Under Pressure: The Increasing Turnover-Performance Sensitivity for Corporate Directors

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Abstract

This paper examines the relation between firm performance and turnover for the directors of public companies over the last two decades. In the mid-2000s, firms with stock price performance in the lowest quartile of the sample exhibit a 15% greater likelihood of director turnover. By the late-2010s, this figure nearly doubles to 28%, a probability that is equivalent to the turnover-performance sensitivity (TPS) for CEOs. We document several factors that contribute to the increase in director TPS over time including trends towards independent board chairs and nominating committees. In addition, the increase in director TPS is most pronounced for firms with a lower local supply of prospective replacement directors and for firms with attentive institutional investors.

Keywords: Director turnover, turnover-performance sensitivity, director labor market
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1. Introduction

The fiduciary role of the corporate board of directors is to monitor and advise management and, more generally, to represent the interests of shareholders in a firm's business dealings (Fama, 1980, Fama and Jensen, 1983). Agency theory posits that directors should be exposed to the threat of replacement for poor performance as an incentive mechanism to align their interests with those of shareholders. In the first paper to systematically address the issue, Yermack (2004) documents a negative and statistically significant relation between firm performance and turnover for a firm's outside directors, although the author notes that "…it is less clear that the relation has sufficient strength to be economically important." In fact, the author finds "that the performance-turnover relation operates three to four times more strongly for CEOs than for outside directors."

While the sensitivity of director turnover to firm performance has historically been weak, there are reasons to believe that this sensitivity has increased over time. The last three decades have seen substantial changes to key aspects of governance including a reliance on outside unaffiliated directors, a declining prevalence of dual chairman/CEO roles and board classification, and increasingly active institutional investors. These changes have placed pressure on the tenure of corporate executives. For example, Guo and Masulis (2015) find that increases in board independence associated with changes in exchange listing requirements in 2003 led to higher turnover-performance sensitivity (TPS) for CEOs. Fos, Li and Tsoutsoura (2018) document that CEO TPS is higher when directors are closer to the end of their term. Bebchuk, Brav, Jiang and Keusch (2020) show that the presence of activist investors is positively correlated with CEO TPS.

Given these changes in the labor market for executives, it is reasonable to expect that corporate directors are also under greater scrutiny for their performance. For example, work in Bar-Hava, Gu and Lev (2020) and Gormley, Gupta, Matsa, Mortal and Yang (2023) suggests that

boards of public corporations have faced increasing scrutiny by institutional investors, regulators, and other stakeholders over the past three decades. There have also been significant shifts in the quality of internal governance practices for corporate boards. For example, Balsam, Puthenpurackal and Upadhyay (2016) find that public firms have increasingly relied on independent board leadership, and Ertimur, Ferri and Oesch (2015) document a trend towards majority voting requirements in director elections.

In this paper we examine how the turnover-performance sensitivity for corporate directors has changed over time. In addition to examining the secular variation in this important aspect of director incentives, we also provide new evidence on both the economic significance of this incentive for individual directors, as well as the mechanisms that may be at work to account for changes in director TPS over time. We begin by estimating the sensitivity of turnover to firm performance for independent directors of U.S. public firms from 2003 to 2019. The sample is drawn from the BoardEx database covering virtually all publicly traded firms, and consists of 362,571 director-firm-year observations. Our results indicate that directors are increasingly likely to lose their board seat following poor firm performance. Our estimates suggest that the likelihood of turnover for the directors of firms in the lowest quartile of industry-adjusted returns is approximately 15% in the mid-2000s. By the late 2010s, this probability almost doubles, to 28%. The increase in director TPS obtains across a variety of firm and director characteristics including firm size, board classification, tenure, committee membership, and leadership roles.

To provide additional context on the magnitude of director TPS, we benchmark our findings to the TPS observed for CEOs. Yermack (2004) reports that director TPS is only a fraction of that estimated for CEOs for a sample drawn from 1994-1996. Our results suggest that by the late 2010's this gap is almost entirely closed. Specifically, for the last five years of our sample the

probably of director turnover is 25% for firms in the lowest quartile of industry-adjusted performance compared to 28% for the CEOs of the same firms. The increase in TPS for corporate directors translates into a direct cost of lost compensation. We estimate that these direct costs increase by approximately 150% from 2003 to 2019. For comparison, the direct costs of turnover for CEOs increase by only 10% during the same interval, highlighting the dramatic increase in the expected cost of performance-related turnover for the directors of public companies.

The loss of a board seat may also result in material indirect costs for directors in the broader labor market. To pin down these indirect costs, we examine the future employment outcomes of directors that leave a board following poor firm performance. First, we consider whether turnover increases the likelihood of subsequent turnover by the same individual on a different board. Our findings indicate that director turnover following poor performance is associated with a 22 to 33% greater likelihood of subsequent turnover on a different board over the three years that follow. Notably, this ancillary turnover effect is strongest in the latter years (2009-2019) of the sample. Second, we explore the effect of performance-based turnover on the change in the number of directorships held by a director, and the probability that they gain a new board seat in the future. Directors that lose their seat following poor firm performance also experience a significant decrease in other directorships held, and are less likely to gain a future board seat. These effects are again concentrated at the end of the sample period. Overall, the indirect costs of director turnover following poor performance increased significantly over the sample period.

To better understand the drivers of the increase in the sensitivity of director turnover to firm performance over time, we consider a number of characteristics that likely influence director TPS. In particular, we examine the impact of time trends in (i) board leadership, (ii) nominating committee independence, (iii) local labor market supply, and (iv) institutional investor attention.

Independent board leadership may play a role in the evaluation of director performance, particularly in light of a sharp rise in the incidence of independent board chairs over our sample period; 26% of firms have an independent board chair in 2003 compared to 50% in 2019. We find that director TPS is 88% higher at firms with an independent board chair compared to firms with an executive or CEO chair. The effect of independent board leadership on director TPS largely manifests in the second half of our sample period suggesting the trend to independent board leadership contributes to the increasing director TPS. Given the potential for an endogenous relation between chair independence and director TPS, we use several methods to account for unmodeled selection including firm fixed effects, a staggered difference-in-difference framework, and an instrumental variables (IV) approach.

We also consider whether the independence of the nominating committee, which plays an important role in the director evaluation process, contributes to the increase in director TPS over this time. We exploit changes in the exchange listing requirements of the NYSE and NASDAQ in the early 2000s that required fully independent nominating committees. Our results suggest that firms exogenously forced to increase the independence of their nominating committee experience a significant increase in TPS following mandated compliance.

Knyazeva, Knyazeva, and Masulis (2013) find that a firm's ability to recruit independent directors is determined by the local supply of prospective directors. We therefore hypothesize that the depth of the local director labor market may also play a role in the sensitivity of director turnover to performance over time. In keeping with this hypothesis, we find that director TPS is significantly higher for firms located in areas with a greater supply of replacement directors. Notably, the positive relation between TPS and labor supply is not significant during the latter two thirds of the sample, a period that saw a substantial increase in remote meeting attendance. The

positive relation between director TPS and local labor supply is attenuated by an increase in director mobility. Specifically, the addition of direct airline routes is associated with an increase in director TPS for firms headquartered in markets with a lower supply of prospective directors.

Institutional investors play an important role in the governance of the firms they own, including decisions to replace corporate executives. Kempf, Manconi and Spalt (2016) find that firms with 'distracted' shareholders are less likely to fire their CEO for bad performance. Liu, Low, Masulis and Zhang (2020) also note that 'distracted' institutional investors are less likely to discipline ineffective directors with negative votes. Using the methodology of Kempf et al. (2016) we consider if institutional investor attention moderates director TPS. Our results indicate that director TPS declines in investor distraction, but only in the latter half of the sample. The greater influence of institutional investors on director TPS during this period coincides with amendments to Exchange Rule 14a-8 that allowed for shareholders proposals seeking direct proxy access.

Overall, our evidence indicates that the threat of turnover for poor performance has become an increasingly important and salient incentive for directors over the last two decades. These findings compliment earlier work on director turnover by revealing that director TPS is remarkably dynamic over time. The evidence also parallels work by Kaplan and Minton (2012) and Peters and Wagner (2014), who document an increase in TPS for corporate CEOs over time.

2. Sample Selection and Data Description

We obtain our sample of director-firm-year observations from BoardEx for the years 2003-2019. While the BoardEx database begins in 2000, we begin our sample in 2003 as this is the first year that BoardEx is fully populated, in keeping with prior studies such as Liu, et al., (2020). Our sample ends in 2019 to exclude years following the outbreak of COVID-19; a period with exceptionally low rates of turnover. BoardEx covers virtually all U.S. publicly traded firms and

includes 603,880 director-firm-year observations during our sample period. We merge director-firm-year observations with Compustat to obtain firm-level accounting data, with the Center for Research of Stock Prices (*CRSP*) database for stock returns, and with the Thomson Reuters Institutional Ownership database for institutional ownership. We exclude director-firm-year observations with missing values for returns, book value of assets, and institutional ownership yielding 514,781 director-firm-year observations.

To identify instances of director turnover, we follow a director from one firm fiscal year board report date on BoardEx to the next. Directors not listed at a subsequent report date are considered to have left a board. We exclude turnover attributable to death (reported by BoardEx) and also eliminate 30,829 director-firm-year observations with no subsequent report to ensure that none of our turnovers are due to acquisition, delisting or privatization. We remove 114,039 director-firm-year observations that are not classified as independent directors at the firm, and 7,342 director-firm-year observations with missing values for age, tenure and/or number of outside directorships. Our final sample consists of 362,571 (56,423) director-firm-year (firm-year) observations, comprised of 6,613 unique firms and 46,604 distinct directors. There are 27,312 instances of director turnover yielding an unconditional rate of turnover of 7.5%.

Panel A of Table 1 summarizes the director-level characteristics of our sample. The average independent director in our sample is 62 years old and has a board tenure of 7.8 years. Just over 42% of directors hold more than one public directorship, with 4% of directors gaining a new board seat in the prior year. Approximately, 4% of the director-firm-years are for an individual that also holds the title of CEO at a public company, and 58%, 54% and 47% of observations are for directors with seats on the audit, compensation and nominating committees, respectively. Just

over 13% of sample directors are female, and 44% are co-opted, defined as directors with tenure less than that of the current CEO (e.g. Coles, Daniel, and Naveen (2014)).

Panel B of Table 1 summarizes the firm-level measures used in our study. The average firm in the sample has an annual industry-adjusted stock return and stock return volatility of 1.5% and 38.2%, respectively. The median firm is 17 years old and has $860 million in assets (log transformed values reported in Table 1). Just over 12% of firm-years have a CEO turnover event. The average board size is just over 8.5 with roughly 75% independent directors.

3. How has Director TPS Changed Over Time?

3.1 Estimating Director TPS

To estimate the turnover-performance sensitivity for directors, we use regression specifications similar to those described in Yermack (2004) and Fahlenbrach, Low and Stulz (2017). Specifically, we estimate the determinants of individual director turnover using a linear probability model as follows:

$$\begin{aligned} Turnover_{i,j,t} = {} & \gamma_0 + \gamma_1 Industry\text{-}adjusted\ stock\ return_{i,j,t-1} + \gamma_2 Age\ (65\text{-}71)_{i,j,t-1} \\ & + \gamma_3 Age\ (72+)_{i,j,t-1} + \gamma_4 Holds\ additional\ board\ seat(s)_{i,j,t-1} \\ & + \gamma_5 Gained\ new\ board\ seat\ in\ prior\ year_{i,j,t-1} \\ & + \gamma_6 Current\ CEO\ at\ other\ firm_{i,j,t-1} + \gamma_7 Audit\ committee_{i,j,t-1} \\ & + \gamma_8 Compensation\ committee_{i,j,t-1} + \gamma_9 Nominating\ committee_{i,j,t-1} \\ & + \gamma_{10} Female_{i,j,t-1} + \gamma_{11} Tenure_{i,j,t-1} + \gamma_{12} Co\text{-}opted_{i,j,t-1} \\ & + \gamma_{13} CEO\ turnover_{i,j,t-1} + \gamma_{14} Firm\ age_{i,j,t-1} + \gamma_{15} Firm\ size_{i,j,t-1} \\ & + \gamma_{16} Return\ volatility_{i,j,t-1} + \gamma_{17} Board\ size_{i,j,t-1} \\ & + \gamma_{18} Board\ independence_{i,j,t-1} + \varepsilon_{i,j,t-1} \end{aligned} \quad (1)$$

where $Turnover_{i,j,t}$ is an indicator equal to one if director *i* at firm *j* experiences turnover during fiscal year *t* and is a function of prior firm stock performance, director attributes and firm characteristics.[1] The coefficient γ_1 represents an estimate of the sensitivity of director turnover to

[1] Cornelli, Kominek, and Ljungqvist (2012) and Guo and Masulis (2015) also use linear probability models in the context of estimating the likelihood of CEO turnover.

prior firm performance. We define *Industry-adjusted stock return*$_{i,j,t-1}$ as the annual buy-and-hold stock return adjusted by the average Fama-French 48 industry stock return. Alternatively, we define firm performance as an indicator equal to one if a firm's industry-adjusted stock return falls in the lowest quartile in a given sample year for ease of interpretation of the coefficient γ_1 (*Low industry-adjusted stock return*). Definitions of the other explanatory variables are in Appendix A.

If corporate directors are ultimately responsible for firm outcomes, we expect that turnover for these agents will largely be isolated to subsamples of firms that experience relatively poor performance. In Table IA.1 we report the results of regressions modeled as in Equation (1), that utilize a continuous measure of industry-adjusted performance as linear and quadratic (squared) terms. The results indicate that, as expected, there is substantial convexity in the relation between industry-adjusted firm performance and the likelihood of observing director turnover in the year that follows. Given this evidence, much of the remainder of this study focuses on TPS for directors as a function of a firm-year in the lowest quartile of industry-adjusted performance.

3.2 Univariate Analysis

Table 2 summarizes the annual point estimates of the turnover-performance sensitivity (TPS) for directors from 2003 to 2019, as well as the 3- and 5-year moving averages. For each year of our sample, we estimate equation (1) and report the turnover-performance sensitivity coefficient (γ_1) in the fourth column of the table. This coefficient can be interpreted as follows: the probability of director turnover increases by γ_1 percentage points if the firm's industry-adjusted stock return is in the lowest quartile of that sample year. For example, the TPS coefficient (γ_1) estimate in 2003 is 0.016 suggesting that the likelihood of director turnover increases by 1.6 percentage points. The 3-year moving average indicates that the TPS coefficient (γ_1) increased from 0.016 to 0.029 over the sample period; an 81% increase.

The fifth column of Table 2 reports the marginal effect derived from the TPS coefficient. For example, the TPS estimate in 2003 suggests a 26% greater probability of turnover attributable to poor performance relative to the unconditional probability that year.[2] As shown in columns 7 and 9 of the table, the 3- and 5-year moving averages of the marginal effect also increase steadily over the sample period. For example, the economic significance of the 3-year moving average increases from 23% to 34% over the sample period, which is a 45% increase in the economic effect of director TPS. In Figure 1, we plot annual director TPS coefficients, the fitted linear trend of the coefficients and the 3- and 5-year moving averages to characterize the change in TPS over time. In sum, the results of our baseline model indicate that there has been a significant increase in the sensitivity of director turnover related to firm performance over the last two decades.

3.3 Subsample Analysis

We consider the robustness of the increase in director TPS for various subsamples of firms and directors. We begin by exploring whether the trend varies with firm size and/or stock market index inclusion. In equilibrium matching models such as Gabaix and Landier (2008), CEOs with higher talent are matched to larger firms and receive greater compensation to reflect their higher marginal product. It is possible that more talented directors may match to boards of larger and more prestigious firms, and thus may be less likely to depart in the context of poor firm performance compared to directors at smaller firms. Consistent with this, Masulis and Mobbs (2014) find that directors are less willing to leave their relatively more prestigious directorships, even when firm performance is poor. Alternatively, directors of larger and more visible firms may be subject to more scrutiny from market participants such as analysts and institutions and therefore

[2] Calculated as the coefficient estimate (0.016) scaled by the unconditional rate of turnover for the sample in 2003 (6.2%).

may experience a higher TPS. We sort our sample firms annually by S&P 1500 index inclusion and book value of assets and plot the 5-year moving average of director TPS for each sort in Figure 2 (Panels A and B respectively). Our results suggest the directors of larger firms experience a lower TPS, however, both large and small firms exhibit an upward trend in the sensitivity over the sample period. For example, the 5-year moving average of director TPS for firms not in the S&P 1500 increases from 0.017 to 0.031 over the sample period, representing an 82% increase. The TPS estimate for directors at S&P 1500 firms increases from 0.010 to 0.019; a 90% increase. We document similar increases in director TPS based on sorts of firm size in Panel B of Figure 2.

