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Dynamics between the Executive Suite and Board Independence

E. Han Kim
Stephen M. Ross School of Business
University of Michigan

Yao Lu
School of Economics and Management
Tsinghua University

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E. Han Kim and Yao Lu*

Abstract

The overall independence of a firm's governing process from CEO influence depends not only on board independence but also on how independent the executive suite is. Difference-in-difference estimation with an exogenous shock reveals that strengthening board independence by regulation weakens executive suite independence, with CEOs exerting heavy influence on remaking the executive suite amid the board restructuring. Additionally, the less independent the executive suite becomes post-regulation, the lesser the improvement in monitoring CEO compensation. These findings demonstrate that one cannot infer the overall independence based on board independence alone. Executive suite independence warrants more attention from Investors and governance specialists.

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*Ross School of Business, University of Michigan, Ann Arbor, Michigan 48109, ehkim@umich.edu, and School of Economics and Management, Tsinghua University, Beijing, China, luyao@sem.tsinghua.edu.cn. We have benefitted from useful comments/suggestions from Jerry Davis, Dave Denis, Aleksandra Gregoric, Augustin Landier, Jagadeesh Sivadasan, Denis Sosyura, Jim Westphal, Mike Weisbach, and participants at 2013 American Finance Association Meetings, 2012 European Finance Association Meetings, Ohio State University Finance Alumni Conference, the First Edwards Symposium on Corporate Governance in Canada, and the 4th Five-Star Conference in Beijing, and seminars at the Ford School of Public Policy and the Ross School of Business at the University of Michigan, Hong Kong Baptist University, Peking University, University of International Business and Economics, University of Utah, and Xiamen University. We acknowledge excellent research assistance by Goudong Chen and Shinwoo Kang and financial support from Mitsui Life Financial Research Center at the University of Michigan and Project 71202020 of National Science Foundation of China.

1. Introduction

The two main governing bodies of corporations are the board of directors and the executive suite of the CEO and her top lieutenants. Much research has been devoted to studying board independence, examining the importance of director independence in protecting shareholder interest against CEOs' self-serving behavior.[1] But a highly independent board alone does not necessarily ensure an overall independent governance process if governance in the executive suite lacks independence from CEO influence.

Fama (1980) points out the importance of independent non-CEO executives in reducing agency problems when he states, "Less well appreciated, however, is the monitoring that takes place from bottom to top" (p. 293). In a more recent contribution, Landier, Sraer, and Thesmar (2009) show that the presence of more top executives with different preferences and dissenting views—independent executives—strengthens governance and steers CEOs toward more shareholder-friendly decisions. Acharya, Myers, and Rajan (2011) also highlight the importance of independence in the executive suite when they analyze how governance is shaped by internal monitoring of CEOs by other top executives.

As the two main governing bodies, the board and the executive suite may display levels of independence that are closely interrelated. How exactly is board independence related to executive suite independence? A highly independent board may strengthen executive suite independence through close oversight of the top executive appointment process. Being on the top of the organization chart, the board has the authority to appoint or dismiss CEOs; hence by extension, it also may be able to influence personnel decisions of other top key executives.

[1] An incomplete list of studies examining the relation between director independence and the strength of board oversight and/or firm performance includes Brickley and James (1987); Weisbach (1988); Rosenstein and Wyatt (1990); Byrd and Hickman (1992); Brickley, Coles, and Terry (1994); Cotter and Zenner (1994); Borokhovich, Parrino, and Trapani (1996); Mayers, Shivdasani, and Smith (1997); Dahya, McConnell, and Travlos (2002); Dahya and McConnell (2007); Chhaochharia and Grinstein (2009); Nguyen and Nielsen (2010); Wintoki, Linck, and Netter (2012); Knyazeva, Knyazeva, and Masulis (2013); and Coles, Daniel, and Naveen (2014).

However, data show an inverse correlation in independence between the board and the executive suite. In fact, when regulation—the independent board requirement for NYSE- and NASDAQ-listed firms—forces a dependent board to become independent, the executive suite becomes less independent. During the remaking of the executive suite amid the board restructuring, CEOs seem to exert significant influence on who stays in the executive suite and who remains as inside director of the board.

These findings imply that dynamics between the board and the executive suite are not as simple as the organization chart suggests. There are several plausible, non-mutually exclusive dynamics that may explain our findings. In their equilibrium analysis, Harris and Raviv (2008) stress the endogenous nature of information revelation by insiders on the board.[2] They show that when the board is controlled by insiders—a dependent board—they are less reluctant to share negative information. But if the board becomes independent, insiders will release less information, which may require tighter control of information flow from the executive suite to the board. Control is easier with greater CEO influence in the executive suite.

A more independent board may also mean fewer affiliated directors,[3] who tend to possess more firm- and/or industry-specific knowledge and expertise useful for advising than independent directors. Data show most of non-independent directors who lost their board seats to make room for additional independent directors during the board restructuring triggered by the regulation were affiliated directors rather than inside directors. Thus, when a dependent board becomes independent, more of the advisory function may shift to the executive suite. To entice executives to come forward with useful advice, and for the CEO to take it constructively, the executive suite requires mutual trust, respect, and liking between the

[2] Raheja (2005) also allows endogenous information revelation in modeling how CEO succession decisions affect inside directors' incentives to reveal information, showing that the optimal level of board independence depends on the level of difficulty with which independent directors can verify projects.

[3] Affiliated directors are non-independent outside directors, such as a provider of professional services (legal, consulting, or financial services) to the company; a customer of, or supplier to the company; a designee, such as a significant shareholder, under a documented agreement between the company and a group; a director who controls more than 50% of the company's voting power; a family member of an employee; a former employee of the company or of a majority-owned subsidiary; or an employee of an organization or institution that receives charitable gifts from the company.

CEO and the executives. It might be easier to nurture such an environment when the CEO is closely connected to the executives.

Finally, when a dependent board becomes independent, the newly independent board may demand better performance and more accountability from the executive team, leading to infusion of new blood to the executive suite. To make room for new appointees, choices have to be made. CEOs may retain executives they feel more connected to and over whom they can exert more influence, leading to more dependent executive suites. This might be possible because CEOs control the information channel to private information necessary for top executive personnel decisions—not just about individual qualifications but also about synergies individual candidates can bring to the management team. The board meets only a few times a year, and independent directors on the board work part-time. Independent directors also have limited access to pertinent information, relying heavily on management as their primary source of information (Dominguez-Martinez, Swank, and Visser, 2008; Adams, Hermalin, and Weisbach, 2010).[4] In contrast, the CEO works full-time and has employees at his disposal to perform the necessary footwork to make a case to the board.

We proxy (the inverse of) executive suite independence by the fraction of top four non-CEO executives appointed (FTA) during a current CEO's tenure. Because most CEOs are heavily engaged in the appointment decisions of their top lieutenants, new appointees are more likely to share similar preferences with, and may be beholden to, the CEO who appointed them than are executives appointed by a previous CEO. A previous CEO's appointee may also feel grateful and loyal to the CEO who decided to retain her. However, new hires and promotions tend to reflect greater commitment on the part of the CEO than retaining someone from the previous team. Furthermore, those retained from the previous

[4]This generalization of passive information gathering by the board applies only to large publicly traded firms with relatively dispersed ownership, not to firms with large shareholders on the board. Using data on private equity-backed firms in transition economies, Cornelli, Kominek, and Ljungqvist (2003) provide evidence that when firms have large shareholders; their boards collect both hard and soft information on firm performance, operations, and the CEO's competence, which they use in CEO dismissal decisions to improve firm performance.

executive team tend to be transitory. (A close look at top executive changes during the remaking of executive suites amid the board transition triggered by the independent board requirement reveal a disproportionate number of previous CEOs' appointees are dropped from the top-four list to make room for new appointees.) Thus, when a CEO has more of his own appointees, his internal influence in the executive suite is likely to increase through what social psychologists refer to as "social influence," which relies on norms of reciprocity, liking, and social consensus to shape management's decision making (Cialdini, 1984).

This way of measuring CEO influence/connectedness through appointment decisions is not new. Landier et al. (2013) measure CEO influence in the executive suite by the fraction of top four non-CEO executives hired by a current CEO. Khanna, Kim, and Lu (2014) argue higher FTA is indicative of weak checks and balances in executive suites, providing evidence that higher FTA facilitates management wrongdoing with CEO involvement, helps evade its detection, and reduces the likelihood of CEO dismissal upon detection. Furthermore, Morse, Nanda and Seru (2011) and Coles et al. (2014) rely on a similar notion of reciprocity between directors and the CEO when they measure how "co-opted" a board is by the fraction of directors appointed during the current CEO's tenure.

We begin our empirical investigation by relating FTA to the percentage of independent directors and other factors that may be related to FTA with firm fixed effects. We find FTA is positively related to the percentage of independent directors on the board, i.e., a negative correlation in independence between the executive suite and the board.

Because board independence is endogenous (Hermalin and Weisbach, 1998), we rely on an exogenous shock on board independence for identification. The shock is the mandate for NYSE- and NASDAQ listed firms to have a majority of independent directors by October 31, 2004. The variation for difference-in-differences estimation comes from the pre-regulation board composition; the treatment group is firms without a majority of independent directors prior to the regulation. Since firms affected and

unaffected by the regulation may not be comparable, we use propensity-scores to construct the control group. Reported estimates are based on both propensity-score matched and unmatched samples.

Regardless of which sample is used, we find that firms affected by the independent board requirement significantly increase their FTA post-regulation. The average turnover level of CEOs or their own appointees is unaffected by the regulation. The higher FTA is attributable to previous CEOs' appointees losing their position on the list of top four non-CEO executives as defined by ExecuComp, which implies diminished influence even if they remain with the firm. The point estimates imply that, following the regulation, treated firms drop, on average, about 17% more previous CEOs' appointees from the list of top four than the control group. In addition, most of inside directors who lost their board seats during the board restructuring are also previous CEOs' appointees.

The regulatory effect on executive suite independence is robust to possible confounding effects associated with the Sarbanes-Oxley Act of 2002[5] and other events in 2000 and 2001, major structural changes within the firm, and an alternative sample construction. In addition, we check the sensitivity of our results to alternative measures of FTA; a compensation-weighted FTA to allow for difference in influence across rank among the top four non-CEO executives and an abnormal measure of FTA using the residuals of regression relating FTA to CEO tenure and other factors mechanically correlated to FTA. The results are robust.

