

Investor Myopia and CEO Turnover: Evidence from Private Firms*

Huasheng Gao
Nanyang Business School
Nanyang Technological University
S3-B1A-06, 50 Nanyang Avenue, Singapore 639798
65.6790.4653
hsgao@ntu.edu.sg

Jarrad Harford
Foster School of Business
University of Washington
Box 353200, Seattle, WA 98195-3200
206.543.4796
jarrad@uw.edu

Kai Li
Sauder School of Business
University of British Columbia
2053 Main Mall, Vancouver, BC V6T 1Z2
604.822.8353
kai.li@sauder.ubc.ca

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Abstract

We provide a large sample comparison of CEO turnover in public and private firms in order to gain insight into whether and how corporate governance and performance horizons influence CEO firing and hiring decisions. We show that public firms have higher CEO turnover rates and exhibit higher CEO turnover-performance sensitivity than private firms. Public firms are less likely to hire external CEOs than private firms, especially less likely to hire external CEOs from private firms. Finally, we show that the performance improvement around CEO turnover is more evident for private firms than for public firms. We conclude that, contrary to the arguments that there is too little turnover risk for CEOs in public firms, public firm CEOs are fired too frequently, possibly due to investor myopia creating pressure on public firm boards. The evidence of segmentation in the CEO labor market provides an explanation for how differing turnover risks can persist in public versus private firms.

Keywords: investor myopia; CEO turnover; forced CEO turnover; external CEO hires; internal CEO hires; labor market segmentation; private firms

JEL Classification: G30; G32

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Abstract

We provide a large sample comparison of CEO turnover in public and private firms in order to gain insight into whether and how corporate governance and performance horizons influence CEO firing and hiring decisions. We show that public firms have higher CEO turnover rates and exhibit higher CEO turnover-performance sensitivity than private firms. Public firms are less likely to hire external CEOs than private firms, especially less likely to hire external CEOs from private firms. Finally, we show that the performance improvement around CEO turnover is more evident for private firms than for public firms. We conclude that, contrary to the arguments that there is too little turnover risk for CEOs in public firms, public firm CEOs are fired too frequently, possibly due to investor myopia creating pressure on public firm boards. The evidence of segmentation in the CEO labor market provides an explanation for how differing turnover risks can persist in public versus private firms.

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1. Introduction

Hiring and firing a CEO may be the most important job of a corporate board. Starting from Coughlan and Schmidt (1985), Warner, Watts, and Wruck (1988), and Weisbach (1988), there is a large literature in finance and accounting examining how CEO turnover takes place. As a testament to its importance, the topic continues to attract considerable interest, most recently by Taylor (2010), Jenter and Kanaan (2010), and Fisman, Khurana, Rhodes-Kropf, and Yim (2013). While we have increased our understanding of the performance and governance factors that influence CEO turnover, the question remains of what the right amount of turnover and sensitivity of turnover to performance should be. Proponents of captured board explanations such as Bebchuk and Fried (2004), would argue that CEO turnover in US public firms is too little and too insensitive to poor performance. But the question is: too little relative to what?

In this paper, we suggest that a natural benchmark is CEO turnover in US private firms. Relative to public firms, private firms have higher ownership concentration and fewer agency problems (see for example, Jensen (1989), Barger, Schlingemann, Stulz, and Zutter (2008), and Gao, Harford, and Li (2013)). More importantly, private firms do not face short-term performance pressures that have been argued to lead to managerial myopic behavior, as outlined in Stein (1989) and shown in Bushee (1998), Asker, Farre-Mensa, and Ljungqvist (2012), and Gao et al. (2013). Consequently, we analyze a large sample of private firms and compare their CEO turnover rates and turnover-performance sensitivity to a sample of public firms. We additionally examine a subsample of non-founder private firm CEOs without a controlling interest to ensure our private firm CEOs are comparable to their public firm counterparts. We also split our sample of public firms along a measure of investor myopia and find results that are consistent with our private versus public sample split. In doing so, we gain insight into how corporate governance and performance horizons influence CEO firing and hiring decisions.

Given the greater ownership concentration and generally stronger governance possible in private firms, we hypothesize that CEOs of private firms face a greater likelihood of turnover for poor performance than do CEOs of public firms—the entrenchment hypothesis. Alternatively, the stronger direct monitoring incentives in private firms coupled with the lack of myopic pressure from outside investors may lead private firm boards to use other information (for example, soft information obtained from direct monitoring) to evaluate a CEO and also not to be as quick to fire a CEO in the face of short-

term underperformance. The resulting hypothesis is that CEO turnover in public firms will be more sensitive to performance than it is in private firms—the myopia hypothesis. If this second hypothesis is supported, then one implication is that public firm CEOs actually turn over too often, and performance improvement will be less pronounced following CEO turnover in public firms than following CEO turnover in private firms.

Using a sample of public and private firms involved with close to 3,000 CEO turnover cases over the period 2001-2008, we first show that there is a significantly higher likelihood for public firm CEOs to experience turnover compared to their private firm counterparts; and the baseline rate of turnover unexplained by performance (the regression constant) is greater for public firm CEOs. Further, there is stronger turnover-performance sensitivity for public firm CEOs than there is for private firm CEOs. These findings remain after controlling for CEO retirement ages, whether the CEO is a founder or not, and whether the CEO has large ownership or not. We further argue that public firm CEOs' higher baseline non-performance related rate of turnover is inconsistent with the conjecture that private firm boards simply use more qualitative information in making turnover decisions. If so, the average unexplained turnover rate should be higher, not lower, for private firms.

Our results instead suggest that, if anything, public firm CEOs appear to be fired too often, as would be predicted by investor myopia in US public firms. Subsequent tests confirm that performance improvements following CEO turnover in public firms are not as strong as those following CEO turnover in private firms, and performance improvements in public firms with investor myopia are weaker than those in public firms with more long-term oriented investors. This is consistent with the implication that CEO turnover decisions in public firms (with myopic investors) are suboptimal.

We then explore the nature of the equilibrium that allows the turnover frequency and turnover-performance sensitivity to differ between public and private firm CEOs and find some evidence of segmentation in the market for CEOs. Public firms are more likely to promote their CEOs internally than private firms do. Conditioning on that a firm hires its CEO externally, public firms are more likely to hire their new CEOs from other public firms than from other private firms; the same applies to private firms in terms of external hires. Further, Gao, Lemmon, and Li (2012) show that public firm CEOs are paid more

than CEOs of similar private firms. The higher pay can be partially explained by public firm CEOs' higher termination risk.

Our paper contributes to several strands of the literature. First and foremost, our paper sheds insight into the source of managerial myopia in public firms that has been highlighted in prior work (see for example, Stein (1988) and (1989)). We show that boards of public firms put too much emphasis on short-term performance, and pull the trigger on CEOs too quickly, leading to suboptimal replacement frequency and little performance improvement post CEO turnover. Our paper is the first in the literature to show the potential CEO turnover consequence of myopic investors (and their boards). The short-term emphasis by public shareholders and their boards could explain the observed managerial myopia in corporate investment decisions (see, for example, Bushee (1998), Asker et al. (2012), and Gao et al. (2013)). Second, by benchmarking public firm CEO turnover to private firm CEO turnover, our paper contributes to the debate over whether corporate governance in public firms is largely characterized by entrenched CEOs with captured boards (see, for example, Bebchuk and Fried (2004) and Kaplan and Rauh (2010)). Finally, we provide fresh new evidence on the market for CEOs, specifically that there is some degree of segmentation between the public and private firm markets for CEOs.

The paper is organized as follows. Section 2 reviews the related literature and develops our hypotheses. Section 3 describes the data and our sample. Section 4 presents the main empirical analysis. We conclude in Section 5.

2. Literature Review and Hypothesis Development

2.1. Related Literature

Coughlan and Schmidt (1985) and Warner et al. (1988) are first in the literature to show that corporate boards control top management behavior by making compensation and management termination decisions related to the firm's stock price performance. Weisbach (1988) further notes that firms with outsider-dominated boards are significantly more likely than firms with insider-dominated boards to remove their CEOs on the basis of accounting and stock price performance. Denis, Denis, and Sarin (1997) show that the likelihood of top executive turnover is significantly greater in poorly performing firms with low managerial ownership than in poorly performing firms with higher managerial

ownership. Further, top executive turnover is more sensitive to poor performance in firms with outside blockholders than in those without an outside blockholder. Their results suggest that higher insider equity ownership insulates managers from internal monitoring efforts and that outside blockholders may perform a monitoring function within firms.

Parrino (1997) is one of the first papers differentiating between forced versus voluntary turnovers and between internal and external hires. He shows that the likelihoods of turnover, forced turnover, and outside succession increase with the similarity of the firms in an industry, suggesting that intra-industry CEO appointments are less costly and that performance measures are more precise in homogeneous industries. Further, he finds that the likelihood that a fired CEO is replaced by an executive from another firm in the same industry also increases with industry homogeneity. Huson, Parrino, and Starks (2001) examine the evolution and interrelation of internal and external monitoring mechanisms over time, from the early 1970s through the mid-1990s. They find that the frequency of forced CEO turnover and the frequency of outside succession have increased, and that there are significant relations between board composition and director stock ownership and the likelihoods of forced CEO turnover and outside succession. Further, although the characteristics of internal monitoring mechanisms and the nature of CEO turnover have changed, overall there has been no significant change in the sensitivity of forced turnover to firm performance.

One strand of the CEO turnover literature examines whether relative performance evaluation is used by boards when making CEO turnover decisions. Morck, Shleifer, and Vishny (1989) show that managers are more likely to be replaced when firms under-perform their industry, and that turnover is relatively low among CEOs of poorly performing firms when the entire industry is performing poorly. They conclude that performance relative to that at other industry firms is used by internal monitors to assess CEO performance. Jenter and Kanaan (2010) and Kaplan and Minton (2012) update the above evidence, showing that CEOs are significantly more likely to be dismissed from their jobs after bad industry or bad market performance. Jenter and Lewellen (2010) revisit the empirical relation between CEO turnover and firm performance, and show that boards aggressively fire CEOs for poor performance, and that the turnover-performance sensitivity increases substantially with board quality, suggesting that the threat of performance-induced dismissal is an important source of incentives for most CEOs.

In contemporaneous work, Cornelli and Karakaş (2012) examine CEO turnover in leveraged buyouts (LBOs) backed by private equity funds in the UK, and find that when a firm is taken private, both CEO turnover and its sensitivity to performance decrease. They conclude that effective monitoring and more inside information allow these private equity funds to rely less on short-term performance and to therefore give CEOs longer horizons. While Cornelli and Karakaş (2012) focus on one particular type of private firms in the UK (the ones that go private via LBOs), our study is based on a more general sample of large US private firms. Both studies complement each other in highlighting the role of investor myopia in CEO turnover decisions.

2.2. Hypothesis Development

The prior literature helps us formulate our hypotheses in order to examine CEO turnover in public and private firms.

Private firms tend to be more closely held as compared to public firms and concentrated illiquid ownership structure provides strong shareholder monitoring (Bhide (1993) and Kahn and Winton (1998)). Given the greater ownership concentration and generally stronger governance possible in private firms, one can argue that public firm CEOs' entrenchment leads them to face a lower chance of dismissal in the face of poor performance. Thus, we have the

Entrenchment Hypothesis: CEOs of private firms face a greater likelihood of turnover for poor performance than do CEOs of public firms.

An often-made point about the major difference between public and private firms is the existence of publicly-traded shares in the former and thus unhappy shareholders easily taking "the Wall Street Walk." Stein (1989) and others have argued that investor myopia can alter managerial decisions. Stein (1988) models this as a takeover (with dismissal) threat when the market underprices the firm. If myopic pressure leads to direct dismissal (even in the absence of a takeover), that would cause public firm CEO turnover to be more sensitive to performance.

In contrast, private firm managers can afford to take a long-term view, knowing that they will not be penalized for poor short-term performance. Further, direct monitoring incentives are stronger in private firms, which allows private firm boards to rely more on subjective performance evaluation for making

CEO turnover decisions relative to boards in publicly listed firms. This view is consistent with the findings in Ke, Petroni, and Safieddine (1999), Engel, Gordon, and Hayes (2002), and Gao et al. (2012) who provide evidence of a substitution between direct monitoring and the use of explicit performance measures across firms with different ownership structures, and findings in Cornelli, Kominek, and Ljungqvist (2012) who show that in private firms soft information (e.g., subjective evaluation) plays a much larger role than hard information (e.g., accounting performance) in boards' decisions to fire CEOs. Thus, we have the alternative

Myopia Hypothesis: CEO turnover in public firms will be more sensitive to performance than it is in private firms.