Researchers including Hermalin and Weisbach (1988), Farrell and Whidbee (2000), and Yermack (2004) have documented that director departures are more likely in the context of contemporaneous CEO turnover. Thus, it is conceivable that the increase in director TPS is driven by an increased rate of CEO departures.[3] To consider this possibility, we sort sample firms annually into those that experienced a CEO turnover event in the current or prior fiscal year, and those that did not. We plot the 5-year moving average of director TPS for each group in Figure 3. While director TPS is indeed higher in years with CEO turnover, there is a substantial increase in TPS over time even absent CEO turnover. The TPS estimate for directors at firms without a CEO turnover event increases from 0.013 to 0.024 during the sample period, a 92% increase.

Director classification may also play a role in the rate of departure for a firm's directors. In the case of a classified board (versus unitary), only a portion of the directors are up for election each year. We sort sample firms annually into those that have a classified board and those that have a unitary board and plot the 5-year moving average of director TPS for each group in Figure

[3] Kaplan and Minton (2012) find that the rate of CEO departures increased in the early 2000s.

4. Director TPS increases for both subsamples; from 0.012 to 0.023 (92% increase) for classified boards, and from 0.016 to 0.030 (88% increase) for unitary boards.

It is also possible that the increasing trend in director TPS may vary with director attributes. Two findings in Yermack (2004) suggest that a director's tenure is related to the TPS. First, director departures in the context of poor performance are negatively correlated with board tenure. Second, directors appointed during a previous CEO's tenure are more likely to experience turnover. We sort our sample of director-firm-years annually by tenure (Panel A) and co-option (Panel B) and report results in Figure 5. We sort directors into three tenure-based groups by sample terciles (< 3 years; >= 3 years & < 8 years; >= 8 years of tenure). In Panel A of Figure 5, director TPS does not vary significantly with tenure, and all three groups experience an increase in TPS over time, including directors with the longest tenure. Panel B of the figure shows that TPS increases over time for directors who were and were not appointed by the current CEO.

Directors who sit on board committees or serve in leadership roles may be more insulated from turnover if they are better monitors or possess key firm-specific information. On the other hand, directors in these roles may be more likely to be held accountable for poor performance by outside investors. For example, Ertimur, Ferri and Maber (2012) find that compensation committee members at firms involved in option backdating scandals were more like to experience turnover. Figure 6 summarizes TPS over time sorted by director's committee roles (Panel A) or leadership role (Panel B). Panel A distinguishes between directors that sit on two or more of the three main board committees (audit, compensation and nominating), and those that sit on less than two. Panel B sorts directors into those that hold a leadership position (independent chair, lead independent director or committee chair) and those that do not. There is an increase in TPS over time for all of

these director-level sorts. Overall, the secular increase in director TPS is remarkably robust and obtains across a variety of firm and director characteristics.

3.4 Multivariate Analysis

In Table 3, we estimate the secular variation in director TPS in multivariate models. As described in Section 3.1, we use linear probability models to estimate the likelihood that an independent director leaves a board seat as a function of past firm performance, director attributes and firm characteristics. In all regressions, we include firm and year fixed effects and report *t*-statistics based on standard errors clustered at the firm level. We incorporate indicator variables for two time periods of 2009 to 2014, and 2015 to 2019, to estimate differences in director TPS over time.[4] Models 1 and 2 of Table 3 use a continuous measure of industry-adjusted stock return to estimate director TPS. The results in Model 1 suggest that, over the full sample period, a one standard deviation decrease in industry-adjusted stock return, is associated with a 7% greater likelihood of turnover for a given director.[5] In Model 2, we introduce the time indicator variables and their interactions with firm performance and find that director TPS has more than doubled over the sample period. In the first subperiod (2003-2008), a one standard deviation decrease in lagged industry-adjusted stock return is associated with a 4.9% greater probability of director turnover.[6] In the last subperiod (2015-2019), a one standard deviation decrease in lagged industry-adjusted stock return is association with a 12.3% greater likelihood of director turnover.[7]

[4] Alternatively, we use one indicator variable for the second half of the sample (2012 to 2019) with qualitatively similar results.
[5] The marginal effect is calculated as the coefficient (-0.011) multiplied by industry-adjusted stock return standard deviation (0.457) and then scaled by the unconditional rate of director turnover (0.075).
[6] The unconditional annual rate of turnover during the time period 2003-2008 is 7.19%.
[7] The unconditional annual rate of turnover during the time period 2015-2019 is 8.42%.

In Models 3 and 4 of Table 3, we use an indicator equal to one if the firm's industry-adjusted return falls in the lowest quartile of the sample for a given year, and zero otherwise.[8] The inferences drawn from Models 1 and 2 of the table are unchanged in these specifications. The results in Model 4 indicate that during the 2003 to 2008 subperiod, the likelihood of turnover increases by 1.1 percentage points for directors at firms in the bottom quartile of performance; a 15% increase relative to the unconditional rate of turnover in this period. In the 2015 to 2019 period, the director TPS doubles to 2.2 percentage points, which is a 28% increase in the likelihood of turnover for directors in the bottom quartile of performance in 2015-2019 time period.

3.5 The Economic Importance of Director TPS

Yermack (2004) notes that '…the association between poor company performance and higher outside director replacement represents a statistically significant finding, but it is less clear that the relation has sufficient strength to be economically important.' In this section, we revisit the economic importance of director TPS for our sample, and how it has changed over time.

3.5.1 Comparing Director and CEO TPS

We follow Yermack (2004), and compare the TPS for independent directors in our sample to the TPS for CEOs. Given that BoardEx does not explicitly track CEOs that do not also have a board seat, we rely on a sample of 27,216 firm-years drawn from the Execucomp database to identify instances of CEO turnover, and match this to a firm-year subsample of the BoardEx data to obtain a comparable subsample of director turnover events.[9] To provide a baseline for CEO TPS, Table IA.2 of the internet appendix summarizes the results of linear probability models of

[8] Our results are robust to defining prior poor firm performance as the lowest quintile or decile of industry-adjusted stock return.

[9] The average (median) firm in this subsample has $11,577 ($2,424) million in assets compared to the full sample average (median) of $6,421 ($860) million.

the likelihood that a CEO leaves a firm as a function of prior firm performance, controlling for a variety of CEO and firm characteristics.[10] The results in Model 1 suggest that for a one standard deviation decrease in industry-adjusted stock return, the likelihood of CEO turnover increases by 16% for the full sample period.[11] In Model 2, we introduce the time indicator variables and their interactions with prior firm performance. The results indicate that CEO TPS does not change significantly over time. Models 3 and 4 utilize an indicator variable equal to one when a firm's industry-adjusted stock return falls in the lowest quartile of the sample in a given year. These specifications mirror the non-linear nature of director TPS.

Table 4 compares the TPS of CEOs and directors for the subsample of firm-years covered on Execucomp and BoardEx. The implied probabilities are calculated as the average predicted value across all observations using the coefficients in Model 4, Panel A (B) of Table IA.2 for CEOs (directors). The table summarizes the implied probabilities of turnover for delineated by industry-adjusted stock return in the top three quartiles, and the lowest quartile of the sample year.

Panel A of Table 4 reports implied probabilities for independent directors over the full sample, and three subsamples (2003-2008, 2009-2014, and 2015-2019). Panel B provides a similar analysis for CEOs. The average implied probability of turnover for directors following performance in the top three quartiles is 7.1% for the full sample, which is comparable to the unconditional probability (7.3%). The average probability of director turnover following industry-adjusted performance in the lowest quartile is 8.1%. In short, directors have a 1.0 percentage point (14%) higher rate of turnover after years in the lowest quartile of industry-adjusted performance.

[10] Given that there are multiple directors for every CEO, and that it is extremely unlikely that an entire board will be replaced at a given time, it follows that director TPS will be lower than that for CEOs. The unconditional rate of CEO turnover is 10.5% for the Execucomp subsample, and 7.5% (7.28%) for the full sample (Execucomp matched) of independent directors. With this in mind, director TPS is still a relevant measure of the incentives for directors tied to prospective turnover.

[11] The marginal effect is calculated as the coefficient (-0.047) multiplied by industry-adjusted stock return standard deviation (0.365) and then scaled by the unconditional rate of CEO turnover (0.105).

The probability of director turnover increases substantially over the last five sample years, driven primarily by an increasing rate of director turnover following poor performance. In stark contrast, the results in Panel B indicate that CEO TPS following poor performance decreased over the same sample period. Our results suggest that the impact of poor performance on director turnover increases to a level that is comparable to CEO turnover by the end of the sample period.

3.5.2 Direct Financial Cost of an Increase in Director TPS

Next, we consider the direct financial cost of lost compensation on directors tied to the loss of a board seat over our sample period. Similar to Yermack (2004), we estimate an incentive-based measure of the expected financial cost to a director per $1,000 change in shareholder wealth; computed by dividing the estimated TPS by the market capitalization of the median firm and then multiplying by the present value of income that a director lost upon leaving a board seat.[12]

Table 5 summarizes the direct financial cost associated with TPS over the full sample, and three subsamples (2003-2008, 2009-2014, and 2015-2019). Panel A includes all 362,571 independent director-firm-years and Panels B and C use the subsample of firm-years covered on Execucomp and BoardEx. In Panel A the estimated cost per $1,000 change in shareholder value for all directors is $0.014. This cost increases significantly over time, from $0.009 in the mid-2000s to $0.022 by the 2015-2019 time period. We find a similar increase in the direct financial cost for the matched subsample of directors in Panel B ($0.004 to $0.011). In contrast, Panel C reports that the financial impact of the TPS for CEOs has remained relatively stable over time. Overall, the results in Table 5 suggest that the expected financial cost to a director associated with TPS increased by 150% over our sample period compared to an increase of only 10% for CEOs.

[12] The present value of lifetime income is calculated using the sample median director (CEO) tenure, sample median annual director (CEO) compensation and a discount rate of 3%.

3.5.2 Evidence from the Labor Market for Directors

In this section we examine whether director TPS also has indirect costs for directors in the form of a loss of future directorships. For the threat of replacement to be economically meaningful, we should observe post-turnover career consequences in the labor market for directors, particularly following poor firm performance. While our focus is on the implications of performance-related turnover for the career outcomes of independent directors, other researchers have focused on the labor market consequences for directors in different contexts. Gilson (1990) shows that outside directors of firms in financial distress hold fewer additional board seats following their departure. Harford (2003) finds that outside directors of firms who reject a takeover offer experience a decline in boards seats. Srinivasan (2005) reports a decrease in other board seats held for directors after earnings restatements. Fich and Shivdasani (2007) show that directors of firms facing lawsuits experience a decline in the number of board seats they hold.[13] Fos and Tsoutsoura (2014) note that directors experience a decrease in board seats following proxy contests.

Our first analysis examines whether the likelihood of a director's turnover in a given year is affected by their performance-based turnover at another public firm in the recent past. Panel A of Table 6 uses the same base specifications as Table 3, adding an indicator variable equal to one for directors who exited a board seat at another public board following poor firm performance in the prior three years (poor performance turnover). We interact this measure with indicator variables for the second (2009-2014) and third (2015-2019) subsamples to capture any differences in the labor market consequences of performance-based turnover over time. For brevity, coefficients for director and firm controls are suppressed, but have a similar sign and magnitude

[13] Dou (2017) reports that preemptive resignations before lawsuits and earnings restatements do not insulate directors from adverse labor market consequences.

as in Table 3. Model 1 includes all director-firm-year observations, while Model 2 only includes observations for directors younger than 72 years old to account for retirements.

The results in Panel A of Table 6 indicate that poor performance turnover at another firm significantly increases the likelihood of director turnover, but only in the latter portion of the sample. Model 1 suggests that performance-based turnover no effect on subsequent turnover in the first period (2003-2008), but increases the likelihood of turnover by 1.6 and 2.8 percentage points in the second (2009-2014) and third (2015-2019) periods, respectively. This represents an increase in the probability of turnover of 22% and 33% relative to the unconditional rate of turnover for the respective time periods. We find consistent results when limiting the sample to only directors less than 72 years old in Model 2. Overall, directors leaving board seats in the context of poor firm performance are increasingly penalized in the director labor market.

Next, we examine the impact of performance-based turnover for a director on the change in the number of directorships they hold, and the probability they gain a new board seat. We limit the sample to directors that experience turnover and measure the change in the number of directorships and the probability of gaining a new board seat over a three-year window following turnover. Panel B of Table 6 summarizes OLS regressions estimating the change in the number of public board seats (Models 1 and 2) and the likelihood of obtaining a new public directorship (Models 3 and 4) over the three-year window following turnover. We use indicator variables for the second (2009-2014) and third (2015-2019) time periods to capture differences in outcomes over time. The average change in the number of board seats over a three-year period is -0.09, while the unconditional probability of gaining a new board seat over a three-year period is 7.7%.

The results in Panel B of Table 6 reveal a negative relation between turnover in the context of poor performance and a director's future labor market opportunities. Model 1 suggests that

performance-based turnover has no effect on the change in future board seats in the first or second time periods, but has a significantly negative effect in the third time period of our sample (2015-2019). The results in Model 3 yield a similar conclusion; performance-based turnover does not have an effect on the probability of gaining a new board seat until the 2015-2019 sample period. Directors that leave a board seat in the context of poor performance experience a reduction in the change in the number of future board seats of roughly 75% relative to the average change.[14] We find consistent results limiting the sample to only directors less than 72 years old (Models 2 and 4). Overall, the results presented in Table 6 indicate that the labor market consequences of performance-based turnover for directors have increased significantly over time.

4. Why has Director TPS Increased Over Time?

4.1 Board Leadership

One aspect of board structure that may impact director turnover is the independence of the board chair. Jensen (1993) suggests that the board may not be able to monitor management effectively without an independent board chair. Consistent with this conjecture, Goyal and Park (2002) find that CEO TPS is significantly lower when the CEO also serves as board chair. Independent board leadership also likely influences director TPS. In 2019, 42% of Fortune 100 firms reported that the independent board chair leads the director evaluation process.[15] In our sample, there is a significant trend towards independent board leadership with 26% of firms reporting an independent board chair in 2003, compared to over 50% in 2019.

[14] The marginal effect is calculated as the coefficient (-0.073) scaled by the average change in the number of future board seats in the following three years (-0.093).

[15] Improving Board Performance Through Effective Eevaluation", Ernst & Young Center for Board Matters, October 2018.

Table 7 summarizes the results of regressions relating independent board leadership to director TPS. Panel A replicates the base specifications in Table 3, and adds an indicator variable equal to one when the board has an independent chair, and an interaction between this indicator and lagged firm performance. The interaction captures variation in director TPS related to board leadership, and a triple interaction term, that includes a dummy variable equal to one for the latter half of the sample (2012-2019), estimates this effect over time.

The results in Model 1 of Table 7 indicate that director TPS is 88% higher at firms with an independent board chair relative to firms with an executive or CEO chair. Model 2 indicates that the likelihood of director turnover is 45% higher with an independent board chair when industry-adjusted performance is in the bottom quartile. Models 3 and 4 suggest that the effect of independent board leadership on director TPS is most pronounced in latter half of the sample.

While the specifications in Panel A of Table 7 include firm fixed effects, it is possible that a correlation between independent chairs and director TPS is the byproduct of unmodeled selection. We account for selection in two ways. First, we follow Baker, Larcker and Wang (2022) and utilize a staggered difference-in-difference framework. The treatment sample is comprised of firms that switch from an executive/CEO board chair to an independent one, where the first year of the independent chair is considered the event year. The control sample is a matched sample of firms with an executive/CEO board chair, with matching conducted with replacement based on event year, Fama-French 48 industry classification, and a 20% firm size bandwidth. We require that both the treatment and control firms have at least two firm-years in the pre- and post-period. The sample consists of 1,083 (9,133) treatment firms (firm-years) and 2,689 (22,869) control firms (firm-years), which scales to 60,426 (142,798) treatment (control) director-firm-years. The diff-in-diff specifications include cohort-by-firm and cohort-by-year fixed effects. A cohort is defined

as a matched treatment firm to control firm(s) group. Thus, the variation isolated is the effect of an independent chair on director TPS within the fixed effect groups.

