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Finance Working Paper N° 584/2018
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ECGI Working Paper Series in Finance

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Keywords: boardroom aging, older directors, board monitoring, board advising, agency problems

JEL Classifications: G34, G32, G35, G41

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Abstract

An unintended consequence of recent board governance reforms in the U.S. is that firms increasingly tap into the pool of older director candidates, causing their boards to become substantially older. We investigate the board aging phenomenon and its implications for corporate governance. We find evidence of both monitoring deficiencies and advisory benefits associated with older independent directors. Specifically, older directors weaken board oversight in acquisition decisions, payout policies, CEO turnover, executive compensation, and financial reporting. However, they provide valuable advisory services when they have specialized experience and when managers have a greater need for board advice.

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1. Introduction

The past two decades witnessed drastic changes to the boards of directors of U.S. public corporations. Several major corporate governance reforms and the rise of shareholder activism have enhanced director independence and qualification and made boards more accountable.[1] However, these changes have also significantly increased the responsibilities and liabilities of outside directors, which undercuts the incentives of active senior corporate executives to serve on outside boards.[2] Faced with this reduced supply and heightened pressure to find qualified independent directors, firms increasingly rely on the pool of older director candidates.[3] As a result, the boards of U.S. public corporations have become notably older in recent years. For example, during the period of 1998 to 2014, the median age of independent directors at large U.S. firms rose from 60 to 64, and the percentage of firms with a majority of independent directors age 65 or above nearly doubled from 26% to 50%. As the trend of boardroom aging draws more attention from institutional investors and governance practitioners, it is important to understand its consequences for the functioning of corporate boards. Yet, this issue has received scant attention in the literature, and the limited evidence from prior research is inconclusive and provides no consensus on the effects of boardroom aging.[4]

We help to fill this gap by examining if, and how, boardroom aging affects board effectiveness measured along multiple dimesons. The answer to this question is not straightforward as there are both potential benefits and costs associated with older independent directors. On the one hand, older independent directors can be valuable assets to firms because of their business experience and professional connections accumulated over their long careers. Therefore, they can be better equipped to understand the opportunities and challenges faced by firms and to leverage their knowledge and

[1] These reforms and regulations include the 2002 Sarbanes-Oxley Act, the 2003 NYSE/Nasdaq listing standards change, the 2009 SEC rule on proxy disclosure enhancements, and the 2010 Dodd-Frank Act.

[2] According to Spencer Stuart, only about 1/3 of active CEOs in S&P500 companies sit on any outside boards in 2017, compared to about 50% ten years earlier, and the percentage of new independent directors who are active CEOs, board chairs, presidents, COOs, and vice board chairs, declined from 41% in 2002 to 18% in 2017.

[3] This is reflected in firms' recruitment and retention of older directors. For example, the percentage of newly appointed independent directors who are at least 65 years old doubled from 10% in 1998 to 20% in 2014 (based on the authors' analysis of S&P1500 firms). The mandatory retirement age for directors has also been rising, with 42% of S&P500 companies setting it at 75 or older, compared to only 11% in 2007 (Spencer Stuart).

[4] Please see our discussion of the related literature on page 6.

resources to advise management on important strategic decisions. In fact, these benefits are reportedly behind several companies' decisions to keep older directors on their boards. For example, Community Bancorp in 2011 raised its director retirement age from 70 to 72, saying it feared "the premature loss of active board members who have valuable knowledge and insight about the company's history, operations and local markets."[5] In 2009, a similar desire to retain key board talent persuaded UAL Corporation to boost its mandatory retirement age from 73 to 75 and Goldman Sachs from 72 to 75.[6] In addition, because older directors are likely to have retired from their full-time jobs, they potentially have more time to devote to their board duties.

On the other hand, there are also reasons to suspect that older independent directors can hinder board effectiveness. Prior research finds that as people get older, their energy, physical health, and mental acumen gradually decline (Horn, (1968), Fair (1994, 2004), Salthouse (2000), Schroeder and Salthouse (2004), and Korniotis and Kumar (2011)). Aging also adversely affects memory and attention spans, leading to erosion in general intelligence (Lindenberger and Baltes (1994), Baltes and Lindenberger (1997)). Older individuals are also less effective at processing and integrating new information (Spaniol and Bayen (2005)). These factors pose a challenge for older independent directors to meet the heavy demands of board duties. For example, they may lack the energy and mental capacity to stay abreast of firms' latest developments and provide necessary management oversight and counseling. They may also have difficulties keeping pace with the latest industrial advances or recognizing new opportunities created by technological innovations.

From an incentive standpoint, to the extent that older directors have fewer future opportunities in the director labor market as they approach normal retirement age, the expected payoff from future directorships may be insufficient to offset the costs they must incur to build and maintain their reputations. Therefore, older directors may have greater incentives to either enjoy the quiet life or seek to maximize current incomes by accepting additional board seats without expending much incremental effort to fulfill their director duties. These actions can undermine board effectiveness.

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[5] http://articles.chicagotribune.com/2012-04-10/business/ct-biz-0411-retirement-age--20120410_1_retirement-age-board-members-middlefield-board

[6] http://www.wsj.com/articles/SB10001424052748703905404576164791847168546

Shareholders have often expressed serious concerns about boardroom aging. For example, in 2010 two prominent activist investors, Relational Investors LLC and the California State Teachers' Retirement System, together launched a proxy contest at Occidental Petroleum Corp, partly because Occidental waived its maximum retirement-age rule for two directors.[7] In early 2015, Coca-Cola Company announced the retirement of two longtime directors, James D. Robinson III, 79 years old, and Peter V. Ueberroth, 77. This move came amid pressures from shareholders as the company missed its revenue growth targets.[8] More recently, the advanced age of independent directors was also a major flash point in the high-profile scandal at Theranos, a now-defunct privately held blood-testing company, where the mean (median) age of independent directors was over 75 (74) and 70% of them were at least 65 years old.[9]

To shed light on the potential costs and benefits associated with boardroom aging, we examine the behavior of older independent directors and relate their presence on boards to key corporate policies and overall firm performance. We define an independent director as an "older independent director" (OID) if he or she is at least 65 years old.[10] In robustness analysis, we use age 70 as a cutoff and obtain similar results. To measure the extent of boardroom aging, we construct a variable, *OID %*, as the fraction of all independent directors who are OIDs. Compared to the average director age measure used in prior literature, our measure is less influenced by outliers, and more importantly, can better capture the right tail of the director age distribution, which is much more affected by the recent boardroom aging trend. Also, unlike much of the prior literature, we focus solely on the directors most responsible for monitoring, namely the independent directors.

We analyze a sample of S&P 1500 firms over the period of 1998-2014. Boardroom aging is pervasive in our sample firms. The median director age increases monotonically from 60 in 1998 to 64 in 2014. The percentage of independent directors who are 65 or older also increases from 33% in 1998

[7] http://www.wsj.com/articles/SB10001424127887323551004578441192135940694
[8] http://www.wsj.com/articles/two-coca-cola-directors-to-retire-amid-board-renovation-1424381549
[9] See http://fortune.com/2015/10/15/theranos-board-leadership for identities of Theranos' outside directors when the scandal broke. Information on the ages of these directors is available from public sources. In addition to their age, the independent directors' lack of pertinent experience in the biotech field was cited as another major concern.
[10] We explain the rationale for using age 65 as our primary cut-off point in section 2.

to 50% in 2014. These changes are not caused by changing firm composition, because both the incumbent firms of and new entrants to the S&P 1500 indices show similar board aging trends. During our sample period, boards also grow older in all Fama-French 12 industries and subsamples stratified based a variety of firm characteristics.

We begin by evaluating individual director performance by comparing board meeting attendance records and major board committee responsibilities between older and younger independent directors. Attending board meetings and serving on key committees are important channels through which independent directors obtain up-to-date information about a firm's operation and financial conditions and actively participate in its corporate governance. Controlling for a battery of director and firm characteristics as well as director, year, and industry fixed effects, we find that OIDs exhibit poorer board attendance records and are less likely to serve as a member or chair of important and time-consuming board committees. These results suggest that OIDs are either less able or willing to fulfill their board duties.

We next conduct firm-level analysis of the impact of OIDs on a number of major corporate policies and find evidence consistent with their displaying monitoring deficiencies. Specifically, firms with a larger proportion of OIDs on their boards exhibit stronger empire building tendencies. They make less profitable acquisitions generating lower shareholder returns, and adopt less generous payout polices. We also find that OIDs are associated with a significantly lower CEO turnover-performance sensitivity, suggesting that OIDs are more lenient or less responsive in disciplining poorly performing CEOs. In addition, as the percentage of OIDs on corporate boards rises, excess CEO compensation increases, and this relationship is driven by the cash component of CEO pay rather than the equity-based portion. Finally, a greater presence of OIDs on corporate boards is also associated with lower financial reporting quality, measured either by performance-adjusted abnormal accruals or by the likelihood of financial misrepresentation.

