined}_{t>4} + u_i + d_t + \varepsilon_{it}$$

where  $u_i$  and  $d_t$  are CEO-firm pair and year fixed effects, respectively.  $\text{Combined}_t$  is an indicator variable that is 1 if period  $t$  is after the CEO became board chair and zero otherwise.



We present the first set of multivariate firm fixed-effect regression results in Table 9. Panel A provides the results on performance. When we do not control for a matched firm, the data reveal significant declines in stock returns, but not ROA, following the combination of the two roles. However, we find no evidence that awarding the additional role of board chair influences the match-adjusted stock returns in any year or cumulatively in the years following the promotion. For match-adjusted accounting returns, however, the coefficients are positive and significant in each post-combination period, and the sum of the coefficients is positive and significant at the 1% level. If firms optimally combine the roles via passing the baton, we would expect stock price to reflect future gains ex ante, but positive accounting returns to persist. Thus, the performance results are more consistent with the learning hypothesis than the incentive hypothesis.

Next, we examine firm policy variables in Panel B of Table 9. We again present results for unadjusted variables and for match-adjusted variables. Although unadjusted capital expenditures decline following the combination, we find no evidence of any influence in investment policy as measured by match-adjusted capital expenditures or R&D. Firms appear to significantly increase their leverage after the award year, but there is no significant change for match-adjusted leverage. The data suggest the possibility of diversifying activities. Summing up the coefficients, firms add about 1.3 new business segments after combining the CEO-chair roles. There is, however, no significant increase in the number of business segments when we perform match-adjusted analysis.

We also use multivariate fixed-effects analysis to examine changes in total firm risk, CAPM systematic risk, and firm-specific risk. These results are presented in Panel C Table 9 and are similar to univariate results discussed earlier. The results indicate that after receiving the additional title of Chair, the CEO appears to significantly reduce total risk and firm-specific risk on both an unadjusted and match-adjusted basis. There is no significant change in systematic risk, so we conclude that the change in total risk derives from the reduction in firm-specific risk.

Table 10 presents robustness results of our performance analysis segmented by factors that could influence the decision to combine the two roles or the performance of the CEO following the combination of roles. First, we examine the influence of four factors from our matched sample that had

p-values marginally close to statistical significance: homogeneous industry and coopted boards for matches based on stock returns as well as CEO ownership and R&D as a fraction of sales for matches based on accounting performance. For completeness, we examine both match-adjusted stock returns and match-adjusted return on assets. Then, we examine several other factors that could influence performance, namely, (i) early or late combinations (ii) insider or outsider CEO status (iii) combinations before or after the implementation of the Sarbanes Oxley act.

We present the performance results for coopted boards in Panel A and for homogeneous industries in Panel B. The empirical estimates confirm our base results. We document no impact of combining the two positions on stock-return performance. The performance does not differ statistically between coopted and non-coopted boards ( $p$ -value of 0.89) or between homogeneous and heterogeneous industries ( $p$ -value of 0.83). On the other hand, accounting performance improves significantly following the combination of the CEO and the chair positions for coopted boards ( $p$ -value of 0.01), non-coopted boards ( $p$ -value of 0.05), homogeneous industries ( $p$ -value of 0.03) and heterogeneous industries ( $p$ -value of 0.03). The accounting performance is not statistically different between coopted and non-coopted boards ( $p$ -value of 0.41) or between homogeneous and heterogeneous industries ( $p$ -value of 1.00). Thus, the data suggest that the match-adjusted performance results are robust to board independence and industry homogeneity. More generally, the results for coopted boards offer no support for the alternative agency explanation of CEO-chair duality.

The results for performance and CEO ownership are presented in Panel C and the results for R&D intensity in Panel D. Again, the robustness tests confirm our base results. We document no impact of combining the two positions on stock-return performance. The performance does not differ statistically between high CEO ownership and low CEO ownership ( $p$ -value of 0.66) or between high R&D intensity and low R&D intensity ( $p$ -value of 0.26). Accounting performance improves significantly following the combination of the CEO and the chair positions for low CEO ownership ( $p$ -value of 0.03), high CEO ownership ( $p$ -value of 0.03), low R&D intensity ( $p$ -value of 0.01) and high R&D intensity ( $p$ -value of 0.08). Accounting performance is not statistically different between low and high CEO ownership ( $p$ -value of 0.94) or between low and high R&D intensity ( $p$ -value of 0.74). Thus, the empirical tests indicate that match-adjusted performance results are robust to CEO ownership and R&D intensity.

It is conceivable that there could be an optimum time frame over which the CEO is given the additional title. If the board delays the award of the title, the CEO could be more likely to leave the firm for alternative employment. On the other hand, awarding the additional title too soon could result in a mediocre performance subsequently. To test early versus late promotions, we separate our sample into two groups. The first group consists of CEOs that get awarded their additional title within three years (the sample median) of becoming CEO. The other group consists of CEOs that get the additional title in four years or later. Our results on performance differentials are presented in Panel E of Table 10. We find no significant difference between the match-adjusted returns for the two groups. Note, however, that since these are comparisons with firms matched in terms of past performance, the results do not imply that the firm would be better off delaying the promotion. The results for the match-adjusted accounting measure of performance are similar to those for stock-price performance. Overall, the data suggest that the change in post-award performance is no different for early recipients than for late recipients.

In Panel F, we present the results when we divide the sample based on whether the CEO is an insider or an outsider before becoming CEO. We find no significant differences for stock return performance between the two groups following the award of the additional title, but we find that the positive impact on accounting performance is concentrated among insider CEOs and that it is significantly different from the accounting performance of outsider CEOs ( $p$ -value of 0.03). A possible explanation is that insider CEOs could be in a position to pursue more aggressive accounting practices after receiving both positions (though the purpose is not readily evident). If so, we might expect the implementation of Sarbanes-Oxley to reduce the post-combination accounting performance. As is well recognized, the Sarbanes-Oxley (SOX) Act resulted in some significant changes in accounting practices, corporate governance rules and regulations. Indeed, we find that the positive match-adjusted accounting performance is concentrated in the pre-SOX years (Panel G). However, the performance is not significantly different from that in the post-SOX years ( $p$ -value of 0.30).

A possible concern with the fixed effects method is that observable policy variables are not fixed within firms over time. As an additional test, we estimate multivariate regressions to understand the impact of policy changes on stock returns following the combination of the two positions. These results are presented in Table 11. The first two columns present the results for match-adjusted stock returns and

the second two columns provide the results for match-adjusted accounting returns. We find no evidence across the different specifications that the match-adjusted stock returns are influenced by the combination of the two roles. Capital expenditures, R&D, and leverage all appear to be negatively related to firm performance prior to combining the two roles, but these policies do not appear to have a differential effect on performance after combining the two positions.

#### *5.4 Multivariate fixed-effects analysis of CEO compensation and incentives*

Subsequent to the award of the additional title, the CEO may be able to use her increase in power to boost her own pay or decouple her pay from performance. If so, we expect to see an increase in compensation levels or a decrease in compensation incentives. We use the fixed effects regression method in Pagano, Panetta, and Zingales (1998) to examine the actual and match-adjusted compensation levels and incentives provided to the CEO. As before, each PTB firm is matched to a firm that is (i) in the same decile by compensation component and (ii) the nearest neighbor based on propensity scores.

To estimate compensation levels and performance-based incentives, we use the adjustment techniques recommended by Coles, Daniel, and Naveen (2013) to account for changes in compensation reporting created by FAS 123R. The natural logarithm of TDC1 from the ExecuComp database serves as our measure of total compensation. TDC1 combines compensation from salary, cash bonuses, stock options, restricted stock, and long-term incentive plans to estimate the CEO's total compensation. Following Core and Guay (2002) and Coles et al (2006), we compute the compensation delta as the dollar change in the executive's annual compensation with respect to a 1% change in stock price. In a given year, an executive's compensation delta is the sum of the delta of new restricted stock grants and the delta of new option grants. The delta of restricted stock grants equals the number of restricted stock grants multiplied by the stock price times 0.01, and the delta of option grants is the number of option grants multiplied by the change in the Black-Scholes option value for a 1% change in stock price.

We estimate an executive's risk-taking incentives as the sensitivity of the executive's Black-Scholes value of new option grants with respect to a 0.01 change in stock volatility (vega). We do not estimate the vega of stock grants since Guay (1999) documents that the vega of stocks is insignificant compared to the vega of options. Because founding families tend to have large equity ownerships in their firms, family executives' total wealth will be more sensitive to changes in stock price and volatility

than the wealth of executives in nonfamily firms. To capture executives' existing incentive from their portfolio holdings, we calculate the portfolio delta and portfolio vega based on the executives' existing equity holdings at the beginning of the year following the approximation method of Core and Guay (2002). To estimate the risk-free rate used in vega and delta computations, we use the ten-year treasury notes constant maturity series available from the Federal Reserve Bank's official website. We define a coopted board as any board in which the percentage of directors with board tenures less than the CEO is greater than the sample median of 37.5%.

Table 12 presents the results of our compensation analysis. Although the total compensation (unadjusted) significantly increases in every one of the years following the award of the additional title, the match-adjusted total compensation shows no increase (Panel A). In Panels B, C, D, and E, we present the results for the annual compensation delta, the total portfolio delta, the annual compensation vega, and the total portfolio vega. As with total compensation, the unadjusted annual compensation delta and annual compensation vega increase each year following the combination of leadership roles, but the changes in the match-adjusted delta and vega are largely insignificant (Panels B and D). Of particular note, the total portfolio delta (vega) increases each year on both an unadjusted and an adjusted basis (Panel C and E). The sum of the coefficients in the post-combination period is significant at less than the 1% level for both unadjusted and adjusted incentive measures. This result indicates that CEOs that obtain both roles tend to retain stock options and shares rather than cash out, which significantly increases their incentive alignment with shareholders. The option and share retention may serve as a bonding mechanism on the part of the CEO, or it may result from explicit or implicit pressure from the board or external monitors. Nonetheless, the consistent increase in incentive alignment is likely to serve as a mechanism that alleviates the agency problems that could arise from the combination of the CEO and the board chair positions.

In Table 13, we report the results for matched-firm compensation results for early and late CEO-Chair combinations. The results in panel A indicate that increases in total match-adjusted compensation accrue primarily to CEOs that receive both titles earlier, and these CEOs tend to also receive higher total compensation gains than do CEOs that receive both titles later ( $p$ -value of 0.02). This result supports the bargaining/retention framework since the decision to combine both roles early reveals the board's private information about the quality of the CEO and its willingness to increase compensation to retain

the CEO. For CEOs that receive both positions later, the learning component and retention imperative are weaker. However, as shown in Panels B & D, there is no influence on annual incentive awards as measured by delta or vega. Total portfolio incentives, both delta and vega increase for both early and late combinations, and the increases are not statistically different (Panels C and E). Thus, the compensation results for early and late combinations tend to support the learning hypothesis and offer no support for the alternative agency explanation.