Panel B of Table 7 presents the results of the staggered difference-in-difference modeling the impact of the introduction of an independent chair on director TPS. *Treatment* is an indicator equal to one if the firm introduces an independent board chair. *Post* is an indicator equal to one for all firm-years following the switch from executive chair to independent chair (event year). The triple interaction of *Treatment, Post* and industry-adjusted return captures any change in the TPS of directors for treatment firms relative to control firms following the introduction of an independent board chair. In Models 1 and 2, the coefficient on the triple interaction is positive and statistically significant indicating that director TPS is higher following a change to independent board chairs. The coefficient in Model 2 indicates that directors at treated firms in the bottom quartile of stock returns are 2.2 percentage points more likely to turn over following the introduction of an independent chair compared to matched control firms with an executive chair; a 31% increase to the unconditional probability of turnover for this matched sample of directors.

Even with the inclusion of high-dimensional fixed effects, the of results in Panel B may still suffer from an endogeneity problem if an unobservable firm characteristic influences both the selection of an independent chair and the increase in director TPS. We address this issue with an instrumental variables approach. To instrument for the presence of an independent board chair, we use the percentage of directors (at the focal firm) who also have a board seat at a different publicly-traded firm that has an independent chair. The use of an overlap-based instrument for internal governance practices following Bouwman (2011) who argues that peer firms' governance

structures have a causal effect on a firm's own governance choices. Notably, board leadership of overlapping board seats is unrelated to the performance of the focal firm.[16]

Panel C of Table 7 presents the results of the two-stage least squares (2SLS) instrumental variable analysis. Given that our focus in explaining director turnover is the interaction between prior firm performance and the presence of an independent chair, the independent chair variable and its interaction with industry-adjusted performance are two endogenous variables in the first stage regressions. Thus, we regress the independent chair indicator and the interaction between this variable and industry-adjusted stock performance on the instrumental variable (Board overlap of independent chair firms), the interaction between the instrument and firm performance, and the other controls from equation (1). In the second stage, we estimate the likelihood of director turnover using the instrumented independent chair variable, the instrumented interaction term between independent chair and prior stock performance and the other controls used in the first-stage regression.

Models 1 and 2 of Panel C present the first stage results. The instrumental variables are significantly correlated with each of the respective endogenous variables. The F-statistics (24.50 in Model 1 and 119.28 in Model 2) are higher than the critical value proposed by Stock and Yogo (2005). Model 3 reports the second stage estimating the effect of the instrumented independent chair on director TPS. The significant negative coefficient for the interaction between instrumented industry-adjusted returns and independent chair suggests that, even after controlling for endogeneity, the turnover-performance sensitivity for directors is higher for boards with an independent chair.[17]

[16] We also use a geography-based instrument to identify the presence of an independent board chair following the methodology of Karpoff, Schonlau and Wehrly (2017) and find similar results.

[17] We find consistent results if we use the indicator measure of low industry-adjusted stock returns as the measure of prior firm performance.

4.2 Nominating Committee Independence

Prior researchers including Weisbach (1988), Huson, Parrino, and Starks (2001) and Guo and Masulis (2015) have documented that board independence has a positive effect on CEO TPS. It is plausible that board independence may also play a material role in the TPS for directors. To consider this possibility, we evaluate whether the independence of the nominating committee has a positive influence on director TPS. Our focus on the composition of the nominating committee reflects the fact that it is explicitly responsible for evaluating the performance of executives and directors.[18] It is possible that the relation between the composition of the committee and director TPS may be endogenous, thus we exploit the exogenous changes to the exchange listing requirements of the NYSE/NASDAQ in the early 2000s that mandated full independence for nominating committees. Guo and Masulis find that non-compliant firms exhibited an increase in CEO TPS following the imposition of this requirement, consistent with an improvement in monitoring. To consider whether this effect extends to directors of the firm board, we follow the sample design and methodology of Guo and Masulis and examine director TPS following a change in the composition of a nominating committee.

We construct a sample of firm-years from the ISS Directors database from 1998-2009. For a firm to be included it must have data available for all years from 2001 to 2005. This restriction allows us to classify firms as compliant or non-compliant in 2001, the last year before the new listing rules, and also assures that the same firms are subject to required compliance by 2005. Guo and Masulis (2015) find that the increase in CEO TPS largely obtains for noncompliant firms that implemented the greatest change in the composition of the nominating committee to achieve

[18] See for example Gua and Masulis (2015). Ernst &Young reports that in 2018, 69% of Fortune 100 companies disclosed that their nominating committee had a direct role in director evaluation ("Improving Board Performance through Effective Evaluation", *EY Center for Board Matters*, October 2018).

independence. Given this, we define treated firms as those without a majority independent nominating committee in 2001, and control firms as those with a majority independent nominating committee the same year.[19] As in Gou and Masulis we create a matched sample of treated and control firms from a propensity score matching model using data from 1998 to 2000 to predict the likelihood that a firm is noncompliant with the listing requirement.[20] We match treated firms to one or more control firms in 2001 from the same Fama-French 48 industry classification within a propensity score radius of 0.15. This results in a sample of 1,709 (3,118) treated (control) firm-years and 10,420 (24,800) treated (control) director-firm-years from 2001-2009.

Panel A of Figure 7 reports the average percentage of independent directors on the nominating committee for treatment and control firms. As expected, we observe a significant increase in nominating committee independence for treatment firms from 2001 to 2005. Panel B of Figure 7 plots the 5-year moving average of director TPS for treatment and control firms based on the regression specification outlined in Figure 1. Prior to the implementation of the new listing rules there is a clear difference in director TPS between the two groups; the TPS for noncompliant firms is significantly lower than control firms. As the treatment firms increase nominating committee independence, director TPS for these firms also increases significantly.

Table 8 reports the results of a difference-in-difference framework analyzing the effect of mandated nominating committee independence on director TPS. Models 1 and 2 estimate director-level specifications similar to Table 3 with the addition of the following variables: *Post*, which is an indicator equal to one for 2005, the first year of mandated compliance, and later years and *Treatment*, which is an indicator equal to one for non-compliant firms. The specifications also

[19] We do not find any significant changes in director TPS for firms that had a majority, but not fully independent nominating committee.
[20] Results of the propensity score matching model are included in Table IA.3.

include interactions between *Post*, *Treatment* and the measure firm performance (continuous measure in Model 1 and indicator measure in Model 2). The triple interaction is the coefficient of interest estimating the change in director TPS for treatment firms following forced compliance, relative to control firms. The specifications include firm and year fixed effects as well as interactions between firm performance and year fixed effects to allow director TPS to vary over time. For brevity, the coefficients for director and firm controls and the interactions between performance and year fixed effects are suppressed, but all have a similar sign, magnitude and significance as in Table 3.

The results in Table 8 suggest that firms experience a significant increase in director TPS following exchange-mandated nominating committee independence. The coefficients on the interaction between *Treatment* and the performance measures in Models 1 and 2 indicate that the turnover-performance sensitivity was lower for noncompliant firms prior to forced compliance compared to the control sample of firms. The triple interaction term, however, suggests that director TPS for treated firms increases significantly following mandated independence.

4.3 Local Director Labor Market

A firm's ability to recruit independent directors is positively correlated with the local supply of prospective directors (Knyazeva, Knyazeva, and Masulis, 2013). In most of the theoretical literature on executive turnover, dismissal is predicated on the observed performance of the agent relative to the expected performance of a replacement.[21] Therefore, it is plausible that the depth of potential replacement directors in the local labor market increases the propensity that a committee will remove a director following poor firm performance. Using the methodology of Knyazeva et al. (2013), we consider whether the depth of the local supply of prospective directors

[21] See, for example Hirshleifer and Thakor (1994, 1998), Hermalin and Weisbach (1998, 2003) and Warther (1998).

plays a role in the documented increase in director TPS over our sample period. We define the supply of directors in the local labor market as the log of the number of non-financial firms outside the firm's industry within a 60-mile radius of the firm's headquarters. The depth of the local labor market is plausibly exogeneous given that firm location is determined well before the observation of firm performance.

Figure 8 plots the 5-year moving average of director TPS for tercile sorts on the depth of the local supply of prospective directors. Our results suggest the directors of firms in the top two terciles of local labor supply experience significantly higher TPS compared to firms in the bottom tercile of local labor supply in the first third of our sample period. This result is consistent with the notion that firms located in areas with a ready supply of replacement directors are more likely to remove a director for poor performance. This difference disappears by the middle of the sample period. Overall, Figure 8 suggests that directors at firms with low local supply of replacement directors exhibit a greater director TPS, particularly early in the sample period.

In Table 9, we summarize linear probability models similar to Models 2 and 4 of Table 3. In Panel A, we examine two subsamples: firms with local labor supply in the bottom tercile (Models 1 and 3) and firms with local labor supply in the top two terciles (Models 2 and 4). For brevity, the coefficients for director and firm controls are suppressed, but all have a similar sign, magnitude and significance as in Table 3. The results of Models 1 and 2 suggest that director TPS is lower for firms with a thin local labor market during the 2003-2008 period.[22] Notably, the difference in director TPS across the two subsamples of market depth becomes insignificantly different from zero from 2009 through the end of the sample, suggesting that the impact of a thin local labor market on director TPS is attenuated over time. The coefficients in Model 3 indicate

[22] The *p*-value for the difference between the two modeled coefficients in Models 1 and 2 is 0.09, and 0.01 for the difference in coefficients in Models 3 and 4.

that during the 2009 to 2014 (2015-2019) subperiod, the likelihood of turnover increases by 1.3 (1.8) percentage points for directors at firms in the bottom quartile of performance; a 19% (23%) increase in the unconditional rate of turnover for directors in this subsample and period.

Our finding that director TPS increases over time for firms located in thin labor markets suggests that firms may rely less on geographically proximate directors over time. One possible explanation for this finding is that boards may have increasingly relied on remote synchronous meetings and virtual shareholder meetings reducing the burden on non-local directors (e.g. Brochet, Chychyla and Ferri (2023) and Cai, Jiang and Kang (2023)). In addition, director mobility has likely increased with the introduction of new direct airline routes flown in the U.S. over the sample period as suggested in Bernstein, Giroud and Townsend (2016). Any increase in director mobility will lower the cost of board serve and have the greatest impact on firms with a relatively low supply of local prospective directors. To assess this possibility, we examine director TPS conditioned on both the depth of the local labor market and the number of direct airline routes available.

Model 1(2) of Panel B of Table 9 includes director-firm-year observations in the bottom (top two) tercile(s) of direct airline routes at airports within a 60-mile radius of the firm's headquarters.[23] The increase in director TPS over time for firms in thin local labor markets is concentrated in areas with a higher quantity of direct airline route and thus greater access to non-local directors. Model 1 yields insignificant coefficients for the TPS interaction terms in the 2009-2014 and 2015-2019 subperiods, but are statistically significant in Model 2. The coefficients in Model 2 indicate that during the 2009-2014 (2015-2019) subperiod, the likelihood of turnover increases by 2.1 (2.5) percentage points for directors at firms in the bottom quartile of performance;

[23] For firms in the bottom (top two) tercile(s) of direct airline routes available, the median number of direct airline routes at airports with a 60-mile radius of the firm's headquarters is 15 (62).

a 30% (29%) increase in the unconditional rate of turnover for directors in this subsample and period. This result is consistent with the notion that director mobility is associated with an increase in director TPS for firms with a low supply of local replacement directors.

4.4 Institutional Investor Attention

Prior research, beginning with Denis, Denis and Sarin (1997) suggests that monitoring by institutional investors can impact TPS for corporate executives. More recent work in Kempf et al. (2016) suggests that distracted institutions, proxied by industry return shocks to their investment portfolio, may be less effective monitors. For example, firms with distracted institutional investors are more likely to announce value-destroying acquisitions, are more likely to opportunistically time CEO stock option grants, and are less likely to fire their CEO for poor performance. Liu et al. (2020) also find that distracted institutional investors are less likely to discipline ineffective directors with negative votes. Using the methodology of Kempf et al. we consider whether institutional investor attention affects TPS for directors. Investor distraction is a firm-level proxy for how much the 'representative' institutional investor in a given firm (*f*) is distracted and is defined for each firm (*f*) and calendar quarter (*q*) as:

$$D_{fq} = \sum_{i \epsilon F_{q-1}} \sum_{IND \neq IND_f} w_{ifq-1} \times w_{iq-1}^{IND} \times IS_q^{IND}$$

where F_{q-1} denotes the set of firm i's institutional investors at the end of quarter *q-1*, *IND* is a given Fama-French 12 industry, and IND_f denotes firm *f*'s Fama-French industry. IS_q^{IND} captures whether a distracting event occurs in an industry other than IND_f, and w_{iq-1}^{IND} captures how much investors *i* cares about the other industry. The weight w_{ifq-1} captures how important investor *i* is for firm *f*, and w_{iq-1}^{IND} is the weight of industry *IND* in the portfolio of investor *i*. *IS* is an indicator variable

equal to one if an industry has the highest or lowest return across all 12 Fama-French industries in a given quarter q. We measure the weight to investor *i* of firm *f* in investor *i*'s portfolio as:

$$w_{ifq-1} = \frac{QPFweight_{ifq-1} + QPercOwn_{ifq-1}}{\sum_{i \epsilon F_{q-1}} (QPFweight_{ifq-1} + QPercOwn_{ifq-1})}$$

where $PercOwn_{ifq-1}$ is the fraction of firm *f*'s shares held by investor *i*, and $PFweight_{ifq-1}$ is the market value weight of firm *f* in investor *i*'s portfolio. To minimize the impact of outliers, we sort all stocks held by investor *i* in quarter *q-1* by $PFweight_{ifq-1}$ into quintiles, denoted $QPFweight_{ifq-1}$. We make a similar adjustment for $PercOwn_{ifq-1}$. In order to create an annual firm-level measure, we use the median value of D_{fq} over the prior four quarters as our measure of investor distraction.[24]

While there is no reason to believe that the impact of investors distraction on director TPS would vary over time, per se, it is possible that the efficacy of institutions as monitors may have changed during the sample period. Specifically, the September 2011, amendment to Rule 14a-8 of the Securities Exchange Act allowed shareholders to submit proposals seeking direct proxy access, and removed blanket restrictions allowing proposals concerning proxy access to be excluded from a firm's voting materials. Bhandari, Iliev and Kalodimos (2021) contend that expanded proxy access presented a "credible threat" to entrenched management, and turned what were previously "rubber stamp" proxy votes into a more contentious process. Given this regulatory update, we expect that the impact of institutional monitoring on director TPS will increase as they are more readily able to influence director elections through proxy access. This effect will be attenuated, however, when institutional owners are distracted.

[24] We find similar results if we use the mean value or the value from the quarter closest to the fiscal year end.

In Table 10, we summarize linear probability models similar to equation (1), adding our measure of firm-level institutional investor distraction and its interaction with prior firm performance. We also create a triple interaction term with investor distraction, prior firm performance and a time indicator variable for the second half of the sample (2012-2019). Importantly, this time period coincides with increased proxy access. For brevity, the coefficients for director and firm controls are suppressed, but all have a similar sign, magnitude and significance as in Table 3. The results presented in the Table indicate that director TPS is negatively related to investor distraction in the latter half of the sample. For example, the negative and statistically significantly coefficient on the triple interaction term in Model 2 suggests that director TPS decreases with investor distraction in the 2012-2019 time period; where a one standard deviation increase in distraction decreases director TPS by 30%.[25]

5. Conclusion

We examine performance-based turnover on corporate boards and find that the threat of turnover for poor performance for these agents has increased substantially over the past two decades. Firm performance in the lowest quartile of industry-adjusted stock returns increases the likelihood of director turnover by 15% in the mid-2000s compared to 28% by the late-2010s, which represents an 87% increase in the marginal effect of this incentive over our sample period. This result is robust as it obtains across various subsamples of firm and director types. Our evidence complements prior studies that document that the sensitivity of CEO turnover to firm performance has also increased over time.

[25] The marginal effect is calculated as the coefficient (-0.089) multiplied by the standard deviation of investor distraction (0.082) and then scaled by the coefficients capturing the director TPS in the 2012-2019 period (0.006 + 0.018).

The economic importance of director TPS as an incentive mechanism has also significantly increased over time. We find that poor firm performance has a similar effect on the probably of director and CEO turnover by the late-2010s. The probably of director turnover increases by 25% following poor firm performance compared to 28% for CEOs at the end of our sample. We also explore whether directors experience indirect costs in the labor market related to performance-based turnover. Our evidence suggests that turnover in the context of poor firm performance has stronger effects on future employment outcomes for directors over time. For example, directors that depart following poor firm performance experience a significant decrease in other directorships held and are less likely to gain a future board seat. These effects are again concentrated toward the end of the sample period. The increasing labor market consequences of director turnover are consistent with our evidence that the threat of replacement has become a more economically meaningful incentive for directors.