Consistent with the above evidence of monitoring deficiencies, we find that on average, firm performance is significantly lower when firms have a greater fraction of OIDs on their boards. We also confirm that this relation is not driven by reverse causality, where poorly performing firms appoint

disproportionally more OIDs to their boards or major shareholders propose the appointment of OIDs to turn around poorly performing firms.

We further explore cross-sectional variations in the effect of OIDs and uncover evidence that they can provide valuable advisory services to firms. For example, in the case of corporate acquisition decisions, we find that when acquirer OIDs have either prior general acquisition experience or work experience in the target's industry, their effect on acquirer returns is either significantly positive or at least non-negative. The previously documented negative relation between OIDs and acquirer returns is limited to OIDs without either type of experience. In addition, we find that in subsamples of firms with high advisory needs, the relation between OIDs and firm performance is no longer significantly negative and in some cases, becomes significantly positive. These results suggest that at key board decision points OIDs can use their experience and resources to provide valuable counsel to firm management.

Identification is a key consideration in our empirical analysis. We address this issue using a number of approaches. First, we include firm-fixed effects wherever applicable to control for time-invariant firm-specific unobservable factors that may correlate with both the presence of OIDs and our corporate outcome variables. Second, we employ an instrumental variable regression approach where we instrument for the presence of OIDs on a firm's board by a measure of the local supply of older director candidates in the firm's headquarters state. Third, we exploit a regulatory shock to firms' board composition created by the 2003 revisions to the NYSE/Nasdaq listing standards, which required listed firms to have a majority of independent directors on the board. We show that firms that were non-compliant with the new rule experienced a significantly larger increase in the percentage of OIDs over the 2000-2005 period than compliant firms. A major reason for the difference is that noncompliant firms appointed more OIDs to comply with the new listing standards.[11] Using a firm's noncompliance status as an instrument for the change in the percentage of OIDs on the firm's board, we find that firm performance deteriorates after noncompliant firms increase OID representation on their boards. Lastly, we conduct two event studies of the announcements of OID appointments and firm policy changes raising the mandatory retirement ages of outside directors. We find that shareholders react significantly

[11] This issue is discussed in more detail in section 4.7.2.

negatively to both types of announcements, and especially for the latter type of events that can have broader and longer-term impacts on the board.

Our research is the first investigation of the pervasive and growing phenomenon of boardroom aging at large U.S. corporations and its impact on board effectiveness and firm performance. We present the first comprehensive set of evidence on the costs and benefits associated with older independent directors. Despite the pronounced pattern of boardroom aging in recent years, the age of directors has rarely been a focal point in studies of corporate boards. Even the limited body of research that touches upon director age mostly includes average director age as a control variable without subjecting it to rigorous econometric analysis needed for drawing causal inferences. Furthermore, in contrast to our study, the evidence in the extant literature is both fragmented in terms of board effectiveness measures studied and decidedly mixed in conclusions.

For example, Core, Holthausen, and Larcker (1999) document a positive relation between the proportion of older directors on a board and CEO compensation. Importantly, their results are based on a small sample of 495 observations for 205 U.S. firms over a short 3-year period (1982 - 1984), and they do not distinguish between independent and affiliated directors. In a more recent and larger sample of S&P 1500 firms from 1998 to 2013, Dou, Sahgal, and Zhang (2015) find no significant relation between average independent director age and CEO compensation, the probability of financial restatements, or acquisition returns. In other work, Minnick and Zhao (2009) show that average independent director age is associated with a higher likelihood of option backdating, while Cai and Sevilir (2012) find that the average age of acquirer directors is positively related to acquirer announcement returns. With respect to firm performance, Faleye (2007) finds that average director age has a negative relation with Tobin's Q, but Francis, Hasan, and Wu (2012) report a positive relation between average director age and a firm's stock returns. Further complicating the interpretation of these mixed findings, some prior studies use all directors to construct their average age measure (Faleye (2007), Cai and Sevilir (2012), and Francis et al. (2012)), while others limit their analysis to outside directors (Core et al. (1999)) or independent directors (Minnick and Zhao (2009) and Dou et al.

(2015)).[12]

We differ from these prior studies in several key dimensions, including methodologies, hypothesis development, and economic implications. First, we construct a measure that more effectively captures the presence of older independent directors on corporate boards by focusing on the right tail of the director age distribution. In addition, we examine a broader set of corporate policy and outcome variables. This dual approach allows us to portray a more complete picture of the consequences of the growing phenomenon of boardroom aging at large U.S. corporations. Second, we develop our hypotheses while recognizing that boardroom aging can have both costs and benefits, which can vary across directors with certain characteristics and firms facing particular circumstances. Empirically we present the first evidence on the types of older independent directors who can be particularly valuable to firms and the types of firms that can especially benefit from the presence of older independent directors. Third, we subject our results concerning the impact of older independent directors to multiple identification strategies, which bolsters our confidence in the study's causal inferences.

As the debate over director age limits continues in the news media and among activist shareholders and regulators, our findings can provide important and timely policy guidance. Specifically, for companies considering lifting or waiving mandatory director retirement age requirements to lower the burden of recruiting and retaining experienced independent directors, our evidence should give them pause. Similarly, while recent corporate governance reforms and the rise in shareholder activism have made boards, and especially independent directors, more accountable for managerial decisions and firm performance, these changes may have created an unintended consequence of raising the burdens on independent directors and thus shrinking the supply of potential independent directors who are active managers. This has led firms to tap deeper into the pool of older director candidates, which our analysis shows can undermine the very objectives that corporate governance reforms seek to accomplish.

2. Sample Construction

[12] As we discuss in Section 2, some prior evidence on director age may be contaminated by errors in the director age information in the widely used ISS (formerly IRRC or RiskMetrics) database.

Our initial sample includes the universe of firms in the Institutional Shareholder Services (ISS, formerly RiskMetrics or IRRC) database during the 1998-2014 period.[13] The sample period begins in 1998 because prior to 1998 some important director information such as director shareholdings and the number of major outside board seats is largely missing from ISS. We then merge the ISS sample with the COMPUSTAT and CRSP databases to obtain financial and stock returns data. We remove dual class firms where board monitoring is unlikely to matter given insiders' disproportionate control of voting rights.[14] We also remove observations with incomplete data on key financial or governance variables.

While analyzing the ISS database, we discovered pervasive errors in director age information starting from year 2006. What alerted us to these errors is that from 2005 to 2006 the median director age rose by three years based on the ISS information, but from 2006 to 2007, it did not increase at all. We also noticed that for directors who entered the database in 2006 or later, their age in the ISS database is often different from the firm's proxy statement, with the difference typically ranging from one to three years. We manually checked the director age for a random sample of firms prior to 2006 and did not discover any errors. Therefore, for the 2006-2014 period, we verified and corrected all directors' age information in the ISS database based on the firms' proxy statements. For directors who entered the ISS database prior to 2006, we used their pre-2006 age information to determine their correct age in the later years. All of our analysis is based on corrected director age information.

We define an independent director as an "older independent director" (OID) if he/she is at least 65 years old. Our choice is based on two considerations. First, the Federal Interagency Forum on Aging-Related Statistics (https://agingstats.gov) defines older Americans as those age 65 or above. Second, Korniotis and Kumar (2011) document a large and sharp decline in individuals' investment performance starting from the age group of 64-72 (see their figure 1), suggesting significant deterioration in cognitive ability for people in that age group and above.

Figure 1 shows the overall time trend for the percentage of OIDs. To examine whether the aging trend of boards is due to changing firm composition, we also report the change in OID percentage for

[13] Firms in the ISS database are current and past members of the S&P 1500 index.
[14] Our results are robust to excluding firms with insider equity ownership above 50%.

firms that are incumbent members of and new entrants to the S&P 1500 index, respectively. We observe that both incumbent firms and new entrant firms exhibit a similar trend towards older boards. Figure 2 further shows that over our sample period, independent directors are also older at the time of their initial appointments to the boards. The average (median) age of independent directors at their initial appointments increased from 55 in 1998 to 59 in 2014. Similarly, Figure 3 shows that the percentage of newly appointed independent directors who are at least 65 years old doubled over our sample period, rising from 10% in 1998 to 20% in 2014. These patterns suggest that that the board aging trend is not simply due to directors growing older as firms age.