In Tables 14 and 15, we present the results for subsamples based on coopted nature of the board and the pre- and post-SOX periods. Comparison of matched-firm compensation results for coopted and non-coopted boards suggests that there are no substantial differences in compensation, compensation delta, compensation vega, portfolio delta and portfolio vega between the two groups. Although CEOs with non-coopted board and CEOs with coopted boards both tend to maintain stock and option portfolios that increase their alignment with shareholders, the portfolio delta actually increases more on the margin for CEOs with coopted boards ( $p$ -value of 0.08). When we divide our sample into two sub groups – pre- and post- Sarbanes-Oxley, we find total compensation increases significantly following the combination for the post-Sox group (Table 15). The results might be explained in part by the increased accountability of the CEOs demanded by the regulation. Moreover, increases in portfolio delta are marginally greater for the post-SOX group ( $p$ -value of 0.08). However, contrary to the agency-model predictions, the notion that a CEO used increased power to boost her own pay is not supported by the data. Overall, we conclude that our evidence supports the premise that CEOs get additional title of chair based on the learning of their ability by the corporate board.

## **6. Conclusion**

In recent years, there has been growing regulatory and investor pressure to split the titles of CEO and board chair. In fact, there is a significant trend towards separation of the two titles. However, the empirical evidence in the literature is inconclusive on the impact of separating these roles. We argue that the inconclusive evidence arises from endogenous self-selection that complicates empirical identification strategies and the ability to recognize the correct counterfactual firms.

We propose a learning model of CEO-chair duality and implement an identification strategy to address sample selection issues. Our model and identification is based on “passing the baton” (PTB)

firms that award the chair position after a probationary period during which the board of directors learns about the ability of the CEO. In the model, the board optimally awards the additional position of board chair if the CEO demonstrates sufficient talent. The increase in CEO power improves the retention of high-quality CEOs by mitigating concerns about the board renegeing on compensation contracts. The model delivers several implications that we test in our empirical analysis.

Using a sample of over 18,000 firm-year observations for the period 1995-2010, we explore the determinants and consequences of the combining the two roles. Firms that always combine the two roles, always separate the roles, or award the additional title following a period of evaluation exhibit significantly different firm characteristics, which suggest self-selection. We find that PTB firms are more likely to be from industries that are less homogenous. This is consistent with the learning rationale underlying PTB strategies, since it CEO performance is harder to benchmark and where renegeing on contracts may be of greater concern to CEOs. We also find that firms with more business segments are more likely to combine the two roles. These findings suggest that more complex organizations are better served by combining the roles of the CEO and the chair.

Overall, CEOs that receive the additional title of board chair outperform their industry benchmark before receiving both titles. In firms that combine the roles after observing the CEO's performance under a separate board chair, the combination is positively related to both firm and industry performance in the two years prior to the combination. As predicted by our model, a naïve analysis of the post-chair appointment performance, one that fails to control for selection issues and mean reversion in performance data, indicates a significant drop in firm performance relative to the pre-chair period. However, in a matched sample of firms where the matching criteria includes the pre-appointment performance and firm attributes that predict a high propensity for using a PTB succession strategy, we find that there is no post-appointment underperformance in stock returns, while there is overperformance in accounting returns. These results suggest that the pass-the-baton succession process appears to be an equilibrium mechanism in which some firms optimally use the PTB structure to learn about the CEO and then award the additional title of board chair to increase the odds of retaining talented CEOs. Thus, the evidence is broadly consistent with the learning hypothesis that the additional title is awarded by the board after evaluating the ability of the CEO.

Our model suggests that, *ceteris paribus*, talented CEOs in a weaker bargaining position relative to the board will tend to be promoted to chair more quickly. The reason is that more vulnerable CEOs are more likely to pursue outside opportunities. Supportive of the prediction, we find that when the board is more independent and not coopted– the promotion to chair occurs more quickly. These findings are also counter to the notion that agency considerations and influence are central to the CEO being appointed chair. We also show that stockholders react positively to combinations that occur early in the CEO’s tenure, which suggests that early promotions reveal directors’ private information about the quality of the CEO to the market. This is inconsistent with alternative explanations such as an incentive rationale for PTB or agency problem, since both of these alternatives would suggest a negative market reaction to such promotions.

We do not interpret our results to indicate that there are no unique agency problems associated with combining the CEO and the chair position. However, the data do not suggest that PTB combinations result from agency problems. Moreover, the incentives of CEOs who receive both positions become more closely aligned with the incentives of shareholders through personal wealth that is increasingly sensitive to share-price performance, which seems to be an equilibrium mechanism to mitigate potential agency problems that might arise from combining the two roles. When one considers the benefits of learning to many firms, we conclude that the process of combining the two roles after a period of observation is likely advantageous for these firms.

A major implication of our analysis for researchers is that one should consider learning mechanisms and retention objectives when evaluating various board structures. Structures that are seemingly incompatible with effective monitoring may in fact be optimal when one considers the impact of learning on retention. For governance activists and policy makers, the implications of our analysis are straightforward: the results call into question the prevailing wisdom that suggests that shareholders will always be better served by separating the two roles. Thus, those who seek to reform governance should be cautious in proposing to unambiguously separate the roles of CEO and board chair. Forcing separation by fiat is likely not an ideal policy. Overall our evidence suggests that having one type of executive and board leadership structure is not optimal for all firms.



Appendix: Definitions and Data Source for Variables

Variable	Source	Definition
Combined CEO/Chair Positions	Proxy Statements, Corporate Library	CEO also chairs the board
Annual Stock Return	Compustat	$(PRCCF_t - PRCCF_{t-1} + DVPSX\_F) / PRCCF_{t-1}$
Annual Return on Assets	Compustat	(Income Before Extraordinary Items)/(Book Value of Total Assets); IB/AT
Assets	Compustat	AT
Sales	Compustat	REVT
Firm Age	CRSP	First listing date on CRSP
Homogeneous Industry (0/1)	Calculated from CRSP data	Takes the value 1 if the Industry Homogeneity Measure (Parrino, 1997) is above the industry median
Board Size	Proxy Statements, Corporate Library	Number of directors on the board
Percentage Insider Directors	Proxy Statements, Corporate Library	Percentage of directors who work for the firm, are retired from the firm, or have an immediate family member who works or retired from the firm
Coopted Board (0/1)	Proxy Statements, Corporate Library	Takes the value 1 if the percentage of coopted directors is above the sample median. A director is coopted if the CEO has been in place longer than the director (Coles, Daniel, and Naveen, 2014)
% Foreign Tax (Percentile Rank)	Compustat	The percentile rank of Foreign Tax/Total Tax
Number of Business Segments	Compustat	The number of reported business segments
Capital Expenditures/Sales	Compustat	CAPX/REVT
R&D/Sales	Compustat	RDIP/REVT
Leverage Ratio	Compustat	Total Debt/Total Assets (DLTT+DLC)/(AT)
CEO Ownership (%)	Proxy Statements, ExecuComp	(Shares owned by the CEO)/)*100%
CEO Tenure	Proxy Statements, ExecuComp	Number of Years the CEO has been CEO
CEO Age	Proxy Statements, ExecuComp	Age of the CEO
Insider CEO (0/1)	Proxy Statements	Takes the value of 1 if the CEO is promoted from within the firm
Total Compensation	Execucomp	The sum of salary, bonus, other annual compensation, total value of restricted stock granted, total value of options granted, long-term incentive payouts, and all other total compensation (TDC1)
Compensation Delta	Calculated from Execucomp data	The dollar change in current CEO compensation for a 1% change in stock price following Coles, Daniel, and Naveen (2013)
Portfolio Delta	Calculated from Execucomp data	The dollar change in the CEO's portfolio holdings for a 1% change in stock price following Coles, Daniel, and Naveen (2013)
Compensation Vega	Calculated from Execucomp data	The dollar change in the CEO's Black-Scholes value of new option grants with respect to a 0.01 change in stock volatility following Coles, Daniel, and Naveen (2013)
Portfolio Vega	Calculated from Execucomp data	The dollar change in the CEO's Black-Scholes value of option portfolio with respect to a 0.01 change in stock volatility following Coles, Daniel, and Naveen (2013)

## References

- Adams, R., and D. Ferreira, 2007. A theory of friendly boards. *Journal of Finance* 62, 217-250.
- Almazan, A., and J. Suarez, 2003. Entrenchment and severance pay in optimal governance structures. *Journal of Finance* 58, 519-548.
- Brickley, J. A., Coles J. L. and Jarrell G., 1997. Leadership structure: Separating the CEO and chairman of the board. *Journal of Corporate Finance* 3, 189-220.
- Brickley, J. A., Coles J. L. and Linck, J., 1999. What Happens to CEOs After They Retire? New Evidence on Career Concerns, Horizon problems, and CEO Incentives, *Journal of Financial Economics* 52, 341-377.
- Coles, J. L., Daniel, N., and Naveen, L., 2008. Boards: Does one size fit all? *Journal of Financial Economics* 87, 329-356.
- Coles, J. L., Daniel, N., and Naveen, L., 2013. Calculation of compensation incentives and firm-related wealth using ExecuComp: data, program, and explanation. Unpublished manuscript.
- Coles, J. L., Daniel, N., and Naveen, L., 2014. Coopted boards, *Review of Financial Studies*, 27 1751-1796.
- Core, J. and Guay. W., 2002. Estimating the value of employee stock options portfolios and their sensitivities to price and volatility, *Journal of Accounting Research* 40(3), 613-630.
- Core, J., Holthausen, R., and Larcker, D., 1999. Corporate Governance, Chief Executive Officer Compensation, and Firm Performance, *Journal of Financial Economics* 51, 371-406.
- Dahya, J., McConnell, J.J., and Travlos, N.G., 2002. The Cadbury Committee, Corporate Performance, and Top Management Turnover, *Journal of Finance* 57, 461-483.
- Dahya, J., and McConnell, J.J, 2007. Board Composition, Corporate Performance, and the Cadbury Committee Recommendation, *Journal of Financial and Quantitative Analysis* 42, 535-564.
- Dalton, D., Daily, C., Johnson, E.J., 1998. Meta-Analytic Reviews of Board Composition, Leadership Structure, and Financial Performance. *Strategic Management Journal* 19, 269-290.
- Dey, A., Engel, E., and Liu, G.L. 2011, CEO and Board Chair Roles: To Split or not to Split?, *Journal of Corporate Finance* 17, 1595-1618.
- Eisfeldt, A., and C. Kuhnen, 2013. CEO turnover in a competitive assignment framework, *Journal of Financial Economics* 109, 351-372.
- Fahlenbrach, R., Minton, B.A., and Pan, C. H., 2011. Former CEO Directors: Lingering CEOs or Valuable Resources, *Review of Financial Studies* 24, 3486-3518.
- Fama, E. F. and Jensen M., 1983. Separation of ownership and control. *Journal of Law and Economics* 26, 301-325.