We also identify several channels that help explain the increase in director TPS over time. First, the increase in director turnover-performance sensitivity we document coincides with a trend towards independent board leadership suggesting the importance of independence in the director evaluation process. We find that director TPS is significantly higher at firms with an independent board chair compared to firms with an executive or CEO chair and this effect manifests in the second half of our sample period. Second, we consider the independence of the nominating committee, which plays an important role in the director evaluation process and find a significant increase in director TPS following mandated independence of nominating committees. Third, a firm's ability to recruit independent directors is positively correlated with the local supply of prospective directors. We find that director TPS improves over time for firms that are located in areas with less director labor supply, a result that is consistent with greater director mobility over

our sample. Finally, prior research suggests that institutional investor monitoring plays a significant role in CEO turnover decisions. Our results indicate that director TPS is significantly negatively related to institutional investor distraction, but only in the latter half of the sample.

Overall, our results are consistent with Fama (1980) and Fama and Jensen (1983) who contend that outside directors have incentives to be effective monitors to signal their value in the director labor market. Our findings provide broad support for the notion that independent directors are increasingly disciplined for poor firm performance and experience reputational consequences in the director labor market. The threat of replacement, particularly in the context of poor firm performance, presents an economically significant incentive for directors.

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Appendix A: Variable Definitions

	Variable Definition
Panel A: Director Characteristics	
Age	Director age in years
Hold additional seats	Indicator equal to one if director holds additional directorships at another public firm
Gain new seats in prior year	Indicator equal to one if director gains an additional directorship at another public firm in the past year
Current CEO at other firm	Indicator equal to one if director is currently a CEO of another public firm
Audit committee	Indicator equal to one if director serves on the audit committee
Compensation committee	Indicator equal to one if director serves on the compensation committee
Nominating committee	Indicator equal to one if director serves on the nominating committee
Tenure	Director tenure in years
Female	Indicator equal to one if director is female
Co-opted	Indicator equal to one if the director's tenure is less than the current CEO's tenure
Panel B: Firm Characteristics	
Industry-adjusted stock return	Annual buy-and-hold return adjusted by the average Fama-French 48 industry return based on all firms in CRSP
CEO turnover	Indicator equal to one if CEO turnover occurs during the current fiscal year, zero otherwise
Firm age	The natural log of firm age in years
Firm size	The natural log of total book value of assets
Return volatility	Annualized standard deviation of monthly stock returns in prior fiscal year
Board size	Total number of directors on the board
Board independence	Number of independent directors scaled by total number of directors on the board
Independent chair	Indicator equal to one if board chair is an independent director
Local director labor market	Defined as in Knyazeva, Knyazeva and Masulis (2013) as the natural log of the number of non-financial firms headquartered within a 60-mile radius of the firm, excluding local firms in the same 4-digit SIC industry
Institutional investor distraction	Defined as in Kempf, Manconi and Spalt (2017) as a firm-level proxy for how much institutional investors are distracted. It is the weighted average distraction of institutional investors. We calculate investor-level distraction as the weighted average return shocks across industries (Fama-French 12 industries) unrelated to the focal firm, held by the investor.

Figure 1: Turnover Performance Sensitivity over Time

The figure presents the annual estimates of director turnover-performance sensitivity (γ_1) from 2003 to 2019. We use the following linear probability model to estimate director turnover-performance sensitivity (TPS) each year:

$$\begin{aligned} Turnover_{i,j,t} = {} & \gamma_0 + \gamma_1 Industry\text{-}adjusted\ stock\ return_{i,j,t-1} + \gamma_2 Age\ (65\text{-}71)_{i,j,t-1} + \gamma_3 Age\ (72+)_{i,j,t-1} \\ & + \gamma_4 Holds\ additional\ board\ seat(s)_{i,j,t-1} + \gamma_5 Gained\ new\ board\ seat\ in\ prior\ year_{i,j,t-1} \\ & + \gamma_6 Current\ CEO\ at\ other\ firm_{i,j,t-1} + \gamma_7 Audit\ committee_{i,j,t-1} + \gamma_8 Compensation\ committee_{i,j,t-1} \\ & + \gamma_9 Nominating\ committee_{i,j,t-1} + \gamma_{10} Female_{i,j,t-1} + \gamma_{11} Tenure_{i,j,t-1} + \gamma_{12} Co\text{-}opted_{i,j,t-1} \\ & + \gamma_{13} CEO\ turnover_{i,j,t-1} + \gamma_{14} Firm\ age_{i,j,t-1} + \gamma_{15} Firm\ size_{i,j,t-1} + \gamma_{16} Return\ volatility_{i,j,t-1} \\ & + \gamma_{17} Board\ size_{i,j,t-1} + \gamma_{18} Board\ independence_{i,j,t-1} + \varepsilon_{i,j,t-1} \end{aligned}$$

where $Turnover_{i,j,t}$ is equal to one if director *i* at firm *j* experiences turnover in year *t*. The independent variable of interest is $Industry\text{-}adjusted\ stock\ return_{i,j,t-1}$ which is an indicator variable equal to one if industry-adjusted stock return at firm *j* in year *t-1* falls in the lowest quartile of performance for the sample year and zero otherwise. The coefficient γ_1 captures the sensitivity of director turnover to prior poor firm performance (TPS) and is plotted each year from 2003 to 2019. The figure also includes a fitted linear trend line of the annual TPS estimates (γ_1). In addition, the 3-year and 5-year moving averages of the γ_1 coefficient are plotted over time. All other independent variables are defined in Appendix A. All variables are winsorized at the 1st and 99th percentiles to mitigate the impact of extreme outliers. The sample period is from 2003 to 2019 and includes 362,571 director-firm-year observations.

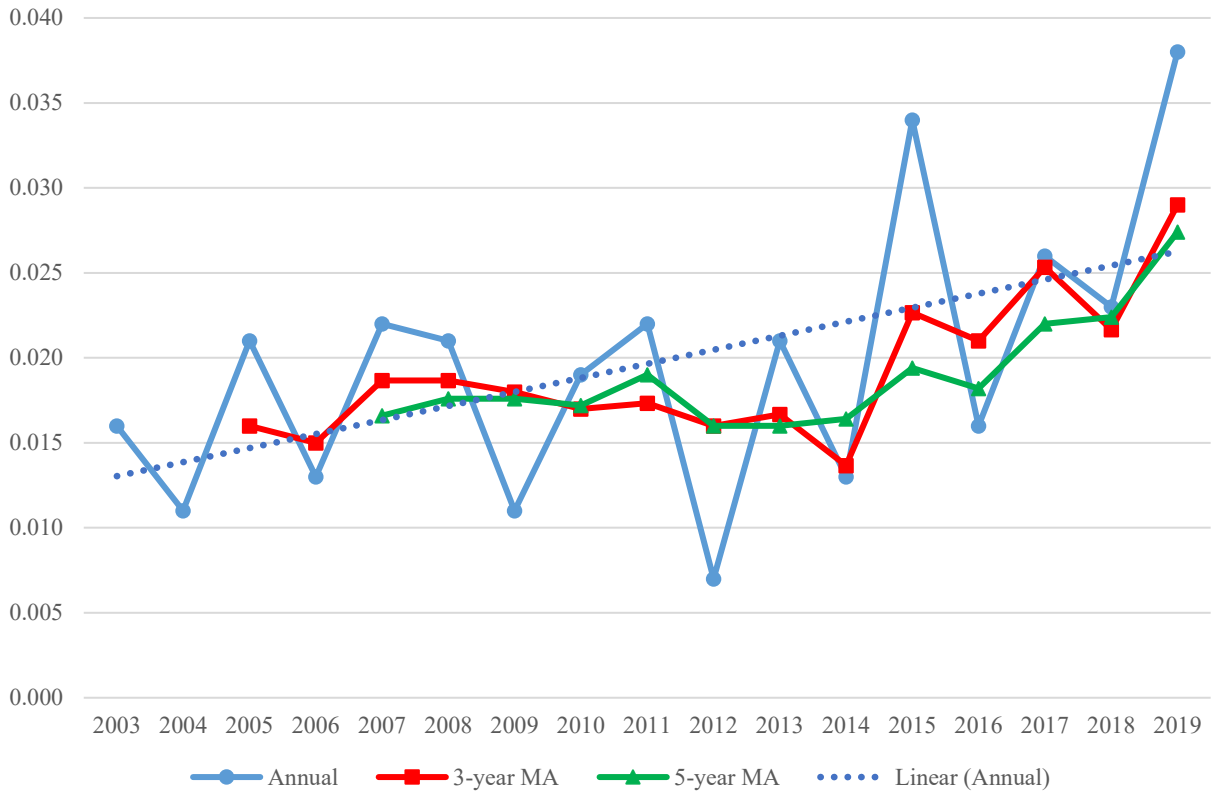
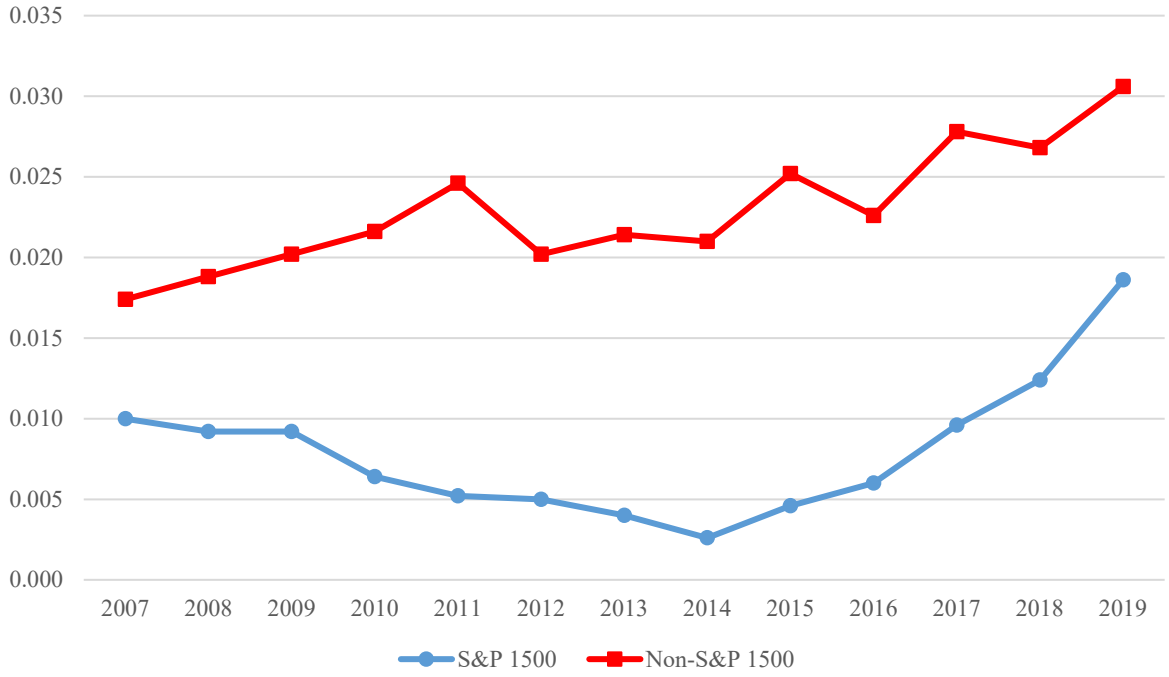


Figure 2: Turnover Performance Sensitivity by S&P Index and Firm Size

The figure presents the 5-year moving average of director TPS based on S&P Index and firm size terciles. Panel A sorts firms into inclusion in the S&P 1500 Index. Panel B sorts firms into terciles based on their firm size (defined as the book value of total assets) each year. We estimate director TPS in the same method described in Figure 1 for each firm sort and plot the 5-year moving average of the director TPS for each group. The year reported on the x-axis represents the last year of the 5-year window.

Panel A: S&P 1500 Index



Panel B: Firm Size

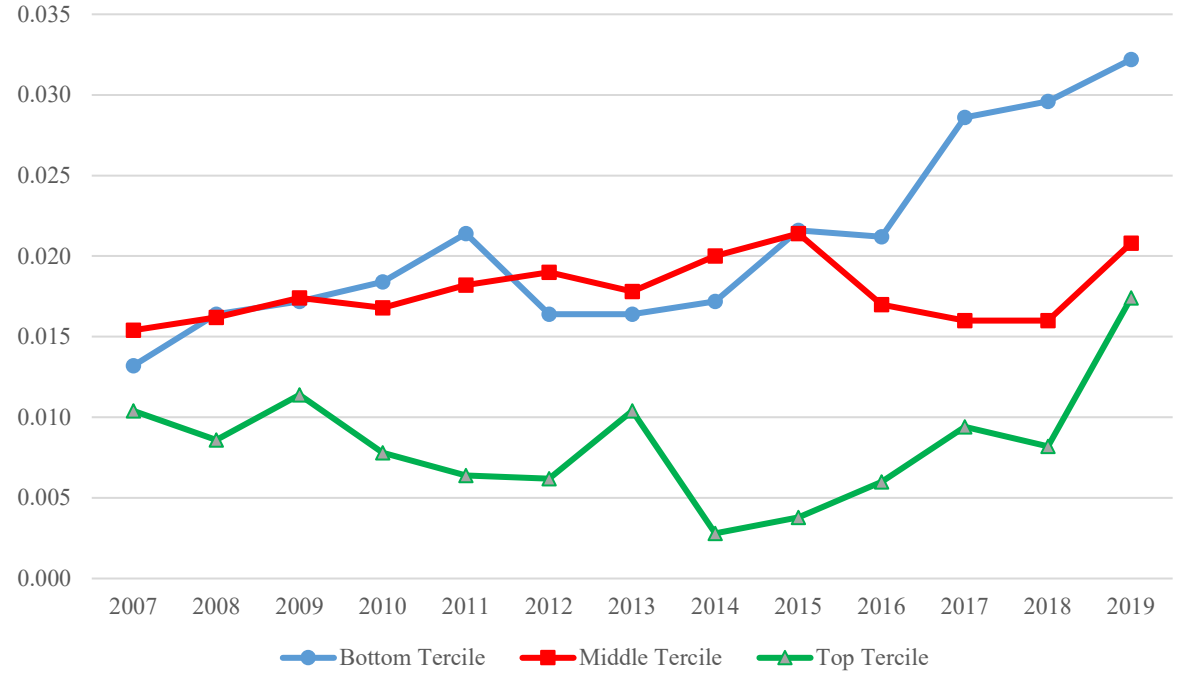


Figure 3: Turnover Performance Sensitivity by CEO Turnover

The figure presents the 5-year moving average of director TPS by CEO turnover. Every year, we sort firms by whether there was a CEO turnover event in the current or prior fiscal year and estimate director TPS for each group following the same method described in Figure 1. We then plot the 5-year moving average of the director TPS for each group. The year reported on the x-axis represents the last year of the 5-year window.

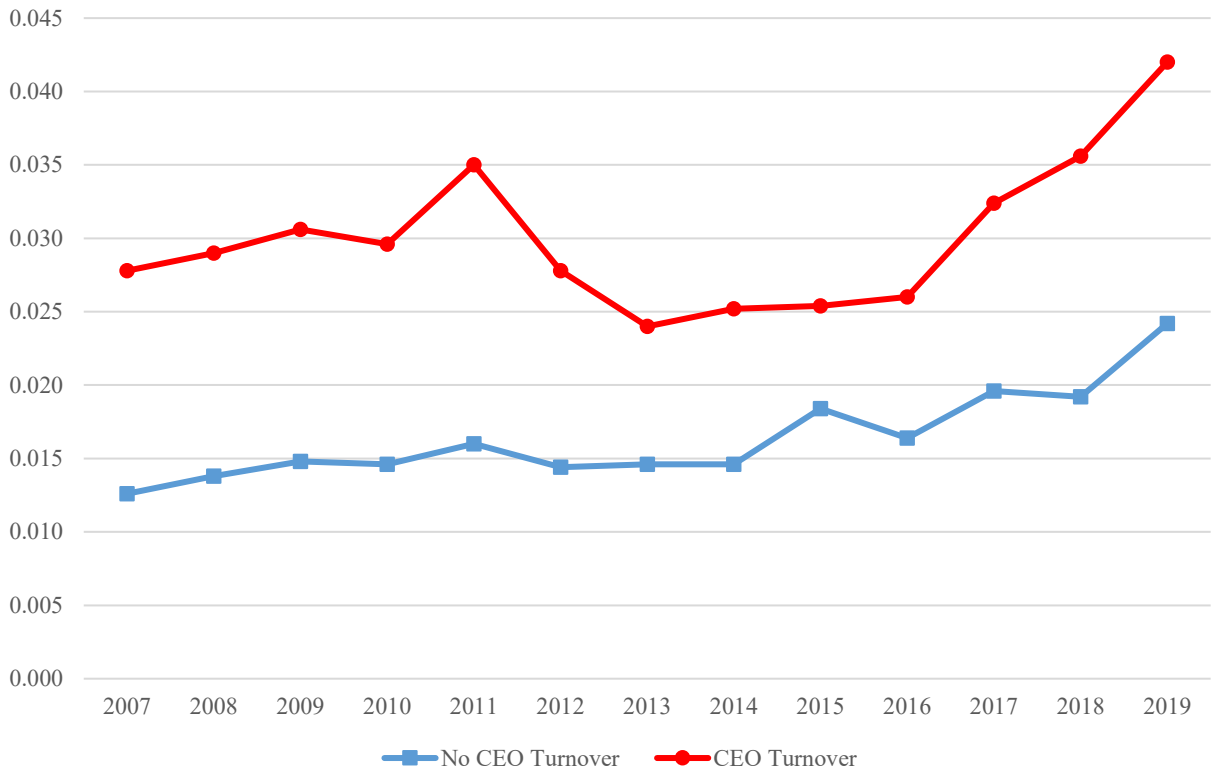


Figure 4: Turnover Performance Sensitivity by Board Classification

The figure presents the 5-year moving average of director TPS by board classification. Every year, we sort firms by board classification and estimate director TPS for each group following the same method described in Figure 1. We then plot the 5-year moving average of the director TPS for each group. The year reported on the x-axis represents the last year of the 5-year window.