We conduct several additional analyses to further investigate the board aging trend. First, we examine boardroom aging by industry. Figure 4 and Table 1 Panel B display the average percentage of OIDs on a firm's board for each of the Fama-French 12-industry sectors by year. We find that the OID percentage increases over time in each industry.

Second, we examine boardroom aging in relation to a number of major firm characteristics, including firm size, growth, investment opportunities, age, leverage, performance, and volatility. Using the annual median of each firm characteristic, we partition firms into two subsamples and examine the board aging trend in each subsample. Figure 5 plots the average OID percentage for each characteristic-based group by year. Regardless of the firm characteristic chosen, the board aging trend is evident in all the subsamples.

Third, we estimate multivariate regressions with the percentage of OIDs as the dependent variable. Table 2 presents the regression results. In column (1), we only include a time trend variable *Year*, which is equal to 1 for 1998, 2 for 1999 and so on. In column (2) and (3), we further include indicators for the Fama-French 12-industry groups and various firm characteristics. The results suggest that firms in the consumer durables and healthcare industries are associated with older boards, while firms in the wholesale & retail and business equipment industries are associated with younger boards.[15] Older firms and firms with lower ROA, R&D, and volatility have older boards. In column (4), to be consistent with

[15] The coefficient for the business equipment industry indicator loses its significance once we control for firm characteristics. We include industry fixed effects in ensuing regression analyses to control for any industry heterogeneity.

the main specifications elsewhere in the study, we replace the time trend variable with year fixed effects and control for industry fixed effects based on the Fama-French 48-industry classification. The coefficient estimates on firm age, ROA, R&D, and volatility remain statistically significant. We caution that our analysis in Table 2 is descriptive in nature and is not intended to provide causal evidence.

Next, we compare the personal attributes between older and younger independent directors in Panel A of Table 3. We find that OIDs are older at their initial appointment dates, more likely to be retired, and less likely to be a sitting CEO or senior executive of another firm. They hold more board seats, have longer tenure, and are less likely to be co-opted, i.e., appointed after the current CEO assumed office. They also have lower share ownership, are less likely to be blockholders, and more likely to be a former firm employee, but these differences, albeit statistically significant, are quite small in size.

Panel B of Table 3 presents summary statistics of key financial, governance and outcome variables of our sample firms. All continuous variables are winsorized at their 1st and 99th percentiles to reduce the influence of outliers. Alongside director age, a closely related issue that has also provoked debate is director tenure. Longer-serving board members may accumulate more experience and knowledge about the firms, but they can also become entrenched and less independent of management.[16] As director age and tenure are often positively correlated, to isolate the effects of director age, we control for either an independent director's tenure or the percentage of independent directors who have at least 15 years of tenure at a firm, depending on whether the analysis is at the director level or the firm level.[17]

3. Analysis of Board Meeting Attendance and Board Committee Service

In this section, we conduct director-level tests to assess whether older independent directors actively participate in the governance of firms and contribute to more effective boards. Specifically, we compare board meeting attendance records of older and younger independent directors as well as their frequency of serving on time-consuming committees and taking on time-intensive committee chair positions.

[16] Dou, Sahgal, and Zhang (2015) find that independent directors with extended tenure are associated with stronger monitoring and better governance outcomes. Huang and Gillary (2018) find an inverted U-shaped relation between board tenure and firm performance and governance outcomes.

[17] Results are robust to replacing the 15-year cutoff with a 10-year cutoff.

3.1. Board Meeting Attendance

Board behavior is largely unobservable, but publicly listed firms in the U.S. are required to disclose a director's board meeting attendance record in their annual proxy filings. The level of disclosure is limited to whether a director attended less than 75% of board meetings during a fiscal year. We obtain the board meeting attendance information from the ISS database for all independent directors.

We estimate a linear probability model where the dependent variable, *Attend_less75_pct*, is equal to one if an independent director attended less than 75% of a firm's board meetings in a given year, and zero otherwise. The key explanatory variable is an indicator variable equal to one if a director is 65 or older. We control for a large array of director attributes and firm financial and governance characteristics as well as director, year, and industry (Fama-French 48) fixed effects.[18] Standard errors are adjusted for heteroscedasticity and director-level clustering.

This model specification focuses on within-director variations and sharpens the identification of our analysis. The coefficient on the *OID* indicator can be interpreted as capturing the change, if any, in a director's board meeting attendance behavior when he/she reaches the age-65 threshold. Given that only 1.4% of director-firm-year observations in our sample are associated with poor attendance, within-director variation in board meeting attendance behavior is even more limited, which should bias against our finding any significant evidence.

Column (1) of Table 4 presents the regression results. We find that the coefficient on the *OID* indicator is positive and significant, suggesting that older directors have significantly worse board meeting attendance records compared to when they are younger. Economically, the coefficient implies that the probability of an independent director aged 65 or older missing more than 25% of board meetings is 0.3 percentage points higher than that of the same independent director aged 64 or younger. This effect is economically meaningful given the unconditional probability (1.4%) of a director missing more than 25% of board meetings in a year in our sample.

[18] The very large number of director fixed effects necessitates the use of the linear probability model. Our results are robust to controlling for industry-year paired fixed effects throughout the study.

For the director-level controls, we observe that independent directors who are current CEOs of other firms, have more board seats, or have lower equity ownership levels are significantly more likely to miss board meetings. For the firm-level controls, we find that directors in smaller firms or firms with higher Tobin's Q or larger boards are more likely to miss board meetings.

Given the importance of board meetings as a mechanism for outside directors to participate in a firm's governance, our results indicate that older independent directors exhibit deficiencies in fulfilling their duties and contribute to weaker board effectiveness.

3.2. Board Committee Services

Another measure of a director's contribution of time and energy to board duties is his/her involvement in major board committees. Therefore, we investigate whether there are any differences between older and younger independent directors with respect to their membership and chairmanship on major committees overseeing matters related to audit, compensation, nominating and governance. Toward that end, we construct two measures at the director-firm-year level. One is a count variable equal to the number of these committees a director serves on in a given firm-year, and the other is a binary variable that is equal to one if a director chairs at least one of these major committees in a given firm-year. Since the audit and compensation committees are generally considered to involve more time-consuming duties, we create two more variables based on a director's membership and chairmanship on at least one of these two committees.

We regress these four variables against the *OID* indicator while controlling for a number of director and firm characteristics as well as director, industry, and year fixed effects. The coefficient estimates are reported in columns (2) - (5) of Table 4. We find that the coefficient on the *OID* indicator is insignificant in column (2) and significantly negative in columns (3), (4), and (5). These results suggest that once directors turn 65, while they do not reduce the overall number of committees they sit on, they become less likely to serve on the audit and compensation committees. They are also less likely to chair any committee, especially the more time-intensive audit and compensation committees. In terms of economic significance, the coefficient of *OID* in column (5) is -0.019, which represents a 7.9% decrease

in the probability of being chair of either the audit or compensation committee. This magnitude is economically meaningful given the unconditional probability of 24% in our sample. Taken together, the results in Table 4 are consistent with older independent directors being less likely to hold committee chair positions or serve on the relatively time-intensive audit and compensation committees.

4. Older Independent Directors and Corporate Policies and Performance

To shed more light on the impact of OIDs on board effectiveness, we relate their presence to major corporate decisions in several key areas, including mergers and acquisitions, payout policies, CEO turnovers, CEO compensation, and financial reporting. We also evaluate the overall effect of OIDs on firm performance, measured by return on assets (ROA) and Tobin's Q. A potential concern with these lines of analysis is the issue of endogeneity. More specifically, the presence of OIDs is likely to be determined by factors related to demand for and supply of OIDs and these factors could also be related to the outcome variables we examine.

We take multiple approaches to address the endogeneity concerns. First, we include an exhaustive set of control variables in our regressions, including many important aspects of corporate governance, managerial incentive, and CEO quality, as well as a firm's growth opportunities and age as proxies for its life cycle.[19] To account for time-invariant unobservable firm characteristics that could drive the relation between OIDs and corporate outcome measures, we also control for firm-fixed effects wherever feasible. Second, we use a two-stage least square (2SLS) framework in which we instrument for the presence of OIDs with the supply of OID candidates available in the firm's headquarters state. Third, we exploit a quasi-natural experiment that produces a plausibly exogenous shock to some firms' demand for OIDs, and relate this resulting change in the OID presence on boards to changes in firm performance around the shock. Fourth, we conduct event studies of the appointments of OIDs and changes in firm policies governing mandatory director retirement age.