Given that most corporate investment decisions are long-term, if public firm boards fire CEOs based on short-term performance metrics—"myopic turnover," we expect this excessive intervention can potentially be value-decreasing because it reduces CEOs' incentives to work hard or make CEOs to become myopic (see, for example, Crémer (1995), Burkart, Gromb, and Panunzi (1997), and Fisman et al. (2013)). Hence, the myopia hypothesis predicts that performance improvement following public firm CEO turnover will not be as pronounced as following private firm CEO turnover.

If CEO turnover-performance sensitivity is different, but post-turnover performance improvement is similar for public and private firms, it could be, as argued above, that private firm boards are dismissing CEOs based on unobservable aspects. This would imply that the average non-performance related turnover, captured in the constant in a turnover regression, would be significantly higher for private firms. Thus, by comparing non-performance related turnover rates and post-turnover performance improvements across samples, we can identify the reason that turnover rates differ.

Below we will first describe our sample and then move on to test the two hypotheses on CEO turnover by assessing any difference in CEO turnover in public and private firms, and within public firms with different degrees of investor myopia.

3. Sample Formation and Overview

We start with all US public and private firms with non-missing values for total assets in Capital IQ, an affiliate of Standard & Poor's, from 2001 to 2008. We start our sample in 2001 because Capital IQ

starts to record detailed information on CEO turnover such as why a CEO is replaced, who the new CEO is, and what the new CEO's background is. Public firms in our sample are traded on the NYSE, Amex, or Nasdaq. Private firms are the ones without shares being traded in any major stock exchanges (Firms traded on the over-the-counter market or non-major stock exchanges are excluded from our sample).

To form our sample, we remove all firm-year observations associated with IPOs (3,802 firm-year observations) or going private transactions (1,300 firm-year observations). We further require sample CEOs to have a minimum tenure of two years (losing 328 public firm-year observations, and 173 private firm-year observations). Finally, the CEO turnover case itself is not confounded by bankruptcy, liquidation, or acquisition (being acquired) events. In the end, we have 26,567 public firm-year observations involving 2,525 CEO turnover cases, and 4,423 private firm-year observations involving 356 CEO turnover cases from 2001-2008. In terms of sample size, Jenter and Kanaan (2010) have 16,865 firm-year observations from 1993-2001, while we have a total of 30,990 firm-year observations including 14% of the overall sample from private firms.

Table 1 presents annual frequency of CEO turnover in public and private firm samples. We show that both public and private firms experience increasing occurrence of CEO turnover over the sample period, peaking in the middle of the recent financial crisis (2008), which is the last year of our sample period. Further, it is clear that public firm CEOs experience on average a higher likelihood of turnover at 9.5% per annum as compared to private firm CEOs at 8% per annum. Assuming public firm performance was not systematically worse over our sample period, this initial summary evidence is inconsistent with our entrenchment hypothesis. Our subsequent investigation addresses why this is the case.

Table 2 presents descriptive statistics of our public and private firm samples. All dollar values are in 2008 dollars. All continuous variables are winsorized at the 2.5th and 97.5th percentiles. The variables are defined in Appendix 1.

In terms of the firm characteristics, we show that the mean (median) firm size as measured by sales is \$1,657 million (\$236 million) for the public firm sample, while the mean (median) sales is \$893 million (\$223 million) for the private firm sample. It is worth noting that private firms in our sample are fairly comparable to public firms in terms of size and disclosure. Further, we show that public firms have better operating performance, and higher (median) sales growth.

Turning to the CEO characteristics, we show that public firm CEOs are actually more likely to be the founder, and are slightly older than their counterparts in private firms. Notably, public firm CEOs in our sample have smaller ownership than their counterparts in private firms: CEOs in public firms own on average 5.76% (median at 1.60%) of their companies, as opposed to 13.79% (median at 2.40%) for private firm CEOs. In our multivariate analyses, we will control for CEO founder status and ownership as well as examine subsamples of non-founder CEOs and CEOs with non-controlling stakes to deal with potential CEO entrenchment in the private firm sample. Overall, despite statistically significant differences in firm and CEO characteristics of the public and private firms in our sample, our sample of privately held firms is fairly comparable to publicly listed firms in the population.

4. CEO Turnover in Public and Private Firms

The univariate analysis in the previous section shows that the unconditional turnover rate is higher for CEOs of public firms relative to CEOs of private firms. In this section we explore the differences in CEO turnover-performance sensitivity in a multivariate setting.

4.1. CEO Turnover-Performance Sensitivity in Public and Private Firms

To examine how CEO turnover responds to firm performance, we estimate the following regression following prior work (Huson et al. (2001) and Jenter and Kanaan (2010)):

$$Pr(\text{CEO Turnover}) = \alpha + \beta_1 \text{Public} + \beta_2 \text{Public} \times \text{ROA} + \beta_3 \text{Public} \times \text{Sales growth} + \beta_4 \text{ROA} + \beta_5 \text{Sales growth} + \beta_6 \text{Firm size} + \beta_7 \text{CF volatility} + \text{Industry FE} + \text{Year FE} + \varepsilon, \quad (1)$$

where the dependent variable is CEO turnover, which takes the value of one if a firm changes its CEO in year t , and zero otherwise. Public is an indicator variable that takes the value of one if the firm is a public firm in that year, and zero otherwise. The interaction terms between the public firm indicator variable and measures of firm performance capture the incremental differences in CEO turnover-performance sensitivity in public firms relative to that in private firms. In addition to firm level controls, we also include industry fixed effects to control for unobserved industry-specific heterogeneity and year fixed effects to account for the time trend. Table 3 presents the results.

In Columns (1) and (2) of Panel A, we estimate the turnover-performance sensitivity separately for public and private firms. We show that both public and private firm CEO turnover responds significantly to bad performance as captured by negative ROA and sales growth, confirming prior evidence as first shown in Coughlan and Schmidt (1985) and Warner et al. (1988) that poor performance drives CEO turnover decisions by the board. Further, both large public and large private firms are associated with higher CEO turnover. Finally, high cash flow volatility is associated with high CEO turnover only in public firms, suggesting public shareholders and boards' aversion to volatility.

Column (3) presents the results from the baseline model in Equation (1). We first show that compared to private firm CEOs, public firm CEOs are about two percentage points more likely to be replaced, inconsistent with the argument that they are more entrenched. The coefficient estimate on the public firm indicator variable is around 0.02 and significant at the 1% level. Notably, the coefficient estimates on the interaction terms between the public firm indicator variables and measures of firm performance are also negative and significant at or lower than the 5% level. Thus, there is significantly greater CEO turnover-performance sensitivity in public firms as compared to private firms, consistent with the prediction based on our myopia hypothesis. Further, we show that CEO turnover is more likely in large firms and firms with high cash flow volatility.¹

Columns (4)-(6) present the results removing CEOs who are close to retirement (with age ≥ 63), who are founders, and who are large shareholders (with ownership $\geq 10\%$), respectively. We continue to show that there is significantly greater CEO turnover-performance sensitivity in public firms as compared to private firms. In the subsample where large shareholding CEOs are removed (Column (6)), the baseline non-performance related turnover difference between public and private firm CEOs becomes insignificant, but the greater turnover-performance sensitivity remains. This suggests that the difference is driven by private firm CEOs with large ownership stakes, who are less likely to leave the firm for non-performance reasons.

Prior work such as Denis et al. (1997) has shown that CEO ownership has important implications for the relation between firm performance and CEO turnover likelihood. Table 3 Panel B presents the

¹ In Appendix 2 Panel A, we show that the main results from Table 3 Panel A remain unchanged when we use both contemporaneous and lagged performance measures. For parsimony, we opted to present our main results using two-year performance measures. Moreover, as shown in Appendix 2 Panel B, our main results remain unchanged when we exclude the year 2008 (the financial crisis year with the highest turnover frequency in our sample).

results accounting for differences in CEO ownership. Low CEO ownership is an indicator variable that takes the value of one if the CEO ownership is below the 25th percentile of CEO ownership across all public and private firms (at 0.21%), and zero otherwise. The variables of interest are the interaction terms between the low CEO ownership indicator variable and two performance variables: ROA and sales growth.

Column (1) presents the results using the full sample of public and private firms. We still observe the differential sensitivity of CEO turnover to firm performance in public and private firms. As would be expected, we show that CEOs with low ownership are significantly more likely to be replaced: The coefficient estimate on the low CEO ownership indicator variable is around 0.11 and significant at the 1% level, suggesting that CEOs with low ownership stakes are about eleven percentage points more likely to be replaced than those with high ownership stakes. Further, the coefficient estimates on the interaction terms between the low CEO ownership indicator variable and measures of firm performance are also negative and significant at or lower than the 10% level, indicating that there is significantly greater turnover-performance sensitivity for CEOs with low ownership stakes than for those with high ownership stakes. Finally, the results show that public firm CEO turnover remains more sensitive to performance even in the presence of controls for the effect of ownership.

Columns (2)-(4) present the results removing CEOs who are close to retirement (with age ≥ 63), who are founders, and who are controlling shareholders (with ownership $\geq 50\%$), respectively. We continue to show that there is significantly greater turnover-performance sensitivity for CEOs with low ownership stakes than for those with high ownership stakes.²

Prior work beginning with Weisbach (1988) has noted that firms with outsider-dominated boards are significantly more likely than firms with insider-dominated boards to remove their CEOs on the basis of firm performance. Panel C of Table 3 presents the results accounting for differences in board independence. High board independence is an indicator variable that takes the value of one if the fraction of independent directors on a board is above the sample median fraction of independent directors across

² In Appendix 2 Panel C, we estimate Column (4) separately for public firms and private firms. We show that there is no significant difference in the sensitivity of CEO turnover to performance for CEOs with low ownership stakes across public and private firms: The coefficient estimates on the interaction terms between the low CEO ownership indicator variable and firm performance variables are not statistically different across the two samples. When we repeat the same analysis using specifications in Columns (1)-(3), we obtain the same findings (untabulated).

all public and private firms (at 83%), and zero otherwise. The variables of interest continue to be the public firm indicator variable and its interaction terms with the two performance measures as well as the interaction terms between the high board independent indicator variable and the two performance variables.

Column (1) presents the results using the full sample of public and private firms. We show that CEOs with more independent boards are significantly more likely to be replaced: The coefficient estimate on the high board independence indicator variable is around 0.02 and significant at the 1% level, suggesting that CEOs with more independent boards are about two percentage points more likely to be replaced than those with less independent boards. Further, the coefficient estimates on the interaction terms between the high board independence indicator variable and measures of firm performance are also negative and significant at or lower than the 10% level, indicating that there is significantly greater turnover-performance sensitivity for CEOs with more independent boards than for those with less independent boards. Throughout the specifications, the public firm interaction terms remain negative and significant, showing that public firm CEO turnover is more sensitive to performance, even after controlling for the effect of board independence.

Columns (2)-(4) present the results removing CEOs who are close to retirement (with age ≥ 63), who are founders, and who are large shareholders (with ownership $\geq 10\%$), respectively. We continue to show that there is significantly greater turnover-performance sensitivity for CEOs with more independent boards than otherwise (with one exception when the coefficient on the interaction between the high board independence indicator variable and sales growth when CEOs with high ownership are excluded).³ We do find that the baseline non-performance related turnover difference becomes insignificant when either older CEOs or CEOs with greater than 10% ownership stakes are removed from the sample. While it is speculative, one interpretation is that older and/or controlling CEOs are more likely to exit public firms than private firms, thus accounting for the significance of the coefficient estimate on the public firm indicator variable when these CEOs are included.

³ In Appendix 2 Panel D, we estimate Column (4) separately for public firms and private firms. We show that there is some differential turnover-performance sensitivity for CEOs with more independent boards across public and private firms: The coefficient estimate on the interaction term between the high board independence indicator variable and sales growth is significantly different across the public and private firm samples. When we repeat the same analysis using specifications in Columns (1)-(3), we obtain the same findings (untabulated).