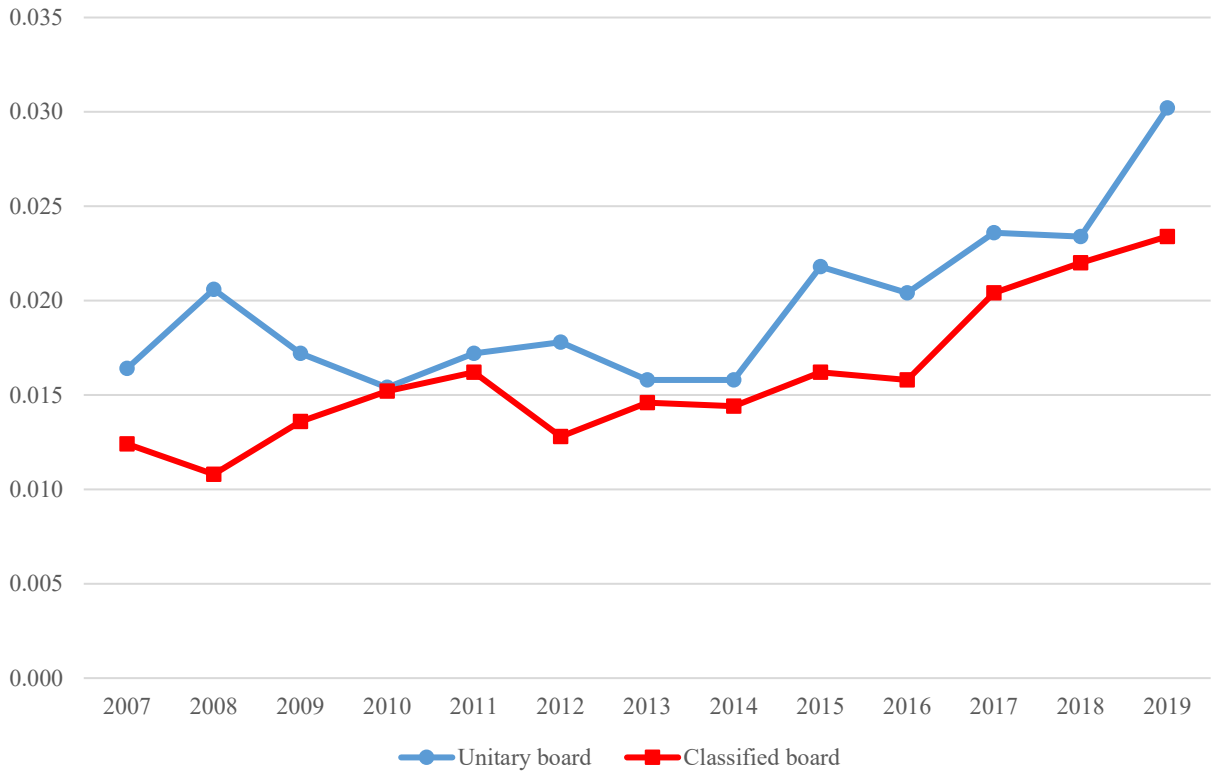
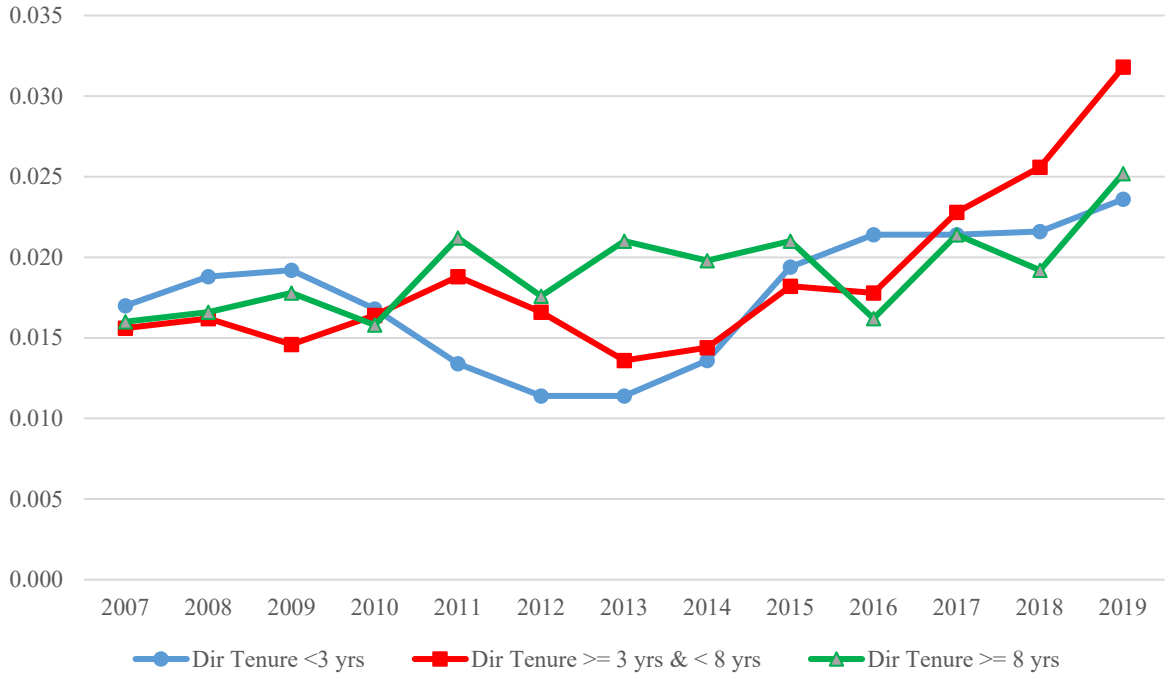


Figure 5: Turnover Performance Sensitivity by Director Tenure and Co-option

The figure presents the 5-year moving average of director TPS based on director tenure and co-option. Panel A sorts directors into three groups based on tenure each year. Panel B sorts directors based on co-option (whether the CEO has a longer tenure than the director) each year. We estimate director TPS in the same method described in Figure 1 for each firm sort and plot the 5-year moving average of the director TPS for each group. The year reported on the x-axis represents the last year of the 5-year window.

Panel A: Director Tenure



Panel B: Director Co-option

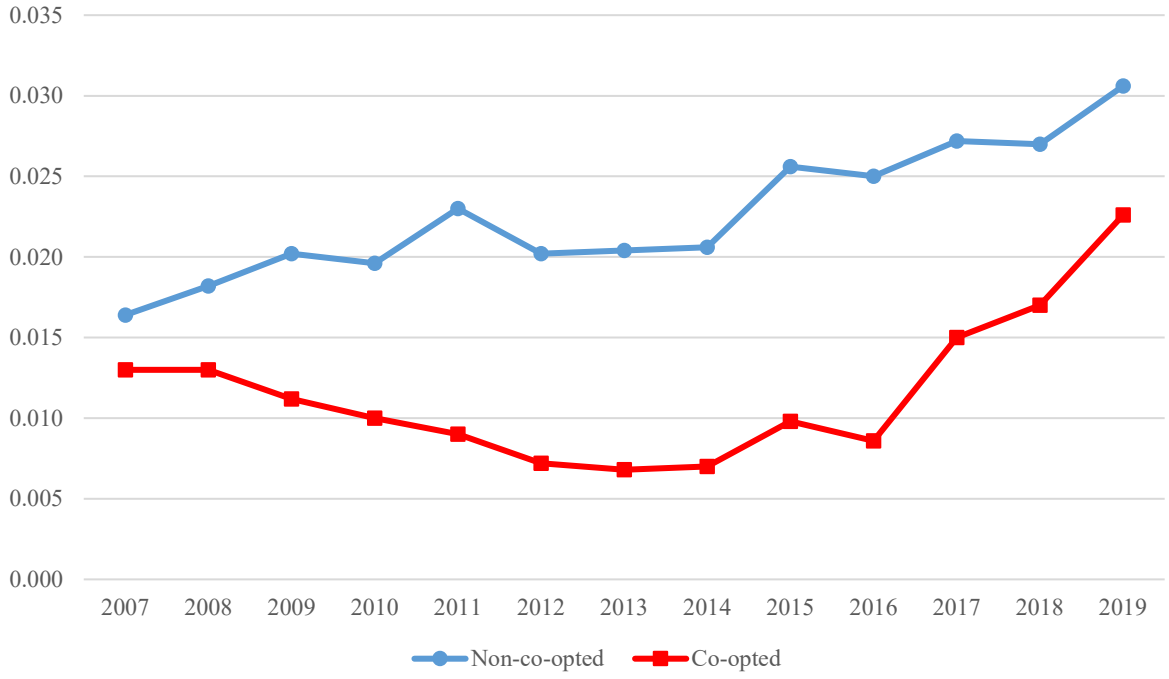
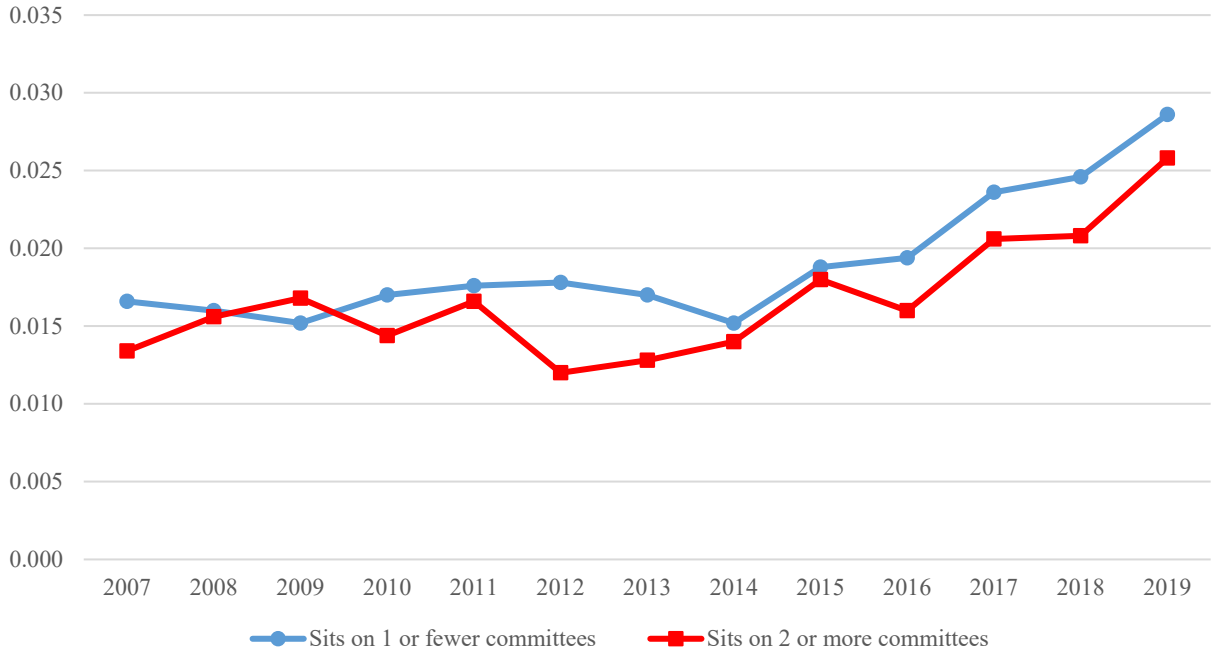


Figure 6: Turnover Performance Sensitivity by Committee Membership & Leadership Position

The figure presents the 5-year moving average of director TPS based on committee membership. Panel A sorts directors based on the number of committee memberships held (two or more committee membership versus 1 or fewer). Panel B sorts directors based on whether they hold a leadership position (board chair, lead independent director or committee chair). We estimate director TPS in the same method described in Figure 1 for each firm sort and plot the 5-year moving average of the director TPS for each group. The year reported on the x-axis represents the last year of the 5-year window.

Panel A: Number of Committee Memberships



Panel B: Leadership Position

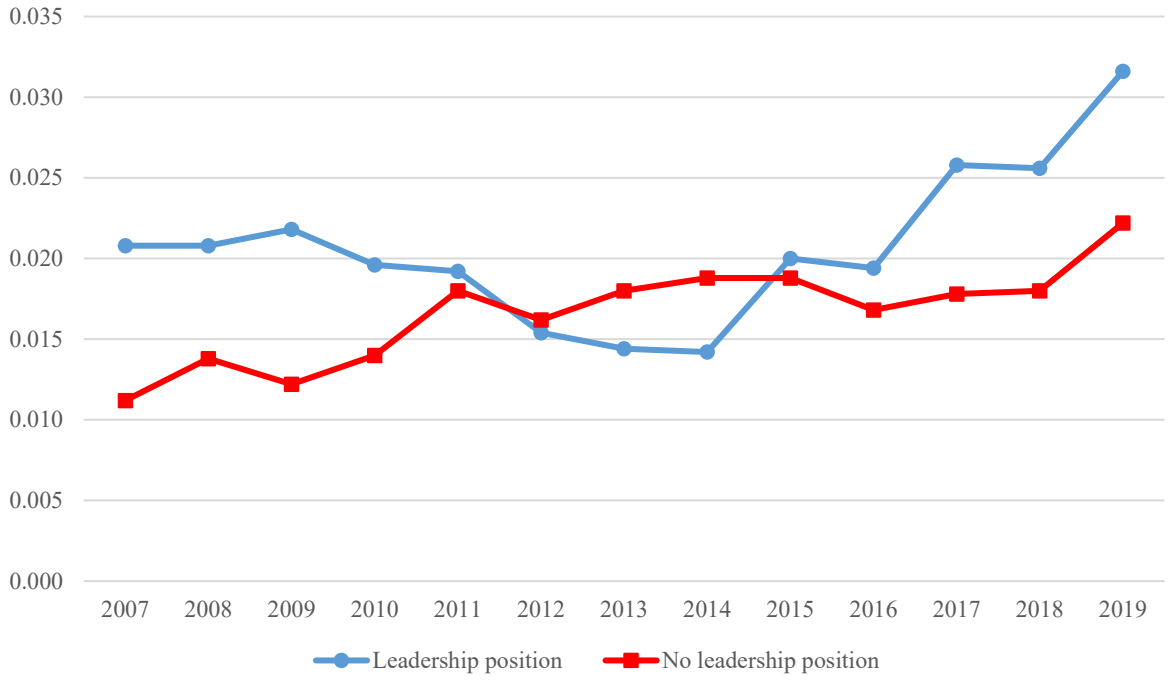
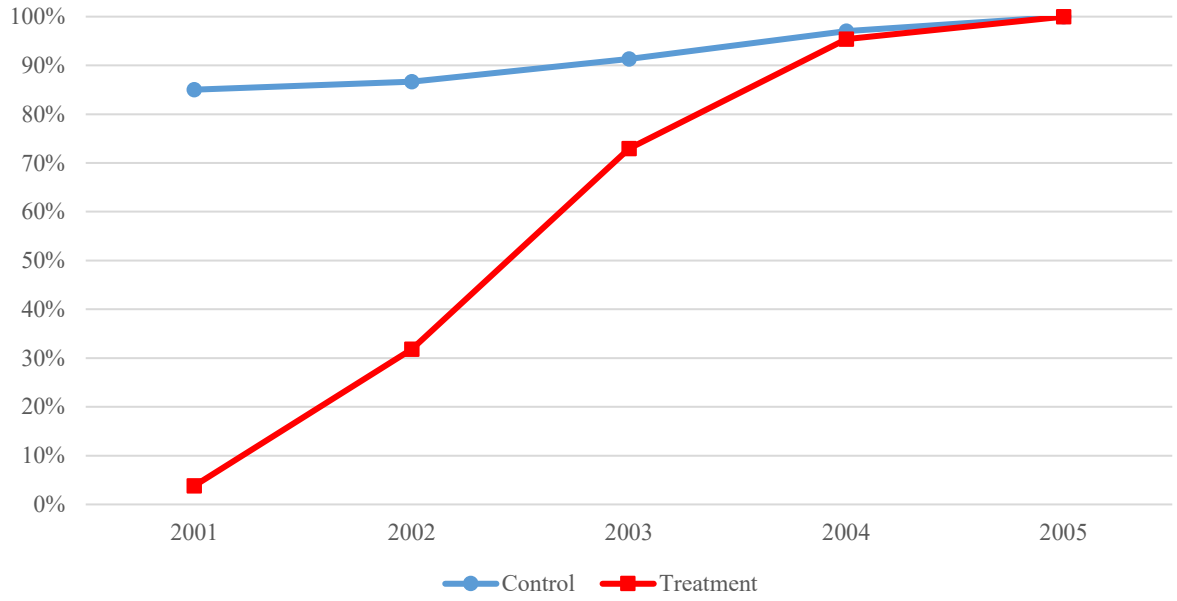


Figure 7: Turnover Performance Sensitivity by Nominating Committee Independence

The figure presents the 5-year moving average of director TPS based on an exogenous change in nominating committee independence. The sample includes 35,220 director-firm-year observations between 2001 and 2009 for a propensity score matched sample. The matched sample is based on the independence of the firm's nominating committee in 2001. Firms with nominating committee independence less than (greater than or equal to) 50% in 2001 are classified as treatment (control) firms. Firms were required to have a fully independent nominating committee by 2005. Panel A reports the average nominating committee independence for each group from 2001-2005. Panel B estimates director TPS for each group following the same method described in Figure 1. We then obtain the 5-year moving average of the director TPS for each group. The year reported on the x-axis represents the mid-point year of the 5-year window.