[19] We use a logarithmic transformation of firm age since the coefficient of raw firm age cannot be estimated in regressions with both year and firm fixed effects due to multicollinearity. Our results are robust to including firm age squared as an additional control variable.

4.1. Analysis of Corporate Acquisition Decisions

Acquisitions are among the largest investments ever made by firms. As such, boards play a major role in devising, evaluating, and ultimately approving firms' acquisition strategies. While acquisitions can generate shareholder value by combining firms with potential synergies, a nontrivial proportion of them are value destroying and appear to be manifestations of agency problems (e.g., Moeller, Schlingemann, and Stulz (2005), Harford and Li (2007), and Masulis, Wang, and Xie (2007)). We hypothesize that the monitoring deficiency of OIDs allows managers to engage in more empire-building acquisitions at the expense of shareholders. To test this conjecture, we assess the performance of a firm's acquisition decisions in relation to the presence of OIDs.

We obtain 3,643 acquisitions made by our sample firms during the sample period from the SDC database. For each acquisition, we require that (i) the deal is completed, (ii) the disclosed deal value is above $1 million and represents at least 1% of the acquirer's equity market capitalization, as measured on the 11th trading day prior to the announcement date, (iii) the acquirer controls less than 50% of target shares prior to transaction and owns 100% of target shares afterwards, and (iv) the acquirer has financial data available from COMPUSTAT, governance data available from ISS for the year prior to the acquisition announcement, and stock return data available from CRSP for the period from the 210th trading day prior to deal announcement to the 2nd trading day after the deal announcement.

We measure a firm's acquisition performance by its stock's cumulative abnormal return (CAR) over the 5-day window (-2, 2), where day 0 is the announcement date obtained from the SDC. The CAR is computed based on a standard one-factor market model, whose coefficients are estimated using daily stock returns over the period (-210, -11) with the CRSP value-weighted return as the market return. The average 5-day CAR for acquirers is 0.229% and the median is 0.101%.

We regress the acquirer's CAR against the percentage of OIDs on its board, while controlling for a battery of firm financial and governance variables and deal characteristics. The results reported in Table 5 show that the coefficient on *OID %* is negative and statistically significant across both model specifications, even when we include firm fixed effects to control for time-invariant firm attributes. Depending on the model used, a one-standard-deviation increase in *OID %* is associated with a decrease

in acquirer CARs of 0.45 or 0.72 percentage points, equivalent to $41.9 million or $67.0 million loss in shareholder value for the average acquirer in our sample. Our findings indicate that firms with greater representation of OIDs on their boards tend to make acquisitions that generate lower shareholder value,[20] which supports our conjecture that boards with more OIDs are less effective at reining in CEO empire building activities.

4.2. Analysis of Corporate Payouts

Boards also play an important role in corporate payout policies. When firms exhaust their profitable investment opportunities, they should return any excess cash to shareholders in the forms of dividends and/or stock repurchases. However, the distribution of free cash flows to shareholders reduces the resources under the CEOs' control. Therefore, left to their own device, self-interested CEOs prefer to retain control over this excess cash, which provides them with ready ammunition to pursue pet projects or empire building acquisitions (Jensen (1993) and Harford (1999)). To the extent that OIDs are less effective monitors, we posit that firms with more OIDs on their boards tend to pay out less free cash flow to shareholders.

To test this prediction, we regress a firm's repurchases, dividends, and total payouts, all scaled by the firm's market capitalization, against our OID measure. Table 6 reports the regression estimates. We find that the coefficient on *OID %* is negative and statistically significant for all three payout measures, (see columns (1), (4), and (7)), suggesting that firms with a greater presence of OIDs on the board are associated with lower payout levels to shareholders. Based on the coefficient estimate in column (7), a one-standard-deviation increase in *OID %* is associated with a 0.24 percentage point reduction in total payouts. After the inclusion of firm fixed effects, the negative coefficient on *OID %* is still statistically significant for repurchases, and marginally significant for dividends and total payouts based on a one-sided test (see columns (2), (5), and (8)).

We further examine the relation between OIDs and payout policies at firms with higher levels of

[20] Dou et al. (2015) use the average age of independent directors as a control variable and find no significant relation to acquirer announcements returns.

excess cash, because board monitoring would be more important at these firms given the higher potential managerial agency problems. We follow Harford (1999) to construct an excess cash measure, defined as the deviation of a firm's ratio of cash and short-term investments to its total assets from its predicted value based on a cash management model. We then create an interaction term between a firm's excess cash and the OID percentage variable and include it as an additional explanatory variable in the payout regressions.

Results from columns (3), (6), and (9) of Table 6 show that excess cash has a positive coefficient estimate, significant in two out of three model specifications, suggesting that firms with more excess cash on average pay out more to shareholders. More important for our purpose, the coefficient of the interaction term between excess cash and OID percentage is always negative and significant, implying that a greater presence of OIDs is associated with a lower sensitivity of payouts to excess cash.[21] This evidence suggests that OIDs are less effective in removing excess liquidity from the control of managers and reining in potential empire building activities, a prime example of which is acquisitions, the subject of our next investigation.

4.3. Analysis of CEO Turnover Decisions

CEO retention and replacement is another major board decision that reflects monitoring effectiveness. A board's ability and readiness to stay informed of managerial decision making and replace managers if necessary provides powerful incentives ex ante for CEOs to act in the best interests of shareholders. We examine whether the presence of OIDs affects a board's effectiveness in disciplining poorly performing managers.

We obtain data on forced CEO turnovers during the period of 1998 to 2007 from Jenter and Kanaan (2015). Merging these data with our sample yields a total of 309 forced CEO turnovers, which translate into a 2.4% unconditional probability of forced CEO turnover in a given firm-year. We estimate a probit model where the dependent variable is equal to one if a firm experiences a forced CEO turnover in a

[21] We find qualitatively similar results when interacting *OID %* with free cash flows, which are measured as operating cash flows minus dividends and capital expenditures.

given year and zero otherwise. There are two key explanatory variables. One is firm performance, and the other is an interaction term between firm performance and *OID %*. We use a firm's industry-adjusted return on assets (ROA) over the previous fiscal year as our primary performance measure.[22] Alternatively, we also use a firm's market-adjusted stock returns over the previous fiscal year and obtain similar results.[23] We control for a number of other corporate governance variables as well as their interaction terms with firm performance. In addition, we control for firm fixed effects in some model specifications to focus on within-firm time-series variation. This approach, however, removes observations associated with firms having no forced CEO departures during our entire sample period, substantially reducing the sample size.

Table 7 presents the regression results for forced CEO turnovers. The coefficient estimate of the standalone firm performance measure is always negative across all model specifications. More importantly, the coefficient of the interaction term between firm performance and *OID %* is always positive and statistically significant, suggesting that the CEO turnover-performance sensitivity is weaker when firms have a higher percentage of OIDs on their boards. To evaluate the economic impact, we calculate the change in the implied probability of CEO forced turnovers when firm performance changes from the 25th percentile to the 75th percentile level (the interquartile range). Using column (1) as an example, if all independent directors on the board are under 65, i.e., *OID %* is equal to zero, the change in the implied probability of forced CEO turnover is 1.3%. When all the independent directors are aged 65 or above, i.e., *OID %* is equal to one, the change in the implied probability of CEO forced turnover declines to only 0.7%. The difference between the implied probability changes is economically meaningful given the unconditional probability of forced CEO turnover of 2.4%. Overall, the evidence in this section is consistent with the notion that OIDs reduce board effectiveness in disciplining poorly performing managers.

4.4. Analysis of CEO Compensation

[22] We obtain similar results using the raw ROA.
[23] Stock returns incorporate investors' belief about the probability of future CEO turnovers and thus may introduce a look-ahead bias (Weisbach (1988)).

Setting CEO pay is one of the most important decisions for boards. To the extent that ineffective monitoring by OIDs allows for more self-serving managerial behavior, we expect firms with more OIDs to pay CEOs more, but at the same time, require less CEO pay sensitivity to shareholder wealth. To test this proposition, we obtain CEO compensation data from ExecuComp. We remove firm-year observations in which CEOs are in office for less than one year, since the compensation received by these CEOs is for a partial fiscal year. Given that CEO pay is under the direct purview of compensation committees, we construct a variable, *Compensation committee OID %*, that is defined as the percentage of independent directors on the compensation committee who are 65 or older.