- Fama, E. F. and Jensen M., 1983. Agency Problems and Residual Claims. *Journal of Law and Economics* 26, 327-349.
- Faleye, O., 2007, Does one hat fit all? The case of corporate leadership structure, *Journal of Managerial Governance* 11, 239-259.
- Goyal, V.K. and Park, C. W., 2002. Board Leadership Structure and CEO Turnover, *Journal of Corporate Finance* 8, 49-66.
- Grinstein, Y. and Valles, Y., 2008. Separating the CEO from the Chairman Position: Determinants and Changes after the New Corporate Governance Regulation. Working Paper, Cornell University.
- Guay, W. R. (1999). The sensitivity of CEO wealth to equity risk: an analysis of the magnitude and determinants. *Journal of Financial Economics*, 53(1), 43-71.
- Harris, M., and Holmstrom B., 1982. A theory of wage dynamics. *The Review of Economic Studies* 49, 315-333.
- Hart, O., and Moore J., 1990. Property Rights and the Nature of the Firm. *Journal of political economy* 1119-1158.
- Hermalin, B., and Weisbach M., 1998. Endogenously chosen boards of directors and their monitoring of the CEO. *American Economic Review* 96-118.
- Hermalin, B., and Weisbach M., 2003. Boards of Directors as an Endogenously Determined Institution: A Survey of the Economic Literature. *Economic Policy Review* 9, 7-26.
- Hermalin, B., and Weisbach M., 2014. Understanding corporate governance through learning models of managerial competence, NBER Working Paper 20028.
- Jenter, D. and F. Kanaan, 2015. CEO turnover and relative performance evaluation. *Journal of Finance*, 70, 2155-2184.
- Kaplan, S., and B. A. Minton, 2012. How has CEO turnover changed? *International Review of Finance* 12, 57-87.
- Krause, R., Semadeni M., and Cannella A., 2014. CEO duality: A review and research agenda. *Journal of Management*, 40, 252-282.
- Linck, J. S., Netter J. M. and Yang T., 2008. The determinants of board structure. *Journal of Financial Economics* 87, 308 – 328.
- Murphy, Kevin J. "Incentives, learning, and compensation: A theoretical and empirical investigation of managerial labor contracts." *The Rand Journal of Economics* (1986): 59-76.
- Pagano, P., Panetta, F., and Zingales, L. 1998. Why Do Companies Go Public? An Empirical Analysis. *Journal of Finance*, LIII, 27-64.
- Palmon, O., Wald, J.K., 2002. Are Two Heads Better than One? The Impact of Changes in management Structure on Firm Performance by Firm Size, *Journal of Corporate Finance* 8, 213-226.

Parrino, R., 1997. CEO Turnover and Outside Succession: A Cross-sectional Analysis, *Journal of Financial Economics* 46, 165-197.

Patell, J. M., 1976. Corporate Forecasts of Earnings per Share and Stock Price Behavior: Empirical Test, *Journal of Accounting Research* 14, 247-276.

Vancil, R. F., 1987. *Passing the Baton: Managing the Process of CEO Succession*. Harvard Business School Press, Boston.

Williamson, O., 2008. Corporate boards of directors: In principle and in practice. *Journal of Law, Economics, and Organization* 24, 247-270.

Yang, T., and Zhao, S., 2014. CEO Duality and Firm Performance: Evidence from an Exogenous Shock to the Competitive Environment, *Journal of Banking and Finance* 49, 534-552.

Table 1. Combined CEO/Chair Roles, CEO Tenure, and Firm Age over Time and by Industry

This table presents summary statistics on the percentage of firms with CEOs who also of Chair the Board of directors, mean CEO tenure, and mean firm age. The sample excludes financial firms (SIC 6000 – 6799) and regulated utility firms (SIC 4910-4949). We provide statistics over time from 1995 to 2010 and across industry at the SIC code single-digit level.

Year	Observations	Percentage of Combined CEO-Chairs	CEO Tenure	Firm Age
1995	993	68.68	8.65	23.91
1996	1,075	68.84	8.48	22.62
1997	1,148	69.77	8.48	22.62
1998	1,175	68.60	8.48	22.25
1999	1,179	67.77	8.40	22.39
2000	1,111	69.04	8.14	22.44
2001	1,092	66.21	7.74	23.10
2002	1,101	66.76	7.71	23.90
2003	1,160	68.79	7.56	23.89
2004	1,177	66.61	7.94	24.33
2005	1,181	63.08	7.74	24.90
2006	1,102	60.25	7.57	24.90
2007	1,240	57.18	7.69	25.27
2008	1,160	58.53	7.77	26.10
2009	1,098	56.38	7.83	27.11
2010	1,031	55.00	8.27	27.02
All Years	18,023	64.46	8.01	24.21
Industry (Single-digit SIC)	Observations	Percentage of Combined CEO-Chairs	CEO Tenure	Firm Age
Agriculture, Forestry, and Fishing (0)	59	81.36	10.81	59.58
Mining and Construction (1)	1,200	65.25	8.45	23.17
Manufacturing (2)	3,697	71.11	7.51	30.71
Manufacturing (3)	6,288	63.93	7.82	25.64
Transportations and Public Utilities (4)	1,129	63.86	9.37	21.98
Wholesale and Retail Trade (5)	2,568	63.20	8.31	22.36
Services (7)	2,306	55.98	7.63	16.33
Health Services (8)	720	63.75	9.32	13.09
Other (9)	56	78.57	8.79	49.16
CEO-Chair Status	Observations	CEO Tenure	Firm Age	
Combined CEO/Chair	11,618	9.86	26.26	
Separate	6,405	4.66	20.50	

Table 2. Summary Statistics

This table presents summary statistics for 18,023 firm years, 2,092 firms, and 3,972 CEO-firm pairs over 1995 - 2010. The sample excludes financial firms (SIC 6000 – 6799) and regulated utility firms (SIC 4910-4949). Industry adjustments are based on a firm's 3-digit historical SIC code. We classify an industry as homogeneous if its homogeneity measure (Parrino, 1997) is above the sample median. We use the sample percentile rank of a firm's foreign tax to total tax as a proxy for the extent of foreign operations. Leverage is the book value of total debt divided by the book value of total assets. All variables are winsorized at the 1% and 99% levels.

	Mean	Median	Minimum	Maximum	Standard Deviation
Combined CEO/Chair (0/1)	0.645	1	0	1	0.479
Passing the Baton Strategy (0/1)	0.440	0	0	1	0.496
Annual Ind.-adjusted Stock Return	0.082	0.003	-0.772	1.877	0.436
Annual Stock Return	0.173	0.103	-0.761	2.357	0.524
Annual Ind.-adjusted ROA	0.006	0.007	-0.359	0.193	0.081
Annual ROA	0.048	0.055	-0.357	0.248	0.088
Assets (\$ millions)	5,363.1	1,210.5	84.7	151,193	14,922.9
Sales (\$ millions)	4,617.6	1,222.3	57.5	67.8	10,064.2
Firm Age	24.197	18	3	81	18.744
Homogeneous Industry (0/1)	0.438	0	0	1	0.496
Board Size	9.091	9	5	17	2.412
Percentage Insider Directors	0.220	0.182	0.067	0.600	0.123
Coopted Board (0/1)	0.285	0	0	1	0.451
% Foreign Tax (Percentile Rank)	63.237	58.913	43.799	100	18.988
Number of Business Segments	2.669	2	1	8	1.833
Capital Expenditures/Sales	0.076	0.041	0	0.733955	0.115
R&D Expense/Sales	0.043	0.004	0	0.402431	0.078
Leverage Ratio	0.213	0.201	0	0.751625	0.174
CEO Ownership (%)	2.443	0.334	0	33.63	5.773
CEO Tenure	7.960	5	0	37	7.868
CEO Age	55.468	55	39	76	7.344
Insider CEO (0/1)	0.830	1	0	1	0.375

Table 3. Comparison of Firm Characteristics by History of Combining the CEO and Chair Roles

This table presents firm, industry, and CEO characteristics for 15,029 firm years, 1,789 firms, and 3,214 CEO-firm pairs over 1995 - 2010. We segregate the sample by the firm's history of combining the roles of CEO and board chair over our sample period or allowing the CEO to receive both roles after a period of observation. We omit 303 firms comprised of 2,994 firm years and 758 CEO-firm pairs that sometimes combine both roles and sometimes separate both roles, but do not award both roles after a period of observation. Industry adjustments are based on a firm's 3-digit historical SIC code. The sample excludes financial firms (SIC 6000 – 6799) and regulated utility firms (SIC 4910-4949). We classify an industry as homogeneous if its homogeneity measure (Parrino, 1997) is above the sample median. We use the sample percentile rank of a firm's foreign tax to total tax as a proxy for the extent of foreign operations. Leverage is the book value of total debt divided by the book value of total assets. All variables are winsorized at the 1% and 99% levels.