Panel D presents the results accounting for differences in CEO tenure. Long CEO tenure is an indicator variable that takes the value of one if the CEO tenure is above the sample median across all public and private firms (at 7 years), and zero otherwise. The variables of interest are the public firm indicator variable and its interaction terms with the two performance measures as well as the interaction terms between the long CEO tenure indicator variable and the two performance variables.

Column (1) presents the results using the full sample of public and private firms. We show that CEOs with longer tenure are significantly less likely to be replaced: The coefficient estimate on the long CEO tenure indicator variable is around 0.02 and significant at the 1% level, suggesting that CEOs with longer tenure are about two percentage points less likely to be replaced than those with shorter tenure. Further, the coefficient estimate on the interaction term between the long CEO tenure indicator variable and ROA is positive and significant at the 1% level, indicating that there is significantly lower turnover-performance sensitivity for CEOs with longer tenure than for those with shorter tenure. Interestingly, we do not observe any mitigating effect of CEO long tenure on the turnover to sales growth sensitivity: The coefficient estimate on the interaction term between the long CEO tenure indicator variable and sales growth is statistically insignificantly different from zero. Again, the result that public firm CEO turnover is more sensitive to performance remains in the presence of controls for CEO tenure.

Columns (2)-(4) present the results removing CEOs who are close to retirement (with age ≥ 63), who are founders, and who are large shareholders (with ownership $\geq 10\%$), respectively. The performance sensitivity interactions are unaffected.

Overall, the results in Table 3 show that both public and private firm CEO turnover is strongly related to firm performance measures as captured by accounting performance and sales growth. Further, public firm CEO turnover exhibits stronger turnover-performance sensitivity than private firm CEO turnover does. In most specifications, the public firm indicator variable is significantly positive, and it is never significantly negative. These results are consistent with the predictions based on our myopia hypothesis that public firm boards, due to their liquid shares, tend to focus on short-term results; in contrast, private firm boards, due to their greater monitoring incentives, collect and use more subjective information in turnover decisions, leading to greater CEO turnover-performance sensitivity in public

firms as compared to that in private firms (also see Cornelli et al. (2012) and Cornelli and Karakaş (2012)).

4.2. Relative Performance Evaluation in Public and Private Firm CEO Turnover

Standard economic theory suggests that, when making CEO firing decision, the board should only focus on components of firm performance that are within a CEO's control, and hence the so-called relative performance evaluation in CEO turnover. Prior work such as Jenter and Kanaan (2010) and Kaplan and Minton (2012) has shown the presence of relative performance evaluation in CEO turnover decisions. These papers also show that CEOs are significantly more likely to be fired after negative performance in their peer firms. To examine whether the differential turnover-performance sensitivity between public and private firm CEOs is driven by the use of relative performance benchmarks, we estimate the following regression:

$$\begin{aligned}
 Pr(CEO\ Turnover) = & \alpha + \beta_1 Public + \beta_2 Public \times Industry - adjusted\ ROA \\
 & + \beta_3 Public \times Industry - adjusted\ sales\ growth + \beta_4 Public \times Industry\ ROA \\
 & + \beta_5 Public \times Industry\ sales\ growth + \beta_6 Industry - adjusted\ ROA \\
 & + \beta_7 Industry - adjusted\ sales\ growth + \beta_8 Industry\ ROA + \beta_9 Industry\ sales\ growth \\
 & + \beta_{10} Firm\ size + \beta_{11} CF\ volatility + Year\ FE + \varepsilon,
 \end{aligned} \tag{2}$$

where the dependent variable is CEO turnover. Industry median performance measures are computed using the entire sample of public and private firms at the 48 Fama-French industry level (Fama and French (1997)). The interaction terms between the public firm indicator variable and measures of industry-adjusted firm performance, capture the incremental differences in CEO turnover-firm-specific performance sensitivity in public firms relative to that in private firms. The interaction terms between the public firm indicator variable and measures of industry-level performance capture the incremental differences in CEO turnover-industry performance sensitivity in public firms relative to that in private firms. In addition to firm level controls, we also include year fixed effects to account for the time trend. Table 4 presents the results.

Panel A Column (1) presents estimates of turnover-performance sensitivity involving industry-adjusted firm-level and industry performance measures separately. We show that both public and private firm CEO turnover responds significantly to bad firm-specific performance (measured in terms of ROA not in terms of sales growth) after removing the industry-level performance, confirming prior evidence as shown in Jenter and Kanaan (2010) that poor firm-specific performance drives CEO turnover decisions by the board. Further, we show that the coefficient estimates on the interaction terms between the public firm indicator variable and measures of firm-specific performance (measured in terms of both ROA and sales growth) are negative and significant at or lower than the 5% level, indicating that there is significantly greater turnover-performance sensitivity in public firms as compared to private firms, based on industry-adjusted performance measures. Finally, both public and private firm CEO turnover responds significantly to the industry-level performance, and there is limited evidence of differential turnover sensitivity to the industry-level performance between public and private firm CEOs (as measured by industry sales growth and significant at the 10% level). Columns (2)-(4) present the results removing CEOs who are close to retirement (with age ≥ 63), who are founders, and who are large shareholders (with ownership $\geq 10\%$), respectively. As with the raw performance measures, we continue to show that there is significantly greater sensitivity of turnover to the industry-adjusted performance in public firms as compared to private firms in these subsamples. However, we do not observe any differential CEO turnover sensitivity to the industry-level operating performance between public and private firms.

To formally investigate the role of relative performance evaluation in CEO turnover across public and private firms, in Panel B we include both the firm's raw ROA (sales growth) and industry ROA (sales growth) in the regression. As shown in Column (1) of Panel B, for public firms the coefficient estimates on the firm's raw ROA and sales growth are significantly negative but the coefficient estimates on the industry ROA and industry sales growth are significantly positive, indicating that after controlling for firms' raw performance, better industry performance (i.e., worse firm performance relative to its industry) significantly increases CEO turnover. Thus, our results support the presence of relative performance evaluation in CEO contracts, consistent with Gibbons and Murphy (1990) and Jenter and Kanaan (2010). For private firms as shown in Column (2), we find that the coefficient estimate on industry ROA is positive but insignificant and the coefficient estimate on industry sales growth is positive and significant at the 5% level, indicating some (weak) evidence of relative performance evaluation in private firm CEO

contracts. Pooling public and private firms together in Columns (3)-(6), we show that the coefficient estimate on the interaction term between the public firm indicator variable and industry sales growth is positive and significant at or lower than the 10% level, implying that relative performance evaluation is more prevalent in public firms than in private firms. Our paper is one of the first in the literature presenting evidence on the presence of relative performance evaluation in CEO turnover decisions in private firms, and pointing out the differential effects in public and private firms.

In Panel C we further use the industry value-weighted portfolio stock return as the measure of industry performance. The coefficient estimate on the industry stock return is negative and significant: CEOs are more likely to be fired when the industry-level stock performance is poor. However, the coefficient estimate on the interaction term between the public firm indicator variable and the industry stock return is negative and significant at the 1% level, implying that CEO turnover sensitivity to the industry-level stock performance is stronger for public firms than for private firms. This is surprising because the board of a public firm can observe the firm's own stock return, so if anything, relative performance evaluation should result in a positive loading for the industry stock return. There is no directly observable return for private firms, so boards may be expected to be more likely to use the industry performance as a proxy. Nonetheless, the finding is consistent with the findings in Jenter and Kanaan (2010) for public firms alone. This result, together with the result in Panel A where we show little difference in CEO turnover sensitivity to the industry-level operating performance between public and private firms, suggests that the pressure from the stock market (and investor myopia) causes public firm boards to fire their CEOs too frequently.

In summary, we conclude that using industry-adjusted performance measures, we continue to find that there is greater turnover-performance sensitivity in public firms compared to that in private firms. Next we explore whether this differential sensitivity remains after separating forced from voluntary turnover.

4.3. CEO Turnover-Performance Sensitivity in Public and Private Firms: Forced versus Voluntary

The existing literature on CEO turnover has debated over whether to classify turnover cases into forced ones versus voluntary ones. On the one hand, voluntary turnover cases may arise due to normal CEO retirement, which needs not be associated with poor prior performance (Huson, Malatesta, and

Parrino (2004)). On the other hand, Kaplan and Minton (2012) find that forced and unforced turnover cases have similar patterns and suggest that some (if not most) turnover cases labeled as unforced are actually not voluntary. Jenter and Lewellen (2010) argue that one should treat all CEO turnover cases as potentially forced ones because existing algorithms used to distinguish forced and voluntary turnover will inevitably misclassify some turnover cases, leading to a downward bias in the estimated turnover-performance sensitivity.

Although our paper is not intended to contribute to this debate, we are interested in whether this classification influences our results on the difference in CEO turnover-performance sensitivity across public and private firms. Following Parrino (1997), we classify a CEO turnover as forced if the press reports that CEO is fired, forced out, or retires or resigns due to pressure. All other departures for CEOs aged 60 or above are classified as voluntary. Departures for CEOs below age 60 are also classified as forced if either the press does not report the reason as death, poor health, or the acceptance of another position (including the chairmanship of the board), or the press reports that the CEO is retiring, but does not announce the retirement at least six months before the succession. For public firms, we have 689 forced turnover cases and 1,836 voluntary turnover cases. For private firms, we have 145 forced turnover cases and 211 voluntary turnover cases. Table 5 Columns (1) and (2) present the marginal effects of a logit regression where the dependent variables are the forced and voluntary CEO turnover indicator variables, respectively. The baseline case is no turnover, and the public firm indicator variable captures the differential forced (voluntary) turnover probability that is unrelated to performance.

In the forced turnover regression (Column (1)), we find that forced turnover unrelated to performance is no different for private and public firm CEOs. These departures could be due to clashes over long-term strategies, management styles or personalities, and so perhaps it is unsurprising that these idiosyncratic causes do not differ across public and private firms. On the other hand, we see that the baseline non-performance related voluntary turnover rate is higher for public firm CEOs than for private firm CEOs (Column (2)). Specifically, the coefficient estimate on the public firm indicator variable is 0.040 and significant at the 1% level, suggesting a four percentage point greater baseline voluntary turnover rate. One plausible interpretation of the above findings is that public firm media releases tend to be “gentle” about outgoing CEOs, leading to under-classification of forced CEO turnover cases as compared to private firms. Importantly, we still observe that irrespective of the nature of the turnover,

there is significantly greater CEO turnover-performance sensitivity in public firms compared to that in private firms, based on both performance measures. Finally, we show that both forced and voluntary turnover is more likely in poorly performing firms, large firms, and firms with high cash flow volatility. In summary, we conclude that splitting the sample by forced versus voluntary turnover (or by implication error in doing so) does not affect our inferences that there is greater CEO turnover-performance sensitivity in public firms relative to private firms, consistent with our myopia hypothesis.

4.4. Internal versus External Hires in Public and Private Firms

We next examine what factors could explain the persistence of differential CEO turnover-performance sensitivity in public and private firms. If there is segmentation in the labor market for CEOs, then this would help explain how it is an equilibrium for the turnover-performance sensitivity to differ. We argued earlier that it is possible that public firm boards behave myopically in terminating poorly performing CEOs too quickly. This tendency could be increased by a belief that there is a larger or higher quality pool from which to draw a replacement CEO. Thus, the perceived difference between the incumbent CEO's quality and the potential replacement CEO's quality would be larger in public firms when performance drops.

To explore this possibility, we examine whether public firms are more likely to hire external replacement CEOs and whether public firms hire external replacement CEOs from different sources than private firms. On the one hand, public firms have better visibility, which provides them better access to external CEO candidates than private firms do. On the other hand, firms with strong governance are more likely to select outside CEOs, as outside CEOs are more willing to break away from the failed policies of their predecessors (Borokhovich, Parrino, and Trapani (1996) and Huson et al. (2001)). This argument, in turn, predicts that private firms are more likely to hire external CEOs than public firms.