Table 8 presents the regression results. The dependent variables are the level of CEO total compensation in columns (1)-(3), the percentage of cash in CEO total pay (cash intensity) in columns (4)-(6), and the percentage of equity in CEO total pay (equity intensity) in columns (7)-(9). Results in column (1) suggest that even after controlling for other known determinants of CEO pay, firms with a higher proportion of OIDs on their boards pay CEOs more. Based on the coefficient estimate of *OID %*, a one-standard deviation increase in the percentage of OIDs on the board is associated with a 3.4% increase in CEO pay.

Turning to CEO pay structure, we find that CEOs at these firms receive a higher percentage of pay in the form of cash (column (4)) and a lower percentage of pay in the form of equity (column (7)), indicating that the higher pay is not compensation for higher CEO compensation risk bearing and the CEO pay for performance sensitivity is lower. Our inferences remain the same when we use the percentage of OIDs on the compensation committee as our key independent variable in columns (2), (5), and (8) and even when we include firm-fixed effects in columns (3), (6), and (9).[24] Overall, our analysis in this section shows that boards with more OIDs are associated with significantly higher CEO pay and a pay structure composed of more cash and less equity. These findings are consistent with OIDs undermining the board's governance effectiveness in properly compensating and incentivizing CEOs.

[24] We also use the Black-Scholes delta of CEO compensation as an alternative pay-performance sensitivity measure. Following Core and Guay (2002), delta is defined as the change in the value of the CEO's total portfolio of stocks and options for a 1% change in stock price. We find that the percentage of older independent directors on a firm's board and compensation committee is associated with significantly lower delta.

4.5. Analysis of Earnings Management and Financial Restatements

Boards are responsible for overseeing and ensuring the quality of firm financial reporting. In this section, we examine the relation between OIDs and a firm's propensity to manipulate earnings. To the extent that OIDs are associated with monitoring deficiencies, we expect their presence to be associated with less reliable financial reporting. Given the importance of the audit committee in monitoring a firm's financial reporting, we construct a variable, *Audit committee OID %*, that is defined as the percentage of independent directors on the on the audit committee who are 65 or older.

Our first measure of financial reporting quality is the performance-adjusted discretionary accruals (Kothari, Leone, and Wasley (2005)), computed as the difference between a firm's total accruals and the fitted normal accruals estimated from a modified Jones (1991) model. Our second measure of financial reporting quality is earnings restatement. We obtain a sample of restatements from the Audit Analytics (AA) restatements database. The AA database covers all SEC registrants who disclose a financial restatement in their electronic filings. AA defines a restatement as a revision of a previously filed financial statement due to an error, fraud, or GAAP principle misapplication. The database excludes revisions due to mergers and acquisitions or accounting principle changes such as the adoption of SFAS 123R. From the AA database, we identify the beginning and end dates of the misreporting period. If multiple filings are related to the same underlying misstatement, we consider them as a single restatement observation. Following Hennes, Leone, and Miller (2008), we further classify restatements as irregularities (intentional misreporting) or accounting errors (unintentional misreporting).[25]

We regress the two measures of financial reporting quality against the presence of OIDs and present the results in Table 9. We find that firms with a higher percentage of OIDs on their boards or audit committees are associated with a significantly higher level of discretionary accruals and a significantly higher likelihood of earnings restatements (columns 1, 2, 4, and 5). These results continue to hold when

[25] Hennes et al. (2008) classify a restatement as irregularity driven if it satisfies one of the following three criteria: (i) variants of the words ''irregularity'' or ''fraud'' were explicitly used in restatement announcements or relevant filings in the four years around the restatement; (ii) the misstatements led to a SEC or DOJ investigation; or (iii) independent investigations were launched by boards of directors of the restating firms. We use three variables from the AA database that correspond to the above three criteria.

we control for firm fixed effects (columns 3 and 6) and when we focus on restatements due to accounting irregularities (columns 7-9). The average marginal effect of *Audit committee OID %* in column (8) is 0.019, suggesting that a one-standard-deviation increase in the OID percentage on the audit committee is associated with a 0.57 percentage point increase in the probability of intentional misreporting. This is an economically meaningful magnitude given that our sample's unconditional probability of intentional misreporting is only 4%. Overall, the evidence in this section suggests that OIDs weaken board oversight of a firm's financial reporting, allowing managers to engage in more aggressive earnings manipulations.

4.6. Analysis of Firm Performance

The collective results up to this point portray a consistent picture that OIDs provide inadequate management oversight and contribute to poorer managerial incentives and more agency problems. We next examine how the presence of OIDs is related to overall firm performance. Based on the evidence documented for specific corporate policies, we expect to find that firm performance is negatively related to the proportion of OIDs on boards. We test this prediction by estimating regressions of firm performance, measured by a firm's ROA or Tobin's Q.

Table 10 presents the regression results. The associations between *OID %* and the two performance measures are negative and statistically significant, even after we control for firm fixed effects. Using the coefficient estimates from column (1) and (3), we find that a one-standard-deviation increase in *OID %* is associated with a 0.5 percentage point decline in ROA and a 0.05 decline in Tobin's Q. With respect to other governance variables, consistent with prior literature, we find that firms with larger and busier boards are associated with worse performance (Yermack (1996) and Fich and Shivdasani (2006)), and there is an inverse U-shaped relation between director ownership and firm performance (Morck, Shleifer, and Vishny (1988) and Kim and Lu (2011)).

While the firm fixed effects specification ensures that the negative relation between OIDs and firm performance is not driven by unobservable time-invariant firm characteristics, another endogeneity related concern is reverse causality. For instance, as part of their turnaround efforts, poorly performing

firms could appoint more OIDs (either voluntarily or at the behest of activist shareholders) to tap into their potentially greater experience and reputation. In this scenario, poor performance leads to a high percentage of OIDs on boards rather than the other way around.

To address this reverse causality possibility, we examine new independent director appointments of firms stratified by prior firm performance. We define good (poor) performers as firms whose ROA is in the top (bottom) tercile of each industry-year cohort. In unreported results, we find that compared to good performers, poor performers are more likely to appoint more independent directors in the next year, but they are equally more likely to appoint younger and older independent directors. Therefore, the negative relation between OID presence and firm performance is unlikely to be driven by poorly performing firms subsequently appointing disproportionately more OIDs.

In a related test, we examine the size of OIDs' equity ownership in firms to gauge the extent to which they are appointed to the boards of poorly performing firms as representatives of major shareholders to monitor managers and engineer corporate turnaround. Examining the aggregate equity ownership of all OIDs at a firm, we find that it averages 0.4% in our sample. In addition, at the individual director level, only 11.3%, 2.1%, 1.1%, or 0.25% of OIDs hold more than 0.1%, 0.5%, 1%, or 5% of a firm's equity ownership, respectively. Given the typical miniscule equity ownership held by OIDs, an overwhelming majority of them do not appear to be affiliated with blockholders. Our results are also robust to removing OIDs with at least 0.1% equity ownership.

4.7. Additional Identification Strategies

So far, we have relied on firm-fixed effect regressions to control for time-invariant firm attributes to mitigate concerns about omitted variables. However, this approach does not account for the influence of time-varying omitted variables. Therefore, we use several additional identification strategies to further alleviate such endogeneity concerns.

4.7.1. 2SLS regression

We first employ a two stage least squares (2SLS) regression framework in which we instrument for

the presence of OIDs on a firm's board by the supply of old director candidates in the firm's local director labor market. Knyazeva, Knyazeva, and Masulis (2013) argue and show that because of the higher board participation costs faced by candidates located more remotely from firms, the local supply of directors significantly affects a firm's ability to hire qualified independent directors. Similar to their approach, we construct a measure of the potential supply of older independent directors in a firm's headquarters state. Specifically, we take the logarithmic transformation of the number of senior executives and directors aged 65 or above employed by public firms headquartered in the same state scaled by the total number of public firms in the state. In constructing this instrument, we exclude firms in the same 4-digit SIC industry in computing the supply of local older directors, because a firm is unlikely to invite executives and directors of its direct competitors to join its board due to antitrust and competitive considerations.

Since a firm's headquarters location is generally determined early in its life and rarely changes (Pirinsky and Wang (2006)), we consider the supply of older directors in the firm's vicinity as a plausibly exogenous source of variation.[26] We argue that the local older director pool should only affect firm outcomes through its effect on OID representation at the firm in question. In other words, the local older director pool affects board composition, but does not directly influence other firm outcomes.