	(1)	(2)	(3)	<u>t-statistics for Differences</u>		
	Roles Always Combined	CEO Earns Both Roles	Roles Always Separate	(1) – (2)	(1) – (3)	(2) – (3)
Combined CEO/Chair (0/1)	1	0.599	0	72.90***	NA	NA
Tobin's Q	1.959	2.011	2.12	2.36**	4.46***	3.11***
Annual Ind.-adjusted Stock Return	0.072	0.079	0.094	0.96	1.82*	1.28
Annual Stock Return	0.170	0.167	0.181	0.35	0.77	1.02
Annual Ind.-adjusted ROA	0.010	0.007	0.001	1.89*	3.70***	2.69***
Annual ROA	0.052	0.049	0.042	2.16**	3.99***	2.82***
Assets (\$ millions)	7,243.0	5,379.3	2,720.4	6.12***	12.58***	9.26***
Sales (\$ millions)	5,7636.5	4,907.0	2,323.9	4.38***	14.49***	12.27***
Firm Age	27.098	26.131	16.066	2.61***	28.13***	31.04***
Homogeneous Industry (0/1)	0.476	0.396	0.491	9.01***	1.10	7.44***
Board Size	9.134	9.275	8.481	3.21***	10.88***	14.22***
Percentage Insider Directors	0.215	0.216	0.227	0.07	3.69***	3.81***
Coopted Board (0/1)	0.371	0.247	0.267	14.91***	8.59***	1.70*
% Foreign Tax (Percentile Rank)	63.268	63.637	60.152	1.09	6.27***	7.43***
Number of Business Segments	2.811	2.641	2.508	5.10***	6.34***	2.97***
Capital Expenditures/Sales	0.079	0.072	0.086	3.47***	2.08***	4.41***
R&D Expense/Sales	0.032	0.044	0.057	10.39***	10.50***	5.24***
Leverage Ratio	0.225	0.212	0.188	4.26***	7.78***	5.33***
CEO Ownership (%)	3.954	1.838	1.151	18.05***	23.38***	8.32***
CEO Tenure	10.662	6.709	5.602	27.51***	30.20***	7.86***
CEO Age	56.887	55.341	52.430	12.21***	24.26***	16.83***
Observations	5,194	7,929	1,906			

Table 4. Multinomial Logistic Analysis of Combining CEO and Board Chair Roles after a Probationary Period

This table presents coefficient estimates from a multinomial logistic model of the propensity to combine the functions of the CEO and board chair for a sample of 15,029 firm years, 1,789 firms, and 3,214 CEO-firm pairs over 1995 - 2010.. The dependent variable is 0 if a firm always separates the roles of CEO and board chair, 1 if a firm follows a practice of awarding CEOs both titles after a period of serving as only CEO, and 2 if the firm always combines the two roles. We omit 303 firms comprised of 2,994 firm years and 758 CEO-firm pairs that sometimes combine both roles and sometimes separate both roles, but do not award both roles after a period of observation. Variables are defined in the Appendix and are winsorized at the 1% and 99% levels. *p*-values for significance, in parentheses, are based on robust standard errors clustered by CEO-firm pair. \*\*\*, \*\*, and \* indicate significance at the 0.01, 0.05, and 0.10 levels, respectively.

	<u>Base Case: Always Separate</u>				<u>Base Case: Always Combined</u>			
	Passing the Baton	Always Combined	Passing the Baton	Always Combined	Passing the Baton	Always Separate	Passing the Baton	Always Separate
Tobin's Q	0.018 (0.65)	0.039 (0.37)	-0.006 (0.88)	0.006 (0.89)	-0.022 (0.54)	-0.039 (0.37)	-0.012 (0.74)	-0.006 (0.89)
Ln(Assets)	0.352*** (0.00)	0.474*** (0.00)	0.399*** (0.00)	0.533*** (0.00)	-0.123*** (0.00)	-0.474*** (0.00)	-0.134*** (0.00)	-0.533*** (0.00)
Ln(Firm Age)	0.595*** (0.00)	0.468*** (0.00)	0.626*** (0.00)	0.492*** (0.00)	0.127* (0.10)	-0.468*** (0.00)	0.134* (0.09)	-0.492*** (0.00)
Homogeneous Industry (0/1)	-0.397*** (0.00)	-0.212 (0.13)	-0.190 (0.30)	0.068 (0.73)	-0.185* (0.08)	0.212 (0.13)	-0.258** (0.05)	-0.068 (0.73)
Ln(board Size)	-0.155 (0.58)	-0.632** (0.04)	-0.282 (0.34)	-0.932*** (0.00)	0.477** (0.03)	0.632** (0.04)	0.650*** (0.00)	0.932*** (0.00)
Inside Directors (%)	0.028 (0.95)	-1.007* (0.06)	-0.989* (0.06)	-2.277*** (0.00)	1.035*** (0.01)	1.007* (0.06)	1.288*** (0.00)	2.277*** (0.00)
Coopted Board (0/1)	-0.322*** (0.00)	-0.267** (0.02)	-0.091 (0.47)	0.171 (0.22)	-0.054 (0.47)	0.267** (0.02)	-0.261*** (0.01)	-0.171 (0.22)
% Foreign Tax (Percentile Rank)	0.005* (0.08)	0.008** (0.02)	0.006* (0.09)	0.009** (0.02)	-0.003 (0.25)	-0.008** (0.02)	-0.003 (0.23)	-0.009** (0.02)
Number of Business. Segments	-0.152*** (0.00)	-0.108*** (0.01)	-0.190*** (0.00)	-0.141*** (0.00)	-0.044* (0.08)	0.108*** (0.01)	-0.048* (0.08)	0.141*** (0.00)
Capital Expenditures/Sales	-0.669 (0.18)	-0.746 (0.14)	-1.197** (0.05)	-1.082* (0.09)	0.076 (0.86)	0.746 (0.14)	-0.115 (0.82)	1.082* (0.09)

*Continued*



Table 4. Continued

	<u>Base Case: Always Separate</u>				<u>Base Case: Always Combined</u>			
	Passing the Baton	Always Combined	Passing the Baton	Always Combined	Passing the Baton	Always Separate	Passing the Baton	Always Separate
R&D Expense/Sales	-0.601 (0.45)	-3.006*** (0.00)	-1.027 (0.22)	-3.439*** (0.00)	2.405*** (0.00)	3.006*** (0.00)	2.412*** (0.00)	3.439*** (0.00)
Leverage Ratio	-0.115 (0.76)	0.319 (0.43)	-0.337 (0.34)	-0.075 (0.85)	-0.434 (0.11)	-0.319 (0.43)	-0.263 (0.35)	0.075 (0.85)
CEO Ownership (%)	0.095*** (0.00)	0.132*** (0.00)	0.098*** (0.00)	0.136*** (0.00)	-0.037*** (0.00)	-0.132*** (0.00)	-0.038*** (0.00)	-0.136*** (0.00)
Ln(CEO Tenure)	0.027 (0.72)	0.602*** (0.00)	0.027 (0.72)	0.561*** (0.00)	-0.575*** (0.00)	-0.602*** (0.00)	-0.533*** (0.00)	-0.561*** (0.00)
Ln(CEO Age)	2.134*** (0.00)	2.197*** (0.00)	1.905*** (0.00)	1.877*** (0.00)	-0.062 (0.88)	-2.197*** (0.00)	0.028 (0.95)	-1.877*** (0.00)
Constant	-10.672*** (0.00)	-12.253*** (0.00)	-11.262*** (0.00)	-10.161*** (0.00)	1.581 (0.33)	12.253*** (0.00)	-1.101 (0.54)	10.161*** (0.00)
Year Dummies (0/1)	No	No	Yes	Yes	No	No	Yes	Yes
Industry Dummies (0/1)	No	No	Yes	Yes	No	No	Yes	Yes
Pseudo R <sup>2</sup>	0.0925		0.1107		0.0925		0.1107	

Table 5. Hazard Model for Propensity to Combine the CEO and Board Chair Functions for Firms That Follow a Passing the Baton Strategy

This table presents estimates of hazard ratios from a Cox proportional hazard model of the propensity to combine the CEO and board chair functions for 1,646 CEO-firm pairs, 688 firms, and 7,929 firm years over 1995-2010. Firms that always separate or always combine the CEO-Chair roles during the sample period are excluded. The dependent variable equals 1 if the CEO receives both titles after a period of observation and zero if not. Variables are defined in the Appendix and are winsorized at the 1% and 99% levels. *p*-values, in parentheses, are based on robust standard errors clustered at the CEO-firm pair level. \*\*\*, \*\*, and \* indicate significance at the 0.01, 0.05, and 0.10 levels, respectively.

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
Industry-adjusted Stock Return <sub>1</sub> ( $\beta_1$ )	1.106** (0.04)		1.132*** (0.01)				1.126** (0.02)
Industry-adjusted Stock Return <sub>2</sub> ( $\beta_2$ )	1.184*** (0.00)		1.223*** (0.00)				1.167*** (0.00)
Industry Median Stock Return <sub>1</sub> ( $\beta_3$ )		1.385*** (0.00)	1.412*** (0.00)				1.467*** (0.00)
Industry Median Stock Return <sub>2</sub> ( $\beta_4$ )		2.517*** (0.00)	2.571*** (0.00)				2.708*** (0.00)
Industry-adjusted ROA <sub>1</sub> ( $\beta_5$ )				3.021*** (0.00)		0.573 (0.62)	0.564 (0.61)
Industry-adjusted ROA <sub>2</sub> ( $\beta_6$ )				1.765** (0.04)		9.565** (0.03)	7.641* (0.05)
Industry Median ROA <sub>1</sub> ( $\beta_7$ )					12.115*** (0.01)	2.690 (0.50)	0.066* (0.07)
Industry Median ROA <sub>2</sub> ( $\beta_8$ )					1.376* (0.09)	6.315 (0.10)	4.037 (0.22)
Ln(Assets)	0.980 (0.52)	0.982 (0.57)	0.982 (0.57)	0.963 (0.25)	0.983 (0.59)	0.965 (0.28)	0.966 (0.29)
Ln(Firm Age)	0.882* (0.07)	0.886* (0.08)	0.901 (0.13)	0.877* (0.06)	0.869** (0.04)	0.874* (0.05)	0.906 (0.15)
Homogeneous Industry (0/1)	0.924 (0.34)	0.912 (0.26)	0.917 (0.29)	0.939 (0.45)	0.922 (0.33)	0.944 (0.48)	0.932 (0.39)
Ln(board Size)	1.488** (0.03)	1.429** (0.04)	1.431** (0.04)	1.474** (0.03)	1.458** (0.04)	1.446** (0.04)	1.429** (0.04)
Inside Directors (%)	5.136*** (0.00)	5.225*** (0.00)	4.932*** (0.00)	5.287*** (0.00)	5.508*** (0.00)	5.373*** (0.00)	4.818*** (0.00)