We also investigate how the post-regulation increase in FTA affects the regulatory impact on board monitoring and shareholder value. Less independent executive suites may allow CEOs tighter control over information flow, making it easier to provide the board with more positive "soft" information to shield CEOs from monitoring. Non-verifiable soft information plays an important role in board monitoring; Cornelli et al. (2013) "find that soft information plays a much larger role in the board's decision to fire the CEO than does hard performance data"(p. 432). We find the higher FTA post-regulation,

[5] Although the board regulation was promulgated around the same time as the enactment of the SOX, it is distinct from the SOX and under purview of different organizations.

the less the improvement in board monitoring. Our proxies for board monitoring are the level of CEO compensation and pay-for-performance sensitivity (PPS). A number of studies show that in the absence of adequate monitoring, CEOs pay themselves what they can (e.g., Bertrand and Mullainathan, 2000, 2001; Bebchuk and Fried, 2004; and Morse et al., 2011). We relate changes in CEO compensation and PPS to post-regulation changes in FTA for each CEO who is the CEO in the base-year 2001.

As for shareholder value, proxied by Tobin's Q, we find no significant interactive effect of the post-regulation change in FTA and the board regulation. The insignificant effect suggests the presence of beneficial effects to offset weaker board monitoring. A close-knit team of executives handpicked by the CEO can be better at coordination, leading to more efficient implementation of strategic decisions, as well as more timely reaction or pro-action to internal and external challenges. In a recent paper, Li, Lu and Phillips (2014) find firms with higher FTA react more productively to changes taking place in the product market. Furthermore, greater FTA means there are more newly-appointed top executives. The new blood may help revitalize the top executive team, enhancing the CEO's productivity itself (Edmans, Goldstein, and Zhu (2013)).

This paper contributes to the literature by investigating dynamics between the executive suite and the board, an important issue overlooked by previous researchers on corporate governance. By identifying the inverse relation in independence between the board and the executive suite, we demonstrate that inferring the overall governance independence from CEO influence based on board independence alone will be misleading.

This study also fills a void in the literature on CEO influence and involvement in the selection of top echelon players governing the firm. Previous studies examine CEO influence on selecting board members and the outcomes (e.g., Shivdasani and Yermack, 1999; Hwang and Kim, 2009; Fracassi and Tate, 2012; Coles et al., 2014). We add to this literature by studying CEO influence on the appointment and composition of the other governing body—the executive suite.

In addition, our difference-in-difference estimation reveals that when one aspect of governance is regulated, some firms shift other aspects of governance. Therefore, when regulators target a specific governance mechanism, they must carefully consider possible spillovers to other governing mechanisms.

The next section describes our empirical design and data. Section 3 estimates the relation between board independence and executive suite independence, followed by a battery of robustness tests. Section 4 takes a closer look at changes in executive suites amid the board restructuring mandated by regulation. Section 5 examines how post-regulation changes in FTA affect regulatory impacts on board monitoring and shareholder value. Section 6 concludes.

2. Empirical Design and Data

2.1. Proxy for Independence in the Executive Suite

Our main proxy for (the inverse of) executive suite independence is FTA_{it}, the number of executives hired or promoted to the top four non-CEO positions during the tenure of firm *i*'s CEO as of year *t,* divided by four. Hence, it ranges from zero to one in increments of 0.25. Top four non-CEO executives are identified from ExecuComp, which ranks executives by the sum of salaries and bonuses. To prevent changes in the reported number of executives from affecting within-firm variation in FTA, we drop firm-year observations when ExecuComp reports less than four non-CEO executives.[6] We assume the year a non-CEO executive first appears on the top-four list is the year she obtained the position. We compare this year with the year a current CEO took office to determine whether the executive is appointed during the CEO's tenure.

2.2. Empirical Methodology

We first relate FTA to the percentage of independent directors and other factors that may be related to FTA with firm fixed effects. Then we estimate difference-in-differences using the regulation

[6]Kim and Lu (2011) illustrate the importance of keeping the number of executives constant when constructing executive variables for panel regressions with firm fixed effects. Cross-checking against proxy statements shows that missing executives in ExecuComp are due to omission rather than to dismissal; hence, the restriction does not seem to introduce a selection bias.

requiring a majority of independent directors. The deadline for compliance with the regulation was October 31, 2004; however, many firms lacking a majority of independent directors began to change their board composition when the recommendations were promulgated by NYSE and NASDAQ in 2002. The largest changes occurred in 2002 and 2003 (see Chhaochharia and Grinstein, 2009, Table 1, Panel A; and Duchin, Matsusaka, and Ozbas, 2010, Figure 1.) Thus, we use 2001 as the base-year to define which firms are affected by the regulation and 2003 as the first year of the post-regulation period. We treat 2002 as the transition period and exclude observations during that year in estimating difference-in-differences. The specification is:

$$Y_{it} = a_i + a_t + \beta_1 Dep\_Board2001_i * Post_t + \beta_2 X_{it} + \varepsilon_{it} \quad (1)$$

Y_{it} is a measure of firm *i*'s level of independence in the executive suite as of year *t*. $Dep\_Board2001_i$ is the affected firm indicator, equal to one if firm *i* does not have a majority of independent directors in 2001, and zero otherwise. This indicator is interacted with $Post_t$, the post-regulation indicator, equal to one if year *t* is 2003 or later. The regression includes firm- and year fixed effects, a_i and a_t. Because of these fixed effects, the specification does not contain a separate term for $Dep\_Board2001_i$ or $Post_t$. *X* is a vector of time-varying control variables. When estimation is based on an unmatched sample, standard errors are clustered at the firm level. Appendix 1 contains definitions of all variables.

In a difference-in-differences estimation, the outcome variable of the control group is used to calculate the expected counterfactual, assuming that the treatment and control groups have the same time trend if there are no regulatory changes. Thus, we construct a propensity-score matched control group following Rosenbaum and Rubin (1983) based on information in the base-year 2001. Ideally, the independent variables used to estimate the probit model must include all factors affecting both the likelihood of being affected by the regulation (board independence) and regulation outcome (FTA).

Linck, Netter, and Yang (2008) show that board independence is affected by firm complexity, costs of monitoring, ownership incentive, and CEO characteristics. Our matching criteria incorporate all four

factors identified by Linck et al. (2008). Firm complexity is captured by firm size, firm age,[7] and the number of business segments within a firm. To capture costs of monitoring, we use EBITDA/TA, Tobin's Q, and board size. Ownership incentive is measured by the percentage share ownership held by a CEO. CEO characteristics include log of CEO age, an indicator for a CEO chairing the board, and CEO gender. These factors are also likely to affect FTA. We also include variables similar to those used in Landier et al. (2013) that are directly related to FTA: CEO tenure,[8] an indicator for CEOs hired from outside, the average tenure of top four non-CEO executives in the top four positions (*EXECSEN*), and the fraction of top four executives appointed during a CEO's first year in office (*FTA_1Y*). We also add the fraction of executives whose first year as a top four non-CEO executive can be identified from ExecuComp (*KNOWN*). This controls noise in *FTA* and *EXECSEN* arising from the ambiguity about the precise year of some of the top four executive appointments.[9] Likewise, we add the fraction of top executives whom we cannot determine whether they are appointed during a CEO's first year in office (*FTA_1Y _Unknown*). This variable helps control noise in *FTA_1Y.*

One affected firm is matched to the three nearest unaffected firms using the Mahalanobis distance metric. We exclude all observations that do not satisfy the common support condition. Log likelihood, Prob > Chi^2, and Pseudo R^2 for estimating the propensity scores are -293.14, 0.00, and 0.13. We bootstrap 200 times to correct standard errors for all OLS regressions estimated with matched samples.

2.3. Sample Construction

Our sample is constructed with NYSE- and NASDAQ-listed firms for which we have information on board composition in 2001 from RiskMetrics and executive data from ExecuComp. Other data sources

[7] Boone, Field, Karpoff, and Raheja (2007) suggest that complexity increases with firm age.

[8] If a CEO leaves the position and returns later, ExecuComp reports only the latest appointment date. Thus simply comparing the CEO appointment date reported by ExecuComp with the current year may generate negative CEO tenure. We correct for this problem by backtracking the previous appointment year using the CEO and company names.

[9] If an executive is already one of the top four non-CEO executives at the firm's first appearance in ExecuComp, we cannot determine the year of her appointment. For such an executive, we use the year the executive joined the company as the year she was appointed as a top-four executive. This understates *FTA* and overstates *EXECSEN,* which is why *w*e include *KNOWN* as a control variable.

include BoardEx for information on directors' and CEOs' education background, past employment, and membership in social organizations; Compustat for accounting data; and CRSP for stock return data. To avoid ambiguity about who constitutes the current CEO, we drop firm-year observations when a new CEO's first year overlaps with the last year of the previous CEO.

The sample period covers 1996 – 2006, excluding 2002. We begin with 1996 to include sufficient pre-regulation observations. We end in 2006 because late 2007 was the beginning of the financial crisis, a rare event that led to unusual changes in the executive suite unrelated to the regulation. In addition, RiskMetrics modified the definition of independent directors in 2007 to conform to the exchanges' definition, making it difficult to compare board composition before and after 2007.

Table 1 lists, by year, the number of firms in the full sample, which contains 8,975 firm-year observations associated with 1,035 unique firms. Panel A reports the number of firms in the treatment and control group for the unmatched full sample. The number of firms increases over time due to greater firm coverage by ExecuComp in later years. The number of unaffected firms in the matched sample (Panel B) is substantially fewer than three times the number of affected firms because of multiple matches of treated firms to same unaffected firms. Both unmatched and matched samples are not balanced. The results are robust when we reestimate regressions using a balanced sample.

2.4. Summary Statistics

Table 2, Panel A provides summary statistics for the unmatched full sample. The indicator for dependent board in 2001, *Dep_Board2001*, has a mean of 0.167, indicating 17% of our sample firms had a dependent board in 2001. This treatment group increased the fraction of independent directors from an average of 0.36 in 2001 to 0.56 in 2004. Their average board size remained more or less the same—9.06 directors in 2001 and 9.28 in 2004. The higher fraction of independent directors is achieved mostly by replacing affiliated directors with independent directors; between 2001 and 2004, the fraction of affiliated directors declined from 0.33 to 0.20, a reduction by 0.13. In contrast, the fraction of inside directors

declined by only 0.07, from 0.32 in 2001 to 0.25 in 2004. Affiliated directors are, by definition, non-executives; hence, their departures from the board do not have a direct effect on FTA.