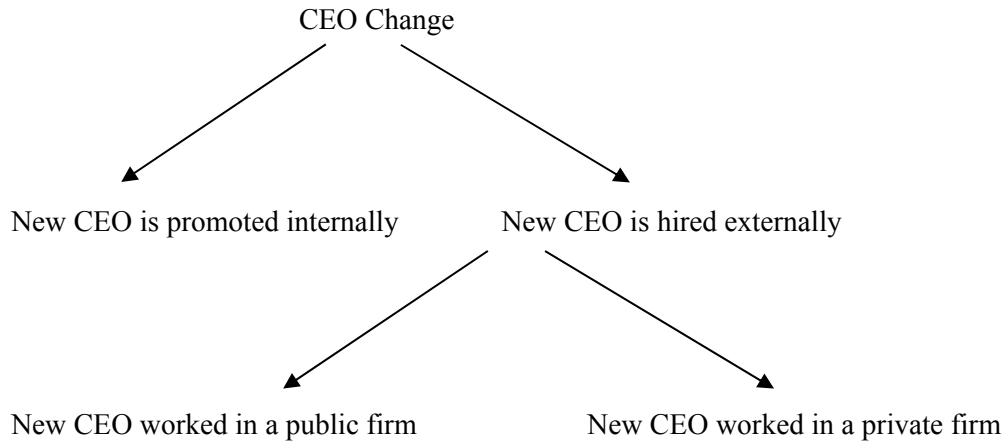
The difference in turnover-performance sensitivity across public and private firm CEOs also suggests some labor market frictions that prevent CEO talents from freely moving across these two types of firms. Public firm CEOs call for a different set of skills as compared to private firm CEOs. For example, public firm CEOs need to be more skillful at dealing with analysts and financial press, and they typically face more regulation and disclosure requirements as compared to private firm CEOs. Without the public shareholders' fixation on short-term performance (i.e., stock prices), private firm CEOs, on the

other hand, have the luxury to make decisions with a longer horizon. Therefore, we expect that, conditioning on outside CEO succession, public firms are more likely to hire CEOs from other public firms, while private firms are more likely to hire CEOs from other private firms.

To gain some understanding on the differential CEO turnover-performance sensitivity between public and private firms, we compare incoming CEOs across these two types of firms. Capital IQ “key development” database provides detailed information on the nature of the CEO turnover, and biographies of the incoming CEO, so that we can determine whether the incoming CEO is an internal versus external hire, and conditional on being an external hire, whether the incoming CEO has most recently worked in a public or private firm. Following Huson et al. (2004), we define an external CEO as the one who takes the CEO position within one year of joining the firm. For each external CEO, we further determine whether he has worked in a private firm or a public firm based on his employment affiliation right before the CEO appointment.

Panels A and B of Table 6 present some basic statistics on internal versus external hires. Within public firms, 72.5% of the new hires are coming from the same company; in contrast, only 57.9% of the new hires are coming from the same company for the private firm sample. The difference in frequency is significant at the 1% level. Conditional on making an external hire, more than 77% of the new CEOs to public firms come from another public firm; about 75% of the new CEOs to private firms come from another private firm. Panel C presents the personal characteristics of outgoing CEOs (measured in the year prior to the turnover) and incoming CEOs (measured in the year following the CEO appointment). In both types of firms, the incoming CEOs are younger, have lower ownership, and are less likely to be a founder or the chairman of the board, as compared to outgoing CEOs.

The data shows that there are material differences between replaced and incoming CEOs within each type of the firms, and across the two types of firms, suggesting the possibility of labor market segmentation across the two types of firms. Then the important and more interesting question is what leads to labor market segmentation? We estimate a nested logit regression as outlined in the plot below:



and specified as the following:

$$\begin{aligned}
 Pr(CEO\ Outcome) = & \alpha + \beta_1 Public + \beta_2 ROA + \beta_3 Sales\ growth + \beta_4 Firm\ size \\
 & + \beta_5 CF\ volatility + \beta_6 Forced\ turnover + \beta_7 High\ industry\ external\ hires \\
 & + Year\ FE + \varepsilon,
 \end{aligned} \tag{3}$$

where in the first stage, the dependent variable is the new CEO hired from outside indicator variable, and we examine whether there is any differential in hiring CEOs from outside an organization between public and private firms. In the second stage, the dependent variable is the new CEO hired from a public firm indicator variable. Conditional on external hires, we examine whether there is any differential in the incoming CEO background—having worked in public or private firms—between public and private firm CEO hires. We control for the nature of the CEO turnover by including the forced CEO turnover indicator variable.

To control for industry-specific differences in the propensity of a firm to hire an external CEO (Murphy and Zbojnik (2006)), we compute for each industry-year, the industry external hires ratio as [# of external CEOs hired/ total # of CEO changes]. High industry external hires is an indicator variable that takes the value of one if this ratio is above the sample median, and zero otherwise. Table 6 Panel D presents results from our multivariate analysis of internal versus external CEO hires.

Column (1) presents the first stage estimation results. We show that consistent with our univariate statistics, public firms are less likely to hire a new CEO from the outside: The coefficient estimate on the

public firm indicator variable is -0.164 and significant at the 1% level, suggesting that the likelihood of public firms hiring external CEOs is about 16 percentage points lower than that of private firms. By showing that private firms are more likely to hire external CEOs, we are able to rule out an alternative explanation for the observed lower CEO turnover-performance sensitivity in private firms because these firms have a more limited (external) labor market pool than public firms and hence more tolerant of poor performance. Further, we show that poorly performing firms and small firms are more likely to hire outside CEOs, as well as firms that force-out the CEO. Notably, greater executive mobility within an industry, as proxied by the high industry external hires indicator variable, is positively and significantly associated with a firm's likelihood to hire outside CEOs.

Column (2) presents the second stage estimation results. We first show that conditional on external hires, public firms are more likely to hire a new CEO from other public firms: The coefficient estimate on the public firm indicator variable is 0.533 and significant at the 1% level, suggesting that the likelihood of public firms hiring external CEOs from other public firms is about 50 percentage points higher than that of private firms hiring external CEOs from public firms. Further, we show that poorly performing firms and large firms are more likely to hire outside CEOs from other public firms. Conditional on making an external hire, neither forced turnover nor industry executive mobility explain whether the new CEO is from a public or private firm.

Gao et al. (2012) show that public firm CEOs are paid more than otherwise similar private firm CEOs. When combined with our evidence here that public firm CEOs are fired more frequently for non-performance based reasons than are private firm CEOs, their findings could be explained in part by the greater turnover risk for public firm CEOs.

In summary, we conclude that the segmented labor market for public and private firm CEOs combined with more readily available internal CEO candidates in public firms contribute to the greater CEO turnover-performance sensitivity in public firms as compared to that in private firms. Then the natural questions to ask are that are the CEO turnover-performance sensitivity and more generally CEO turnover decision in public firms optimal? To answer these questions, we need to come to a full loop by examining performance outcome post CEO turnover in public and private firms.

4.5. Performance Changes around CEO Turnover in Public and Private Firms

Jenter and Kanaan (2010) point out that stricter corporate governance practices may be associated not just with more performance pressure on the CEOs, but also with more performance mis-attribution by the corporate boards, hinting that the current amount of CEO turnover and turnover-to-performance sensitivity are short of being optimal. Fisman et al. (2013) caution that insulation from (public) shareholder pressure on short-term results may allow for better long-term corporate decision making and that greater CEO turnover-performance sensitivity may have unintended consequences.

In this section, we examine firm performance after CEO turnover in public and private firms. By doing so, we can gain insight into the optimality of the turnover decisions across these two types of firms. If the higher turnover-performance sensitivity in public firms is driven by investor myopia, then we will see less performance improvement following public firm CEO turnover. Panels A and C of Figure 1 reveal that, on average, performance improves in the year following CEO turnover in both public and private firms. There is a “V” shape in ROA and sales growth around the turnover year (i.e., the year 0 in the plot), and it is more pronounced in the case of private firms.

To further investigate the effect of turnover on subsequent firm performance, we estimate the following regression to explain difference in performance improvement in the year following CEO turnover across public and private firms:

$$\Delta Performance = \alpha + \beta_1 Public\ turnover + \beta_2 Private\ turnover + \beta_3 Firm\ size + \beta_4 CF\ volatility + Industry\ FE + Year\ FE + \varepsilon, \quad (4)$$

where the dependent variable is the change in ROA (sales growth) from the turnover year (i.e., year 0) to year +1. Our variables of interest are the two indicator variables *Public turnover* and *Private turnover*, where *Public turnover* (*Private turnover*) takes the value of one if a public (private) firm changes its CEO in year 0, and zero otherwise. Table 7 presents the results.

In Column (1), the dependent variable is ΔROA ; the coefficient estimates on the public turnover and private turnover indicator variables are 0.004 and 0.009, respectively, and both are significant at the 1% level. The F test on the equality of these two coefficients is rejected at the 1% level. This result indicates that, while both types of firms have significant performance improvement after CEO turnover, the improvement is more pronounced in private firms than in public firms. In Column (2), we exclude the voluntary turnover cases, and find that both the coefficient estimates on the public turnover and private

turnover indicator variables become slightly larger relative to the ones in Column (1), suggesting that the performance turnaround is more evident for forced CEO dismissals. Importantly, we still find that private firms experience greater performance improvement after CEO turnover, as compared to public firms. We find similar results when using Δ Sales growth in Columns (3) and (4).

This significant performance improvement after a turnover could be due to mean reversion of industry and firm-specific factors. To explore this possibility, we match each CEO-dismissing sample firm to a control firm using the following procedure. We first identify a group of firms in the same Fama and French (1997) 48 industry whose ROA (sales growth) in year -1 is at least $0.9 \times$ and no more than $1.1 \times$ the sample firm's ROA (sales growth) in year -1, and whose ROA (sales growth) in year 0 is also within the same band around the sample firm's ROA (sales growth) in year 0 (i.e., the turnover year). Among them, we then pick the firm with the closest two-year cumulative ROA (sales growth) in year -1 and year 0. The control-adjusted performance measure of each sample firm is computed by subtracting the performance measure of its control firm. Similar to the matching approach advocated by Barber and Lyon (1996), our method can isolate the component of performance change attributable to turnover from that due to mean reversion in performance time series.

Panels B and D of Figure 1 show that the CEO-dismissing sample firms were outperforming their matched control firms prior to the matching period and then decreased in the turnover year. Following the turnover, their performance shows a small, but significant increase in control-adjusted ROA (sales growth). From year 0 to year +1, the average Δ control-adjusted ROA is 1.02% for private firms and 0.32% for public firms, and the difference is significant at the 1% level. Similarly, the average Δ control-adjusted sales growth from year 0 to year +1 is 2.59% for private firms, which is significantly larger than the corresponding number in public firms (1.11%). The results on the improvement in operating performance are consistent with Denis and Denis (1995) and Huson et al. (2004), who provide evidence of improved operational performance after CEO forced turnover. Based on the forced CEO turnover sample, Panels E-H also find that firm performance improves after CEO forced turnover and the performance improvement is more pronounced for private firms than for public firms.

Overall, Figure 1 and Table 7 together show that the performance improvement around CEO turnover is more evident for private firms than for public firms, supporting our myopia hypothesis. This evidence is consistent with our conjecture that CEOs of public firms are myopically dismissed too often.

4.6. Investor Myopia and CEO Turnover within Public Firms

To provide further evidence that the differences in CEO turnover between public and private firms are driven by stock market investor myopia, we examine how CEO turnover rates vary with different degrees of investor myopia within public firms. Following Stein (1989) and Asker et al. (2012), investor myopia is measured by the sensitivity of a firm's stock price to its earnings news. A higher sensitivity indicates that investors are more likely to base their expectations of a firm's future cash flows on its current cash flow, and thus implies more severe investor myopia.

Following Easton and Zmijewski (1989), we use the earnings response coefficient (ERC) to measure the sensitivity of firm stock price to earnings news. We first compute a firm's size-adjusted cumulative abnormal return over the three-day window around its quarterly earnings announcement (CAR3) and unexpected earnings as the difference between its actual earnings per share and the median forecasted value by analysts (obtained from IBES). Next, for each industry-year we estimate the ERC by regressing firm-level CAR3s on a constant and firm-level unexpected earnings for all firms in that industry in that year; the coefficient estimate on the unexpected earnings is the ERC for each industry-year and is assigned to each public firm in that industry-year. Finally, we let the myopia indicator variable to take the value of one if the firm's ERC is greater than the sample median, and zero otherwise.

The regression specification in Panel A of Table 8 is similar to Panel A of Table 3, except that we only employ the public firm sample and replace the public firm indicator variable with the new myopia indicator variable. The coefficient estimate on the myopia indicator variable is positive and significant and the coefficient estimates on the interaction terms between the myopia indicator variable and two performance measures (ROA and sales growth) are both negative and significant. This result indicates that within public firms, firms with myopic investors are more likely to fire CEOs in response to poor performance.