*Continued*

Table 5. Continued

Coopted Board (0/1)	0.707*** (0.00)	0.676*** (0.00)	0.673*** (0.00)	0.707*** (0.00)	0.699*** (0.00)	0.696*** (0.00)	0.675*** (0.00)
% Foreign Tax (Percentile Rank)	0.998 (0.32)	0.999 (0.67)	0.999 (0.68)	0.999 (0.53)	0.998 (0.40)	0.999 (0.65)	1.000 (0.87)
Number of Business. Segments	1.045** (0.03)	1.035* (0.10)	1.033 (0.12)	1.048** (0.02)	1.045** (0.03)	1.046** (0.03)	1.035* (0.10)
Capital Expenditures/Sales	1.855** (0.01)	1.618** (0.04)	1.533* (0.07)	1.969*** (0.00)	1.950*** (0.00)	1.984*** (0.00)	1.541* (0.06)
R&D Expense/Sales	1.106 (0.83)	1.390 (0.46)	1.363 (0.49)	1.199 (0.72)	1.451 (0.41)	1.555 (0.37)	1.333 (0.55)
Leverage Ratio	1.963*** (0.00)	1.898*** (0.00)	2.035*** (0.00)	2.146*** (0.00)	1.919*** (0.00)	2.224*** (0.00)	2.274*** (0.00)
Outsider CEO (0/1)	0.733*** (0.01)	0.739*** (0.01)	0.743*** (0.01)	0.745*** (0.01)	0.737*** (0.01)	0.752** (0.01)	0.750** (0.01)
CEO Ownership (%)	0.992 (0.36)	0.992 (0.33)	0.992 (0.38)	0.992 (0.39)	0.991 (0.27)	0.992 (0.33)	0.994 (0.46)
Residual Ln(CEO Tenure)	1.693*** (0.00)	1.739*** (0.00)	1.730*** (0.00)	1.679*** (0.00)	1.718*** (0.00)	1.698*** (0.00)	1.709*** (0.00)
Ln(CEO(Age))	0.996 (0.99)	0.949 (0.88)	0.971 (0.93)	0.975 (0.94)	0.972 (0.93)	0.963 (0.91)	0.961 (0.91)
$\psi^2$ for $\beta_1 = \beta_3$			9.75 ***				14.43***
$\psi^2$ for $\beta_2 = \beta_4$			83.24***				95.54***
$\psi^2$ for $\beta_5 = \beta_7$						2.43	3.90*
$\psi^2$ for $\beta_6 = \beta_8$						1.88	3.95**
Pseudo R <sup>2</sup>	0.0126	0.0162	0.0168	0.0130	0.0127	0.0135	0.0174

Table 6. Investor Reactions to the Announcement that a CEO Will Become Chair of the Board

This table presents event study results around the announcement that a CEO will be awarded the additional title of board chair. We use the event study method of Patell (1976) based on the market model and the value-weighted CRSP index. The sample excludes financial firms (SIC 6000 – 6799) and regulated utility firms (SIC 4910-4949,

	Obs.	CAR (t-1-t+1)	Patell Z-score	Sign Rank Test
All Announcements	213	0.35%	0.96	0.47
Receive Tenure < 4 Years	119	1.09%	2.71***	2.27**
Receive Tenure ≥ 4 Years	94	-0.59%	-1.60	-1.27
Non-coopted Boards	152	-0.15%	-0.06	0.17
Coopted Boards	61	1.58%	1.89*	0.61
Before Sarbanes-Oxley Act	139	0.09%	0.18	-0.10
After Sarbanes-Oxley Act	74	0.82%	1.24	0.94
CEO is Insider	187	0.39%	1.30	0.86
CEO is Outsider	26	0.00%	-0.75	-0.95

Table 7. Comparison of Firm Characteristics after Propensity Score Matching

Panel A presents a comparison of the value of these matching variables in the year that the CEO receives the title of board chair

	Mean		Paired t-test	Median		Paired Sign Test
	PTB	Matched	p-value	PTB	Median	p-value
<i>Panel A. Firms Matched by Stock Return Decile and Propensity Score</i>						
Stock Return (%)	19.71	2.09	0.70	11.64	11.86	0.90
Tobin's Q	2.07	2.15	0.27	1.62	1.57	0.46
Ln(Assets)	7.27	7.28	0.89	7.07	7.05	0.65
Ln(Firm Age)	2.96	2.98	0.62	3.00	3.00	0.48
Homogeneous Industry (0/1)	0.40	0.44	0.12	0.00	0.00	0.13
Ln(Board Size)	2.21	2.21	0.81	2.20	2.20	0.86
Percent Inside Directors (%)	23.90	23.75	0.82	21.83	21.43	0.77
Coopted Board (0/1)	0.16	0.19	0.09	0.00	0.00	0.11
% Foreign Tax (Percentile Rank)	62.75	63.20	0.69	58.72	58.18	1.00
Number of Business Segments	2.60	2.64	0.74	2.00	2.00	0.22
Capital Expenditures/Sales	0.08	0.08	0.35	0.04	0.40	0.83
R&D Expense/Sales	0.04	0.04	0.71	0.00	0.00	1.00
Leverage Ratio	0.22	0.23	0.50	0.22	0.22	0.87
CEO Ownership (%)	1.38	1.50	0.52	0.21	0.17	0.39
Ln(CEO Tenure)	1.29	1.30	0.70	1.39	1.10	1.00
Ln(CEO Age)	3.97	3.96	0.26	3.98	3.97	0.80
<i>Panel B. Firms Matched by Return on Asset Decile and Propensity Score</i>						
Return on Assets (%)	4.86	4.78	0.81	5.47	5.38	0.60
Tobin's Q	2.07	2.07	0.98	1.62	1.58	0.60
Ln(Assets)	7.27	7.36	0.28	7.07	7.22	0.44
Ln(Firm Age)	2.96	3.02	0.13	3.00	3.18	0.21
Homogeneous Industry (0/1)	0.40	0.43	0.34	0.00	0.00	0.37
Ln(Board Size)	2.21	2.21	0.64	2.20	2.20	0.40
Percent Inside Directors (%)	23.90	24.38	0.49	21.83	22.22	0.90
Coopted Board (0/1)	0.16	0.17	0.32	0.00	0.00	0.37
% Foreign Tax (Percentile Rank)	62.75	62.25	0.65	58.72	55.02	0.69
Number of Business Segments	2.60	2.61	0.96	2.00	2.00	0.92
Capital Expenditures/Sales	0.08	0.68	0.12	0.04	0.04	0.71
R&D Expense/Sales	0.04	0.04	0.13	0.00	0.00	0.71
Leverage Ratio	0.22	0.22	0.81	0.22	0.21	0.18
CEO Ownership (%)	1.38	1.42	0.85	0.21	0.18	0.03
Ln(CEO Tenure)	1.29	1.29	0.79	1.39	1.10	0.55
Ln(CEO Age)	3.97	3.98	0.21	3.98	4.00	0.23

Table 8. Firm Performance and Policies Before and After Receiving Both CEO and Chair Positions

This table presents mean (median) firm stock and accounting performance before and after awarding the CEO the position of board chair. Variables are defined in The Appendix and are winsorized at the 1% and 99% levels. \*\*\*, \*\*, and \* indicate significance at the 0.01, 0.05, and 0.10 levels, respectively.

*Panel A. Comparison of Firm Performance*

	Obs.	Before Combining CEO and Chair	After Combining CEO and Chair	p-value for difference	Entire Period
Stock Returns	4,169	20.03%***	14.66%***	0.00***	16.91%***
	4,169	(12.10%***)	(9.62%***)	0.04**	(10.35%***)
Match-adjusted Stock Returns	4,169	1.09%	0.49%	0.68	0.74%
	4,169	(0.20%)	(0.57%)	0.97	(0.42%)
Return on Assets	4,169	5.26%***	5.22%***	0.91	5.24%***
	4,169	(5.71%***)	(5.69%***)	0.79	(5.70%***)
Match-adjusted Return on Assets	4,116	0.35 %	1.29%***	0.01**	0.89%***
	4,116	(0.07%)	(0.61%***)	0.00***	(0.23%***)

*Panel B. Comparison of Firm Policies*

	Obs.	Before Combining CEO and Chair	After Combining CEO and Chair	p-value for difference	Entire Period
CAPEX/Sales	4,169	0.082***	0.078***	0.32	0.079***
	4,169	(0.043)	(0.037)	0.00***	(0.040)
Match-adjusted CAPEX/Sales	4,036	0.003	0.009***	0.13	0.007***
	4,036	(0.000)	(0.001)**	0.00***	(0.001)**
R&D/Sales	4,169	0.045***	0.043***	0.66	0.044***
	4,169	(0.000)***	(0.004)***	0.01**	(0.003)***
Match-adjusted R&D/Sales	4,060	0.002	-0.001	0.06*	0.000
	4,060	(0.000)	(0.000)***	0.00**	(0.000)
Leverage	4,169	0.207***	0.226***	0.00***	0.218***
	4,169	(0.199)***	(0.218)***	0.00***	(0.211)***
Match-adjusted Leverage	4,031	-0.013***	0.010***	0.00***	0.000
	4,031	(0.000)*	(0.000)	0.00***	(0.000)
Business Segments	4,169	2.400***	2.820***	0.00***	2.644***
	4,169	(2.000)***	(3.000)***	0.00***	(2.000)***
Match-adjusted Business Segments	4,029	-0.076**	-0.147***	0.15	-0.117***
	4,029	(0.000)***	(0.000)**	0.00***	(0.000)***

*Panel C. Comparison of Firm Stock Risk*

	Obs.	Before Combining CEO and Chair	After Combining CEO and Chair	p-value for difference	Entire Period
Total Risk	4,133	0.461***	0.423***	0.00***	0.439***
	4,133	(0.408)***	(0.375)***	0.00***	(0.388)***
Match-adjusted Total Risk	3,989	0.009**	-0.010***	0.00***	-0.002
	3,989	(0.004)***	(-0.001)	0.00***	(0.002)
CAPM Market Risk	4,133	0.990***	1.070***	0.00***	1.036***
	4,133	(0.868)***	(1.011)***	0.00***	(0.959)***
Match-adjusted CAPM Market Risk	4,027	0.003	-0.009	0.46	0.000
	4,027	(-0.000)	(0.001)	0.00***	(-0.004)
Firm-specific Risk	4,133	0.417***	0.361***	0.00***	0.384***
	4,133	0.369***	0.322***	0.00***	0.339***
Match-adjusted Firm-specific Risk	3,992	0.004	-0.015	0.00***	-0.007
	3,992	0.003	-0.006	0.00***	-0.007

Table 9. Effects of Combining the CEO and Board Chair Functions

This table presents our analysis of performance and policy variables after combining the CEO and the chair positions. Following the method in Pagano, Panetta, and Zingales (1998), we estimate the following specification for each dependent variable:  $y_{it} = \sum_{t=1}^4 \beta_t \text{Combined}_t + \beta_4 \text{Combined}_{t>4} + u_i + d_t + \varepsilon_{it}$  where  $u_i$  and  $d_t$  are CEO-firm pair and year fixed effects, respectively.  $\text{Combined}_t$  is 1 if period  $t$  is after the CEO became board chair and zero otherwise. The sample comprises 600 CEO-firm pairs. Variables are defined in The Appendix and are winsorized at the 1% and 99% levels.  $p$ -values, in parentheses, are based on robust standard errors clustered by CEO-firm pair. \*\*\*, \*\*, and \* indicate significance at the 0.01, 0.05, and 0.10 levels, respectively.