Panel A: Nominating committee independence



Panel B: Turnover-performance sensitivity by nominating committee independence

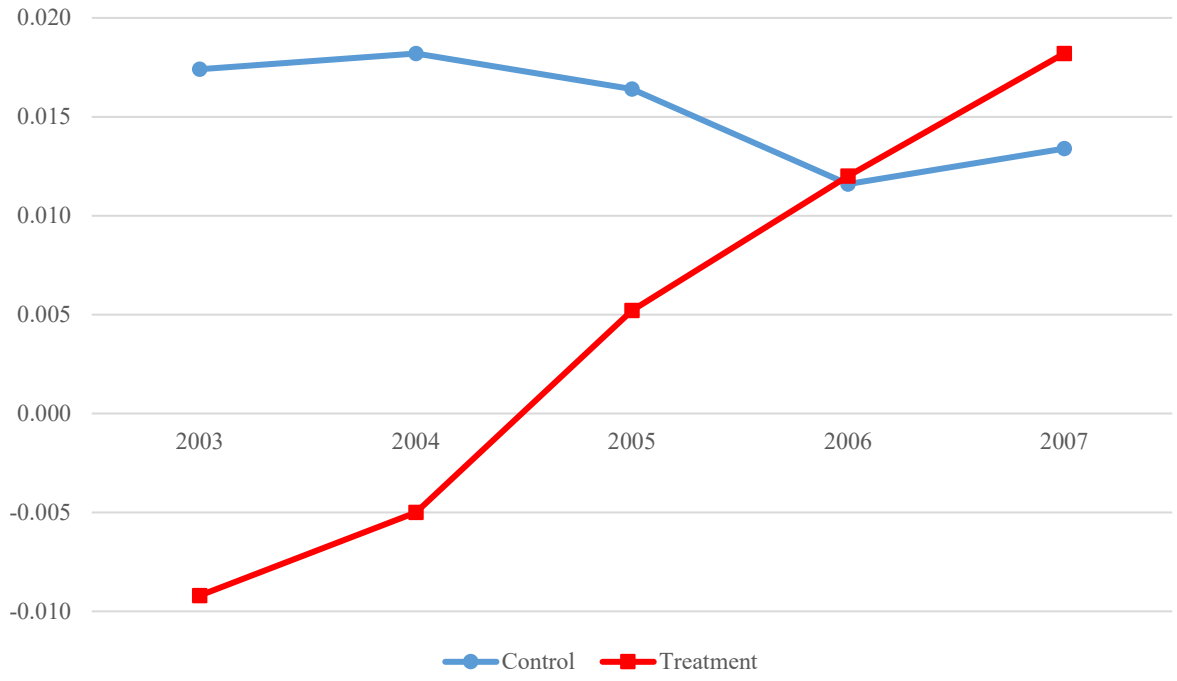


Figure 8: Turnover Performance Sensitivity by Local Director Labor Market

The figure presents the 5-year moving average of director TPS by local director labor market depth. Following Knyazeva et al. (2013), we define the supply of directors in the local labor market as the log of the number of non-financial firms outside the firm's industry within a 60-mile radius of the firm's headquarters. Every year, we sort firms into those in the bottom tercile of local labor market depth and those in the top two terciles of local labor market depth and estimate director TPS for each group following the same method described in Figure 1. We then plot the 5-year moving average of the director TPS for each group. The year reported on the x-axis represents the last year of the 5-year window.

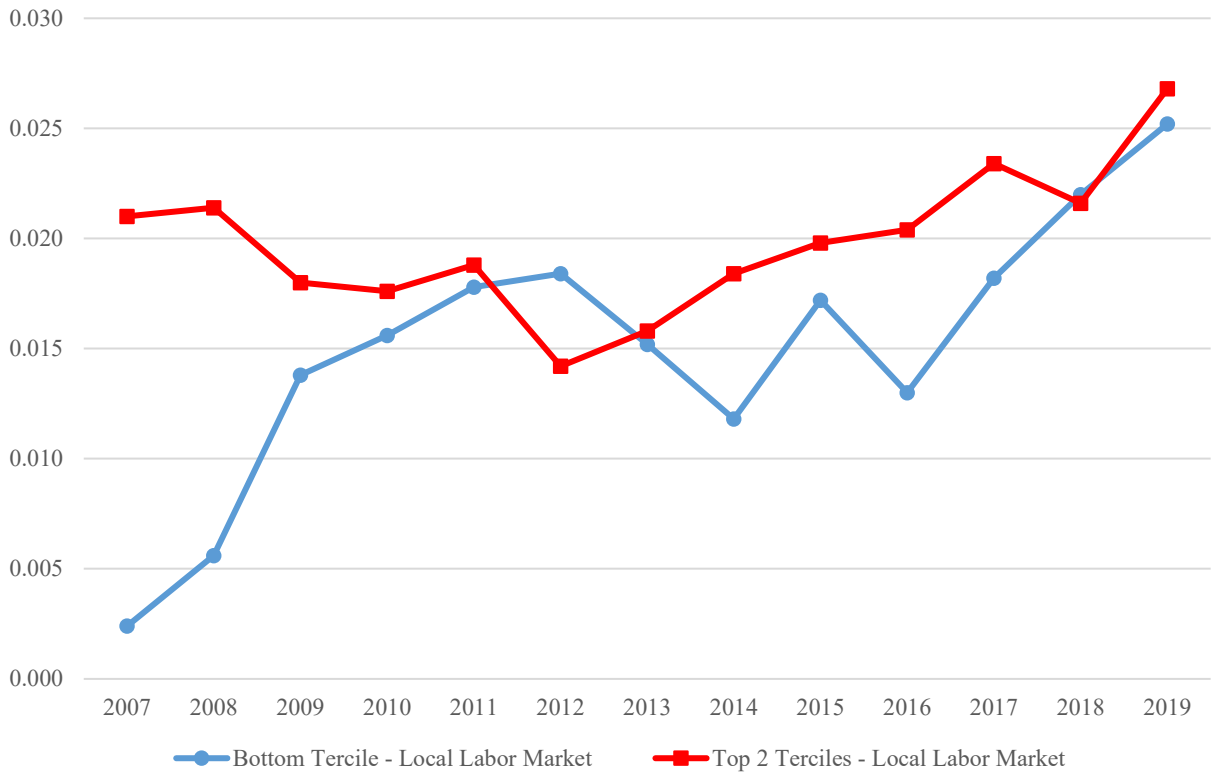


Table 1: Summary Statistics

The table presents summary statistics for our main sample between 2003 and 2019. Panel A reports director-level characteristics for 362,571 independent director-firm-years. Panel B reports firm-level characteristics for 56,423 firm-year observations. All variable definitions are included in Appendix A.

	Mean	Std Dev	Q1	Median	Q3
Panel A: Director Characteristics					
Age	62.09	8.97	56.00	63.00	68.00
Hold additional seats	42.2%	49.4%	0.0%	0.0%	100.0%
Gained new seat in prior year	4.0%	19.7%	0.0%	0.0%	0.0%
Current CEO at another firm	3.9%	19.4%	0.0%	0.0%	0.0%
Audit committee	58.4%	49.3%	0.0%	100.0%	100.0%
Compensation committee	54.1%	49.8%	0.0%	100.0%	100.0%
Nominating committee	46.9%	49.9%	0.0%	0.0%	100.0%
Female	13.8%	34.5%	0.0%	0.0%	0.0%
Tenure	7.75	6.78	2.70	5.80	10.90
Co-opted	43.8%	49.6%	0.0%	0.0%	100.0%
Panel B: Firm Characteristics					
Industry-adjusted stock return	1.5%	45.7%	-23.1%	-2.5%	18.9%
CEO turnover	12.2%	32.7%	0.0%	0.0%	0.0%
Firm age	2.82	0.74	2.30	2.83	3.37
Firm size	6.72	2.11	5.27	6.76	8.13
Return volatility	38.2%	21.6%	22.2%	33.1%	49.3%
Board size	8.57	2.57	7.00	8.00	10.00
Board independence	75.7%	13.3%	66.7%	77.8%	86.7%
Independent chair	41.3%	49.2%	0.0%	0.0%	100.0%
Local director labor market	4.12	1.45	3.26	4.53	5.19
Institutional investor distraction	12.4%	5.2%	8.4%	11.9%	16.0%

Table 2: Director Turnover-Performance Sensitivity over Time

The table presents the annual estimates of director turnover-performance sensitivity (γ_1) along with 3- and 5-year moving averages. We use the following linear probability model to estimate director turnover-performance sensitivity (TPS) each year:

$$\begin{aligned} Turnover_{i,j,t} = \gamma_0 &+ \gamma_1 Industry\text{-}adjusted\ stock\ return_{i,j,t-1} + \gamma_2 Age\ (65\text{-}71)_{i,j,t-1} + \gamma_3 Age\ (72+)_{i,j,t-1} \\ &+ \gamma_4 Holds\ additional\ board\ seat(s)_{i,j,t-1} + \gamma_5 Gained\ new\ board\ seat\ in\ prior\ year_{i,j,t-1} \\ &+ \gamma_6 Current\ CEO\ at\ other\ firm_{i,j,t-1} + \gamma_7 Audit\ committee_{i,j,t-1} + \gamma_8 Compensation\ committee_{i,j,t-1} \\ &+ \gamma_9 Nominating\ committee_{i,j,t-1} + \gamma_{10} Female_{i,j,t-1} + \gamma_{11} Tenure_{i,j,t-1} + \gamma_{12} Co\text{-}opted_{i,j,t-1} \\ &+ \gamma_{13} CEO\ turnover_{i,j,t-1} + \gamma_{14} Firm\ age_{i,j,t-1} + \gamma_{15} Firm\ size_{i,j,t-1} + \gamma_{16} Return\ volatility_{i,j,t-1} \\ &+ \gamma_{17} Board\ size_{i,j,t-1} + \gamma_{18} Board\ independence_{i,j,t-1} + \varepsilon_{i,j,t-1} \end{aligned}$$

where $Turnover_{i,j,t}$ is equal to one if director *i* at firm *j* experiences turnover in year *t*. The independent variable of interest is $Industry\text{-}adjusted\ stock\ return_{i,j,t}$ which is an indicator variable equal to one if industry-adjusted stock return at firm *j* in year *t-1* falls in the lowest quartile of performance for the sample year and zero otherwise. The coefficient γ_1 captures the sensitivity of director turnover to prior poor firm performance (TPS). All other independent variables are defined in Appendix A. All variables are winsorized at the 1st and 99th percentiles to mitigate the impact of extreme outliers. The sample period is from 2003 to 2019 and includes 362,571 director-firm-year observations. The marginal effect of TPS is also reported and captures the change in the likelihood of director turnover if industry-adjusted stock return at firm *j* in year *t-1* falls in the lowest quartile of performance for the sample year. The final row of the table presents the percent change in the TPS estimate or marginal effect from the first observation in the column to the last.

Table 2: Director Turnover-Performance Sensitivity (TPS) over Time (continued)

Year	Director-firm-years	Rate of Turnover	Annual TPS Estimate (γ_1)	Annual TPS Marginal Effect	3-Year Moving Average of TPS Estimate (γ_1)	3-Year Moving Average of TPS Marginal Effect	5-Year Moving Average of TPS Estimate (γ_1)	5-Year Moving Average of TPS Marginal Effect
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
2003	20,258	0.063	0.016	26%				
2004	22,732	0.077	0.011	14%				
2005	22,644	0.071	0.021	30%	0.016	23%		
2006	22,486	0.078	0.013	17%	0.015	20%		
2007	22,064	0.073	0.022	30%	0.019	25%	0.017	23%
2008	22,412	0.069	0.021	30%	0.019	26%	0.018	24%
2009	22,028	0.067	0.011	16%	0.018	26%	0.018	25%
2010	21,351	0.068	0.019	28%	0.017	25%	0.017	24%
2011	20,910	0.066	0.022	33%	0.017	26%	0.019	28%
2012	20,659	0.074	0.007	10%	0.016	24%	0.016	23%
2013	20,892	0.076	0.021	28%	0.017	23%	0.016	23%
2014	20,696	0.080	0.013	16%	0.014	18%	0.016	23%
2015	20,360	0.082	0.034	42%	0.023	29%	0.019	26%
2016	20,718	0.082	0.016	20%	0.021	26%	0.018	23%
2017	20,644	0.083	0.026	31%	0.025	31%	0.022	27%
2018	20,653	0.084	0.023	27%	0.022	26%	0.022	27%
2019	21,064	0.090	0.038	42%	0.029	34%	0.027	32%
% Δ from first to last observation		44%	138%	65%	81%	45%	65%	39%

Table 3: Director TPS over Time

The table reports OLS regressions modeling the likelihood that an independent director turns over in a given firm-year for a sample of 362,571 independent director-firm-year observations between 2003 and 2019. The dependent variable is an indicator equal to one if the director turns over and zero otherwise. Models 1 and 2 include continuous measures of lagged performance: industry-adjusted stock returns. Models 3 and 4 include measures of industry-adjusted stock return based on sample quartiles for a given sample year. Low industry-adjusted stock return is an indicator equal to one if industry-adjusted stock return falls in the lowest quartile of performance for the sample year, zero otherwise. All stock performance measures are winsorized at the 1st and 99th percentiles. All other independent variables are measured as of the fiscal year-end prior to when turnover is identified and are defined in Appendix A. Firm and year fixed effects are also included. *t*-statistics based on standard errors clustered at the firm level are included in parentheses.