We further investigate the performance improvement after CEO turnover and the results are reported in Panel B. We classify a turnover as either a myopic turnover or a non-myopic turnover, based on whether the firm has myopic investors as defined above. The regression specification of Panel B of Table 8 is the same as Table 7, except that we replace the public (private) turnover indicator variable with the myopic (non-myopic) turnover indicator variable. We show that the coefficient estimates on both the myopic and non-myopic turnover indicator variables are positive and significant, indicating that both types of turnover are associated with improvement in operating performance. However, the coefficient estimate on the non-myopic turnover indicator variable is significantly larger than that on the myopic turnover indicator variable, which implies that the performance improvement after CEO turnover is smaller if investors are myopic. In untabulated analysis, we also compute the control-adjusted ROA and control-adjusted sales growth across myopic and non-myopic turnovers. From year 0 to year +1, the average Δ control-adjusted ROA is 0.11% (0.42%) for myopic (non-myopic) public firms and the average Δ control-adjusted sales growth is 0.80% (1.43%) for myopic (non-myopic) public firms; both the differences are significant at the 1% level. Because these firms have similar industry-adjusted performance declines from year -1 to 0, these results indicate that the difference in performance improvement after CEO turnover across myopic and non-myopic public firms is not a mere reflection of mean-reversion in operating performance.

Overall, we show that within the public firm sample, firms with myopic shareholders appear to fire their CEOs too frequently, leading to smaller performance improvements compared to firms with less myopic shareholders. These results are consistent with our earlier findings on the differences in CEO turnover between public and private firms and provide further evidence that investor myopia drives US public firms to fire their CEOs in a suboptimal way.

5. Conclusions

In this paper we make use of a natural benchmark to better understand the role of corporate governance and performance horizons in public firm CEO turnover. Specifically, we compare turnover in

public firms to turnover in similar private firms. Even in subsamples that exclude founder and controlling shareholder CEOs, we find that private firm CEOs experience lower rates of turnover and that turnover is less sensitive to performance. Given that monitoring and governance practices in private firms are better than in public firms, it is unlikely that CEO turnover in private firms is suboptimally low. Rather, if anything the results suggest that public firm boards turnover their CEOs too frequently. We provide some evidence consistent with this conclusion—performance improvements following turnover are not as strong in public firms as they are in private firms. We further corroborate the above findings by exploring the cross-sectional variation in investor myopia within the public firm sample.

We then investigate the reasons for this difference in turnover-performance sensitivity. We find that there is evidence of segmentation in the market for CEOs. Public firms tend to promote from within and when they do hire externally, they are more likely to hire from another public firm. Similarly, private firms are significantly more likely to hire from other private firms. We argue that overall, the results are consistent with myopic behavior on the part of public firm boards. Faced with short-term performance deterioration, they are too quick to fire CEOs. This tendency is potentially enhanced by the perception that they have a larger pool of potential replacements from within and outside the firm. Evidence in other work, by Gao et al. (2012), shows that public firm CEOs are paid more than otherwise similar private firm CEOs. This could be explained in part by their greater turnover risk.

Appendix 1:

Variable Definitions

<i>Variable</i>	<i>Definition</i>
CF volatility	the standard deviation of industry-median-adjusted quarterly operating cash flows over the previous eight quarters.
Chairman	an indicator variable that takes the value of one if the CEO is also the chairman of board, and zero otherwise.
Contemporaneous ROA	return on assets at year t , computed by Capital IQ as $EBIT \times 0.625 / \text{total assets}$ by assuming that the average corporate tax rate is 37.5%.
Contemporaneous sales growth	$(\text{sales at year } t / \text{sales at year } t-1) - 1$.
Founder	an indicator variable that takes the value of one if the CEO is the firm's founder, and zero otherwise.
High board independence	an indicator variable that takes the value of one if the percentage of outside directors on the board is greater than the sample median, and zero otherwise. The board information for private firms is hand collected from a firm's 10-K or DEF14A. The board information for public firms are obtained from IRRC and BoardEx.
High industry external hires	For each industry-year, we compute external hiring ratio as (number of external CEO hired/ total number of CEO changes), where an external CEO is defined as the one who takes the CEO position within one year of joining the firm. The indicator variable, high industry external hires, takes the value of one if external hiring ratio is above the sample median, and zero otherwise.
Industry-adjusted ROA	two-year accumulative industry-median-adjusted ROA.
Industry-adjusted sales growth	two-year accumulative industry-median-adjusted sales growth rate.
Industry stock return	two-year accumulative industry value-weighted portfolio stock return.
Lagged sales growth	$(\text{sales at year } t-1 / \text{sales at year } t-2) - 1$.
Lagged ROA	return on assets at year $t-1$, computed by Capital IQ as $EBIT \times 0.625 / \text{total assets}$ by assuming that the average corporate tax rate is 37.5%.
Long CEO tenure	an indicator variable that takes the value of one if the CEO tenure is greater than the sample median, and zero otherwise.
Low CEO ownership	an indicator variable that takes the value of one if CEO ownership is below the 25 th percentile of sample CEO ownership, and zero otherwise.
New CEO hired from outside	an indicator variable that takes the value of one if the CEO is hired from outside, and zero otherwise.
New CEO hired from a public firm	an indicator variable that takes the value of one if the CEO is hired with prior experience in public firms, and zero otherwise.
Myopia	We first compute size-adjusted accumulative abnormal returns over the three-day window around quarterly earnings announcements (CAR3) and obtain a firm's unexpected earnings as the difference between the actual earnings per share and the median forecasted value by analysts obtained from IBES. We then regress CAR3 on a constant and unexpected earnings, and obtain the coefficient on unexpected earnings as the earnings response coefficient (ERC) for each industry and year, which is assigned to each public firm in the same industry and year. The myopia indicator variable takes the value of one if a firm's earnings response coefficient is larger than the sample median, and zero otherwise.
Myopic turnover	an indicator variable that takes the value of one if a public firm with the myopia indicator variable being one experiences CEO turnover in a year, and zero otherwise.

Non-myopic turnover	an indicator variable that takes the value of one if a public firm with the myopia indicator variable being zero experiences CEO turnover in a year, and zero otherwise.
MBA	an indicator variable that takes the value of one if the CEO holds an MBA degree, and zero otherwise.
Male	an indicator variable that takes the value of one if the CEO is male, and zero otherwise.
Ownership	the number of shares owned by the CEO normalized by the total number of shares outstanding. For public firms, we first collect the ownership data from ExecuComp, Corporate Library, and IRRC; for firms not covered in those databases, we hand collect the ownership data from the firm's annual reports and proxy statements. For private firms, we hand collect the ownership data from the firm's annual reports and proxy statements.
Private turnover	an indicator variable that takes the value of one if a private firm experiences CEO turnover in a year, and zero otherwise.
Public	an indicator variable that takes the value of one if the firm is a public firm, and zero otherwise.
Public turnover	an indicator variable that takes the value of one if a public firm experiences CEO turnover in a year, and zero otherwise.
ROA	two-year accumulative return on assets, computed by Capital IQ as $EBIT \times 0.625 / \text{total assets}$ by assuming that the average corporate tax rate is 37.5%.
Sales growth	two-year accumulative sales growth rate.

Appendix 2: Additional Investigation

This table presents the marginal effects of a logit regression where the dependent variable, Turnover, takes the value of one if a firm changes its CEO in year t , and zero otherwise. Our sample consists of 26,567 public firm-year observations involving 2,525 CEO turnover cases, and 4,423 private firm-year observations involving 356 CEO turnover cases from 2001-2008, obtained from Capital IQ. Definitions of all variables are provided in Appendix 1. All dollar values are in 2008 dollars. All continuous variables are winsorized at the 2.5th and 97.5th percentiles. ROA and sales growth are the two-year accumulative ROA and sales growth from year $t-1$ to year t . Panel A presents the baseline turnover model by controlling for contemporaneous ROA and sales growth and lagged ROA and sales growth, respectively. Panel B is based on Table 3 Panel A by excluding year 2008. Panel C is based on Table 3 Panel B Column (4) by separating public and private firms. Panel D is based on Table 3 Panel C Column (4) by separating public and private firms. Industry and year fixed effects are included in the regressions and the heteroskedasticity-consistent standard errors (in brackets) account for possible correlation within a firm cluster. Superscripts ***, **, * correspond to statistical significance at the 1, 5, and 10 percent levels, respectively.

Panel A: Baseline model of CEO turnover using contemporaneous and lagged performance respectively

	(1) Public firms	(2) Private firms	(3) Full sample	(4) Excluding CEOs with Age ≥ 63	(6) Excluding Founder CEOs	(7) Excluding Owner CEOs
Public			0.021** [0.008]	0.014 [0.009]	0.024*** [0.009]	0.007 [0.010]
Public \times Contemporaneous ROA			-0.501*** [0.138]	-0.456*** [0.148]	-0.562*** [0.157]	-0.601*** [0.169]
Public \times Lagged ROA			-0.237* [0.141]	-0.296* [0.153]	-0.201 [0.158]	-0.068 [0.168]
Public \times Contemporaneous sales growth			-0.050** [0.020]	-0.051** [0.021]	-0.064*** [0.023]	-0.052** [0.023]
Public \times Lagged sales growth			-0.047** [0.019]	-0.044** [0.020]	-0.039* [0.021]	-0.045** [0.021]
Contemporaneous ROA	-0.396*** [0.071]	-0.245*** [0.093]	-0.272*** [0.089]	-0.287*** [0.096]	-0.292*** [0.100]	-0.229** [0.107]
Lagged ROA	-0.088*** [0.023]	-0.062** [0.028]	-0.047 [0.100]	-0.108 [0.108]	-0.046 [0.113]	-0.083 [0.124]
Contemporaneous sales growth	-0.029** [0.012]	-0.024* [0.013]	-0.006 [0.011]	-0.005 [0.011]	-0.011 [0.012]	-0.003 [0.013]
Lagged sales growth	-0.035*** [0.007]	-0.001 [0.002]	-0.004 [0.005]	-0.006 [0.005]	-0.003 [0.006]	-0.008 [0.006]
Ln(sales)	0.013*** [0.002]	0.010*** [0.003]	0.018*** [0.002]	0.015*** [0.002]	0.017*** [0.003]	0.016*** [0.003]
CF volatility	0.338*** [0.110]	-0.072 [0.205]	0.011 [0.152]	0.073 [0.148]	0.091 [0.152]	0.060 [0.159]
Industry and Year FEs	Yes	Yes	Yes	Yes	Yes	Yes
Observations	26,567	4,423	30,990	26,724	26,686	25,361
Pseudo R2	3%	5%	5%	5%	5%	4%

Panel B: Excluding year 2008

	(1) Full sample	(2) Excluding CEOs with Age \geq 63	(3) Excluding Founder CEOs	(4) Excluding Owner CEOs
Public	0.012** [0.006]	0.006 [0.006]	0.015** [0.007]	0.008 [0.008]
Public \times ROA	-0.056* [0.033]	-0.066* [0.034]	-0.068* [0.040]	-0.083* [0.047]
Public \times Sales growth	-0.010** [0.004]	-0.010** [0.005]	-0.014** [0.006]	-0.013** [0.006]
ROA	-0.091*** [0.025]	-0.081*** [0.025]	-0.099*** [0.030]	-0.093*** [0.028]
Sales growth	-0.001 [0.001]	-0.001 [0.001]	-0.001 [0.002]	-0.001 [0.002]
Ln(sales)	0.011*** [0.002]	0.010*** [0.002]	0.012*** [0.002]	0.010*** [0.002]
CF volatility	0.213*** [0.078]	0.166** [0.081]	0.220** [0.091]	0.331*** [0.101]
Industry and Year FEs	Yes	Yes	Yes	Yes
Observations	27,556	23,908	23,687	22,441
Pseudo R2	3%	3%	3%	3%

Panel C: Controlling for CEO ownership

	(1) Public Firms	(2) Private Firms	(3) F-statistic of Chow test (1) – (2)
Low CEO ownership × ROA	-0.127** [0.060]	-0.147 [0.190]	0.49
Low CEO ownership × Sales growth	-0.058 [0.048]	-0.186 [0.140]	1.40
Low CEO ownership	0.096*** [0.017]	0.113*** [0.038]	
ROA	-0.140*** [0.026]	-0.207*** [0.070]	
Sales growth	-0.011** [0.005]	-0.028* [0.016]	
Ln(sales)	0.006*** [0.002]	0.019*** [0.006]	
CF volatility	0.308*** [0.099]	0.259 [0.263]	
Industry and Year FEs	Yes	Yes	
Observations	26,061	3,959	
Pseudo R2	4%	7%	

Panel D: Controlling for board independence

	(1) Public firms	(2) Private firms	(3) F-statistic of Chow test (1) – (2)
High board independence × ROA	-0.491** [0.234]	-1.181* [0.666]	0.56
High board independence × Sales growth	-0.036 [0.033]	-0.170* [0.090]	3.92*
Board independence	0.072* [0.040]	0.531*** [0.129]	
ROA	-0.155 [0.158]	-0.434 [0.470]	
Sales growth	-0.017 [0.023]	-0.093 [0.057]	
Ln(sales)	-0.002 [0.004]	-0.006 [0.012]	
CF volatility	0.000 [0.003]	-0.005 [0.013]	
Industry and Year FEs	Yes	Yes	
Observations	15,750	3,113	
Pseudo R2	3%	7%	

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Table 1. CEO Turnover over Time

This table presents the annual frequency of CEO turnover in both the public and private firms. Our sample consists of 26,567 public firm-year observations involving 2,525 CEO turnover cases, and 4,423 private firm-year observations involving 356 CEO turnover cases from 2001-2008, obtained from Capital IQ. To form our sample, we remove all firm-year observations associated with IPOs or going private transactions. We further require sample CEOs to have a minimum tenure of two years. Finally, the CEO turnover case itself is not confounded by bankruptcy, liquidation, or acquisition (being acquired) events.