	Obs.	Year 1	Year 2	Year 3	Year 4	Year > 4	F-Test
<i>Panel A. Performance Analysis</i>							
Stock Return	4,169	-0.020 (0.39)	-0.088*** (0.00)	-0.047* (0.07)	-0.105*** (0.00)	-0.120*** (0.00)	17.47*** (0.00)
Match-Adjusted Stock Return	4,169	0.001 (0.97)	-0.018 (0.55)	-0.039 (0.31)	-0.062 (0.13)	-0.009 (0.65)	1.27 (0.26)
ROA	4,169	0.004 (0.19)	0.000 (0.94)	0.03 (0.43)	-0.001 (0.91)	-0.011 (0.11)	0.01 (0.93)
Match-Adjusted ROA	4,116	0.012*** (0.01)	0.011* (0.06)	0.015** (0.02)	0.16** (0.04)	0.015* (0.06)	8.25*** (0.00)
<i>Panel B. Policy Analysis</i>							
Capex/Sales	4,169	-0.006*** (0.00)	-0.007*** (0.01)	-0.007** (0.03)	-0.008** (0.02)	-0.06 (0.11)	9.59*** (0.00)
Match-Adjusted CAPEX/Sales	4,077	-0.004 (0.25)	-0.003 (0.45)	0.003 (0.48)	0.008 (0.20)	0.011* (0.09)	0.87 (0.35)
R&D/Sales	4,169	-0.002 (0.13)	-0.003 (0.14)	-0.001 (0.61)	-0.002 (0.24)	0.000 (0.92)	0.95 (0.33)
Match-Adjusted R&D/Sales	4,060	-0.02 (0.16)	-0.02 (0.30)	-0.000 (0.99)	0.000 (0.96)	-0.001 (0.88)	0.27 (0.60)
Leverage Ratio	4,169	0.006 (0.12)	0.019*** (0.00)	0.014** (0.04)	0.012 (0.15)	0.015* (0.09)	6.14** (0.01)
Match-Adjusted Leverage Ratio	4,031	-0.01 (0.84)	0.008 (0.28)	0.003 (0.77)	-0.006 (0.59)	0.007 (0.56)	0.10 (0.76)
Business Segments	4,169	0.154*** (0.00)	0.189*** (0.00)	0.212*** (0.00)	0.273*** (0.00)	0.465*** (0.00)	25.98*** (0.00)
Match-Adjusted Business Segments	4,029	0.063 (0.29)	-0.031 (0.70)	-0.079 (0.40)	-0.010 (0.93)	-0.053 (0.65)	0.10 (0.75)

*Continued*

Table 9. Continued

	Obs.	Year 1	Year 2	Year 3	Year 4	Year > 4	F-Test
<i>Panel C. Firm Stock Risk Analysis</i>							
Total Risk	4,133	-0.011** (0.03)	-0.020*** (0.00)	-0.014* (0.06)	-0.015* (0.09)	-0.006 (0.59)	4.57** (0.03)
Match-adjusted Total Risk	3,989	-0.013** (0.03)	-0.027*** (0.00)	-0.022** (0.03)	--0.015 (0.16)	-0.013 (0.26)	7.10*** (0.01)
CAPM Market Risk	4,133	0.021 (0.19)	0.028 (0.20)	0.026 (0.29)	0.005 (0.88)	0.064* (0.08)	2.07 (0.15)
Match-adjusted CAPM Market Risk	4,027	0.016 (0.76)	0.012 (0.67)	0.003 (0.92)	-0.043 (0.26)	0.024 (0.53)	0.01 (0.91)
Firm-specific Risk	4,133	-0.019*** (0.00)	-0.030*** (0.00)	-0.029*** (0.00)	-0.034*** (0.00)	-0.034*** (0.00)	27.21*** (0.00)
Match-adjusted Firm-specific Risk	3,992	-0.013** (0.05)	-0.020** (0.01)	-0.024*** (0.01)	-0.017* (0.09)	-0.025** (0.02)	8.37*** (0.00)



Table 10. Comparison of Change in Performance CEO-Chair Combinations: Robustness Tests

This table presents robustness tests for performance variables after combining the CEO and the chair positions. Following the method in Pagano, Panetta, and Zingales (1998), we estimate the following specification for each dependent variable:  $y_{it} = \sum_{t=1}^4 \beta_t \text{Combined}_t + \beta_4 \text{Combined}_{t>4} + u_i + d_t + \varepsilon_{it}$  where  $u_i$  and  $d_t$  are CEO-firm pair and year fixed effects, respectively.  $\text{Combined}_t$  is 1 if period  $t$  is after the CEO became board chair and zero otherwise. The sample comprises 600 CEO-firm pairs and 4,169 (4,116) observations for stock return (ROA). Variables are defined in The Appendix and are winsorized at the 1% and 99% levels.  $p$ -values, in parentheses, are based on robust standard errors clustered by CEO-firm pair. \*\*\*, \*\*, and \* indicate significance at the 0.01, 0.05, and 0.10 levels, respectively.

	Year 1	Year 2	Year 3	Year 4	Year > 4	F-Test
<i>Panel A. Firm Performance by Homogeneous Industries (242 firms) and Heterogeneous Industries (358 firms)</i>						
Match-adjusted Stock Returns (Non-coopted)	-0.010 (0.77)	-0.004 (0.93)	-0.047 (0.28)	-0.029 (0.59)	-0.028 (0.59)	0.82 (0.37)
Match-adjusted Stock Returns (Coopted)	0.051 (0.38)	-0.055 (0.24)	-0.025 (0.69)	-0.096* (0.09)	-0.014 (0.75)	0.74 (0.39)
$p$ -value for Difference	0.35	0.38	0.77	0.35	0.80	0.89
Match-adjusted ROA (Non-coopted)	0.010** (0.05)	0.010 (0.15)	0.016** (0.02)	0.016 (0.13)	0.005 (0.67)	3.77* (0.05)
Match-adjusted ROA (Coopted)	0.021** (0.05)	0.013 (0.14)	0.012 (0.18)	0.018* (0.08)	0.019** (0.02)	7.66*** (0.01)
$p$ -value for Difference	0.33	0.77	0.70	0.89	0.17	0.41
<i>Panel B. Firm Performance by Non-Coopted (486 CEOs) and Coopted (114 CEOs) Boards at Combination</i>						
Match-adjusted Stock Returns (Homogeneous)	0.089 (0.07)	-0.031 (0.49)	-0.079 (0.19)	-0.114* (0.08)	-0.032 (0.56)	0.98 (0.32)
Match-adjusted Stock Returns (Heterogeneous)	-0.057 (0.14)	-0.010 (0.81)	-0.014 (0.77)	-0.032 (0.53)	-0.010 (0.83)	0.67 (0.41)
$p$ -value for Difference	0.02**	0.72	0.38	0.30	0.72	0.83
Match-adjusted ROA (Homogeneous)	0.012* (0.09)	0.016** (0.04)	0.017* (0.06)	0.016* (0.24)	0.007 (0.49)	4.50** (0.03)
Match-adjusted ROA (Heterogeneous)	0.012** (0.04)	0.007 (0.36)	0.013 (0.11)	0.017* (0.07)	0.020** (0.04)	4.89** (0.03)
$p$ -value for Difference	0.92	0.43	0.76	0.93	0.34	1.00
<i>Panel C. Firm Performance for CEO Ownership Below Median (300 CEOs) and Above Median (300 CEOs)</i>						
Match-adjusted Stock Returns (Below Median)	-0.018 (0.71)	-0.022 (0.59)	-0.054 (0.31)	-0.074 (0.18)	-0.041 (0.38)	0.44 (0.51)
Match-adjusted Stock Returns (Above Median)	0.018 (0.65)	-0.017 (0.71)	-0.025 (0.63)	-0.052 (0.37)	0.002 (0.96)	1.95 (0.16)
$p$ -value for Difference	0.56	0.94	0.69	0.77	0.46	0.66
Match-adjusted ROA (Below Median)	0.009 (0.20)	0.014 (0.11)	0.013 (0.14)	0.013 (0.23)	0.023** (0.04)	4.65** (0.03)
Match-adjusted ROA (BAbove Median)	0.015** (0.01)	0.008 (0.31)	0.016* (0.05)	0.021* (0.06)	0.008 (0.39)	4.64*** (0.03)
$p$ -value for Difference	0.52	0.58	0.77	0.57	0.27	0.94