The post regulation period indicator, *Post,* has a mean of 0.44, indicating fairly evenly distributed observations between pre- and post-regulation periods. The mean and median *FTA* is 0.44 and 0.50, implying about half of the top four non-CEO executives are appointed during a current CEO's tenure.

Panel B compares affected and unaffected firms in the matched sample at the time of matching, the base-year 2001. It shows the mean FTA in 2001 is significantly smaller for affected firms than unaffected firms, suggesting that, absent regulation, firms with a dependent board tend to have more independent executive suites. Most firm and CEO characteristic variables in Panel B show insignificant differences between the treatment and control group, with a few exceptions that arise because the propensity score matching is based on the overall similarity.

3. Relation between Board Independence and Executive Suite Independence

3.1. The Fraction of Independent Directors and FTA

Our initial estimation of the relation between executive independence and board independence relies on a panel regression relating FTA to the percentage of independent directors. The regression controls for firm- and year fixed effects. We also control for time-varying firm and CEO characteristics that may influence FTA and board independence. Controls for firm characteristics include *Ln(TotalAssets)*, log of the book value of total assets; *FirmAge*, one plus the number of years from the firm's IPO or the number of years since its first appearance in CRSP; and *Segment*, the number of business segments as reported by Compustat Segments. Controls for CEO characteristics include *Ln(CEOAge)*, log of a CEO's age; *CEO_OWN*, the percentage of outstanding shares a CEO owns; *CEO_Chair*, an indicator for a CEO chairing the board; and *Female,* an indicator for a CEO's gender. Firm size, the number of segments, and CEO share ownership are lagged by one year. We also control for the variables mechanically correlated to FTA: *CEOTEN*, CEO tenure; *OUTSIDE*, an indicator for CEOs hired from outside; *EXECSEN*, the average tenure of

top four non-CEO executives; and *FTA_1Y*, the fraction of top four executives appointed during a CEO's first year in office. *KNOWN* and *FTA_1Y_Unknown* are also added to control noise in *FTA, EXECSEN,* and *FTA_1Y.*

Table 3 presents the estimation results. The first column reports OLS results. The coefficient on the percentage of independent directors*, Pct_Ind_Dir,* is positive and significant, which implies that executive suite independence is inversely related to board independence. The second column estimates the relation using the Ordered Logistic regression because FTA takes ordered discrete values. The results are robust. As expected, FTA is greater, the longer the CEO tenure and the shorter the average tenure of non-CEO top executives. Other control variables indicate that the older a CEO and the fewer shares a CEO owns, the greater is FTA.[10]

3.2. Difference-in-difference Estimates

Because the percentage of independent directors is endogenous, a causal relation cannot be inferred from the above estimation results. In this section we use the independent board requirement as an exogenous shock and estimate the difference-in-differences in specification (1). Control variables are the same as before.

Table 4 reports estimate results. Odd-numbered columns report OLS estimates. The coefficient on *Dep_Board2001*Post,* the estimated regulatory effect, is positive and significant at the one percent level, irrespective of whether the sample is unmatched or propensity-score matched. Ologit estimates, reported in even-numbered columns, are consistent with the OLS results. All estimates imply the external shock increasing board independence weakens executive suite independence.

The coefficient on *Dep_Board2001*Post* in Column (1) implies that the regulation leads to 0.41 (0.102/0.25) more top executive appointed by the current CEO replacing previous CEOs' appointees (one

[10] Table 3 shows an insignificant coefficient on *OUTSIDE*, which differs from Landier et al. (2013), who show a positive and significant coefficient while confining FTA only to newly-hired top executives. The difference is due to our control of firm fixed effects. Without firm fixed effects to control for unobserved time invariant firm characteristics, the coefficient on *OUTSIDE* in Table 3 becomes positive and significant.

new appointment increases FTA by 0.25). This impact is economically meaningful. The mean affected firms' FTA in 2001 was 0.381, which means the average number of top executives appointed by previous CEOs was 2.476 ((1 - 0.381)/0.25)). Thus, the point estimate implies about 16.6% (0.41/2.476) more previous CEOs' appointees were replaced.

Coefficients on the control variables are largely consistent across the four regressions. As expected, FTA is positively related to the length of the CEO tenure, negatively related to the average tenure of non-CEO executives, and positively related to the fraction of top executives appointed during a CEO's first year in office. Interestingly, older CEOs appoint more executives during their tenure, whereas CEOs with greater share ownership and female CEOs are less likely to do so. Larger and older firms with fewer business segments tend to have a higher FTA.

The affected firm indicator, $Dep\_Board2001_i$, may be too crude. Consider two affected firms, one with 40% and another with 10% of independent directors in 2001. Clearly, the latter is more affected by the regulation and may react more strongly. We reestimate all regressions with the interaction of the percentage of non-independent directors in 2001, $Pct\_Dep\_Board2001_i$, and the post-regulation indicator. The results are reported in Table 5. The estimates indicate that the more a firm is affected by the regulation, the greater the increase in FTA, irrespective of whether the sample is unmatched or matched.

3.3. Robustness Tests

In this section we check the robustness of our results to confounding effects, organizational structure-changing events, alternative definitions of FTA, and an alternative sample construction.

3.3.1. Sarbanes-Oxley Act of 2002

While the independent board requirement proposal was under consideration by the SEC, the Sarbanes–Oxley Act was enacted in 2002. Titles 1 through 4 of the SOX are designed to enhance financial

transparency, disclosure practices, and internal controls.[11] These are of concern because firms with dependent boards in 2001 may differ in those aspects from firms with independent boards and, hence, may be affected differently by the SOX. For example, treated firms may have been more opaque and had less independent audit committees than the control group. If so, their earnings reports in 2001 would be less accurate than the control group.[12]

To test this conjecture, we examine whether the treated group engaged in more earnings management in 2001. A commonly used proxy for earnings management is discretionary accruals (DAC), those parts of total accruals over which management has discretion. Total accruals are computed as the difference between earnings and operating cash flows.[13] To identify the discretionary components of total accruals, we follow Dechow, Sloan, and Sweeney (1995) by regressing total accruals on the inverse of total assets in the previous fiscal year; the change in sales less the change in accounts receivable; and property, plant, and equipment. Discretionary accruals (DAC) are the regression residuals.

For each firm in our sample, we calculate this measure of DAC in 2001 and compute its correlation with the dependent board indicator in 2001. The idea is to see whether before the regulation, the treated firms engaged in more earnings management than the control group. We find no such evidence: The correlation between the dependent board indicator and DAC in 2001 is 0.023 with *P*-value equal to 0.512. It seems safe to conclude that our results are not driven by the SOX.

3.3.2. Other Confounding Events

[11] The SOX contains 11 Titles. Titles 5 through 7 focus on financial analysts, securities professionals, credit agencies, and investment banks. Titles 8 through 11 include provisions for prevention and detection of corporate frauds.

[12] Harris and Raviv (2008) raise doubt on whether independent audit committees improve the accuracy of the earnings report. They show that if insiders' information is more important than agency costs, audit committee independence does not affect the accuracy of the earnings report, because the endogenous nature of information revelation is such that even when independent directors are in control of the audit committee, they will always delegate to insiders.

[13] Specifically, they are the change between non-cash current assets minus the change in current liabilities, excluding those due to the maturation of the firm's long-term debt, minus depreciation and amortization, scaled by total assets in the previous fiscal year.

Our results may be confounded by other events affecting the market for top executives around the time when the regulation was promulgated. For example, the dotcom bubble burst in 2000 and the 9/11 attack in 2001 may have led to fewer top executive hires and promotions during 2000-2002, lowering FTA during those years and leading to the appearance of higher FTA in later years.

To check whether our results are contaminated by the confounding effects, we follow the approach used in Bertrand and Mullainathan (2003), replacing the post-regulation indicator, *Post*, with dummies for year 2000, 2001, 2003, 2004, and 2005-2006. Table 6 reports the reestimation results. If our main results are confounded by the events in 2000 and 2001, the interaction of *Dep_Board2001* and year dummy should be negative for 2000 or 2001; however, they are all insignificant with mostly positive signs. By contrast, the interaction terms are positive and significant for all post-regulation years.

Interestingly, coefficients on the interaction of the dependent board indicator and post-regulation year dummies show an increasing trend over time. Because it takes time to replace top executives through new hires and promotions, the time trend is consistent with our conclusion that the regulation has led affected firms to increase their FTAs.

3.3.3. *Are results driven by corporate organizational structure-changing events?*

Organizational structure-changing events such as mergers and acquisitions, divestitures, and spinoffs are often accompanied by changes in the executive suite, which is one reason we control for the number of segments in all regressions. As a further robustness check, we control for the number of mergers and acquisitions, MA_{it-1}, and divestitures and spinoffs, DS_{it-1}, completed in the prior year. The data for *MA* and *DS* are obtained from SDC. The results (unreported) are robust.

3.3.4. Alternative Definitions of FTA

Our measure of FTA treats all top four non-CEO executives equally. However, executives with higher salaries and bonuses tend to be higher ranked and to be more influential. (ExecuComp defines top

five executives based on their salaries and bonuses.) Since CEO connections with more influential executives matter more, we calculate a compensation weighted FTA,

$$WFTA_{it} = \sum_{k=1}^{k=n} Exe\_Com_{kit} / \sum_{j=1}^{j=4} Exe\_Com_{jit}. \quad (2)$$

Exe_Com_{kit} is the sum of salary and bonus of executive k appointed during the tenure of firm i's CEO as of year t, and n is the number of top executives appointed during the CEO's tenure.

In addition, we follow Landier et al. (2013) and estimate residuals of a regression relating *FTA* to *CEOTEN, OUTSIDE, EXECSEN, KNOWN, FTA_1Y, FTA_1Y_Unknown* with year fixed effects. The residuals are used as a measure of the abnormal fraction of top executives appointed, *AFTA*, during a CEO's tenure.

We also calculate AFTA weighted by the executives' salaries and bonuses, *WAFTA*, by estimating the same regression with *WFTA* as the dependent variable. When these abnormal measures of FTA are used as dependent variables, the regressions do not include independent variables used to estimate the residuals.

Reestimation results based on these three alternative measures are reported in Table 7. The results are robust regardless of which alternative measure is used.