Year	Public Firms			Private Firms		
	# of Firms	# of CEO Turnover	Percentage of Firms with CEO Turnover	# of Firms	# of CEO Turnover	Percentage of Firms with CEO Turnover
2001	3596	200	5.56%	637	26	4.08%
2002	3619	230	6.36%	648	32	4.94%
2003	3710	320	8.63%	650	44	6.77%
2004	3381	348	10.29%	580	54	9.31%
2005	3376	365	10.81%	534	51	9.55%
2006	2865	294	10.26%	497	55	11.07%
2007	2999	299	9.97%	464	48	10.34%
2008	3021	469	15.52%	413	46	11.14%
Full Sample	26567	2525	9.50%	4423	356	8.05%

Table 2. Summary Statistics

Our sample consists of 26,567 public firm-year observations involving 2,525 CEO turnover cases, and 4,423 private firm-year observations involving 356 CEO turnover cases from 2001-2008, obtained from Capital IQ. Definitions of all variables are provided in Appendix 1. All dollar values are in 2008 dollars. All continuous variables are winsorized at the 2.5th and 97.5th percentiles. The last two columns present the differences in means and medians across the public and private firms and corresponding significance levels in superscript. Superscripts ^{***}, ^{**}, ^{*} correspond to statistical significance at the 1, 5, and 10 percent levels, respectively.

	Public Firms			Private Firms			Test of Differences	
	Mean (1)	Median (2)	StdDev (3)	Mean (4)	Median (5)	StdDev (6)	t-test (1) – (4)	Wilcoxon test (2) – (5)
Sales (\$M)	1657	236	3767	893	223	1696	764 ^{***}	13 ^{***}
Contemporaneous ROA	2.30%	3.12%	8.72%	1.49%	2.93%	9.57%	0.81% ^{***}	0.19% ^{***}
Lagged ROA	2.13%	3.13%	9.41%	1.45%	3.08%	10.20%	0.68% ^{***}	0.05% ^{***}
ROA	5.11%	6.26%	17.02%	3.67%	6.09%	18.20%	1.44% ^{***}	0.17% ^{***}
Contemporaneous sales growth	14.21%	8.75%	30.52%	15.31%	6.00%	41.15%	-1.10%	2.75% ^{***}
Lagged sales growth	15.42%	9.71%	28.78%	15.87%	6.80%	34.03%	-0.45%	2.91% ^{***}
Sales growth	33.04%	19.19%	55.56%	34.46%	13.59%	69.05%	-1.42%	5.60% ^{***}
CF volatility	2.77%	1.96%	2.65%	3.58%	1.95%	4.54%	-0.81% ^{***}	0.01% ^{***}
Founder	0.15	0	0.35	0.09	0	0.29	0.06 ^{***}	0 ^{***}
Ownership	5.76%	1.60%	10.04%	13.79%	2.40%	24.86%	-8.03% ^{***}	-0.80% ^{***}
CEO age	54.14	54	7.81	53	53	7.85	1.14 ^{***}	1 ^{***}

Table 3. Difference in CEO Turnover-Performance Sensitivity between Public and Private Firms

This table presents the marginal effects of a logit regression where the dependent variable, CEO Turnover, takes the value of one if a firm changes its CEO in year t , and zero otherwise. Our sample consists of 26,567 public firm-year observations involving 2,525 CEO turnover cases, and 4,423 private firm-year observations involving 356 CEO turnover cases from 2001-2008, obtained from Capital IQ. Definitions of all variables are provided in Appendix 1. All dollar values are in 2008 dollars. All continuous variables are winsorized at the 2.5th and 97.5th percentiles. ROA and sales growth are the two-year accumulative ROA and sales growth from year $t-1$ to year t . Panel A presents results from the basic CEO turnover model. Panel B presents results controlling for ownership. Panel C presents results controlling for board independence. Panel D presents results controlling for CEO tenure. Industry and year fixed effects are included in the regressions and the heteroskedasticity-consistent standard errors (in brackets) account for possible correlation within a firm cluster. Superscripts ***, **, * correspond to statistical significance at the 1, 5, and 10 percent levels, respectively.

Panel A: The baseline model of CEO turnover

	(1) Public firms	(2) Private firms	(3) Full sample	(4) Excluding CEOs with Age \geq 63	(5) Excluding Founder CEOs	(6) Excluding CEOs with Ownership \geq 10%
Public			0.024*** [0.008]	0.017* [0.009]	0.026*** [0.009]	0.016 [0.010]
Public \times ROA			-0.088** [0.042]	-0.104** [0.045]	-0.084* [0.048]	-0.127** [0.064]
Public \times Sales growth			-0.014*** [0.006]	-0.014** [0.006]	-0.017*** [0.006]	-0.014** [0.006]
ROA	-0.218*** [0.033]	-0.142*** [0.051]	-0.114*** [0.036]	-0.102*** [0.038]	-0.133*** [0.041]	-0.133*** [0.042]
Sales growth	-0.022*** [0.005]	-0.013* [0.008]	-0.002 [0.002]	-0.002 [0.002]	-0.002 [0.002]	-0.003 [0.002]
Ln(sales)	0.014*** [0.002]	0.009*** [0.003]	0.014*** [0.002]	0.012*** [0.002]	0.014*** [0.002]	0.012*** [0.002]
CF volatility	0.323*** [0.110]	0.055 [0.262]	0.341*** [0.103]	0.296*** [0.113]	0.334*** [0.115]	0.475*** [0.126]
Industry and Year FEs	Yes	Yes	Yes	Yes	Yes	Yes
Observations	26,567	4,423	30,990	26,724	26,686	25,361
Pseudo R2	3%	5%	3%	3%	3%	3%

Panel B: Controlling for CEO ownership

	(1) Full sample	(2) Excluding CEOs with Age \geq 63	(3) Excluding Founder CEOs	(4) Excluding CEOs with Ownership \geq 50%
Public	0.028*** [0.008]	0.024*** [0.008]	0.032*** [0.009]	0.025*** [0.008]
Public \times ROA	-0.092** [0.046]	-0.121** [0.050]	-0.125** [0.056]	-0.116** [0.052]
Public \times Sales growth	-0.020** [0.010]	-0.023** [0.011]	-0.022* [0.011]	-0.022** [0.010]
Low CEO ownership \times ROA	-0.130** [0.061]	-0.158** [0.068]	-0.140** [0.067]	-0.124* [0.065]
Low CEO ownership \times Sales growth	-0.083* [0.046]	-0.083* [0.050]	-0.084* [0.050]	-0.084* [0.049]
Low CEO ownership	0.106*** [0.016]	0.115*** [0.018]	0.106*** [0.016]	0.106*** [0.016]
ROA	-0.097*** [0.034]	-0.073** [0.035]	-0.099*** [0.036]	-0.100*** [0.034]
Sales growth	-0.002 [0.004]	-0.005 [0.005]	-0.003 [0.005]	-0.003 [0.005]
Ln(sales)	0.009*** [0.002]	0.006*** [0.002]	0.008*** [0.002]	0.009*** [0.002]
CF volatility	0.318*** [0.095]	0.280*** [0.103]	0.311*** [0.106]	0.329*** [0.101]
Industry and Year FEs	Yes	Yes	Yes	Yes
Observations	30,990	26,724	26,686	30,020
Pseudo R2	4%	4%	4%	4%

Panel C: Controlling for board independence

	(1) Full Sample	(2) Excluding CEOs with Age \geq 63	(3) Excluding Founder CEOs	(4) Excluding CEOs with Ownership \geq 10%
Public	0.025** [0.010]	0.019 [0.012]	0.030** [0.012]	0.010 [0.012]
Public \times ROA	-0.133** [0.065]	-0.220*** [0.078]	-0.173** [0.079]	-0.130* [0.079]
Public \times Sales growth	-0.031** [0.014]	-0.031* [0.017]	-0.032* [0.017]	-0.025* [0.014]
High board independence \times ROA	-0.109** [0.043]	-0.101** [0.048]	-0.136*** [0.053]	-0.106** [0.048]
High board independence \times Sales growth	-0.016* [0.009]	-0.022* [0.012]	-0.018* [0.011]	-0.013 [0.010]
High board independence	0.021*** [0.008]	0.026*** [0.009]	0.023** [0.009]	0.008 [0.009]
ROA	-0.097*** [0.036]	-0.090** [0.040]	-0.097** [0.043]	-0.103** [0.043]
Sales growth	-0.002 [0.002]	-0.003 [0.002]	-0.003 [0.003]	-0.002 [0.003]
Ln(sales)	0.018*** [0.003]	0.016*** [0.003]	0.018*** [0.003]	0.015*** [0.003]
CF volatility	0.429*** [0.138]	0.430*** [0.159]	0.422*** [0.162]	0.617*** [0.172]
Industry and Year FEs	Yes	Yes	Yes	Yes
Observations	22,602	19,528	19,576	18,863
Pseudo R2	3%	3%	3%	3%

Panel D: Controlling for CEO tenure

	(1) Full sample	(2) Excluding CEOs with Age \geq 63	(3) Excluding Founder CEOs	(4) Excluding CEOs with Ownership \geq 10%
Public	0.028*** [0.009]	0.026** [0.011]	0.030*** [0.010]	0.019* [0.011]
Public \times ROA	-0.109** [0.049]	-0.130** [0.059]	-0.100* [0.058]	-0.146** [0.062]
Public \times Sales growth	-0.026*** [0.008]	-0.029*** [0.010]	-0.031*** [0.011]	-0.017** [0.007]
Long CEO tenure \times ROA	0.107*** [0.037]	0.078* [0.040]	0.092** [0.041]	0.133*** [0.037]
Long CEO tenure \times Sales growth	0.001 [0.002]	0.001 [0.004]	0.002 [0.007]	0.001 [0.004]
Long CEO tenure	-0.021*** [0.007]	-0.031*** [0.008]	-0.008 [0.007]	-0.007 [0.007]
ROA	-0.132*** [0.036]	-0.130*** [0.044]	-0.170*** [0.044]	-0.165*** [0.041]
Sales growth	-0.001 [0.002]	-0.001 [0.002]	-0.001 [0.003]	-0.003 [0.003]
Ln(sales)	0.014*** [0.002]	0.012*** [0.002]	0.015*** [0.002]	0.012*** [0.002]
CF volatility	0.268** [0.109]	0.238* [0.136]	0.285** [0.130]	0.360*** [0.132]
Industry and Year FEs	Yes	Yes	Yes	Yes
Observations	27,246	23,556	23,507	22,546
Pseudo R2	3%	3%	3%	3%

Table 4. CEO Turnover-Performance Sensitivity Using Industry-Adjusted Performance

This table presents the marginal effects of a logit regression where the dependent variable, Turnover, takes the value of one if a firm changes its CEO in year t , and zero otherwise. Our sample consists of 26,567 public firm-year observations involving 2,525 CEO turnover cases, and 4,423 private firm-year observations involving 356 CEO turnover cases from 2001-2008, obtained from Capital IQ. Definitions of all variables are provided in Appendix 1. All dollar values are in 2008 dollars. All continuous variables are winsorized at the 2.5th and 97.5th percentiles. ROA and sales growth are the two-year accumulative ROA and sales growth from year $t-1$ to year t . Panel A uses industry operating performance to construct industry-adjusted performance measure. Panel B examines relative performance evaluation based on industry operating performance. Panel C uses industry stock performance. Year fixed effects are included in the regressions and the heteroskedasticity-consistent standard errors (in brackets) account for possible correlation within a firm cluster. Superscripts ***, **, * correspond to statistical significance at the 1, 5, and 10 percent levels, respectively.