We estimate 2SLS regressions for each of the firm outcome variables examined in previous sections. In the first stage estimation, the dependent variable is the percentage of OIDs on a firm's board, and the key explanatory variable is the instrument, the local supply of older director candidates. Table A2 in the Appendix presents the first-stage regression results. The coefficient on the local older director pool is positive and statistically significant at the 1% level, supporting the instrument's strength and relevance. The Cragg-Donald Wald F-statistic is above 30, easily rejecting the null hypothesis of a weak instrument.

Table 11 presents excerpts of the coefficient estimates from the second-stage regressions. All the results from previous sections continue to hold. Specifically, the coefficient on *OID %* remains significantly negative in regressions of acquirer returns, corporate payouts, CEO equity intensity, and

[26] Information on firms' historical headquarters state is from the WRDS's SEC Analytics Suite database, which records the location of firms' historical headquarters based on their 10-K filings. Our results are robust to excluding firms that changed their headquarters state during the sample period.

firm performance, and significantly positive in regressions of CEO total compensation and cash pay, discretionary accruals, and earnings restatements. In the CEO turnover regressions, the coefficients on the interaction terms between *OID %* and firm performance remain significantly positive. Therefore, our findings are robust to correction for endogeneity using the instrumental variable approach.[27]

4.7.2. Quasi-Natural Experiment

To further establish a causal relationship between OIDs and firm performance, we exploit changes to the NYSE and Nasdaq listing rules in 2003 as a quasi-natural experiment. Exogenous shocks to the composition of corporate boards rarely exist, but the NYSE and Nasdaq rule changes provide an ideal setting. Previous studies have used the same regulatory shock to examine the effect of board independence on CEO compensation (Chhaochharia and Grinstein (2009)), corporate transparency (Armstrong, Core, and Guay (2014)), and CEO monitoring (Guo and Masulis (2015)).

Responding to a number of major U.S. corporate governance scandals, the United States Congress passed the Sarbanes-Oxley Act in 2002 and concurrently the NYSE and Nasdaq made major listing rule changes in 2003, with the intent of strengthening the independent oversight of corporate boards. In particular, the NYSE and Nasdaq issued a regulation in 2003 that required listed firms to have a majority of independent directors on their boards. Firms compliant with the regulation prior to the issuance were not affected. Only noncompliant firms were forced to increase the percentage of independent directors. Noncompliant firms could meet the requirements by recruiting new directors to the boards. To the extent that there was a shortage of qualified candidates due to the exogenous increase in demand for independent directors, noncompliant firms may look to individuals who recently retired as officers or directors of other firms as a logical source of director talent. Therefore, they may experience an increase in OID representation on their boards. Our empirical strategy is to use a firm's noncompliant status to instrument for the change in the percentage of OIDs on the firm's board and then relate the change in the OID percentage to the change in firm performance.

[27] To the extent that large firms tend to have high national or international visibility and are less constrained by the local director labor market in their director recruitment, we exclude from our analysis firms in the top quartile based on their market capitalization as a robustness. We find that our results continue to hold.

Following Chhaochharia and Grinstein (2009) and Guo and Masulis (2015), we use the period between 2000 and 2005 as our event window. We choose 2000 as the benchmark year to ensure that our event window begins before the new regulation could be reasonably anticipated. We choose 2005 as the end of our event window as firms have to comply with the new listing rule by that year.[28] We define compliant firms as those that had a majority of independent directors on their boards in 2000. Firms that do not satisfy the above criteria are classified as noncompliant.

To assess the impact of this regulatory shock, we estimate the change in *OID %* separately for compliant firms and noncompliant firms. In a univariate comparison, we find that noncompliant firms and compliant firms had similar levels of *OID %* in 2000 (31.8% for noncompliant firms and 30.6% for compliant firms). However, noncompliant firms increased their *OID %* by 5.97 percentage points (almost 20% on a relative scale) over the event window, while compliant firms experienced a much smaller increase of 1.74 percentage points (about 6% on a relative scale), where the difference is statistically significant at the 5% level. A major reason behind the larger rise in *OID %* at noncompliant firms is that they appointed significantly more OIDs during this period to comply with the new listing standards. Indeed, the percentage of OIDs among newly appointed independent directors at non-compliant firms increased from 10% to 15% (by 50% on a relative scale), while it held steady at about 10% at compliant firms.

We next proceed to estimate 2SLS regressions of firm performance using a firm's noncompliance status to predict the change in its OID percentage. We use model specifications similar to those in Table 10, except that we measure all variables as changes over the event window 2000-2005. We instrument for *Change in OID %* with *Noncompliance,* an indicator variable that equals one if the firm's board structure was not complaint with the new rule in 2000 and zero otherwise.

Table 12 presents the second-stage estimation results. The dependent variable is *Change in ROA* in column (1) and *Change in Tobin's Q* in column (2). The instrumented version of *Change in OID %* has

[28] Specifically, firms with unitary boards were required to comply with the regulation by the earlier of: (1) the firm's first annual shareholder meeting after January 15, 2004; or (2) October 31, 2004. Firms with classified boards were required to comply with the regulation by their first annual meeting after January 15, 2005, but no later than December 31, 2005 (Chhaochharia and Grinstein (2009) and Armstrong et al. (2014)).

a negative and statistically significant coefficient in both columns.[29] These results reinforce our findings in Tables 10 and 11 that firm performance decreases with the percentage of OIDs on the board.

4.7.3. Event Studies of OID Appointments and Director Retirement Policy Changes

In this section, we take a model-free approach to examine OIDs' net impact on firm value. Specifically, we conduct two separate event studies to gauge the stock price reactions to the announcements of (1) firms changing their director retirement policies and (2) firms appointing older independent directors.

4.7.3.1. Announcements of Director Retirement Policy Changes

To construct the sample for this analysis, we gather information on director retirement policy changes from the Capital IQ Key Development Database. Specifically, we conduct a keyword search on "Age", "Director" and "Retire". The search returns 208 news articles. We read each article and remove irrelevant news, duplicate news, news where we cannot identify the direction of change in retirement age, and news about companies that do not have stock return data available from CRSP. We confirm the changes in bylaws by checking firms' SEC filings. We identify 91 retirement policy changes that can potentially increase a board's OID representation. After removing contaminated announcements, the "clean" sample contains 59 retirement policy change announcements.[30] Table A3 in the Appendix provides details on the full and clean samples.

We measure the announcement-period cumulative abnormal returns (CAR) over a 3-day event window (-1, 1) with event date 0 being the announcement date. Abnormal returns are computed based on the coefficients of a standard one-factor market model estimated using daily stock returns over the 200-day window (-210, -11) and the CRSP value-weighted return as the market return. The results are reported in Panel A of Table 13. The mean CAR is -0.62% and the median is -0.685%, both statistically

[29] To the extent that large firms face fewer constraints in their recruitment of independent directors to comply with the new regulation, we exclude them from our analysis and find that our results continue to hold.
[30] We exclude announcements contaminated by events such as the annual general meetings, director appointments, earnings announcements, dividend declaration and other bylaws changes.

significant. The effect is equivalent to a $44.1 - $48.7 million loss in shareholder value for the average event firm in our sample. This suggests that on average shareholders view director mandatory retirement age increase as value destroying.

During our keyword and news search, we also identify 5 events that decrease the mandatory retirement age, 2 events that impose a mandatory retirement age, and 1 event that eliminates the board's discretion to waive the mandatory retirement age. Although the number of these events is too small for formal statistical testing, it is worth noting that the stock market reacts positively to these 8 director-age-decreasing events, with an average CAR of 0.976%. The effect is equivalent to a $91.3 million gain in shareholder value for the average event firm in our sample.

4.7.3.2. Announcements of Old Independent Director Appointments

To construct the sample of OID appointment announcements, we gather information on independent directors who were 65 or older when they joined the board from the ISS database. We then identify the first public disclosure dates of these appointments by manually searching news articles in Factiva. If the announcement dates cannot be located in Factiva, we use the dates recorded in the Capital IQ Key Development Database. The sample construction is described in Table A4 of the Appendix. There are 1,127 appointments in total. We remove director appointments that coincide with annual shareholder meetings because these director announcements are contaminated by other information disclosed in proxy statements. We further remove appointments contaminated by confounding events such as multiple appointments of directors, earnings announcements and dividend declaration. Our final sample contains 676 uncontaminated appointment announcements.

We estimate the appointing firms' cumulative abnormal returns (CAR) over a 3-day event window (-1, 1) and report the results in Panel B of Table 13. We find that the mean and median CARs are -0.197% and -0.217%, both statistically significant. This evidence suggests that the stock market holds a skeptical view of OIDs and reacts negatively to their appointments. The effect is equivalent to a $21.7 - $23.9 million loss in shareholder value for the average appointing firm in our sample.