3.3.5. Alternative Sample Construction

Finally, we check the robustness to possible biases arising from an unbalanced sample by reestimating regressions with a balanced sample of 830 firms that exist during the entire period, 1999 through 2006. We exclude observations in 2002 and 2003 so that the pre- and post-regulation periods have the same number of years (three years in each). In this sample, 2004 is the first year fully affected by the regulation. The rest is the same. The reestimation results (unreported) are robust.

4. Changes in the Executive Suite

The robust evidence of higher FTA following the regulation suggests a shakeup in executive suites. In this section we take a closer look at how the regulation affected CEOs, their own appointees, and previous CEOs' appointees.

4.1. CEO Turnovers

When a dependent board becomes independent, the newly-independent board may put more pressure on the whole management team, which may lead to the departure of the team captain, the CEO. A newly-appointed CEO may join the firm with, or build, her own team of top executives, increasing FTA relative to her tenure.

To examine this possibility, we estimate the effect of the regulation on CEO turnovers with firm-level conditional logistic regressions. The dependent variable is an indicator for CEO turnover, equal to one if a CEO in year *t* is not the same as the CEO in year *t-1*. As before, the variable of key interest is the interaction term *Dep_Board2001*Post.* Because CEO turnovers could be related to firm performance, we control for *Return*, one year buy-and-hold stock returns. Other control variables include CEO tenure, CEO share ownership, CEOs chairing the board, firm size, and year dummies. All control variables are lagged by one year.

Table 8 reports the estimation results for both unmatched and propensity-score matched samples. Columns (1) and (3) contain a triple interaction, $Dep\_Board2001*Post*Return_{t-1}$, to see whether the newly-independent board improves CEO turnover-performance sensitivity (Weisbach, 1988). The coefficient on the triple interaction term is significantly negative. Mandating independent boards seems to increase CEO turnover-performance sensitivity.

More important, the coefficient on *Dep_Board2001*Post* is insignificant, indicating the level of CEO turnover per se is unaffected by the regulation. To reaffirm this, Columns (2) and (4) drop the triple interaction term and reestimate the regression. The coefficient on *Dep_Board2001*Post* remains insignificant. This evidence rules out CEO turnovers as an explanation for the increase in FTA.

4.2. Top Four Non-CEO Executive Turnovers

If the higher FTA is not caused by higher CEO turnover, then it should be due to higher turnovers of top four non-CEO executives. Table 9 estimates the effect on the level of the top four executive

turnovers with firm- and year-fixed effects. The dependent variable is the percentage of new top four non-CEO executives who were not on the top-four list in the previous year. Independent variables are the same as those in Table 8, except CEO tenure and share ownership are replaced by the average tenure and share ownership of the top four non-CEO executives.

The coefficients on the triple interaction term are consistent with those for CEOs in Table 8; the newly independent boards also improve non-CEO executives' turnover-performance sensitivity. However, there is an important difference: The coefficient on *Dep_Board2001*Post* is positive and significant in Columns (2) and (4), implying the treated firms' average level of the top four non-CEO executive turnovers significantly increase following the regulation.

The more interesting question is which executives are more likely to be dropped from the list of top four; the current or previous CEOs' appointees. Among our sample of affected firms covered by ExecuComp in both 2001 and 2004, we identify 339 executives who are dropped from the list of top four non-CEO executives between the pre- and the post-regulation year. Of the 339, 64% (217) are previous CEOs' appointees. Not all those dropped from the list left the firm; about 60% (129) remained with the firm as of 2004. The higher FTA is due to both the departure of previous CEOs' appointees and the appointment or promotion of someone else ahead of them, diminishing their relative influence.

Previous CEOs' appointees who serve on the board as insider director are also disproportionately affected during the board restructuring. By matching ExecuComp and RiskMetrics for our sample of affected firms covered by both data sources in 2001 and 2004, we identify 103 top four non-CEO executives who sat on the board in 2001 no longer serving on the board in 2004. Of the 103, 84 are previous CEOs' appointees; and of the 84, 47 remained with the firm as of 2004, and the rest left the firm due to death (1), retirement (22), and resignation (14).

These raw statistics indicate it is mainly previous CEOs' appointees who are adversely affected during the remaking of executive suites amid board restructuring required by the regulation. To verify this

inference, we separate the top four executives into current CEO appointees, *Cur_CEO_Appt* and previous CEO appointees, *Pre_CEO_Appt,* and estimate firm level conditional logistic regressions using executive level data for each subsample. The dependent variable is an indicator equal to one if an executive on the top-four list in year *t* is not on the list in year *t+1*. Independent variables are the same as those in Table 9, except the tenure and share ownership variables are at the individual executive level.

The estimation results are reported in Table 10.[14] The first two columns show a sharp contrast. The likelihood of being dropped from the top four list amid the board restructuring significantly increases for previous CEOs' appointees, but not for current CEOs' appointees. Comparison of coefficients on executive tenure, *EXETEN,* is also revealing. The longer the tenure, the more likely previous CEOs' appointees are to be dropped from the list. The opposite holds for current CEOs' appointees; the longer their tenure, the more likely they are to stay on the list. Current CEOs' appointees who have been with the CEO longer are more likely to remain as one of the top lieutenants.

The greater turnover among previous CEOs' appointees could be simply due to their longer tenure relative to the current CEO's appointees. Longer tenure may indicate more entrenchment; hence, the newly independent board may target previous CEOs' appointees more. To address this possible tenure bias, we restrict each subsample to only those executives with tenure (as one of the top four) longer than the sample median and reestimate the regressions. The results, reported in Columns (3) and (4), are robust to this alternative sample construction.

In sum, the shakeup in executive suites is concentrated on previous CEOs' appointees, leading to higher FTA following the regulation. There is no significant change in the average level of CEO turnovers or of their own appointees' turnovers, illustrating CEOs' staying power and their influence on who occupies executive suites and who sits on the board as inside director amid the restructuring of the board.

[14] Because the propensity score match is done at the firm level, not at the executive level, our estimation is based on the unmatched sample.

5. Monitoring CEOs and Shareholder Value

The evidence in the preceding section shows that the regulation has increased the turnover-performance sensitivity for both CEOs and their top executives, indicating an improvement in board monitoring. In this section, we investigate how the higher FTA affects the regulatory effect on board monitoring and shareholder value.

Board monitoring encompasses many different tasks, from assessing the accuracy of the earnings report, making top executives accountable for their performance, determining their compensation, and so on. In this section we focus on CEO compensation. Chhaochharia and Grinstein (2009) examine how the regulation has affected board monitoring of CEO compensation. Our inquiry goes a step further—how does the mandated board independence interact with changes in executive independence to affect board monitoring of CEO compensation?

With higher FTA, the CEO may have more control of information flows to independent directors, which can help provide the board with more positive non-verifiable soft information. Cornelli et al. (2013) demonstrate the importance of non-verifiable soft information for board monitoring when they find soft information has greater impact on the board's decision to fire the CEO than hard performance data. If soft information is an important factor in CEO dismissal decisions, it also is likely to play an important role in CEO compensation decisions.

The strength of monitoring CEO compensation is proxied by the level of compensation and pay-for-performance sensitivity (PPS). CEO compensation, *CEO_Comp,* is item tdc1 in ExecuComp, which includes salary, bonus, the total value of restricted stocks and stock options granted, long-term incentive payments, and other miscellaneous compensation. CEO PPS is measured by *CEO_Delta,* which is the Edmans, Gabaix, and Landier (2009) measure of scaled wealth-performance sensitivity.[15] Shareholder

[15] Previous studies suggest two other ways to measure the pay-for-performance sensitivity: dollar change in wealth for a dollar change in firm value (Jensen and Murphy, 1990) or dollar change in wealth for a percentage change in firm value (Hall and Liebman, 1998). We use Edmans et al.'s (2009) compensation scaled wealth-performance

value is proxied by Tobin's Q, as measured by the sum of the market value of common stocks plus the book value of total liabilities divided by the book value of total assets.

We relate post-regulation changes in FTA, *ΔFTA*, to changes in CEO compensation, *ΔLn(CEO_Comp)*; changes in CEO PPS, *ΔCEO_Delta*; and changes in Tobin's Q, *ΔQ*. The changes are the differences in each variable's average between the pre- and the post-regulation periods, which span up to four years over 1998-2001 and 2003-2006 and overlap with the tenure of each CEO who was the CEO in 2001. Only observations in which a CEO was the CEO in 2001 are included to avoid including CEOs who were not subjected to the regulation. To construct the changes, the panel data is collapsed to cross-sectional data such that each observation is associated with one firm. The regression specification is:

$$\Delta Y_i = \lambda_1 Dep\_Board2001_i + \lambda_2 Dep\_Board2001_i * \Delta FTA_i + \lambda_3 \Delta FTA_i + \lambda_5 \Delta X_i + \varepsilon_i. \qquad (3)$$

ΔY_i is *ΔLn(CEO_Comp), ΔCEO_Delta,* or *ΔQ*. $Dep\_Board2001_i * \Delta FTA_i$ is the variable of main interest. The regression estimates how changes in FTA from the pre- to post-regulation periods affect the regulatory impact on CEO compensation, PPS, or Q. ΔX_i is a vector of control variables, which are also differences between the up to four-year pre- and post-regulation periods overlapping with the tenure of each CEO who was the CEO in 2001. All estimations are based on the unmatched sample. The propensity-score matched sample becomes too small when we collapse the panel into cross-sectional data. Robust standard errors are clustered at the industry level as defined by the three-digit SIC code.

Control variables include firm size, *Ln(TotalAssets);* the number of business segments, *Segment*; and EBIDA divided by total assets, *EBITDA/TA.* These variables may be related to CEO compensation, firm performance, and FTA. Because the incentive contract portion of CEO compensation is likely to reflect risk, we add two proxies for firm risk: *Risk,* the standard error of the residuals from the market model estimated using daily data for the period covered by the annual sample; and *R&D/PPE,* the ratio of research and development expenditures to property, plant, and equipment. These are commonly used

sensitivity measure because, as they point out, it is independent of firm size, and thus comparable across firms and over time. It is downloaded from Edman's website (http://faculty.london.edu/aedmans/data.html).

proxies for firm risk (e.g., Himmelberg, Hubbard, and Palia, 1999; Kim and Lu, 2011; Coles et al., 2014). To avoid reducing the sample size due to missing observations, we follow Himmelberg et al. (1999) and set *R&D/PPE* and *Risk* equal to zero if they are missing, and use dummy variables, *RDUM* and *RiskD,* which are set to one if *R&D/PPE* and *Risk* are available and zero otherwise.