	Dependent variable: Director turnover (0/1)			
	Model 1	Model 2	Model 3	Model 4
Industry-adjusted stock return	-0.011***	-0.007***		
	(-8.14)	(-3.26)		
Industry-adjusted stock return x Years (2009-2014)		-0.003		
		(-1.12)		
Industry-adjusted stock return x Years (2015-2019)		-0.017***		
		(-4.30)		
Low industry-adjusted stock return			0.014***	0.011***
			(9.10)	(4.82)
Low industry-adjusted stock return x Years (2009-2014)				-0.003
				(-0.76)
Low industry-adjusted stock return x Years (2015-2019)				0.011***
				(2.90)
Years (2009-2014)	0.026***	0.025***	0.024***	0.025***
	(6.25)	(6.09)	(5.83)	(5.93)
Years (2015-2019)	0.037***	0.037***	0.036***	0.034***
	(7.20)	(7.13)	(6.94)	(6.58)
Age (65-71)	0.012***	0.012***	0.012***	0.012***
	(10.13)	(10.12)	(10.17)	(10.17)
Age (72+)	0.112***	0.112***	0.112***	0.112***
	(41.63)	(41.64)	(41.63)	(41.63)
Holds additional board seats	-0.009***	-0.009***	-0.009***	-0.009***
	(-8.10)	(-8.10)	(-8.10)	(-8.12)
Gain new board seat in prior year	0.004*	0.004*	0.004*	0.004*
	(1.92)	(1.92)	(1.92)	(1.93)
Current CEO at other firm	0.008***	0.008***	0.008***	0.008***
	(3.40)	(3.41)	(3.41)	(3.42)
Audit committee	-0.017***	-0.017***	-0.017***	-0.017***
	(-16.62)	(-16.62)	(-16.62)	(-16.62)
Compensation committee	-0.012***	-0.012***	-0.012***	-0.012***
	(-12.18)	(-12.19)	(-12.17)	(-12.18)
Nominating committee	-0.014***	-0.014***	-0.014***	-0.014***
	(-12.82)	(-12.81)	(-12.78)	(-12.80)
Female	-0.002**	-0.002**	-0.002**	-0.002**
	(-2.13)	(-2.13)	(-2.12)	(-2.11)

Table continues on next page

Table 3: Director TPS over Time (continued)

	Dependent variable: Director turnover (0/1)			
	Model 1	Model 2	Model 3	Model 4
Tenure	0.003***	0.003***	0.003***	0.003***
	(22.58)	(22.60)	(22.58)	(22.59)
Co-opted	-0.019***	-0.019***	-0.019***	-0.019***
	(-14.15)	(-14.18)	(-14.16)	(-14.17)
CEO turnover	0.031***	0.031***	0.031***	0.031***
	(14.13)	(14.10)	(14.11)	(14.13)
Firm age	-0.011**	-0.011**	-0.010**	-0.011***
	(-2.49)	(-2.49)	(-2.40)	(-2.59)
Firm size	-0.017***	-0.017***	-0.017***	-0.017***
	(-10.02)	(-9.67)	(-9.88)	(-9.63)
Return volatility	0.038***	0.037***	0.032***	0.032***
	(7.86)	(7.68)	(6.89)	(6.80)
Board Size	0.015***	0.015***	0.015***	0.015***
	(22.17)	(22.20)	(22.20)	(22.19)
Board Independence	0.116***	0.116***	0.118***	0.118***
	(12.23)	(12.25)	(12.38)	(12.38)
Intercept	-0.039**	-0.042***	-0.043***	-0.044***
	(-2.53)	(-2.75)	(-2.82)	(-2.84)
Firm and Year Fixed Effects	Yes	Yes	Yes	Yes
Observations	362,571	362,571	362,571	362,571
Adjusted r^2	0.054	0.054	0.054	0.054

Table 4: The Effect of Poor Firm Performance on the Likelihood of Director and CEO Turnover

The table reports the implied probability of director (Panel A) and CEO (Panel B) turnover given specific levels of prior firm performance over time. We rely on a sample of 27,216 firm-years drawn from the Execucomp database to identify instances of CEO turnover, and match this to a firm-year subsample of the BoardEx data to obtain a comparable subsample of director turnover events. The implied probabilities are calculated as the average predicted value across all observations using the linear probability model coefficients from Model 4 of Panel B of Table IA.2 for directors and from Model 4 of Panel A of Table IA.2 for CEOs. At each level of prior firm performance listed below, the implied probability is calculated by setting the predicted value of industry-adjusted stock return to the described level and all other independent variables remain at their actual values. Poor firm performance is defined as industry-adjusted stock return that falls in the lowest quartile. The final row of each panel represents the increase in the probability of director or CEO turnover associated with poor prior firm performance relative to the unconditional rate of turnover, respectively.

Panel A: Director Turnover	Full Sample	2003-2008	2009-2014	2015-2019
Unconditional rate of turnover	7.3%	7.1%	6.9%	8.0%
Rate of turnover when firm performance$_{t-1}$ in top 3 quartiles	7.1%	7.2%	6.8%	7.4%
Rate of turnover when firm performance$_{t-1}$ in bottom quartile (Poor performance)	8.1%	8.1%	7.2%	9.5%
Poor perf. – Top 3 quartiles perf.	1.0%	0.9%	0.4%	2.0%
Poor performance increases probability of turnover by:	14%	12%	6%	25%
Panel B: CEO Turnover	Full Sample	2003-2008	2009-2014	2015-2019
Unconditional rate of turnover	10.5%	11.0%	9.5%	11.2%
Rate of turnover when firm performance$_{t-1}$ in top 3 quartiles	9.6%	10.2%	8.7%	10.2%
Rate of turnover when firm performance$_{t-1}$ in bottom quartile (Poor performance)	13.2%	14.3%	12.0%	13.3%
Poor perf. – Top 3 quartiles perf.	3.6%	4.1%	3.3%	3.1%
Poor performance increases probability of turnover by:	34%	37%	35%	28%

Table 5: Direct Financial Cost of TPS for Directors and CEOs

The table reports the direct financial cost of lost compensation associated with TPS for directors (Panels A and B) and CEOs (Panel C) over time. Panel A includes all 362,571 independent director-firm-year observations in our main sample. Panels B and C rely on a sample of 27,216 firm-years drawn from the Execucomp database to identify instances of CEO turnover, and match this to a firm-year subsample of the BoardEx data to obtain a comparable subsample of director turnover events. The TPS coefficient for Panel A is reported from Model 2 of Table 3 and for Panel B (C) is reported from Panel B (C) Model 2 of Table IA.2. The present value (PV) of lifetime income is calculated using the sample median director (CEO) tenure, sample median annual director (CEO) compensation and a discount rate of 3% for each respective time period. The final row of each panel represents the incentive-based estimate of the expected financial cost to a director (CEO) per $1,000 change in shareholder wealth. We calculate this measure by dividing the estimated TPS coefficient by the median sample firm's market capitalization and then multiplying by the present value of lifetime income that a director would expect to lose if she left the board.

Panel A: Directors (Full sample)	Full Sample	2003-2008	2009-2014	2015-2019
TPS coefficient	-0.011	-0.007	-0.007	-0.024
Median market capitalization (mil)	$617.54	$437.16	$648.89	$1,017.68
Median tenure	5.8	5.5	6.5	5.5
Median total annual compensation	$150,338	$111,339	$143,797	$190,497
PV of lifetime income	$789,525	$556,867	$837,868	$952,779
Cost per $1,000 change in shareholder value	$0.014	$0.009	$0.009	$0.022
Panel B: Directors (Exec. Sample)	Full Sample	2003-2008	2009-2014	2015-2019
TPS coefficient	-0.011	-0.008	-0.008	-0.024
Median market capitalization (mil)	$1,881.15	$1,577.01	$1,606.67	$2,830.69
Median tenure	6.6	5.9	7	6.6
Median total annual compensation	$180,936	$137,232	$172,819	$220,000
PV of lifetime income	$1,068,957	$732,071	$1,076,711	$1,299,744
Cost per $1,000 change in shareholder value	$0.006	$0.004	$0.005	$0.011
Panel C: CEOs	Full Sample	2003-2008	2009-2014	2015-2019
TPS coefficient	-0.047	-0.045	-0.045	-0.045
Median market capitalization (mil)	$1,881.15	$1,577.01	$1,606.67	$2,830.69
Median tenure	6	5.5	6.3	6
Median total annual compensation	$3,861,420	$2,938,240	$3,751,490	$5,320,920
PV of lifetime income	$20,918,051	$14,695,736	$21,247,117	$28,824,442
Cost per $1,000 change in shareholder value	$0.523	$0.419	$0.595	$0.458

Table 6: Labor Market Impact of Director Turnover over Time

The table presents tests of the director labor market consequences of director turnover in the context of poor performance. Panel A reports OLS regressions modeling the likelihood that an independent director turns over in a given firm-year as a function of turnover in the context of poor performance at another board for a sample of 319,581 independent director-firm-year observations between 2005 and 2019. The dependent variable is an indicator equal to one if the director turns over and zero otherwise. Poor performance turnover at other firm in prior 3 years is an indicator equal to one if during the prior 3-year period the director experiences turnover in the context of poor performance (lowest quartile) at a firm in the sample. Director and firm controls from Table 3 are also included in these models but their reporting is suppressed for brevity. Model 1 includes all directors and Model 2 includes directors with an age less than 72. Panel B reports OLS regressions modeling the change in number of board seats held and the likelihood of gaining a new board seat for a sample of 25,408 independent director-firm-year observations that experience turnover between 2003 and 2017. The dependent variable in Models 1 and 2 is the change in number of board seats held in the sample from the year prior to when turnover is identified (year t) to year t+3. The dependent variable in Models 3 and 4 is an indicator equal to one if the director gains a new board seat during the year t+1 to t+3 window. Models 1 and 3 include all directors and Models 2 and 4 include directors with an age less than 72. Poor performance turnover is an indicator equal to one if the turnover occurred in the context of poor performance (lowest quartile) at a firm in the sample. All other independent variables are measured as of the fiscal year-end prior to when turnover is identified and are defined in Appendix A. Firm and year fixed effects are also included. *t*-statistics based on standard errors clustered at the firm level are included in parentheses.

Panel A	Dependent variable: Director turnover (0/1)	
	Model 1	Model 2
	All directors	Directors < 72 years old
Poor performance turnover at other firm in prior 3 years	-0.005 (-0.63)	-0.006 (-0.79)
Poor performance turnover at other firm in prior 3 years x Years (2009-2014)	0.016*** (3.96)	0.009** (2.47)
Poor performance turnover at other firm in prior 3 years x Years (2015-2019)	0.028*** (5.47)	0.018*** (3.72)
Years (2009-2014)	0.029*** (2.89)	0.021** (2.10)
Years (2015-2019)	0.024** (2.23)	0.029*** (2.66)
Low industry-adjusted stock return	0.014*** (8.56)	0.013*** (8.14)
Director & Firm Controls included	Yes	Yes
Firm and Year Fixed Effects	Yes	Yes
Observations	319,581	274,935
Adjusted r^2	0.058	0.043

Table 6: Labor Market Impact of Director Turnover over Time (continued)

Panel B	Dependent variable:			
	Change in # of board seats (0,+3)		Gain new board seat (0,+3)	
	Model 1	Model 2	Model 3	Model 4
	All directors	Directors < 72 years old	All directors	Directors < 72 years old
Poor performance turnover	0.016 (0.83)	0.024 (0.96)	0.002 (0.28)	0.007 (0.74)
Poor performance turnover x Years (2009-2014)	-0.037 (-1.39)	-0.036 (-1.03)	-0.003 (-0.37)	-0.011 (-0.84)
Poor performance turnover x Years (2015-2019)	-0.073** (-2.54)	-0.094** (-2.32)	-0.015 (-1.47)	-0.030** (-1.99)
Years (2009-2014)	-0.050 (-0.60)	0.019 (0.16)	0.003 (0.18)	0.023 (1.01)
Years (2015-2019)	-0.021 (-0.22)	0.066 (0.47)	0.019 (1.07)	0.052** (1.97)
Age (65-71)	-0.161*** (-10.66)	-0.152*** (-9.23)	-0.070*** (-13.82)	-0.063*** (-11.10)
Age (72+)	-0.215*** (-15.49)		-0.084*** (-17.20)	
Holds additional board seats	-0.421*** (-34.45)	-0.342*** (-22.88)	0.067*** (14.62)	0.081*** (13.01)
Gain new board seat in prior year	-0.104*** (-2.60)	-0.127*** (-3.03)	0.088*** (5.55)	0.087*** (5.02)
Current CEO at other firm	0.436*** (13.44)	0.421*** (12.45)	0.092*** (5.35)	0.092*** (4.95)
Audit committee	0.025** (2.06)	0.039** (2.27)	0.004 (0.98)	0.007 (1.32)
Compensation committee	0.000 (0.01)	0.019 (1.04)	0.002 (0.59)	0.006 (1.00)
Nominating committee	-0.030*** (-2.87)	-0.029** (-2.10)	-0.000 (-0.06)	0.002 (0.35)
Female	0.052*** (2.88)	0.065*** (3.00)	0.059*** (7.76)	0.064*** (7.00)

Table continues on next page

Table 6: Labor Market Impact of Director Turnover over Time (continued)

Panel B (continued)	Dependent variable:			
	Change in # of board seats (0,+3)		Gain new board seat (0,+3)	
	Model 1	Model 2	Model 3	Model 4
Tenure	-0.002***	-0.004***	-0.002***	-0.004***
	(-2.79)	(-3.49)	(-7.20)	(-7.52)
Co-opted	0.002	0.005	0.007	0.006
	(0.13)	(0.26)	(1.25)	(0.85)
CEO turnover	0.019	0.008	-0.004	-0.003
	(1.28)	(0.44)	(-0.77)	(-0.46)
Firm age	0.036	0.006	0.029*	0.024
	(0.74)	(0.09)	(1.94)	(1.12)
Firm size	0.026**	0.023	0.004	0.004
	(2.18)	(1.51)	(0.71)	(0.67)
Return volatility	0.024	0.039	0.007	0.011
	(0.76)	(0.98)	(0.50)	(0.61)
Board Size	-0.001	0.004	-0.001	-0.002
	(-0.29)	(0.62)	(-0.68)	(-0.79)
Board Independence	-0.115	-0.187**	0.019	0.009
	(-1.59)	(-2.03)	(0.63)	(0.24)
Intercept	0.047	0.091	-0.023	-0.010
	(0.31)	(0.45)	(-0.43)	(-0.14)
Firm and Year Fixed Effects	Yes	Yes	Yes	Yes
Observations	25,408	18,096	25,408	18,096
Adjusted r^2	0.087	0.022	0.049	0.028

Table 7: Board Leadership and Director TPS

The table reports OLS regressions modeling the effect of an independent board chair on independent director turnover-performance sensitivity. Panel A reports the impact of an independent board chair on director turnover-performance sensitivity using firm fixed effect models. Year fixed effects are also included. Panel B provides an event-time analysis of the impact of switching from an executive board chair to an independent board chair on director turnover-performance sensitivity. Firms that switch from an executive board chair to an independent board chair are considered treatment firms. Firms that have an executive board chair are considered control firms. Treatment and control firms are matched based on industry and firm size. Post is an indicator variable equal to one for years following the switch from an executive board chair to an independent board chair for both treatment and matched control firms, zero otherwise. Each regression includes cohort by firm and cohort by year fixed effects. A cohort is defined as a matched treatment firm to control firm(s) group. Panel C provides an instrumental variable approach to control for the possible endogenous relation between board leadership and director turnover-performance sensitivity. Models 1 and 2 report the 1st stage results where the dependent variables are the two endogenous variables (*Independent board chair* and *Low industry-adjusted stock return x Independent board chair*). Model 3 reports the 2nd stage results using the fitted values from Models 1 and 2 to instrument for the two endogenous variables. Firm and year fixed effects are also included. In all models, *t*-statistics based on standard errors clustered at the firm level are included in parentheses. For brevity, director and firm controls as in Table 3 are included in all models but are unreported for brevity. All variable definitions are included in Appendix A.