5. Advisory Benefits of Older Independent Directors

In this section, we go beyond the average negative effect of OIDs documented above and explore whether OIDs can provide valuable advisory benefits to firms. We focus primarily on the expertise of OIDs and economic settings where firms are in greater need of board expertise and advice.

First, we differentiate among OIDs with respect to whether they have specialized experience pertinent to firms' acquisition decisions. In particular, we identify OIDs with prior acquisition experience or working experience in the target's industry. OIDs with such experiences should be able to provide more valuable counsel on M&A transactions and help acquirers generate higher shareholder value. We define an OID as having acquisition experience if she has participated in at least one acquisition made by another company where she served as a director or a senior executive during the prior 10 years. We defined an OID as having target industry experience if she previously served as a director or a senior executive at another firm in the same three-digit SIC industry as the target over the prior 10 years.[31] We obtain director experience from ISS and executive experience from ExecuComp.

We re-estimate the acquirer return regressions while decomposing *OID %* into two separate variables, *Inexperienced OID %* and *Experienced OID %*, based on an OID's prior acquisition experience or target industry experience. Panel A of Table 14 presents the results. We find that OIDs with prior acquisition experience are not related to acquirer returns, possibly because the benefits of their better advice offset the costs from their poorer monitoring. On the other hand, OIDs with target industry experience have a significantly positive relation to acquirer returns, suggesting that the benefits from their advice outweigh the costs of their monitoring deficiencies. Finally, OIDs with neither type of experience continue to exhibit a significantly negative association with acquirer returns.

Next, we investigate the possibility that firms may benefit from the presence of OIDs in certain situations. To the extent that OIDs are more experienced and can provide more seasoned opinions and advice to management, they may be able to make positive contributions to firms that are in greater need of board advice. We exploit import tariff cuts as a quasi-natural experiment that substantially heightens the product market competition of our sample firms. Import tariff cuts lower the cost of foreign rivals

[31] The results are robust if we use two-digit or four-digit SIC code to define target industry experience.

entering U.S. product markets, and as a result, increase the competitive pressure on U.S. firms in impacted industries. The experience and advice from OIDs may be especially valuable to firms as they adapt to a different and more challenging industry landscape.

We use the U.S. import tariff data compiled by Feenstra (1996), Feenstra, Romalis, and Schott (2002), and Schott (2010).[32] The tariff data are only available for manufacturing industries from 1998 to 2005 in our sample period. For each three-digit SIC industry in each year, we compute the tariff rate as the duties collected by U.S. Customs divided by the custom value of imports. Similar to prior studies, e.g., Fresard (2010) and Valta (2012), we define a tariff cut in terms of the deviations of the yearly changes in industry tariffs from their median level. Specifically, a tariff cut occurs in an industry-year when the industry experiences a negative tariff change that is two times larger than the median change of the industry's tariff during the sample period. We exclude tariff cuts followed by equivalent tariff raises over the subsequent two years. We then construct an indicator *Tariff Cut*, which is equal to one if a firm's industry experiences a tariff cut in a particular year and zero otherwise. We repeat the firm performance regressions with the inclusion of *Tariff Cut* and its interaction term with *OID %*.

Panel B of Table 14 presents the results. Consistent with prior research on tariff cuts, the coefficient on *Tariff Cut* is negative and statistically significant in both *ROA* and *Tobin's Q* regressions, suggesting that following tariff cuts, firm performance deteriorates due to increased product market competition. More importantly, the coefficient on the interaction term between *OID %* and *Tariff Cut* is positive and statistically significant for both firm performance measures, indicating that the presence of OIDs is beneficial when firms face more intense product market competition.[33] This finding is consistent with OIDs using their experience to help firms better cope with heightened challenges in their competitive environment.

We also explore whether firms with certain characteristics benefit more from the OIDs' advisory function. Following Coles, Daniel, and Naveen (2008) and Field, Lowry, and Mkrtchyan (2013), we

[32] The tariff data are available at http://faculty.som.yale.edu/peterschott/sub_international.htm.

[33] The results are qualitative similar if we define a tariff cut in alternative ways, such as using three times the median change as the cutoff, using two (or three) times the median reduction as the cutoff and using four-digit SIC code industries.

consider several types of firms that potentially have greater needs for board advice: firms operating in highly volatile industries, younger firms, firms with higher sales growth, and firms with multiple business segments. Firms in highly volatile industries need to contend with unpredictable operating environments, and decision making is made more difficult by rapidly evolving industry landscapes. Similarly, young and fast growing firms often face uncertain future and changing business conditions, and their managers may be inexperienced in dealing with many of the challenges and therefore can use the inputs and advice from OIDs. Firms operating in multiple industry sectors usually have more complex business operations and can benefit from OIDs' extensive experience.

For each industry, we compute the industry-level volatility as the average standard deviation of annual stock returns of all firms in the industry. We define firm age as the number of years that a firm exists in Compustat and sales growth as the annual growth rate of sales. We obtain a firm's number of business segments from Compustat. Using these variables, we construct two indicators, *Low advisory need* and *High advisory need*. The indicator *High advisory need* is equal to one if (1) a firm's industry volatility is above the median of all industries; or (2) a firm's age is below the annual median; or (3) a firm's sales growth is above the annual median; or (4) a firm has more than one business segment, and zero otherwise. The *Low advisory need* indicator is equal to one minus *High advisory need*. We re-estimate firm performance regressions and separately interact *OID %* with the two indicators. We also control for a firm's advisory needs in these regressions.[34]

Panel C of Table 14 reports the results. We find across all proxies for firm advisory needs that the negative and significant relation between OID presence and firm performance only exists among firms with low advisory needs. For firms with high advisory needs, there is no significant relation between OID presence and firm performance. The difference in the coefficients of the two interactions is statistically significant across all specifications.[35] These results suggest that OIDs do not harm performance in firms with greater needs for board advice.

[34] Note that for the industry volatility analysis, the control variable *Advisory need* is absorbed as it is constant for individual industries.

[35] The results are robust to alternatively using the 75th percentile of industry volatility, firm age, sales growth, and the number of different 2-digit SIC segments to divide firms into high- and low-advisory need groups.

Finally, we differentiate between busy and non-busy OIDs, where an OID is defined as busy if he/she holds three or more directorships (Fich and Shivdasani (2006)).[36] Having multiple board seats can be an indicator of higher-quality directors, who can potentially provide greater advisory benefits to firms. However, serving on multiple boards also limits the time and resources that directors have to meet their responsibilities on each board, which could exacerbate the monitoring deficiencies of OIDs.

We re-estimate the firm performance regressions after decomposing the key variable *OID %* into two components: *Busy OID %* and *Non-busy OID %*.[37] Panel D of Table 14 presents the regression results. We find that the coefficients of both *Busy OID %* and *Non-busy OID %* are significantly negative,[38] suggesting that our results are not just driven by busy OIDs. Moreover, the coefficients of *Busy OID %* are significantly larger in magnitude than those of *Non-busy OID %*. This evidence does not support the view that busy OIDs are on average of higher quality and thus provide more valuable advisory services. Instead, it suggests that the deficiencies associated with OIDs are compounded when they become overly busy.

In sum, our analysis in this section uncover interesting cross-sectional variations in the relation between OIDs and firm performance. While the presence of OIDs on average has a negative impact due to their monitoring deficiencies, it is important to recognize that they can also bring valuable advisory benefits to firms when they have certain specialized experience or when managers need more advice from directors.

6. Conclusion

We explore the implications of older independent directors for board effectiveness and corporate governance. Evidence from our director and firm level analyses suggests that older independent directors are associated with both monitoring deficiencies and advisory benefits. With respect to

[36] The results remain qualitatively the same if we use two or four directorships to define busy directors.
[37] Given that the variable *Busy OID %* is highly correlated with the existing control variable *Busy board*, we remove *Busy board* from the regressions. The results are robust if we control for the busyness of younger directors, measured as the percentage of below-65 independent directors who hold three or more directorships.
[38] The lone exception is that the coefficient of *Non-busy OID %* is insignificant in the ROA regression with firm fixed effects.

monitoring deficiencies, we find that older independent directors are more likely to miss board meetings and less likely to be a member or chair of important board committees. Their presence on corporate boards is associated with worse acquisition decisions, lower total payouts, lower CEO turnover-performance sensitivity, higher CEO compensation, and poorer financial disclosure. On average, a greater representation of older independent directors on corporate boards is negatively associated with firm performance. Investors tend to react negatively to firm policy changes that increase the mandatory director retirement age and firm appointments of older independent directors.