In addition, we control for changes in the total number of preexisting network ties a CEO has with independent directors, *ΔDir_Tie*. Hermalin and Weisbach (1998) argue that if regulation forces a board to appoint more independent directors than endogenously determined, affected firms may attempt to circumvent the regulation by recruiting independent directors with more "disutility for monitoring." Directors socially pre-connected to the CEO could be those with disutility for monitoring (Fracassi and Tate, 2012). In Appendix 2 we examine how the board regulation has affected CEOs' network connections with independent directors by estimating difference-in-differences.[16] Consistent with Hermalin and Weisbach's conjecture, the regulation appears to have led to an increase in CEOs' preexisting network ties with independent directors.

Table 11 reports the estimation results. For CEO compensation, *ΔFTA*Dep_Board2001* shows a positive coefficient significant at 5%, while the coefficient of *Dep_Board2001* is negative and marginally significant (*P*-value = 0.105). Together, they suggest the greater the increase in FTA post-regulation, the smaller the decrease in CEO compensation following the regulation. For CEO delta, *ΔFTA*Dep_Board2001* shows a negative coefficient significant at 10%, while the coefficient of *Dep_Board2001* is positive and marginally significant (*P*-value = 0.112). It appears the greater the post-regulation increase in FTA, the less the improvement in the board's monitoring CEO compensation.

[16] Appendix 2 also describes how we measure CEOs' pre-existing network ties. Network ties are missing when BoardEx does not cover the relevant individual. Even when they are not missing, BoardEx sometimes provides insufficient information to determine whether the connections occurred during overlapping years. To avoid reducing the sample size, we assign zero connection when information on network ties is missing or incomplete. This leads to underestimation of network ties. To counter the underestimation problem, we include *Dir_Tie_Unknown*, the percent of independent directors whose pre-existing network ties to their CEOs are either missing or incomplete.

Together with the evidence on the turnover-performance sensitivity, the evidence on CEO compensation suggests the mandated board independence improves board monitoring; however, the concomitant decline in executive suite independence seems to impede the improvement in board monitoring.

As for the impact on shareholder value, the last column in Table 11 shows insignificant coefficients on both *Dep_Board2001*[17] and *ΔFTA*Dep_Board2001*. The insignificant interactive effects of the regulation and higher FTA on firm performance suggest the presence of beneficial effects associated with higher FTA that offset its negative impact on board monitoring. A management team with a higher FTA is likely to be better at coordination, which helps to implement strategic decisions more efficiently in response to internal and external challenges. For example, Li et al. (2014) find firms with higher FTA react more productively to changes taking place in the product market.

6. Conclusion

Our empirical investigation reveals that board independence is negatively related to executive suite independence. Thus, inferring the overall independence of a firm's governing process by board independence alone will be misleading. When board independence is strong (weak), the overall independence is likely to be weaker (stronger) than board independence alone indicates. Both simple panel regression estimates and difference-in-differences estimates using an external shock suggest that strengthening board independence leads to weaker executive suite independence.

Close examination of changes in executive suites amid the board restructuring mandated by regulation reveals surprisingly strong CEO influence on who stays in the executive suite and who remains

[17] The equilibrium analysis in Harris and Raviv (2008) provides an ambiguous prediction on how the regulation per se will impact shareholder value. Their model shows certain information-related circumstances in which shareholders are better off with an insider-controlled board; hence, regulation forcing these firms to have an outsider-controlled board will be value-reducing. However, the model also predicts that if agency costs are large, mandating a majority of independent directors is consistent with optimality. Thus, whether the regulation has a positive or a negative effect on shareholder value critically hinges on whether our sample of affected firms is mostly the former or latter type, which is difficult to distinguish based on publically available information. Although the former type is likely to have a dependent board, so is the latter type with large agency costs because it is easier to enjoy private benefits with a dependent board.

as inside director on the board. Current CEOs' own appointees are protected, while previous CEOs' appointees are dropped from the list of top four lieutenants and from the board to make room for new top executives and new independent directors. This influence over top executive personnel decisions is useful in strengthening CEOs' appointment-based connectedness/influence within the executive suite. When an external shock reduces CEOs' influence in the board room, CEOs seem to exercise their influence on executive personnel decisions to balance out their overall influence in the governing process.

Our findings also have a message for policy makers: When they target a specific governance mechanism, they must carefully evaluate how their regulatory actions spill over to other governing bodies.

Finally, our analysis focuses only on dynamics between the board and the executive suite, ignoring an important stakeholder—employees. Employees also influence the governing process through their working relationships with the management (Bertrand and Mullainathan, 2003) and through the collective bargaining process (Atanassov and Kim, 2009). The possible dynamics among the three governing bodies, with the board representing shareholders, employees representing their own self-interest, and the executive suite managing often conflicting interests of capital providers and labor suppliers, are intriguing and complex. More research is needed on the three-way dynamic for a more comprehensive understanding of how firms are actually governed in the real world.

Appendix 1: Variable Description.

Board Composition Variables	
Dep_Board2001	Dependent board indicator equal to one if a firm does not have a majority of independent directors in 2001; zero, otherwise.
Pct_Dep_Board2001	The percentage of non-independent directors on the board in 2001.
Pct_Ind_Dir	The percentage of independent directors on the board.
Executive Suite Composition Variables	
FTA	Fraction of top four non-CEO executives appointed during a current CEO's tenure.
AFTA	Abnormal fraction of top four non-CEO executives appointed during a current CEO's tenure.
WFTA	Fraction of top four non-CEO executives appointed during a current CEO's tenure, weighted by the sum of executives' salaries and bonuses.
WAFTA	Abnormal fraction of top four non-CEO executives appointed during a current CEO's tenure, weighted by the sum of executives' salaries and bonuses.
Monitoring Outcome and Shareholder Value Variables	
Ln(CEO_Comp)	Logged value of a CEO's total compensation (item tdc1 in ExecuComp), which includes salary, bonus, total value of restricted stocks and stock options granted, long-term incentive payouts, and other miscellaneous compensation.
CEO_Delta	Dollar change in CEO wealth for a 100 percentage point change in firm value, divided by annual flow compensation, a delta measure proposed by Edmans, Gabaix, and Landier (2009). Downloaded from Edmans' website (http://faculty.london.edu/aedmans/data.html).
Tobin's Q	The market value of common equity plus the book value of total liabilities divided by the book value of total assets.
Other Variables	
Post	Post-regulation indicator, equal to one if year *t* is 2003 or thereafter; zero, otherwise.
Num_Ind_Dir	The number of independent directors on the board.
BoardSize	The total number of directors on the board.
CEOTEN	The number of years a CEO has been in office.
OUTSIDE	Outsider indicator equal to one, if a CEO comes from outside the firm; zero, otherwise.
FTA_1Y	The fraction of top executives appointed within the year of a new CEO appointment.
FTA_1Y_Unknown	The fraction of top four non-CEO executives whose information on whether they are appointed within the year of a new CEO appointment is unknown.
KNOWN	The fraction of executives whose first year on the list of the top four non-CEO executives can be identified with data in ExecuComp.
EXECSEN	The average number of years top four non-CEO executives have been on the list of the top four non-CEO executives.
Female	Indicator equal to one for female CEO; zero, otherwise.
Ln(CEOAge)	The logged value of CEO age.
CEO_OWN	The percentage of outstanding common shares held by a CEO.
CEO_Chair	Indicator equal to one for CEO also chairing the board; zero, otherwise.
Ln(TotalAssets)	The logged book value of total assets in 2000 US million dollars.
FirmAge	One plus the number of years from the firm's IPO or the number of years since its first appearance in CRSP.
Segment	The number of business segments a firm has in a given year as reported by Compustat/Segment.
EBITDA/TA	Earnings before interest, tax, depreciation, and amortization divided by the book value of total assets.

Variable Description (continued).

R&D/PPE	The ratio of research and development expenditures to property, plant, and equipment. It is set to zero, if the data is missing.
RDUM	Dummy variable equal to one if R&D data is available; zero, otherwise.
Risk	Variance of residuals from the market model estimated using daily data for the period covered by the annual sample. It is equal to zero, if the data to construct Risk are unavailable.
RiskD	Dummy variable equal to one if the data required to estimate Risk are available; zero, otherwise.
Pct_Exe_Turnover	The percentage of new top four non-CEO executives who were not on the list of top four non-CEO executive positions in the previous year.
CEO_Turnover	CEO turnover indicator equal to one, if the CEO in year *t-1* is different from the CEO in year *t*; zero, otherwise.
Return	One year buy-and-hold stock returns.
Avg_EXE_OWN	Average percentage of shares held by top four non-CEO executives.
Exe_Turnover	An indicator for an executive turnover, equal to one if an executive on the list of top four non-CEO executives in year *t* is not on the list in year *t+1*.
EXE_TEN	The number of years an executive has been on the list of top four non-CEO executives.
EXE_OWN	The percentage share ownership held by a non-CEO executive.
Dir_Tie	The total number of pre-existing network ties a CEO has with independent directors through past employment (either working as an employee or serving on the board), educational institutions, and *past* membership to social and professional organizations. Only network ties established during overlapping years are included.
Dir_Tie_Unknow	The percent of the independent directors whose pre-existing network ties to their CEOs are either missing or incomplete.

Appendix 2: Preexisting Network Ties between Independent Directors and the CEO.

Preexisting social connections between the CEO and independent directors are measured by network ties formed prior to their appointments. BoardEx provides information about directors' and CEOs' past employment, education background, and membership in social organizations (e.g., philanthropic and religious organizations, social clubs, and professional organizations). We count the number of network ties for each category (past employment, education, or membership in social organizations) to capture the depth of past connections. To be included, network ties must be established during overlapping years. For example, in the case of education, the years a CEO and an independent director attended the same school must overlap. Then we sum the three types of ties to arrive at the total number of ties. Similar measures of social connections have been used in previous papers (e.g., Cohen, Frazzini, and Malloy, 2008; Engelberg, Gao, and Parsons, 2013; Fracassi and Tate, 2012; Duchin and Sosyura, 2012).