Panel A: Using industry operating performance

	(1) Full sample	(2) Excluding CEOs with Age ≥ 63	(3) Excluding Founder CEOs	(4) Excluding CEOs with Ownership \geq 10%
Public	0.007 [0.015]	0.006 [0.016]	0.006 [0.015]	0.010 [0.016]
Public \times Industry-adjusted ROA	-0.109*** [0.041]	-0.135*** [0.044]	-0.108** [0.046]	-0.105** [0.051]
Public \times Industry-adjusted sales growth	-0.012** [0.005]	-0.011** [0.005]	-0.013** [0.006]	-0.012** [0.005]
Public \times Industry ROA	-0.052 [0.114]	-0.037 [0.124]	-0.075 [0.122]	-0.034 [0.127]
Public \times Industry sales growth	-0.106* [0.058]	-0.075 [0.054]	-0.060 [0.053]	-0.065 [0.056]
Industry-adjusted ROA	-0.104*** [0.029]	-0.086*** [0.030]	-0.088*** [0.031]	-0.111*** [0.032]
Industry-adjusted sales growth	-0.002 [0.002]	-0.002 [0.002]	-0.002 [0.002]	-0.002 [0.002]
Industry ROA	-0.130* [0.069]	-0.064 [0.076]	-0.156** [0.076]	-0.065 [0.078]
Industry sales growth	-0.098** [0.049]	-0.068* [0.037]	-0.049 [0.035]	-0.052 [0.037]
Ln(sales)	0.013*** [0.001]	0.011*** [0.001]	0.013*** [0.001]	0.011*** [0.001]
CF volatility	0.411*** [0.083]	0.402*** [0.088]	0.439*** [0.089]	0.572*** [0.094]
Year FEs	Yes	Yes	Yes	Yes
Observations	30,990	26,724	26,686	25,361
Pseudo R2	3%	3%	3%	3%

Panel B: Relative performance evaluation based on industry operating performance

	(1) Public firms	(2) Private firms	(3) Full sample	(4) Excluding CEOs with Age \geq 63	(5) Excluding Founder CEOs	(6) Excluding CEOs with Ownership \geq 10%
Public			0.035*** [0.010]	0.032*** [0.010]	0.035*** [0.009]	0.021** [0.011]
Public \times ROA			-0.148* [0.083]	-0.137* [0.080]	-0.124* [0.066]	-0.117 [0.081]
Public \times Sales growth			-0.083** [0.037]	-0.108*** [0.038]	-0.086** [0.039]	-0.078** [0.038]
Public \times Industry ROA			0.117 [0.083]	0.109 [0.079]	0.097 [0.062]	0.110 [0.082]
Public \times Industry sales growth			0.070** [0.033]	0.094*** [0.035]	0.072** [0.036]	0.065* [0.035]
ROA	-0.302*** [0.041]	-0.164** [0.078]	-0.213*** [0.080]	-0.204*** [0.079]	-0.252*** [0.070]	-0.195** [0.082]
Sales growth	-0.174*** [0.014]	-0.014** [0.006]	-0.118*** [0.034]	-0.102*** [0.034]	-0.107*** [0.035]	-0.115*** [0.035]
Industry ROA	0.136*** [0.042]	0.050 [0.094]	0.058 [0.080]	0.054 [0.077]	0.084 [0.067]	0.030 [0.081]
Industry sales growth	0.132*** [0.012]	0.002** [0.001]	0.104*** [0.030]	0.091*** [0.030]	0.095*** [0.031]	0.102*** [0.031]
Ln(sales)	0.015*** [0.001]	0.008*** [0.002]	0.017*** [0.001]	0.014*** [0.001]	0.016*** [0.001]	0.014*** [0.001]
CF volatility	0.507*** [0.093]	0.028 [0.137]	0.454*** [0.085]	0.442*** [0.090]	0.485*** [0.090]	0.593*** [0.094]
Year FEs	Yes	Yes	Yes	Yes	Yes	Yes
Observations	26,567	4,423	30,990	26,724	26,686	25,361
Pseudo R2	5%	4%	5%	5%	5%	5%

Panel C: Using industry stock performance

	(1) Full sample	(2) Excluding CEOs with Age \geq 63	(3) Excluding Founder CEOs	(4) Excluding CEOs with Ownership \geq 10%
Public	0.008*** [0.003]	0.007** [0.003]	0.009*** [0.003]	0.004 [0.004]
Public \times ROA	-0.038** [0.016]	-0.043** [0.018]	-0.040** [0.019]	-0.037* [0.021]
Public \times Sales growth	-0.005** [0.002]	-0.005** [0.002]	-0.006** [0.002]	-0.005** [0.002]
Public \times Industry stock return	-0.028*** [0.009]	-0.037*** [0.011]	-0.033*** [0.010]	-0.033*** [0.011]
ROA	-0.040*** [0.011]	-0.039*** [0.012]	-0.047*** [0.013]	-0.045*** [0.012]
Sales growth	-0.001 [0.001]	-0.001 [0.001]	-0.001 [0.001]	-0.001 [0.001]
Industry stock return	-0.014** [0.006]	-0.010 [0.007]	-0.016** [0.007]	-0.015** [0.007]
Ln(sales)	0.005*** [0.001]	0.005*** [0.001]	0.006*** [0.001]	0.005*** [0.001]
CF volatility	0.165*** [0.033]	0.169*** [0.038]	0.190*** [0.038]	0.249*** [0.041]
Year FEs	Yes	Yes	Yes	Yes
Observations	30,990	26,724	26,686	25,361
Pseudo R2	3%	3%	3%	3%

Table 5. Forced versus Voluntary Turnover

This table presents the marginal effects of a logit regression where the dependent variable is Forced (Voluntary) turnover. Our sample consists of 26,567 public firm-year observations involving 2,525 CEO turnover cases, and 4,423 private firm-year observations involving 356 CEO turnover cases from 2001-2008, obtained from Capital IQ. Following Parrino (1997), we classify a CEO turnover as forced if the press reports that CEO is fired, forced out, or retires or resigns due to pressure. All other departures for CEOs aged 60 or above are classified as voluntary. Departures for CEOs below age 60 are also classified as forced if either the press does not report the reason as death, poor health, or the acceptance of another position (including the chairmanship of the board), or the press reports that the CEO is retiring, but does not announce the retirement at least six months before the succession. For public firms, we have 689 forced turnover cases and 1,836 voluntary turnover cases. For private firms, we have 145 forced turnover cases and 211 voluntary turnover cases. The baseline case is doing nothing. Definitions of all variables are provided in Appendix 1. All dollar values are in 2008 dollars. All continuous variables are winsorized at the 2.5th and 97.5th percentiles. ROA and sales growth are the two-year accumulative ROA and sales growth from year $t-1$ to year t . Industry and year fixed effects are included in the regressions and the heteroskedasticity-consistent standard errors (in brackets) account for possible correlation within a firm cluster. Superscripts ***, **, * correspond to statistical significance at the 1, 5, and 10 percent levels, respectively.

	(1) Forced Turnover	(2) Voluntary Turnover
Public	0.003 [0.003]	0.040*** [0.009]
Public × ROA	-0.059*** [0.023]	-0.103** [0.052]
Public × Sales growth	-0.011* [0.006]	-0.014** [0.006]
ROA	-0.023 [0.014]	-0.087*** [0.027]
Sales growth	-0.003** [0.002]	-0.001 [0.002]
Ln(sales)	0.003*** [0.001]	0.014*** [0.002]
CF volatility	0.034 [0.034]	0.352*** [0.105]
Industry and Year FEs	Yes	Yes
Observations	28,943	30,156
Pseudo R2	5%	3%

Table 6. Internal versus External Hires in Public and Private Firms

Panel A presents the statistics of internally-promoted CEO versus externally-hired CEOs. An external CEO is the one who takes the CEO position within one year of joining the firm. Panel B presents the external CEOs' background prior to taking the CEO position. Panel C presents the characteristics of dismissed and incoming CEOs. Panel D presents the marginal effects of a nested logit regression. In the first stage, the dependent variable is, New CEO is hired from outside. In the second stage, the dependent variable is, New CEO is hired from a public firm. The baseline case is doing nothing. Our sample consists of 26,567 public firm-year observations involving 2,525 CEO turnover cases, and 4,423 private firm-year observations involving 356 CEO turnover cases from 2001-2008, obtained from Capital IQ. Definitions of all variables are provided in Appendix 1. All dollar values are in 2008 dollars. All continuous variables are winsorized at the 2.5th and 97.5th percentiles. ROA and sales growth are the two-year accumulative ROA and sales growth from year $t-1$ to year t . Industry and year fixed effects are included in the regressions and the heteroskedasticity-consistent standard errors (in brackets) account for possible correlation within a firm cluster. Superscripts ***, **, * correspond to statistical significance at the 1, 5, and 10 percent levels, respectively.

Panel A: Internal versus external CEOs

	Public Firms	Private Firms
# of new CEOs promoted internally	1832 (72.5%)	206 (57.9%)
# of new CEOs hired externally	693 (27.5%)	150 (42.1%)
In Total	2525 (100%)	356 (100%)

Panel B: External CEOs from public firms versus from private firms

	Public Firms	Private Firms
# of external CEOs from other public firms	535 (77.2%)	37 (24.7%)
# of external CEOs from other private firms	158 (22.8%)	113 (75.3%)
In Total	693 (100%)	150 (100%)

Panel C: CEO characteristics of dismissed CEOs versus incoming CEOs (mean values)

	Public Firms			Private Firms		
	Dismissed CEOs (1)	Incoming CEOs (2)	Test of Difference (1)– (2)	Dismissed CEOs (3)	Incoming CEOs (4)	Test of Difference (3)– (4)
MBA	0.16	0.23	-0.07***	0.23	0.26	-0.03
Male	0.97	0.96	0.01**	0.94	0.96	-0.02
Founder	0.11	0.04	0.07***	0.04	0.01	0.03*
Chairman	0.62	0.39	0.23***	0.39	0.27	0.12**
CEO age	55	51	4***	54	52	2***
CEO ownership	4.08%	2.21%	1.87%***	7.29%	3.14%	4.15%**

Panel D: Nested logit regression

	(1) First Stage New CEO Hired from Outside	(2) Second Stage New CEO Hired from a Public Firm
Public	-0.164*** [0.031]	0.533*** [0.041]
ROA	-0.148* [0.083]	-0.267* [0.144]
Sales growth	-0.004 [0.016]	0.013 [0.027]
Ln(sales)	-0.009* [0.005]	0.037*** [0.009]
CF Volatility	-0.221 [0.339]	-0.387 [0.570]
Forced	0.063*** [0.023]	-0.011 [0.038]
High industry external hires	0.210*** [0.018]	-0.063 [0.038]
Year FEs	Yes	Yes
Observations	2,881	843
Pseudo R2	7%	17%

Table 7. Firm Performance after CEO Turnover

This table presents firm performance improvement after CEO turnover. In Columns (1) and (2), the dependent variable is ΔROA , computed as $ROA(t+1) - ROA(t)$. In Columns (3) and (4), the dependent variable is Δ Sales growth, computed as $\text{sales growth}(t+1) - \text{sales growth}(t)$. *Public turnover* takes the value of one if a public firm experiences CEO turnover in year t , and zero otherwise. *Private turnover* takes the value of one if a private firm experiences CEO turnover in year t , and zero otherwise. Our sample consists of 26,567 public firm-year observations involving 2,525 CEO turnover cases, and 4,423 private firm-year observations involving 356 CEO turnover cases from 2001-2008, obtained from Capital IQ. Definitions of all variables are provided in Appendix 1. All dollar values are in 2008 dollars. All continuous variables are winsorized at the 2.5th and 97.5th percentiles. Industry and year fixed effects are included in the regressions and the heteroskedasticity-consistent standard errors (in brackets) account for possible correlation within a firm cluster. Superscripts ***, **, * correspond to statistical significance at the 1, 5, and 10 percent levels, respectively. The F-statistics to test the equality of coefficients on *Public turnover* and *Private turnover* are provided at the bottom of the table.