*continued*

Table 10. Continued

	Year 1	Year 2	Year 3	Year 4	Year > 4	F-Test
<i>Panel D. Firm Performance for R&amp;D/Sales Below Median (300 CEOs) and Above Median (300 CEOs)</i>						
Match-adjusted Stock Returns (Below Median)	0.070*	0.002	-0.042	-0.055	0.000	0.02
	(0.08)	(0.96)	(0.41)	(0.37)	(0.99)	(0.88)
Match-adjusted Stock Returns (Above Median)	-0.069	-0.040	-0.035	-0.072	-0.038	2.68
	(0.14)	(0.37)	(0.50)	(0.16)	(0.43)	(0.11)
<i>p</i> -value for Difference	0.02**	0.48	0.92	0.82	0.52	0.26
Match-adjusted ROA (Above Median)	0.010	0.016**	0.020**	0.018*	0.014	7.33***
	(0.11)	(0.03)	(0.02)	(0.07)	(0.15)	(0.01)
Match-adjusted ROA (Below Median)	0.015**	0.006	0.010	0.016	0.017	3.09*
	(0.03)	(0.48)	(0.28)	(0.18)	(0.12)	(0.08)
<i>p</i> -value for Difference	0.57	0.40	0.39	0.89	0.84	0.74
<i>Panel E. Firm Performance for Early (&lt;4 years, 298 CEOs) and Late (≥ 4 years, 302 CEOs) Combinations</i>						
Match-adjusted Stock Returns (Early)	0.042	-0.047	-0.028	-0.043	-0.043	1.20
	(0.35)	(0.27)	(0.55)	(0.39)	(0.36)	(0.42)
Match-adjusted Stock Returns (Late)	-0.037	0.014	-0.49	-0.085	0.011	0.61
	(0.37)	(0.75)	(0.40)	(0.18)	(0.83)	(0.38)
<i>p</i> -value for Difference	0.20	0.31	0.77	0.59	0.36	0.89
Match-adjusted ROA (Early)	0.015**	0.019**	0.015**	0.009	0.188**	6.08***
	(0.03)	(0.02)	(0.07)	(0.39)	(0.05)	(0.01)
Match-adjusted ROA (Late)	0.09	0.003	0.015*	0.027**	0.011	3.90**
	(0.12)	(0.75)	(0.09)	(0.02)	(0.31)	(0.05)
<i>p</i> -value for Difference	0.52	0.16	0.97	0.19	0.51	0.77
<i>Panel F. Firm Performance for Insider CEOs (509 CEOs) and Outsider CEOs (101 CEOs)</i>						
Match-adjusted Stock Returns (Insider)	0.028	-0.019	-0.012	-0.054	-0.025	0.42
	(0.39)	(0.57)	(0.78)	(0.22)	(0.54)	(0.51)
Match-adjusted Stock Returns (Outsider)	-0.138	-0.010	-0.175	-0.098*	0.055	1.59
	(0.11)	(0.90)	(0.30)	(0.07)	(0.33)	(0.21)
<i>p</i> -value for Difference	0.07*	0.92	0.12	0.68	0.33	0.34
Match-adjusted ROA (Insider)	0.014***	0.014**	0.019***	0.024***	0.015*	11.19***
	(0.01)	(0.02)	(0.00)	(0.00)	(0.08)	(0.00)
Match-adjusted ROA (Outsider)	0.002	-0.010	-0.009	-0.031*	0.017	0.43
	(0.87)	(0.50)	(0.56)	(0.08)	(0.21)	(0.51)
<i>p</i> -value for Difference	0.33	0.14	0.10*	0.00***	0.88	0.03**
<i>Panel G. Firm Performance for Combinations Before (398 CEOs) and After (212 CEOs) Sarbanes Oxley</i>						
Match-adjusted Stock Returns (Before SOX)	-0.016	-0.024	-0.057	-0.062	-0.039	0.45
	(0.71)	(0.56)	(0.20)	(0.21)	(0.39)	(0.50)
Match-adjusted Stock Returns (After SOX)	0.027	-0.021	-0.008	-0.091	0.074	1.65
	(0.50)	(0.71)	(0.91)	(0.22)	(0.38)	(0.20)
<i>p</i> -value for Difference	0.48	0.98	0.60	0.74	0.23	0.92
Match-adjusted ROA (Before SOX)	0.015**	0.016**	0.018**	0.021**	0.019**	8.62***
	(0.01)	(0.03)	(0.03)	(0.02)	(0.04)	(0.00)
Match-adjusted ROA (After SOX)	0.008	0.002	0.009	0.007	-0.001	0.24
	(0.30)	(0.88)	(0.40)	(0.71)	(0.95)	(0.63)
<i>p</i> -value for Difference	0.52	0.29	0.52	0.47	0.40	0.30

Table 11. Influence of Policy Changes on Firm Performance Following Combination of CEO and Chair Positions

This table present our analysis of the influence of policy changes on firm performance after combining the CEO and the chair positions. Following the method in Pagano, Panetta, and Zingales (1998), we estimate the following specification for each dependent variable:  $y_{it} = \sum_{t=1}^4 \beta_t \text{Combined}_t + \beta_4 \text{Combined}_{t>4} + u_i + d_t + \varepsilon_{it}$  where  $u_i$  and  $d_t$  are CEO-firm pair and year fixed effects, respectively.  $\text{Combined}_t$  is 1 if period  $t$  is after the CEO became board chair and zero otherwise. The sample comprises 600 CEO-firm pairs. Variables are defined in The Appendix and are winsorized at the 1% and 99% levels.  $p$ -values, in parentheses, are based on robust standard errors clustered at the CEO-firm pair level. \*\*\*, \*\*, and \* indicate significance at the 0.01, 0.05, and 0.10 levels, respectively.

	Match-Adjusted Stock Return	Match-Adjusted Stock Return	Match-Adjusted Return on Assets	Match-Adjusted Return on Assets
Year 1	-0.020 (0.71)		0.008 (0.40)	
Year2	-0.039 (0.49)		0.009 (0.38)	
Year3	-0.058 (0.32)		0.012 (0.23)	
Year4	-0.087 (0.16)		0.013 (0.23)	
> Year5	-0.038 (0.53)		0.016 (0.16)	
Capital Expenditures/Sales	-1.461*** (0.00)	-1.435*** (0.00)	-0.052 (0.21)	-0.058 (0.17)
R&D/Sales	-1.088** (0.02)	-1.043** (0.02)	-0.706*** (0.00)	-0.715*** (0.00)
Leverage	-0.319** (0.02)	-0.294** (0.03)	-0.181*** (0.00)	-0.188*** (0.00)
Number of Business Segments	0.011 (0.45)	0.014 (0.32)	-0.003 (0.17)	-0.004 (0.10)
CAPEX/Sales*Combined	0.101 (0.60)	0.069 (0.70)	0.039 (0.17)	0.048* (0.08)
R&D/Sales*Combined	-0.227 (0.42)	-0.307 (0.24)	0.081 (0.26)	0.101 (0.12)
Leverage*Combined	0.097 (0.47)	0.054 (0.64)	-0.011 (0.66)	0.001 (0.97)
No. Bus. Segments*Combined	-0.004 (0.76)	-0.009 (0.38)	0.000 (1.00)	0.001 (0.41)
Constant	0.158** (0.02)	0.132** (0.02)	0.077*** (0.00)	0.084*** (0.00)
Firm and Year Fixed Effects	Yes	Yes	Yes	Yes
Observations	4,169	4,169	4,116	4,116
R <sup>2</sup>	0.023	0.022	0.084	0.083

Table 12. Comparison of Change in Compensation for CEO-Chair Combinations

This table present our analysis of CEO compensation after combining the COE and the chair positions. Following the method in Pagano, Panetta, and Zingales (1998), we estimate the following specification for each dependent variable:  $y_{it} = \sum_{t=1}^4 \beta_t \text{Combined}_t + \beta_4 \text{Combined}_{t>4} + u_i + d_t + \varepsilon_{it}$  where  $u_i$  and  $d_t$  are CEO-firm pair and year fixed effects, respectively.  $\text{Combined}_t$  is 1 if period  $t$  is after the CEO became board chair and zero otherwise. The sample comprises 600 CEO-firm pairs. Variables are defined in The Appendix and are winsorized at the 1% and 99% levels.  $p$ -values, in parentheses, are based on robust standard errors clustered at the CEO-firm pair level. \*\*\*, \*\*, and \* indicate significance at the 0.01, 0.05, and 0.10 levels, respectively.

	Obs.	Year 1	Year 2	Year 3	Year 4	Year > 4	F-Test
<i>Panel A. Analysis of Ln(Total Compensation)</i>							
Total Compensation	4,169	0.178*** (0.00)	0.224*** (0.00)	0.224*** (0.00)	0.324*** (0.00)	0.337*** (0.00)	62.46*** (0.00)
Match-Adjusted Total Comp.	4,068	0.020 (0.62)	-0.018 (0.72)	-0.013 (0.82)	0.041 (0.49)	0.011 (0.88)	0.04 (0.84)
<i>Panel B. Analysis of Ln(Compensation Delta)</i>							
Compensation Delta	4,169	0.180*** (0.00)	0.153** (0.02)	0.184*** (0.01)	0.285*** (0.00)	0.211** (0.03)	12.29*** (0.00)
Match-Adjusted Compensation Delta	4,082	0.702*** (0.00)	-0.239 (0.29)	0.376 (0.21)	0.509 (0.15)	0.208 (0.53)	0.24 (0.62)
<i>Panel C. Analysis of Ln(Total Portfolio Delta)</i>							
Portfolio Delta	4,169	0.336*** (0.00)	0.424*** (0.00)	0.539*** (0.00)	0.557*** (0.00)	0.668*** (0.03)	156.27 (0.00)
Match-Adjusted Portfolio Delta	4,082	0.208*** (0.09)	0.347*** (0.58)	0.510*** (0.95)	0.610*** (0.24)	0.667*** (0.68)	18.76*** (0.00)
<i>Panel D. Analysis of Ln(Compensation Vega)</i>							
Compensation Vega	4,169	0.312*** (0.00)	0.434*** (0.00)	0.481*** (0.00)	0.659*** (0.00)	0.708*** (0.00)	111.79*** (0.00)
Match-Adjusted Compensation Vega	4,082	0.026 (0.76)	0.011 (0.92)	0.000 (0.99)	0.253* (0.10)	-0.006 (0.97)	0.35 (0.55)
<i>Panel E. Analysis of Ln(Portfolio Vega)</i>							
Portfolio Vega	4,169	0.180*** (0.00)	0.153** (0.02)	0.184*** (0.01)	0.285*** (0.00)	0.211** (0.03)	12.29*** (0.00)
Match-Adjusted Portfolio Vega	4,036	0.210*** (0.00)	0.314*** (0.00)	0.402*** (0.01)	0.389*** (0.00)	0.565** (0.02)	16.97*** (0.00)

Table 13. Comparison of Matched-firm Compensation Results for Early and Late CEO-Chair Combinations

This table presents our analysis of CEO compensation for early and late CEO-chair combinations. Following the method in Pagano, Panetta, and Zingales (1998), we estimate the following specification for each dependent variable:  $y_{it} = \sum_{t=1}^4 \beta_t \text{Combined}_t + \beta_4 \text{Combined}_{t>4} + u_i + d_t + \varepsilon_{it}$  where  $u_i$  and  $d_t$  are CEO-firm pair and year fixed effects, respectively.  $\text{Combined}_t$  is 1 if period  $t$  is after the CEO became board chair and zero otherwise. The sample comprises 600 CEO-firm pairs. Variables are defined in The Appendix and are winsorized at the 1% and 99% levels.  $p$ -values, in parentheses, are based on robust standard errors clustered at the CEO-firm pair level. \*\*\*, \*\*, and \* indicate significance at the 0.01, 0.05, and 0.10 levels, respectively.