Table A provides difference-in-difference estimates for the log of one plus the total number of preexisting network ties a CEO has with independent directors. The key independent variable and control variables are the same as the baseline difference-in-differences specification, except we add the number of independent directors, *Num_Ind_Dir*, as a control because the number of pre-existing network ties is likely to increase with more independent directors and *Dir_Tie_Unknow* to account for missing or incomplete information on network ties. We also exclude variables specifically related to FTA: *FTA_1Y, EXECSEN, KNOWN,* and *FTA_1Y_Unknown*. These variables are also excluded in constructing the propensity-score matched sample for the analysis of network ties.

We start the sample period from 2000 because BoardEx provides limited coverage prior to 2000 and the dependent variable is the total number of network ties. However, when network ties are used as a control variable in Tables 9 and 10, we use network ties from 1996 to maintain the sample period of 1996-2006.

The estimation results in Table A show a positive and significant coefficient on *Dep_Board2001*Post* at the five percent level for the unmatched sample. For the propensity-score matched sample, the coefficient is positive but the *P*-value is 0.174. Given the shorter sample period and the relatively high frequency of missing or incomplete information on network ties, we interpret these results as being supportive of the conjecture by Hermalin and Weisbach (1998) that if regulation forces a board to appoint more independent directors than endogenously determined, the firm will attempt to circumvent the regulation by recruiting independent directors with more "disutility for monitoring."

Table A: Difference-in-Differences Estimation of Pre-existing Network Ties between Independent Directors and the CEO.

This table estimates the effect of the independent board requirement on preestablished social connections between the CEO and independent directors. The dependent variable is the log of one plus the total number of all preexisting network ties between independent directors and the CEO. Definitions of all variables are provided in Appendix 1. The sample period is 2000 – 2006, excluding 2002. All regressions control for year- and firm-fixed effects. The regression does not include *Dep_Board2001* and *Post* as separate controls because of firm- and year fixed effects. Robust standard errors reported in parentheses are clustered at the firm level in Column (1) and are corrected by bootstrapping 200 times in Column (2). Coefficients marked with *, **, and *** are significant at 10%, 5%, and 1%, respectively.

VARIABLES	**Ln(1+Dir_Tie)**	
	Unmatched	**PS-matched**
	(1)	**(2)**
Dep_Board2001*Post	0.074**	0.045
	(0.032)	(0.028)
Dir_Tie_Unknow	-0.186*	-0.148
	(0.108)	(0.171)
CEOTEN	0.004	-0.001
	(0.004)	(0.005)
OUTSIDE	-0.042	0.033
	(0.067)	(0.094)
Female	0.070	0.126
	(0.160)	(0.193)
Ln(CEOAge)	0.689***	0.638**
	(0.187)	(0.261)
CEO_OWN_{t-1}	0.081	0.233
	(0.200)	(0.347)
CEO_Chair	0.001	-0.017
	(0.052)	(0.066)
$Ln(TotalAsset)_{t-1}$	0.008	0.014
	(0.026)	(0.036)
FirmAge	0.004	-0.000
	(0.004)	(0.002)
$Segment_{t-1}$	-0.002	0.004
	(0.002)	(0.003)
Num_Ind_Dir	0.051***	0.063***
	(0.007)	(0.009)
Constant	-2.739***	-2.668**
	(0.767)	(1.045)
Firm FE & Year FE	Y	Y
Observations	3,992	1,793
Adjusted-R^2	0.848	0.830

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Table 1: Sample Description.

This table shows the number of observations for unmatched and matched samples, by year, in Panels A and B, respectively. Columns (1) and (4) report the number of firms for which we have information on both board composition in 2001 and the fraction of top executives appointed (FTA) during a CEO's tenure. Columns (2) and (5) report the number of firms without a majority of independent directors in 2001 and, hence, affected by the regulation. Columns (3) and (6) show the number of firms unaffected by the regulation.

	Panel A: Unmatched Sample			Panel B: PS-matched Sample		
Year	**Full**	**Affected**	**Unaffected**	**Full**	**Affected**	**Unaffected**
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
1996	691	106	585	296	104	192
1997	755	113	642	318	110	208
1998	825	128	697	355	125	230
1999	913	147	766	390	145	245
2000	946	156	790	402	153	249
2001	944	157	787	410	157	253
2003	958	164	794	403	152	251
2004	969	171	798	405	154	251
2005	978	171	807	400	152	248
2006	996	182	814	400	154	246
Total Obs.	8,975	1,495	7,480	3,779	1,406	2,373
Total Firms	1,035	185	850	410	157	253

Table 2: Summary Statistics.

Panel A reports summary statistics for the unmatched full sample. Panel B compares firms affected and unaffected by the regulation in the propensity-score (PS) matched sample. The comparison is based on the mean value of variables at the time of matching, the base-year 2001. Definitions of the variables are provided in Appendix 1.

	Panel A: Unmatched Sample					Panel B: PS-matched Sample			
						Mean			
	Mean	Median	Std. Dev.	Min	Max	Affected	Unaffected	Diff	P-Value
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(6)-(7)	
Board Composition Variables									
Dep_Board2001	0.167	0.000	0.373	0.000	1.000	1.000	0.000		
Pct_Dep_Board2001	0.351	0.333	0.176	0.063	1.000	0.646	0.305		
Pct_Ind_Dir	0.674	0.700	0.169	0.000	1.000	0.362	0.701		
Executive Suite Composition Variables									
FTA	0.437	0.500	0.334	0.000	1.000	0.381	0.450	-0.069	0.034
AFTA	0.034	0.043	0.284	-1.039	0.752	-0.047	0.022	-0.069	0.013
WFTA	0.415	0.412	0.335	0.000	1.000	0.353	0.430	-0.078	0.017
WAFTA	0.033	0.025	0.284	-1.016	0.774	-0.054	0.021	-0.075	0.007
Other Variables									
Post	0.435	0.000	0.496	0.000	1.000				
CEOTEN	6.920	5.000	7.334	0.000	55.000	9.847	6.901	2.946	0.001
OUTSIDE	0.142	0.000	0.349	0.000	1.000	0.191	0.134	0.057	0.125
FTA_1Y	0.538	0.500	0.399	0.000	1.000	0.572	0.519	0.053	0.202
KNOWN	0.973	1.000	0.093	0.000	1.000	0.971	0.983	-0.012	0.136
EXECSEN	4.350	4.000	1.872	0.000	14.750	4.909	4.530	0.378	0.033
FTA_1Y_Unknown	0.001	0.000	0.021	0.000	0.500	0.002	0.000	0.002	0.205
Female	0.013	0.000	0.113	0.000	1.000	0.006	0.012	-0.005	0.584
Ln(CEOAge)	4.015	4.025	0.135	3.466	4.511	4.034	3.999	0.034	0.019
CEO_OWN	0.023	0.003	0.060	0.000	0.638	0.052	0.023	0.029	0.000
CEO_Chair	0.657	1.000	0.475	0.000	1.000	0.605	0.652	-0.047	0.337
Ln(TotalAssets)	7.765	7.599	1.657	2.227	14.291	7.400	7.431	-0.031	0.837
FirmAge	26.830	23.000	19.571	1.000	82.000	19.541	23.601	-4.059	0.010
Segment	15.036	14.000	9.695	1.000	87.000	14.929	16.119	-1.190	0.129
CEO_Turnover	0.122	0.000	0.327	0.000	1.000	0.123	0.142	-0.019	0.573
Return	0.233	0.145	0.659	-0.972	17.726	0.108	0.185	-0.077	0.181
Pct_Exe_Turnover	0.255	0.25	0.214	0.000	1.000	0.228	0.253	-0.025	0.220
Avg_EXE_OWN	0.003	0.001	0.011	0.000	0.178	0.006	0.004	0.002	0.127
Exe_Turnover	0.259	0.000	0.438	0.000	1.000	0.202	0.242	-0.040	0.077
EXE_TEN	5.166	5.000	2.956	1.000	15.000	5.636	5.519	0.117	0.449
EXE_OWN	0.003	0.000	0.019	0.000	0.577	0.006	0.003	0.003	0.040
Ln(CEO_Comp)	7.959	7.940	1.166	-6.908	13.393	7.649	7.884	-0.235	0.058
CEO_Delta	125.425	8.262	2207.004	0.000	113868.500	164.988	45.414	119.574	0.001
Tobin's Q	2.195	1.564	2.899	0.475	105.0904	2.127	1.870	0.257	0.070
R&D/PPE	0.244	0.000	0.785	0.000	24.610	0.178	0.200	-0.022	0.704
RDUM	0.538	1.000	0.499	0.000	1.000	0.490	0.545	-0.055	0.279
Risk	0.022	0.019	0.013	0.000	0.196	0.032	0.031	0.000	0.750
RiskD	0.936	1.000	0.245	0.000	1.000	0.936	0.988	-0.052	0.004
EBITDA/TA	0.137	0.133	0.113	-2.989	1.001	0.133	0.134	0.000	0.961
Dir_Tie	1.251	0.000	2.516	0.000	27.000	0.403	1.150	-0.747	0.965

Table: 3: Relation between Fraction of Top Executives Appointed (FTA) during a CEO's Tenure and Board Independence.

This table estimates the relation between the fraction of top four non-CEO executives appointed (FTA) during a CEO's tenure and the percent of independent directors on the board. The sample period is 1996 – 2006, excluding 2002. Columns (1) and (2) are OLS and ordered logistic regression estimates, respectively, controlling for year- and firm fixed effects and year- and firm dummies. Definitions of all variables are provided in Appendix 1. Robust standard errors reported in parentheses are clustered at the firm level. Coefficients marked with *, **, and *** are significant at 10%, 5%, and 1%, respectively.

VARIABLES	**FTA**	
	OLS	**Ologit**
	(1)	**(2)**
Pct_Ind_Dir	0.097**	1.412**
	(0.043)	(0.559)
CEOTEN	0.019***	0.317***
	(0.003)	(0.055)
OUTSIDE	-0.004	-0.283
	(0.039)	(0.569)
FTA_1Y	0.054	0.693
	(0.039)	(0.609)
KNOWN	-0.366***	-5.607***
	(0.064)	(0.956)
EXECSEN	-0.086***	-1.320***
	(0.003)	(0.067)
FTA_1Y_Unknown	0.870	7.676
	(0.593)	(17.120)
Female	-0.052	-0.843
	(0.151)	(2.370)
Ln(CEOAge)	0.265**	3.989***
	(0.107)	(1.541)
CEO_OWN_{t-1}	-0.518**	-8.046**
	(0.226)	(3.519)
CEO_Chair	0.013	-0.014
	(0.030)	(0.433)
$Ln(TotalAsset)_{t-1}$	0.035	0.684**
	(0.024)	(0.275)
FirmAge	0.002	0.020
	(0.001)	(0.014)
$Segment_{t-1}$	-0.001	-0.022
	(0.001)	(0.013)
Constant	-0.697	
	(0.483)	
Firm FE & Year FE (Dummies)	Y	Y
Observations	5,687	5,687
Adjusted-R^2 (Pseudo-R^2)	0.710	(0.492)

Table 4: Impact of the Independent Board Requirement on the Fraction of Top Executives Appointed (FTA) during a CEO's Tenure.