Panel A: Firm fixed effects models	Dependent variable: Director turnover (0/1)			
	Model 1	Model 2	Model 3	Model 4
Industry-adjusted stock return	-0.008***		-0.008***	
	(-4.64)		(-3.29)	
Industry-adjusted stock return x Independent chair	-0.007***		0.004	
	(-2.61)		(0.84)	
Industry-adjusted stock return x Independent chair x Years (2012-2019)			-0.015***	
			(-2.71)	
Low industry-adjusted stock return		0.011***		0.013***
		(5.89)		(4.28)
Low industry-adjusted stock return x Independent chair		0.005*		-0.003
		(1.66)		(-0.69)
Low industry-adjusted stock return x Independent chair x Years (2012-2019)				0.012*
				(1.96)
Independent chair	0.002	0.001	0.002	0.003
	(1.00)	(0.35)	(0.76)	(1.01)
Years (2012-2019)			0.036***	0.036***
			(6.88)	(6.78)
Independent chair x Years (2012-2019)			-0.000	-0.003
			(-0.01)	(-1.04)
Industry-adjusted stock return x Years (2012-2019)			-0.000	
			(-0.14)	
Low industry-adjusted stock return x Years (2012-2019)				-0.002
				(-0.56)
Director and Firm Controls	Yes	Yes	Yes	Yes
Firm and Year Fixed Effects	Yes	Yes	Yes	Yes
Observations	362.571	362.571	362.571	362.571
Adjusted r^2	0.054	0.054	0.054	0.054

Table 7: Board Leadership and Director TPS (continued)

Panel B: Event-time analysis	Dependent variable: Director turnover (0/1)	
	Model 1	Model 2
Industry-adjusted stock return	-0.003*	
	(-1.81)	
Industry-adjusted stock return x Treatment	0.001	
	(0.23)	
Industry-adjusted stock return x Post	-0.002	
	(-0.78)	
Industry-adjusted stock return x Treatment x Post	-0.009**	
	(-2.01)	
Low industry-adjusted stock return		0.010***
		(3.39)
Low industry-adjusted stock return x Treatment		-0.007
		(-1.12)
Low industry-adjusted stock return x Post		0.002
		(0.37)
Low industry-adjusted stock return x Treatment x Post		0.022***
		(2.70)
Treatment x Post	0.002	-0.005
	(0.47)	(-1.57)
Director and Firm Controls	Yes	Yes
Cohort by Firm Fixed Effects	Yes	Yes
Cohort by Year Fixed Effects	Yes	Yes
Observations	203,224	203,224
Adjusted r^2	0.063	0.063

Table 7: Board Leadership and Director TPS (continued)

Panel C: IV analysis	Dependent variable:		
	Independent chair	Industry-adjusted stock return x Independent chair	Director turnover (0/1)
	1st stage	1st stage	2nd stage
	Model 1	Model 2	Model 3
Industry-adjusted stock return	-0.001 (-0.31)	0.363 (29.65)	0.006 (0.85)
Instrumented industry-adjusted stock return x Independent chair			-0.040** (-2.44)
Instrumented independent chair			-0.007 (-0.13)
Board overlap of independent chair firms	0.107*** (4.95)	-0.001 (-0.08)	
Board overlap of independent chair firms x Industry-adjusted stock return	0.034* (1.67)	0.521*** (10.92)	
Director and Firm Controls	Yes	Yes	Yes
Firm and Year Fixed Effects	Yes	Yes	Yes
1st stage F-stat	24.50	119.28	
Observations	362,571	362,571	362,571
Adjusted r^2	0.674	0.520	0.054

Table 8: Nominating Committee Independence and Director TPS

The table reports OLS regressions modeling the effect of nominating committee independence on independent director turnover-performance sensitivity. The dependent variable is an indicator equal to one if an independent director turns over and zero otherwise. The sample includes 35,220 director-firm-year observations between 2001 and 2009 for a propensity score matched sample. Results of the propensity score model are included in Table IA.3. The matched sample is based on the independence of the firm's nominating committee in 2001. Firms with nominating committee independence less than (greater than or equal to) 50% are classified as treatment (control) firms. Post is an indicator variable equal to one for year 2005 or later, zero otherwise. For brevity, director and firm controls as in Table 3 are included in all models but are unreported for brevity. All models include firm and year-fixed effects. Unreported interactions between year fixed effects and stock return measures are included in both models. All variable definitions are included in Appendix A. *t*-statistics based on standard errors clustered by firm are in parentheses.

	Dependent variable: Director turnover (0/1)	
	Model 1	Model 2
Industry-adjusted stock return	-0.011	
	(-0.949)	
Industry-adjusted stock return x Treatment	0.027**	
	(2.584)	
Industry-adjusted stock return x Post	-0.005	
	(-0.183)	
Industry-adjusted stock return x Treatment x Post	-0.033*	
	(-1.915)	
Low industry-adjusted stock return		0.017
		(1.274)
Low industry-adjusted stock return x Treatment		-0.039***
		(-2.715)
Low industry-adjusted stock return x Post		-0.014
		(-0.714)
Low industry-adjusted stock return x Treatment x Post		0.046**
		(2.377)
Post	-0.034***	-0.028**
	(-2.650)	(-2.197)
Treatment x Post	0.011	-0.006
	(1.151)	(-0.718)
Director and Firm Controls	Yes	Yes
Firm and Year Fixed Effects	Yes	Yes
Observations	35,220	35,220
Adjusted r^2	0.054	0.054

Table 9: Local Labor Markets and Director TPS

The table reports OLS regressions modeling the effect of the local director labor market on independent director turnover-performance sensitivity. In all models, the dependent variable is an indicator equal to one if an independent director turns over and zero otherwise. The measure of local labor market includes all non-financial firms outside of the firm's industry in a 60-mile radius of the firm's headquarters. Models 1 and 3 (2 and 4) of Panel A include director-firm-year observations in the bottom (top) tercile of local labor market supply for a given year. Panel B includes only director-firm-year observations in the bottom tercile of local labor market supply. Models 1 (2) of Panel B include director-firm-year observations with low (high) access to non-local director labor market supply. We proxy for access to non-local director labor market supply with the number of direct flight routes at airports within a 60-mile radius of the firm's headquarters. Low (High) access to non-local director labor market supply is defined as the bottom tercile (top two terciles) of direct flight routes available. Firm and year fixed effects are included and *t*-statistics based on standard errors clustered at the firm level are included in parentheses. For brevity, director and firm controls as in Table 3 are included in all models but are unreported for brevity. All variable definitions are included in Appendix A.

Panel A	Dependent variable: Director turnover (0/1)			
	Model 1	Model 2	Model 3	Model 4
	Low local labor market supply	High local labor market supply	Low local labor market supply	High local labor market supply
Industry-adjusted stock return	-0.000	-0.008***		
	(-0.10)	(-3.42)		
Industry-adjusted stock return x Years (2009-2014)	-0.012**	-0.000		
	(-2.38)	(-0.15)		
Industry-adjusted stock return x Years (2015-2019)	-0.019***	-0.015***		
	(-3.00)	(-3.47)		
Low industry-adjusted stock return			0.001	0.014***
			(0.18)	(4.82)
Low industry-adjusted stock return x Years (2009-2014)			0.013**	-0.005
			(2.29)	(-1.23)
Low industry-adjusted stock return x Years (2015-2019)			0.018***	0.008*
			(3.00)	(1.81)
Director and Firm Controls	Yes	Yes	Yes	Yes
Firm and Year Fixed Effects	Yes	Yes	Yes	Yes
Observations	127,610	234,959	127,610	234,959
Adjusted r^2	0.058	0.053	0.058	0.053

Table 9: Local Labor Markets and Director TPS (cont.)

Panel B	Dependent variable: Director turnover (0/1)	
	Model 1	Model 2
	Low local labor market supply	
	Low access to non-local labor market	High access to non-local labor market
Low industry-adjusted stock return	0.006	-0.003
	(0.79)	(-0.67)
Low industry-adjusted stock return x Years (2009-2014)	0.001	0.021***
	(0.03)	(2.92)
Low industry-adjusted stock return x Years (2015-2019)	0.006	0.025***
	(0.61)	(3.35)
Director and Firm Controls	Yes	Yes
Firm and Year Fixed Effects	Yes	Yes
Observations	50,413	77,197
Adjusted r^2	0.064	0.058

Table 10: Institutional Investor Distraction and Director TPS

The table reports OLS regressions modeling the effect of institutional investor distraction on independent director turnover-performance sensitivity. In all models, the dependent variable is an indicator equal to one if an independent director turns over and zero otherwise. Investor distraction is defined following Kempf et al. (2017). Firm and year fixed effects are included and *t*-statistics based on standard errors clustered at the firm level are included in parentheses. For brevity, director and firm controls as in Table 3 are included in all models but are unreported for brevity. All variable definitions are included in Appendix A.

	Dependent variable: Director turnover (0/1)	
	Model 1	Model 2
Industry-adjusted stock return	-0.003	
	(-1.05)	
Industry-adjusted stock return x Investor distraction	-0.021	
	(-0.90)	
Industry-adjusted stock return x Investor distraction x Years (2012-2019)	0.072*	
	(1.80)	
Low industry-adjusted stock return		0.006*
		(1.69)
Low industry-adjusted stock return x Investor distraction		0.033
		(1.41)
Low industry-adjusted stock return x Investor distraction x Years (2012-2019)		-0.089**
		(-2.49)
Investor distraction	0.015*	0.006
	(1.78)	(0.68)
Years (2012-2019)	0.013***	0.007***
	(4.83)	(2.67)
Investor distraction x Years (2012-2019)	-0.040***	-0.016
	(-2.99)	(-1.10)
Industry-adjusted stock return x Years (2012-2019)	-0.022***	
	(-3.59)	
Low industry-adjusted stock return x Years (2012-2019)		0.018***
		(3.08)
Director and Firm Controls	Yes	Yes
Firm and Year Fixed Effects	Yes	Yes
Observations	362.571	362.571
Adjusted r^2	0.054	0.054

Internet Appendix:

Under Pressure: The Increasing Turnover-Performance Sensitivity for Corporate Directors

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Table IA.1: Non-Linearity in Director Turnover Performance Sensitivity (TPS)

The table reports OLS regressions modeling the likelihood that an independent director turns over in a given firm-year for a sample of 362,571 independent director-firm-year observations between 2003 and 2019. The dependent variable is an indicator equal to one if the director turns over and zero otherwise. Model 1 utilizes a continuous measure of industry-adjusted stock return performance as linear and quadratic (squared) terms. All other independent variables are measured as of the fiscal year-end prior to when turnover is identified and are defined in Appendix A. Firm and year fixed effects are also included. *t*-statistics based on standard errors clustered at the firm level are included in parentheses.

	Dependent variable: Director turnover (0/1)
	Model 1
Industry-adjusted stock return	-0.016***
	(-9.18)
Industry-adjusted stock return^2	0.005***
	(4.78)
Age (65-71)	0.012***
	(10.14)
Age (72+)	0.112***
	(41.64)
Holds additional board seats	-0.009***
	(-8.10)
Gain new board seat in prior year	0.004*
	(1.92)
Current CEO at other firm	0.008***
	(3.40)
Audit committee	-0.017***
	(-16.63)
Compensation committee	-0.012***
	(-12.18)
Nominating committee	-0.014***
	(-12.78)
Female	-0.002**
	(-2.13)
Tenure	0.003***
	(22.58)
Co-opted	-0.019***
	(-14.14)
CEO turnover	0.031***
	(14.07)

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Table IA.1: Non-Linearity in Director Turnover Performance Sensitivity (TPS)

	Dependent variable: Director turnover (0/1)
	Model 1
Firm age	-0.010**
	(-2.41)
Firm size	-0.017***
	(-9.98)
Return volatility	0.035***
	(7.37)
Board Size	0.015***
	(22.19)
Board Independence	0.117***
	(12.27)
Intercept	-0.043***
	(-2.79)
Firm and Year Fixed Effects	Yes
Observations	362,571
Adjusted r^2	0.054

Table IA.2: CEO versus Director TPS over Time

The table reports OLS regressions modeling the likelihood of CEO turnover and director turnover. Panel A reports the results of regressions estimating the likelihood that a CEO turns over in a given firm-year for a sample of 27,216 CEO-firm-year observations between 2003 and 2019 from Execucomp. The dependent variable is an indicator equal to one if the CEO turns over and zero otherwise. Panel B reports the results of regressions estimating the likelihood that an independent director turns over in a given firm-year for a sample of 201,127 independent director-firm-year observations that matched up to the CEO-firm-year observations from Execucomp between 2003 and 2019. We use this subsample of BoardEx director data to obtain a comparable subsample of director turnover events. Models 1 and 2 include continuous measures of lagged performance: industry-adjusted stock returns. Models 3 and 4 include measures of industry-adjusted stock return based on sample quartiles for a given sample year. Low industry-adjusted stock return is an indicator equal to one if industry-adjusted stock return falls in the lowest quartile of performance for the sample year, zero otherwise. All stock performance measures are winsorized at the 1st and 99th percentiles. All other independent variables are measured as of the fiscal year-end prior to when turnover is identified and are defined in Appendix A. Firm and year fixed effects are also included. *t*-statistics based on standard errors clustered at the firm level are included in parentheses.

Panel A: CEO turnover	Dependent variable: CEO turnover (0/1)			
	Model 1	Model 2	Model 3	Model 4
Industry-adjusted stock return	-0.047***	-0.045***		
	(-9.06)	(-5.03)		
Industry-adjusted stock return x Years (2009-2014)		0.004		
		(0.34)		
Industry-adjusted stock return x Years (2015-2019)		-0.021		
		(-1.40)		
Low industry-adjusted stock return			0.035***	0.040***
			(7.34)	(4.78)
Low industry-adjusted stock return x Years (2009-2014)				-0.007
				(-0.64)
Low industry-adjusted stock return x Years (2015-2019)				-0.009
				(-0.77)
Years (2009-2014)	0.013	0.013	0.008	0.009
	(0.89)	(0.83)	(0.52)	(0.61)
Years (2015-2019)	0.037**	0.037**	0.031*	0.033*
	(2.02)	(2.04)	(1.69)	(1.79)
CEO age	0.528***	0.528***	0.527***	0.527***
	(16.04)	(16.06)	(16.00)	(15.99)
CEO tenure	0.071***	0.071***	0.071***	0.071***
	(14.67)	(14.66)	(14.66)	(14.65)
CEO ownership > 5%	-0.017	-0.017	-0.017	-0.017
	(-1.28)	(-1.28)	(-1.29)	(-1.28)
Firm age	-0.036**	-0.036**	-0.035*	-0.034*
	(-2.04)	(-2.03)	(-1.95)	(-1.90)
Firm size	0.002	0.002	0.004	0.003
	(0.28)	(0.37)	(0.61)	(0.55)
Return volatility	0.049***	0.048***	0.034**	0.034**
	(3.14)	(3.06)	(2.19)	(2.19)

Table continues on next page

Table IA.2: CEO versus Director TPS over Time (continued)

Panel A: CEO turnover (continued)	Dependent variable: CEO turnover (0/1)			
	Model 1	Model 2	Model 3	Model 4
Board Size	0.008***	0.008***	0.008***	0.008***
	(4.08)	(4.09)	(4.06)	(4.05)
Board Independence	-0.018	-0.018	-0.020	-0.019
	(-0.70)	(-0.71)	(-0.76)	(-0.74)
Intercept	-2.150***	-2.155***	-2.166***	-2.167***
	(-15.61)	(-15.65)	(-15.72)	(-15.73)
Firm and Year Fixed Effects	Yes	Yes	Yes	Yes
Observations	27,216	27,216	27,216	27,216
Adjusted r^2	0.059	0.059	0.059	0.059

Panel B: Director turnover	Dependent variable: Director turnover (0/1)			
	Model 1	Model 2	Model 3	Model 4
Industry-adjusted stock return	-0.011***	-0.008**		
	(-5.30)	(-2.19)		
Industry-adjusted stock return x Years (2009-2014)		-0.000		
		(-0.02)		
Industry-adjusted stock return x Years (2015-2019)		-0.016***		
		(-2.70)		
Low industry-adjusted stock return			0.010***	0.009**
			(5.11)	(2.43)
Low industry-adjusted stock return x Years (2009-2014)				-0.003
				(-0.66)
Low industry-adjusted stock return x Years (2015-2019)				0.011**
				(2.00)
Years (2009-2014)	0.025***	0.023***	0.022***	0.022***
	(4.51)	(4.24)	(4.07)	(4.11)
Years (2015-2019)	0.034***	0.033***	0.031***	0.030***
	(4.97)	(4.89)	(4.67)	(4.43)
Director and Firm Controls	Yes	Yes	Yes	Yes
Firm and Year Fixed Effects	Yes	Yes	Yes	Yes
Observations	201,127	201,127	201,127	201,127
Adjusted r^2	0.061	0.061	0.061	0.061

Table IA.3 Propensity Score-matching Model for Nominating Committee Independence

The table reports the results of the propensity score-matching models estimating the likelihood of nominating committee independence non-compliance. Model 1 includes 2,557 firm-year observations from 1998-2000 from the ISS database used to estimate the probability that a firm has less than 50% independent directors on its nominating committee in 2001. The dependent variable is equal to one if the firm has a non-compliant nominating committee in 2001. All independent variables are calculated as of the prior fiscal year end. All variable definitions are included in Appendix A. *t*-statistics based on standard errors clustered by firm are in parentheses and ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels respectively.

	Dependent Variable: Non-compliance (0/1)
	Model 1
Firm size	-0.184***
	(-9.15)
Market-to-book	-0.009
	(-0.17)
Return volatility	0.901***
	(6.22)
Board independence	-2.437***
	(-13.17)
E-index	-0.119***
	(-5.34)
Dual class	0.086
	(0.82)
CEO chair	-0.059
	(-0.93)
Inside/Linked voting	1.076***
	(4.98)
Non-employee blockholder	0.042
	(0.71)
CEO tenure	0.127***
	(4.21)
Intercept	2.055***
	(8.79)
Observations	2,557
Pseudo R^2	0.232