	Obs.	Year 1	Year 2	Year 3	Year 4	Year > 4	F-Test
<i>Panel A. Analysis of Match-adjusted Ln(Total Compensation)</i>							
Early Combination (298 CEOs)	1,740	0.065 (0.26)	0.052 (0.42)	0.119* (0.08)	0.222*** (0.00)	0.156** (0.01)	8.42*** (0.00)
Late Combination (302 CEOs)	2,328	0.036 (0.50)	-0.002 (0.98)	-0.044 (0.53)	-0.002 (0.98)	0.059 (0.37)	0.05 (0.82)
<i>p</i> -value for Difference		0.70	0.53	0.08*	0.03**	0.21	0.02**
<i>Panel B. Analysis of Match-adjusted Ln(Compensation Delta)</i>							
Early Combination (298 CEOs)	1,743	0.107 (0.35)	0.019 (0.88)	0.129 (0.36)	0.313** (0.05)	0.016 (0.92)	1.39 (0.24)
Late Combination (302 CEOs)	2,339	0.190* (0.09)	-0.107 (0.42)	-0.114 (0.45)	-0.033 (0.85)	-0.131 (0.44)	0.15 (0.70)
<i>p</i> -value for Difference		0.60	0.48	0.22	0.12	0.48	0.22
<i>Panel C. Analysis of Match-adjusted Ln(Portfolio Delta)</i>							
Early Combination (298 CEOs)	1,760	0.185** (0.02)	0.388*** (0.00)	0.470*** (0.00)	0.543*** (0.00)	0.403** (0.02)	13.86*** (0.00)
Late Combination (296 CEOs)	2,322	0.241*** (0.01)	0.313*** (0.01)	0.359** (0.02)	0.312* (0.01)	0.330* (0.087)	7.60*** (0.01)
<i>p</i> -value for Difference		0.64	0.64	0.56	0.28	0.76	0.56
<i>Panel D. Analysis of Match-adjusted Ln(Compensation Vega)</i>							
Early Combination (298 CEOs)	1,760	-0.007 (0.96)	0.085 (0.59)	0.154 (0.39)	0.449** (0.04)	0.004 (0.98)	0.96 (0.33)
Late Combination (296 CEOs)	2,322	0.079 (0.49)	-0.050 (0.74)	-0.162 (0.39)	0.023 (0.91)	-0.015 (0.94)	0.04 (0.84)
<i>p</i> -value for Difference		0.63	0.53	0.21	0.13	0.94	0.36
<i>Panel E. Analysis of Match-adjusted Ln(Portfolio Vega)</i>							
Early Combination (298 CEOs)	1,713	0.234*** (0.00)	0.348*** (0.00)	0.587*** (0.01)	0.333** (0.01)	0.330* (0.07)	12.72*** (0.00)
Late Combination (302 CEOs)	2,323	0.198*** (0.01)	0.183* (0.06)	0.169* (0.06)	0.390 (0.15)	0.289** (0.02)	6.74*** (0.01)
<i>p</i> -value for Difference		0.75	0.22	0.46	0.78	0.87	0.63

Table 14. Comparison of Matched-firm Compensation Results for Coopted and Non-coopted Boards

This table presents our analysis of CEO compensation after combining the CEO and chair positions for firms with coopted boards and for firms with non-coopted boards. Following the method in Pagano, Panetta, and Zingales (1998), we estimate the following specification for each dependent variable:

$$y_{it} = \sum_{t=1}^4 \beta_t \text{Combined}_t + \beta_4 \text{Combined}_{t>4} + u_i + d_t + \varepsilon_{it}$$

where  $u_i$  and  $d_t$  are CEO-firm pair and year fixed effects, respectively.

$\text{Combined}_t$  is 1 if period  $t$  is after the CEO became board chair and zero otherwise. The sample comprises 600 CEO-firm pairs. Variables are defined in The Appendix and are winsorized at the 1% and 99% levels.  $p$ -values, in parentheses, are based on robust standard errors clustered at the CEO-firm pair level. \*\*\*, \*\*, and \* indicate significance at the 0.01, 0.05, and 0.10 levels, respectively.

	Obs.	Year 1	Year 2	Year 3	Year 4	Year > 4	F-Test
<i>Panel A. Analysis of Match-adjusted Ln(Total Compensation)</i>							
Non-coopted Board (506 CEOs)	3,261	0.00 (0.99)	-0.054 (0.31)	-0.036 (0.55)	0.041 (0.51)	0.026 (0.72)	0.01 (0.91)
Coopted Board (94 CEOs)	807	0.105 (0.27)	0.184 (0.15)	0.128 (0.32)	0.066 (0.63)	-0.038 (0.86)	0.71 (0.40)
<i>p</i> -value for Difference		0.32	0.08*	0.24	0.86	0.76	0.40
<i>Panel B. Analysis of Match-adjusted Ln(Compensation Delta)</i>							
Non-coopted Board (506 CEOs)	3,264	0.093 (0.29)	-0.041 (0.67)	-0.05 (0.66)	0.149 (0.26)	-0.020 (0.88)	0.10 (0.75)
Coopted Board (94 CEOs)	818	0.361 (0.08)	-0.123 (0.64)	0.362 (0.14)	0.187 (0.55)	-0.209 (0.49)	0.38 (0.54)
<i>p</i> -value for Difference		0.22	0.77	0.12	0.91	0.55	0.65
<i>Panel C. Analysis of Match-adjusted Ln(Portfolio Delta)</i>							
Non-coopted Board (503 CEOs)	3,283	0.132** (0.04)	0.293*** (0.00)	0.341*** (0.00)	0.374*** (0.00)	0.355** (0.02)	11.45*** (0.00)
Coopted Board (91 CEOs)	799	0.520*** (0.00)	0.567** (0.01)	0.792*** (0.00)	0.800** (0.00)	0.561** (0.05)	11.74*** (0.00)
<i>p</i> -value for Difference		0.03**	0.25	0.09*	0.14	0.50	0.08*
<i>Panel D. Analysis of Match-adjusted Ln(Compensation Vega)</i>							
Non-coopted Board (503 CEOs)	3,283	-0.002 (0.98)	0.018 (0.88)	0.086 (0.53)	0.272* (0.09)	0.029 (0.87)	0.64 (0.42)
Coopted Board (91 CEOs)	799	0.223 (0.27)	0.019 (0.95)	-0.466 (0.21)	0.210 (0.59)	-0.204 (0.57)	0.04 (0.85)
<i>p</i> -value for Difference		0.31	1.00	0.16	0.88	0.52	0.61
<i>Panel E. Analysis of Match-adjusted Ln(Portfolio Vega)</i>							
Non-coopted Board (506 CEOs)	3,223	0.205*** (0.00)	0.263*** (0.00)	0.211** (0.02)	0.287*** (0.01)	0.322** (0.02)	13.72*** (0.0)
Coopted Board (94 CEOs)	813	0.217 (0.11)	0.248 (0.14)	0.311 (0.12)	0.750** (0.03)	0.244 (0.53)	3.25* (0.07)
<i>p</i> -value for Difference		0.93	0.94	0.64	0.20	0.85	0.65

Table 15. Comparison of Matched-firm Compensation Results Before and After Sarbanes-Oxley

This table presents our analysis of CEO compensation after combining the CEO and the chair positions for combinations before implementation and after the implementation of Sarbanes Oxley. Following the method in Pagano, Panetta, and Zingales (1998), we estimate the following specification for each dependent variable:

$$y_{it} = \sum_{t=1}^4 \beta_t \text{Combined}_t + \beta_4 \text{Combined}_{t>4} + u_i + d_t + \varepsilon_{it}$$

where  $u_i$  and  $d_t$  are CEO-firm pair and year fixed effects, respectively.

$\text{Combined}_t$  is 1 if period  $t$  is after the CEO became board chair and zero otherwise. The sample comprises 600 CEO-firm pairs. Variables are defined in the Appendix, and are winsorized at the 1% and 99% levels.  $p$ -values, in parentheses, are based on robust standard errors clustered at the CEO-firm pair level. \*\*\*, \*\*, and \* indicate significance at the 0.01, 0.05, and 0.10 levels, respectively.

	Obs.	Year 1	Year 2	Year 3	Year 4	Year > 4	F-Test
<i>Panel A. Analysis of Match-adjusted Ln(Total Compensation)</i>							
Before Sarbanes-Oxley (397 CEOs)	2,803	-0.034 (0.54)	-0.074 (0.29)	-0.085 (0.25)	-0.041 (0.58)	-0.027 (0.75)	0.91 (0.34)
After Sarbanes-Oxley (203 CEOs)	1,265	0.098 (0.11)	0.072 (0.37)	0.132 (0.19)	0.246*** (0.04)	0.127 (0.38)	3.15* (0.08)
<i>p</i> -value for Difference		0.13	0.19	0.11	0.05	0.35	0.07*
<i>Panel B. Analysis of Match-adjusted Ln(Compensation Delta)</i>							
Before Sarbanes-Oxley (397 CEOs)	2,800	0.071 (0.51)	0.024 (0.85)	-0.061 (0.66)	0.190 (0.24)	-0.021 (0.89)	0.02 (0.90)
After Sarbanes-Oxley (203 CEOs)	1,282	0.272 (0.18)	-0.220 (0.96)	0.201 (0.97)	0.037 (0.28)	-0.210 (0.77)	0.16 (0.69)
<i>p</i> -value for Difference		0.25	0.27	0.30	0.61	0.56	0.91
<i>Panel C. Analysis of Ln(Portfolio Delta)</i>							
Before Sarbanes-Oxley (395 CEOs)	2,891	0.098 (0.25)	0.258** (0.02)	0.299** (0.02)	0.247* (0.08)	0.284* (0.08)	5.23** (0.02)
After Sarbanes-Oxley (199 CEOs)	1,261	0.367*** (0.00)	0.470*** (0.00)	0.615*** (0.00)	0.921*** (0.00)	0.659** (0.02)	13.01*** (0.00)
<i>p</i> -value for Difference		0.06**	0.30	0.21	0.04**	0.25	0.08*
<i>Panel D. Analysis of Ln(Compensation Vega)</i>							
Before Sarbanes-Oxley (395 CEOs)	2,821	-0.048 (0.67)	0.056 (0.68)	0.082 (0.61)	0.183 (0.30)	-0.039 (0.84)	0.15 (0.70)
After Sarbanes-Oxley (199 CEOs)	1,261	0.161 (0.29)	-0.115 (0.60)	-0.239 (0.38)	0.441 (0.19)	0.146 (0.70)	0.15 (0.70)
<i>p</i> -value for Difference		0.29	0.53	0.34	0.51	0.67	0.90
<i>Panel E. Analysis of Ln(Portfolio Vega)</i>							
Before Sarbanes-Oxley (397 CEOs)	2,759	0.172* (0.02)	0.211* (0.02)	0.198* (0.06)	0.209 (0.11)	0.254* (0.09)	5.44** (0.02)
After Sarbanes-Oxley (203 CEOs)	1,277	0.252** (0.01)	0.335** (0.04)	0.239 (0.21)	0.732*** (0.00)	0.511* (0.09)	8.34*** (0.00)
<i>p</i> -value for Difference		0.55	0.52	0.86	0.09*	0.47	0.28