This table reports estimates of the impact of the independent board requirement on the fraction of top four non-CEO executives appointed (FTA) during a CEO's tenure. Columns (1)-(2) and (3)-(4) report estimation results with the unmatched and propensity-score (PS) matched sample, respectively. The sample period is 1996 – 2006, excluding 2002. Columns (1) and (3) are OLS estimates; Columns (2) and (4), estimates by ordered logistic regressions. Definitions of all variables are provided in Appendix 1. Regressions in Columns (1) and (3) control for year- and firm fixed effects and regressions in Columns (2) and (4) control for year- and firm dummies. The regression does not include *Dep_Board2001* and *Post* as separate controls because of firm- and year fixed effects. Robust standard errors reported in parentheses are clustered at the firm level in Columns (1)-(2) and are corrected by bootstrapping 200 times in Columns (3)-(4). Coefficients marked with *, **, and *** are significant at 10%, 5%, and 1%, respectively.

VARIABLES	**FTA**			
	Unmatched		**PS-matched**	
	OLS	**Ologit**	**OLS**	**Ologit**
	(1)	**(2)**	**(3)**	**(4)**
Dep_Board2001*Post	0.102***	1.272***	0.070***	0.998***
	(0.020)	(0.284)	(0.013)	(0.205)
CEOTEN	0.019***	0.305***	0.015***	0.286***
	(0.003)	(0.047)	(0.002)	(0.036)
OUTSIDE	0.004	-0.134	-0.067**	-1.384***
	(0.033)	(0.466)	(0.032)	(0.484)
FTA_1Y	0.091***	1.151**	0.138***	2.343***
	(0.035)	(0.534)	(0.029)	(0.455)
KNOWN	-0.308***	-4.262***	-0.453***	-7.174***
	(0.055)	(0.772)	(0.042)	(0.770)
EXECSEN	-0.087***	-1.265***	-0.091***	-1.482***
	(0.003)	(0.056)	(0.002)	(0.063)
FTA_1Y_Unknown	0.985**	9.882	-0.078	-3.078
	(0.449)	(10.145)	(0.231)	(3.169)
Female	-0.106	-1.572	-0.207***	-3.237***
	(0.097)	(1.268)	(0.075)	(0.844)
Ln(CEOAge)	0.216**	2.880**	0.139**	1.032
	(0.088)	(1.213)	(0.064)	(1.040)
CEO_OWN_{t-1}	-0.453***	-6.087**	-0.416***	-5.965***
	(0.163)	(2.382)	(0.136)	(2.026)
CEO_Chair	0.013	-0.009	0.023	-0.095
	(0.026)	(0.368)	(0.024)	(0.391)
$Ln(TotalAsset)_{t-1}$	0.048***	0.760***	0.058***	0.857***
	(0.017)	(0.193)	(0.011)	(0.166)
FirmAge	0.003***	0.032***	0.001	0.017
	(0.001)	(0.012)	(0.001)	(0.012)
$Segment_{t-1}$	-0.001*	-0.022**	-0.001	-0.020*
	(0.001)	(0.011)	(0.001)	(0.011)
Constant	-0.608		0.356	
	(0.390)		(0.254)	
Firm FE & Year FE (Dummies)	Y	Y	Y	Y
Observations	6,581	6,581	2,998	2,998
Adjusted-R^2 (Pseudo-R^2)	0.703	(0.5377)	0.745	(0.5115）

Table 5: Heterogeneity in the Degree of the Shock by the Board Regulation.

This table examines how changes in the fraction of top executives appointed (FTA) during a CEO's tenure are related to the degree to which a firm is affected by the independent board requirement. The dependent variable is FTA. The key independent variable is *Pct_Dep_Board2001*Post*, the percentage of non-independent directors in 2001 interacted with the post-regulation indicator. The regression does not include *Pct_Dep_Board2001* and *Post* as separate controls because of firm- and year fixed effects. Panel A and Panel B report estimation results with the unmatched sample and the propensity-score (PS) matched sample, respectively. The sample period is 1996 – 2006, excluding 2002. Definitions of all variables are provided in Appendix 1. All regressions control for year- and firm fixed effects. Robust standard errors reported in parentheses are clustered at the firm level in Column (1) and are corrected by bootstrapping 200 times in Column (2). Coefficients marked with *, **, and *** are significant at 10%, 5%, and 1%, respectively.

VARIABLES	**FTA**	
	Unmatched	**PS-matched**
	(1)	**(2)**
Pct_Dep_Board2001*Post	0.279***	0.199***
	(0.048)	(0.036)
CEOTEN	0.018***	0.015***
	(0.003)	(0.002)
OUTSIDE	0.005	-0.068**
	(0.033)	(0.031)
FTA_1Y	0.087**	0.140***
	(0.034)	(0.030)
KNOWN	-0.321***	-0.459***
	(0.054)	(0.049)
EXECSEN	-0.088***	-0.091***
	(0.003)	(0.003)
FTA_1Y_Unknown	1.016**	-0.065
	(0.456)	(0.218)
Female	-0.118	-0.224***
	(0.098)	(0.065)
Ln(CEOAge)	0.211**	0.139**
	(0.089)	(0.065)
CEO_OWN_{t-1}	-0.411**	-0.366***
	(0.159)	(0.140)
CEO_Chair	0.014	0.025
	(0.026)	(0.024)
$Ln(TotalAsset)_{t-1}$	0.048***	0.061***
	(0.017)	(0.013)
FirmAge	0.003***	0.001
	(0.001)	(0.001)
$Segment_{t-1}$	-0.002*	-0.001*
	(0.001)	(0.001)
Constant	-0.571	0.277
	(0.394)	(0.294)
Firm FE & Year FE	Y	Y
Observations	6,581	2,998
Adjusted-R^2	0.705	0.746

Table 6: Confounding Effects.

Dummy variables *2000, 2001, 2003, 2004, and 2005 and after* are equal to one if the observation is in 2000, 2001, 2003, 2004, and 2005-2006, respectively. Panels A and Panel B report results estimated with the unmatched and the propensity-score (PS) sample. The sample period is 1996 – 2006, excluding 2002. Definitions of variables are provided in Appendix 1. All regressions control for year- and firm fixed effects. The regression does not include *Dep_Board2001* and year indicator variables as separate controls because of firm- and year fixed effects. Robust standard errors reported in parentheses are clustered at the firm level in Column (1) and are corrected by bootstrapping 200 times in Column (2). Coefficients marked with *, **, and *** are significant at 10%, 5%, and 1%, respectively.

VARIABLES	**FTA**	
	Unmatched	**PS-matched**
	(1)	**(2)**
Dep_Board2001*2000	0.012	-0.000
	(0.020)	(0.019)
Dep_Board2001*2001	0.032	0.019
	(0.024)	(0.019)
Dep_Board2001*2003	0.080***	0.055***
	(0.024)	(0.020)
Dep_Board2001*2004	0.102***	0.069***
	(0.027)	(0.022)
Dep_Board2001*2005 and after	0.133***	0.087***
	(0.028)	(0.021)
CEOTEN	0.019***	0.015***
	(0.003)	(0.002)
OUTSIDE	0.004	-0.067**
	(0.033)	(0.031)
FTA_1Y	0.091***	0.137***
	(0.035)	(0.030)
KNOWN	-0.308***	-0.454***
	(0.055)	(0.055)
EXECSEN	-0.087***	-0.091***
	(0.003)	(0.002)
FTA_1Y_Unknown	0.974**	-0.084
	(0.450)	(0.238)
Female	-0.107	-0.209***
	(0.097)	(0.068)
Ln(CEOAge)	0.215**	0.139**
	(0.088)	(0.068)
CEO_OWN_{t-1}	-0.447***	-0.410***
	(0.163)	(0.126)
CEO_Chair	0.013	0.023
	(0.026)	(0.022)
$Ln(TotalAsset)_{t-1}$	0.048***	0.058***
	(0.017)	(0.011)
FirmAge	0.003***	0.001
	(0.001)	(0.001)
$Segment_{t-1}$	-0.001*	-0.001
	(0.001)	(0.001)
Constant	-0.600	0.351
	(0.389)	(0.275)
Firm FE & Year FE	Y	Y
Observations	6,581	2,998
Adjusted-R^2	0.703	0.745

Table 7: Alternative Definitions of FTA.

This table re-estimates the OLS regressions in Table 4 with three alternative measures of FTA. *WFTA* is FTA weighted by the sum of executives' salaries and bonuses; *AFTA,* an abnormal measure of FTA; and *WAFTA*, an abnormal measure of *WFTA*. Definitions of all variables are provided in Appendix 1. Panels A and B report results estimated with the unmatched sample and the propensity-score (PS) matched sample, respectively. The sample period is 1996 – 2006, excluding 2002. All regressions control for firm- and year fixed effects. The regression does not include *Dep_Board2001* and *Post* as separate controls because of firm- and year fixed effects. Robust standard errors reported in parentheses are clustered at the firm level in Panel A and are corrected by bootstrapping 200 times in Panel B. Coefficients marked with *, **, and *** are significant at 10%, 5%, and 1%, respectively.