	ΔROA		Δ Sales growth	
	(1) Full sample	(2) Excluding voluntary turnovers	(3) Full sample	(4) Excluding voluntary turnovers
Public turnover	0.004*** [0.001]	0.006*** [0.002]	0.055*** [0.008]	0.058*** [0.012]
Private turnover	0.009*** [0.003]	0.010** [0.004]	0.096*** [0.024]	0.119*** [0.035]
Ln(sales)	-0.001 [0.000]	0.001 [0.000]	-0.010*** [0.001]	-0.009*** [0.001]
CF Volatility	0.073*** [0.011]	0.060*** [0.012]	-0.194** [0.088]	-0.230** [0.092]
Constant	-0.010*** [0.003]	-0.012*** [0.003]	0.038 [0.028]	0.011 [0.029]
Industry and Year FEs	Yes	Yes	Yes	Yes
Observations	25,504	24,257	25,504	24,257
Adj R2	2%	2%	3%	3%
F-statistic of the test: Public turnover = Private turnover	12.41***	9.65***	8.54***	5.70***

Table 8. Investor Myopia and CEO Turnover within Public Firms

This table presents how the variations in investor myopia within public firms influence the CEO turnover decisions. Our sample consists of 26,567 public firm-year observations involving 2,525 CEO turnover cases from 2001-2008, obtained from Capital IQ. Definitions of all variables are provided in Appendix 1. All dollar values are in 2008 dollars. All continuous variables are winsorized at the 2.5th and 97.5th percentiles. Industry and year fixed effects are included in the regressions and the heteroskedasticity-consistent standard errors (in brackets) account for possible correlation within a firm cluster. Superscripts ***, **, * correspond to statistical significance at the 1, 5, and 10 percent levels, respectively. Panel A presents the marginal effects of a logit regression where the dependent variable, CEO Turnover, takes the value of one if a firm changes its CEO in year t , and zero otherwise. Panel B presents firm performance improvement after CEO turnover. The F-statistics to test the equality of coefficients on the myopic and non-myopic turnover indicator variables are provided at the bottom of the table.

Panel A: CEO turnover-performance Sensitivity

	(1) Full sample	(2) Excluding CEOs with Age \geq 63	(3) Excluding Founder CEOs	(4) Excluding CEOs with Ownership \geq 10%
Myopia	0.006** [0.003]	0.005 [0.003]	0.007* [0.004]	0.006 [0.004]
Myopia \times ROA	-0.047*** [0.017]	-0.034** [0.014]	-0.060** [0.024]	-0.057** [0.022]
Myopia \times Sales growth	-0.019*** [0.007]	-0.019*** [0.005]	-0.019** [0.009]	-0.015* [0.009]
ROA	-0.019** [0.007]	-0.030*** [0.006]	-0.024** [0.010]	-0.017* [0.009]
Sales growth	-0.001 [0.001]	-0.001 [0.001]	-0.002 [0.002]	-0.002 [0.003]
Ln(sales)	0.003*** [0.001]	0.003*** [0.001]	0.004*** [0.001]	0.003*** [0.001]
CF volatility	0.157*** [0.053]	0.140*** [0.042]	0.218*** [0.075]	0.237*** [0.078]
Industry and Year FEs	Yes	Yes	Yes	Yes
Observations	26,567	22,782	22,658	22,153
Pseudo R2	3%	3%	3%	3%

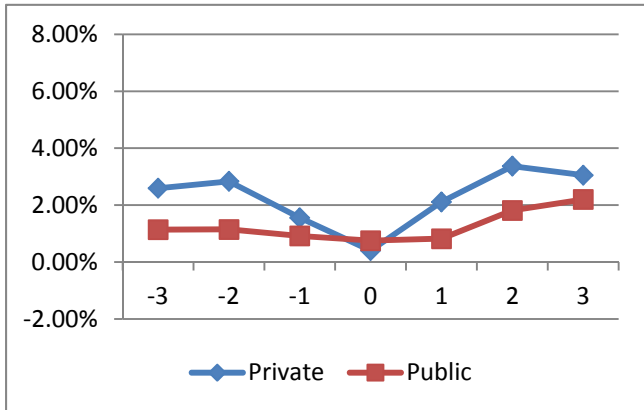
Panel B: Performance improvement after CEO turnover

	Δ ROA		Δ Sales growth	
	(1) Full sample	(2) Excluding voluntary turnovers	(3) Full sample	(4) Excluding voluntary turnovers
Myopic turnover	0.001 [0.001]	0.004* [0.002]	0.029*** [0.009]	0.034** [0.015]
Non-myopic turnover	0.005*** [0.001]	0.008*** [0.001]	0.045*** [0.004]	0.047*** [0.004]
Ln(sales)	-0.001*** [0.000]	-0.001*** [0.000]	-0.019*** [0.001]	-0.019*** [0.001]
CF Volatility	0.107*** [0.011]	0.155*** [0.011]	0.143* [0.083]	0.212** [0.085]
Constant	-0.002 [0.003]	0.008*** [0.003]	0.221*** [0.026]	0.222*** [0.027]
Industry and Year FEs	Yes	Yes	Yes	Yes
Observations	22,278	20,781	22,278	20,781
Adj R2	2%	2%	5%	6%
F-statistic of Chow test: Myopic turnover = Non-myopic turnover	8.58***	4.2**	8.54***	7.60***

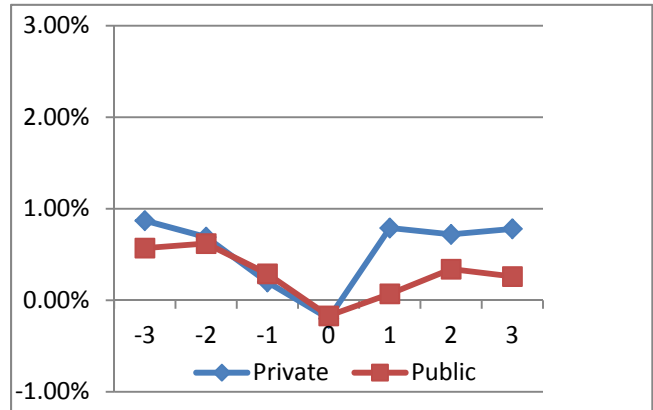
Figure 1. Firm Performance around CEO turnover

This figure presents firm performance around CEO turnover. Each CEO-dismissing firm is matched to a control firm in the following way. We first identify a group of firms in the same Fama and French (1997) 48 industry whose ROA in year $t-1$ is at least $0.9 \times$ and no more than $1.1 \times$ the sample firm's ROA in year $t-1$, and whose ROA in year t is also within the same band around the sample firm's ROA in year t (i.e., turnover year). Among them, we then pick the firm with the closest two-year cumulative ROA in year $t-1$ and year t . The control-adjusted performance measure of each sample firm is computed by subtracting the performance measure of its control firm. Control-adjusted sales growth is computed similarly. Mean values are presented.

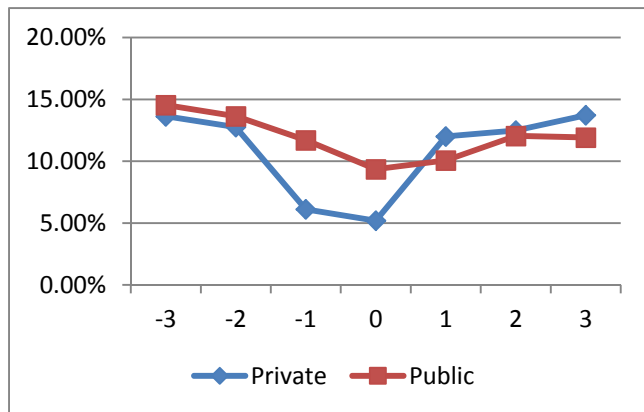
Panel A: ROA (all turnovers)



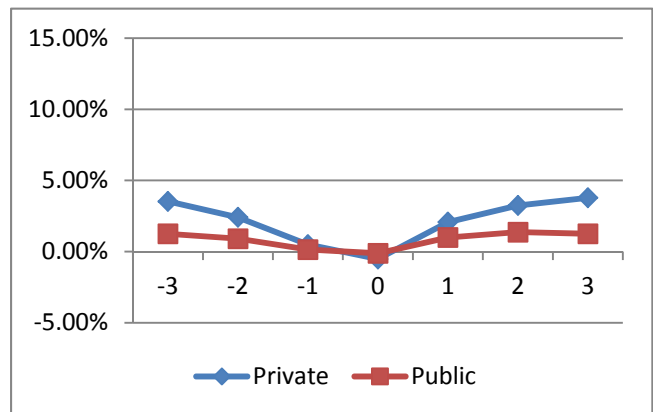
Panel B: Control-adjusted ROA (all turnovers)



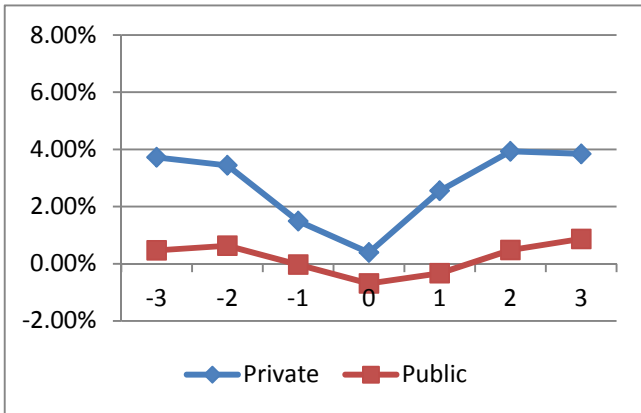
Panel C: Sales growth (all turnovers)



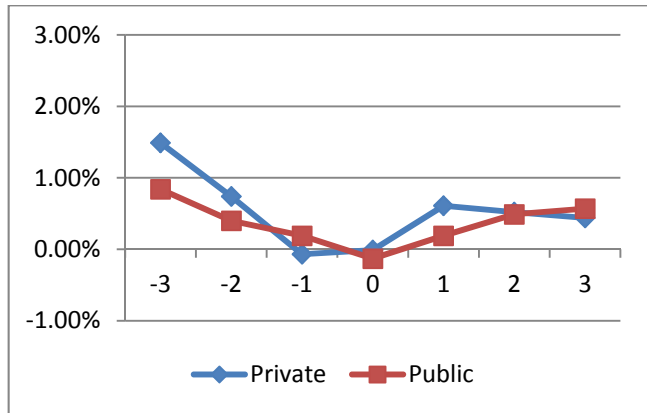
Panel D: Control-adjusted sales growth (all turnovers)



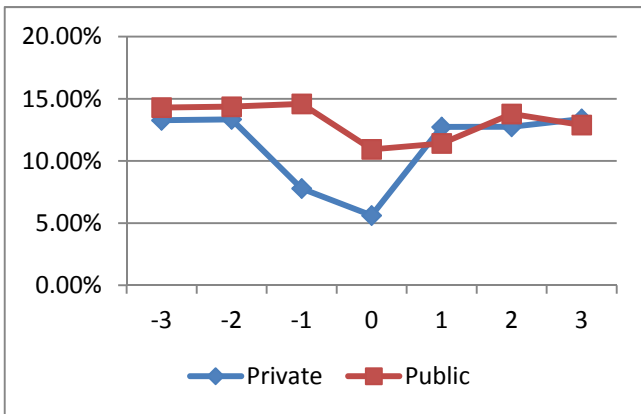
Panel E: ROA (forced turnovers)



Panel F: Control-adjusted ROA (forced turnovers)



Panel G: Sales growth (forced turnovers)



Panel H: Control-adjusted sales growth (forced turnovers)