	Panel A: Unmatched			Panel B: PS-matched		
VARIABLES	**WFTA**	**AFTA**	**WAFTA**	**WFTA**	**AFTA**	**WAFTA**
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
Pct_Dep_Board2001*Post	0.095***	0.088***	0.083***	0.057***	0.074***	0.067***
	(0.021)	(0.019)	(0.020)	(0.015)	(0.013)	(0.014)
CEOTEN	0.019***			0.016***		
	(0.003)			(0.002)		
OUTSIDE	-0.001			-0.083**		
	(0.034)			(0.037)		
FTA_1Y	0.078**			0.117***		
	(0.034)			(0.031)		
FTA_1Y_Unknown	1.027**			-0.108		
	(0.491)			(0.336)		
KNOWN	-0.289***			-0.456***		
	(0.057)			(0.055)		
EXECSEN	-0.086***			-0.090***		
	(0.003)			(0.002)		
Female	-0.145	-0.081	-0.120	-0.259***	-0.157*	-0.201*
	(0.099)	(0.108)	(0.109)	(0.089)	(0.088)	(0.106)
Ln(CEOAge)	0.203**	0.364***	0.360***	0.141**	0.251***	0.268***
	(0.091)	(0.069)	(0.070)	(0.067)	(0.051)	(0.048)
CEO_OWN_{t-1}	-0.433***	-0.307*	-0.287*	-0.426***	-0.238*	-0.246*
	(0.161)	(0.166)	(0.161)	(0.125)	(0.137)	(0.142)
CEO_Chair	0.010	0.013	0.011	0.013	0.020	0.009
	(0.026)	(0.024)	(0.025)	(0.023)	(0.023)	(0.021)
$Ln(TotalAsset)_{t-1}$	0.049***	0.057***	0.058***	0.058***	0.081***	0.083***
	(0.018)	(0.016)	(0.017)	(0.013)	(0.011)	(0.013)
FirmAge	0.003**	0.005***	0.005***	0.001	0.005***	0.005***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)	(0.002)
$Segment_{t-1}$	-0.001	0.001	0.001	-0.001	0.002**	0.002**
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Constant	-0.598	-1.986***	-1.976***	0.353	-1.710***	-1.788***
	(0.400)	(0.293)	(0.300)	(0.292)	(0.195)	(0.177)
Firm FE	Y	Y	Y	Y	Y	Y
Year FE	Y	N	N	Y	N	N
Observations	6,581	6,581	6,581	2,998	2,998	2,998
Adjusted-R^2	0.703	0.517	0.523	0.743	0.551	0.553

Table 8: CEO Turnovers and the Independent Board Requirement.

This table estimates the impact of the independent board requirement on CEO turnovers. The dependent variable is an indicator for CEO turnover, equal to one if a CEO in year *t* is not the same as the CEO in year *t-1*. Columns (1)-(2) and (3)-(4) report estimation results with the unmatched and propensity-score (PS) matched sample, respectively. The sample period is 1996 – 2006, excluding 2002. Definitions of all variables are provided in Appendix 1. All regressions are estimated by the firm level conditional logistic regressions and control for year dummies. Robust standard errors reported in parentheses are clustered at the firm level in Columns (1)-(2) and are corrected by bootstrapping 200 times in Columns (3)-(4). Coefficients marked with *, **, and *** are significant at 10%, 5%, and 1%, respectively.

	Unmatched		**PS-matched**	
	CEO_Turnover		**CEO_Turnover**	
VARIABLES	**(1)**	**(2)**	**(3)**	**(4)**
Dep_Board2001*Post	0.437	0.365	0.190	0.123
	(0.283)	(0.292)	(0.303)	(0.309)
$Return_{t-1}$	-0.248***	-0.299***	-0.186	-0.324**
	(0.090)	(0.094)	(0.148)	(0.159)
Dep_Board2001*Post*$Return_{t-1}$	-1.599***		-1.926***	
	(0.527)		(0.582)	
$Ln(TotalAsset)_{t-1}$	0.047	0.026	0.216	0.148
	(0.122)	(0.123)	(0.205)	(0.212)
$CEOTEN_{t-1}$	0.267***	0.267***	0.220***	0.219***
	(0.031)	(0.031)	(0.042)	(0.042)
CEO_OWN_{t-1}	-3.483	-3.378	-5.314	-5.170
	(2.483)	(2.445)	(3.609)	(3.446)
CEO_Chair_{t-1}	0.001	-0.001	0.182	0.193
	(0.211)	(0.212)	(0.330)	(0.333)
Year Dummies	Y	Y	Y	Y
Observations	5,670	5,670	2,383	2,383
pseudo-R-squared	0.174	0.170	0.174	0.162

Table 9: Turnovers in the List of Top Four Non-CEO Executives and the Independent Board Requirement

This table estimates the impact of the independent board requirement on turnovers in the list of top four non-CEO executives. The dependent variable is the percentage of new top four non-CEO executives who were not on the list of top four in the previous year. Columns (1)-(2) and (3)-(4) report estimation results with the unmatched and propensity-score (PS) matched sample, respectively. The sample period is 1996 – 2006, excluding 2002. Definitions of all variables are provided in Appendix 1. All regressions are estimated by the OLS with firm- and year fixed effects. Robust standard errors reported in parentheses are clustered at the firm level in Columns (1)-(2) and are corrected by bootstrapping 200 times in Columns (3)-(4). Coefficients marked with *, **, and *** are significant at 10%, 5%, and 1%, respectively.

	Unmatched		**PS-matched**	
	Pct_Exe_Turnover			
VARIABLES	**(1)**	**(2)**	**(3)**	**(4)**
Dep_Board2001*Post	0.048***	0.042***	0.027	0.022*
	(0.015)	(0.015)	(0.017)	(0.013)
$Return_{t-1}$	-0.010**	-0.011***	-0.010	-0.013**
	(0.004)	(0.004)	(0.006)	(0.006)
Dep_Board2001*Post*$Return_{t-1}$	-0.035**		-0.030**	
	(0.014)		(0.015)	
$Ln(TotalAsset)_{t-1}$	0.034***	0.034***	0.032***	0.031***
	(0.009)	(0.009)	(0.012)	(0.010)
$EXECSEN_{t-1}$	0.061***	0.061***	0.057***	0.057***
	(0.002)	(0.002)	(0.003)	(0.003)
$Avg\_EXE\_OWN_{t-1}$	0.269	0.269	0.217	0.216
	(0.266)	(0.267)	(0.393)	(0.368)
Constant	0.179***	0.183***	0.183**	0.192***
	(0.065)	(0.065)	(0.087)	(0.068)
Firm FE & Year FE	Y	Y	Y	Y
Observations	8,155	8,155	3,500	3,500
Adjusted R-squared	0.261	0.261	0.244	0.243

Table 10: The Type of Executives Dropped from the Top Four List and the Independent Board Requirement

This table estimates the impact of the independent board requirement on the likelihood of a top four non-CEO executive to be dropped from the list of top four non-CEO executives, separately for current CEOs' appointees, *Cur_CEO_Appt,* and previous CEOs' appointees, *Pre_CEO_Appt*. The dependent variable is an indicator equal to one if an executive on the top four list in year *t* is not on the list in year *t+1*. Columns (1) and (2) utilize the full executive panel data, while Columns (3) and (4) include only executives with long tenure on the list of top four non-CEO executives (*L-EXETEN* = 1 when an executive's tenure is above the sample median). The sample period is 1996 – 2006, excluding 2002. Definitions of all variables are provided in Appendix 1. All regressions are estimated by the firm level conditional logistic regressions and control for year dummies. Robust standard errors reported in parentheses are clustered at the firm level. Coefficients marked with *, **, and *** are significant at 10%, 5%, and 1%, respectively.

	Exe_Turnover			
	Cur_CEO_Appt	Pre_CEO_Appt	Cur_CEO_Appt & L_EXETEN=1	Pre_CEO_Appt & L_EXETEN=1
VARIABLES	(1)	(2)	(3)	(4)
Dep_Board2001*Post	-0.029	0.231**	-0.010	0.343***
	(0.130)	(0.102)	(0.282)	(0.121)
EXETEN	-0.011**	0.026***	-0.000	0.032***
	(0.005)	(0.004)	(0.009)	(0.004)
EXE_OWN	1.388	-1.239	-0.132	-1.034
	(1.135)	(0.998)	(0.994)	(1.023)
Return	-0.147***	-0.084***	-0.259***	-0.111***
	(0.048)	(0.024)	(0.095)	(0.037)
Ln(TotalAsset)	0.136**	0.143***	0.068	0.069
	(0.062)	(0.055)	(0.161)	(0.071)
Year Dummies	Y	Y	Y	Y
Observations	15,368	21,583	4,668	15,323
pseudo-R-squared	0.00437	0.00754	0.0123	0.0121

Table 11: Interactive Effects of Changes in FTA and the Independent Board Requirement on CEO Compensation and Firm Value.

This table estimates how changes in FTA after the board regulation, *ΔFTA*, affect the impact of the independent board requirement on CEO compensation and firm value. The dependent variables are changes in total CEO compensation in Column (1); changes in CEO Delta in Column (2); and changes in Tobin's Q in Column (3). The sample is cross-sectional and each observation is the difference in the averages of up to four years over 1998-2001 and 2003-2006 that overlap with the tenure of each CEO who was the CEO in 2001. Definitions of all variables are provided in Appendix 1. Robust standard errors reported in parentheses are clustered at the industry level, as defined by 3-digit SIC. Coefficients marked with *, **, and *** are significant at 10%, 5%, and 1%, respectively.

VARIABLES	**ΔLn(CEO_Comp)**	**ΔCEO_Delta**	**ΔTobin's Q**
	(1)	**(2)**	**(3)**
ΔFTA*Dep_Board2001	0.654**	-434.887*	-1.405
	(0.269)	(243.558)	(1.066)
Dep_Board2001	-0.191	209.629	0.275
	(0.117)	(131.439)	(0.285)
ΔFTA	-0.239*	401.187	-1.303*
	(0.134)	(273.468)	(0.742)
ΔDir_Tie	0.023	-9.000	-0.100
	(0.021)	(30.517)	(0.114)
ΔDir_Tie_UnKnown	0.007	-251.682*	-0.960
	(0.111)	(150.405)	(0.854)
ΔLn(TotalAssets)	0.288***	-155.027	-1.629***
	(0.069)	(98.965)	(0.452)
ΔSegment	-0.000	-5.507	0.010
	(0.007)	(14.000)	(0.016)
ΔEBITDA/TA	2.978***	-720.489	
	(0.387)	(883.499)	
ΔR&D/PPE	0.078	-190.449	0.059
	(0.188)	(128.191)	(0.731)
ΔRDUM	0.108	85.431	0.325
	(0.128)	(99.434)	(0.450)
ΔRisk	5.681*	7,089.039	-17.324
	(3.065)	(5,855.998)	(33.163)
ΔRiskD	-0.342**	-214.414	-1.044
	(0.173)	(269.327)	(1.043)
Constant	0.298***	-142.349	0.273*
	(0.062)	(88.528)	(0.144)
Observations	705	705	644
Adjusted-R^2	0.133	-0.005	0.102