On the other hand, consistent with their advisory value, we find that older independent directors can improve firms' acquisition decisions when they have prior acquisition experience or professional experience in the target's industry. In addition, their effect on firm performance can sometimes become significantly positive when managers are in greater need of board advice.

In sum, our study sheds light on the recent board aging phenomenon in the U.S. and its impact on boards' ability to fulfill their monitoring and advising functions. As such, it carries important economic messages for both firms' director recruitment efforts and any future governance reforms and regulations that may alter the availability and characteristics of qualified director candidates.

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Figure 1. Overall Time Trend of Older Independent Directors

This figure shows the average percentage of older independent directors (OID %) for our sample firms by year. OIDs are defined as independent directors who are at least 65 years old. OID % is defined as the percentage of a firm's independent directors who are at least 65 years old. In addition to the full sample, we separately examine firms that are incumbent members of the S&P 1500 indices and firms that are new entrants to the indices. We define new entrant firms as firms that appeared in the sample for no more than two years.

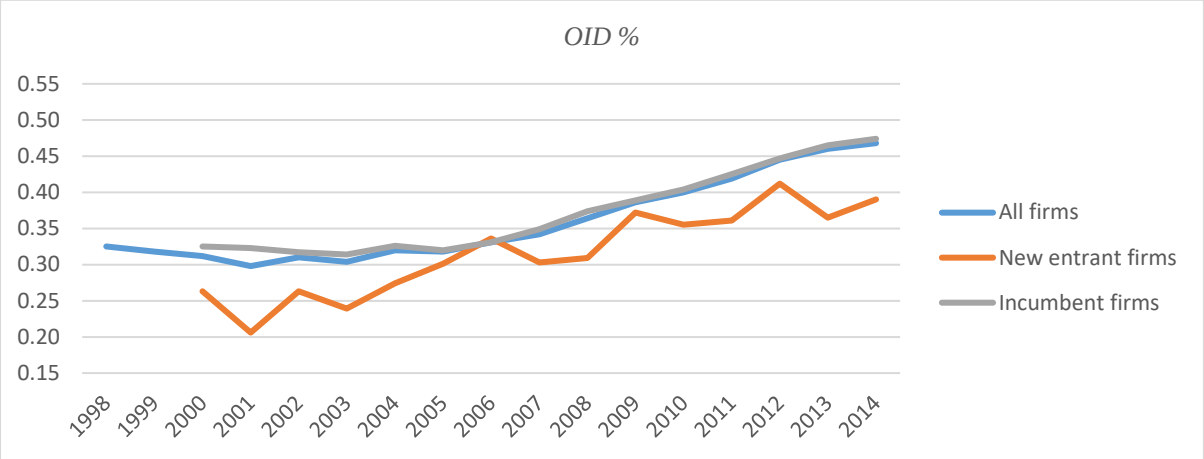


Figure 2. Time Trend of Independent Director Age at Initial Appointment

This figure shows the average and median age of independent directors at the time of their initial appointments by year. The sample includes all new appointments of independent directors.

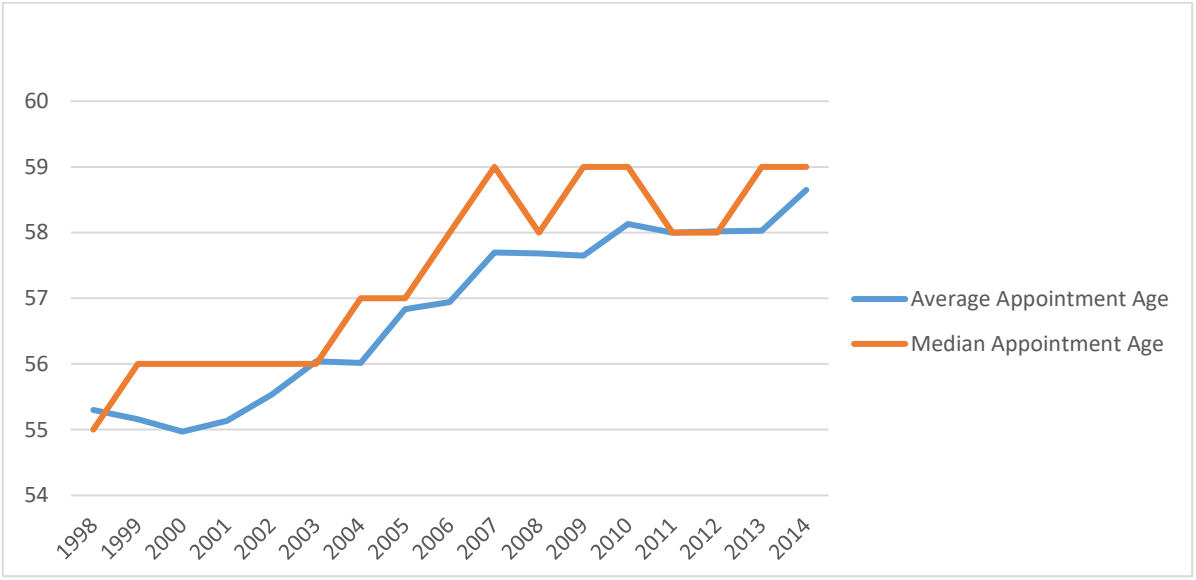


Figure 3. Time Trend of the Percentage of Older Independent Directors at Appointments

This figure shows the percentage of independent directors who are at least 65 years old at their initial appointments by year. The sample includes all new appointments of independent directors.

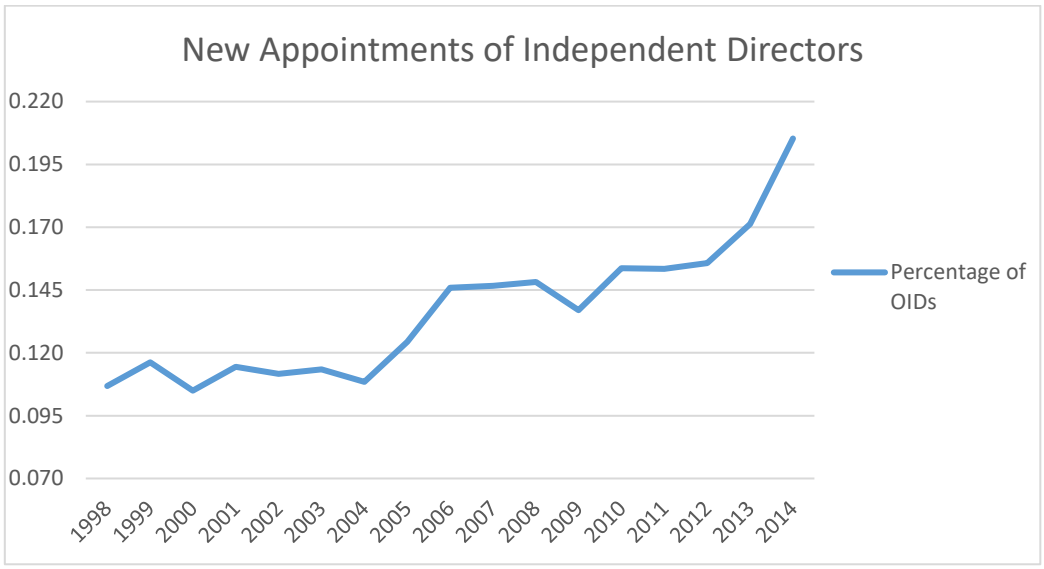


Figure 4. Time Trend of Older Independent Directors across Fama-French 12 Industry Groupings

This figure shows the average percentage of older independent directors (OID %) for firms in each of the Fama-French 12 Industry Groupings by year. OIDs are defined as independent directors who are at least 65 years old. OID % is defined as the percentage of a firm's independent directors who are at least 65 years old. The 12 industry groups are: (1) Consumer Non-Durables - Food, Tobacco, Textiles, Apparel, Leather, Toys; (2) Consumer Durables - Cars, TVs, Furniture, Household Appliances; (3) Manufacturing -- Machinery, Trucks, Planes, Off Furn, Paper, Com Printing; (4) Energy, Oil, Gas, and Coal Extraction and Products; (5) Chemicals and Allied Products; (6) Business Equipment - Computers, Software, and Electronic Equipment; (7) Telephone and Television Transmission; (8) Utilities; (9) Wholesale, Retail, and Some Services (Laundries, Repair Shops); (10) Healthcare, Medical Equipment, and Drugs; (11) Finance; (12) Other - Mines, Constr, BldMt, Trans, Hotels, Bus Serv, Entertainment.

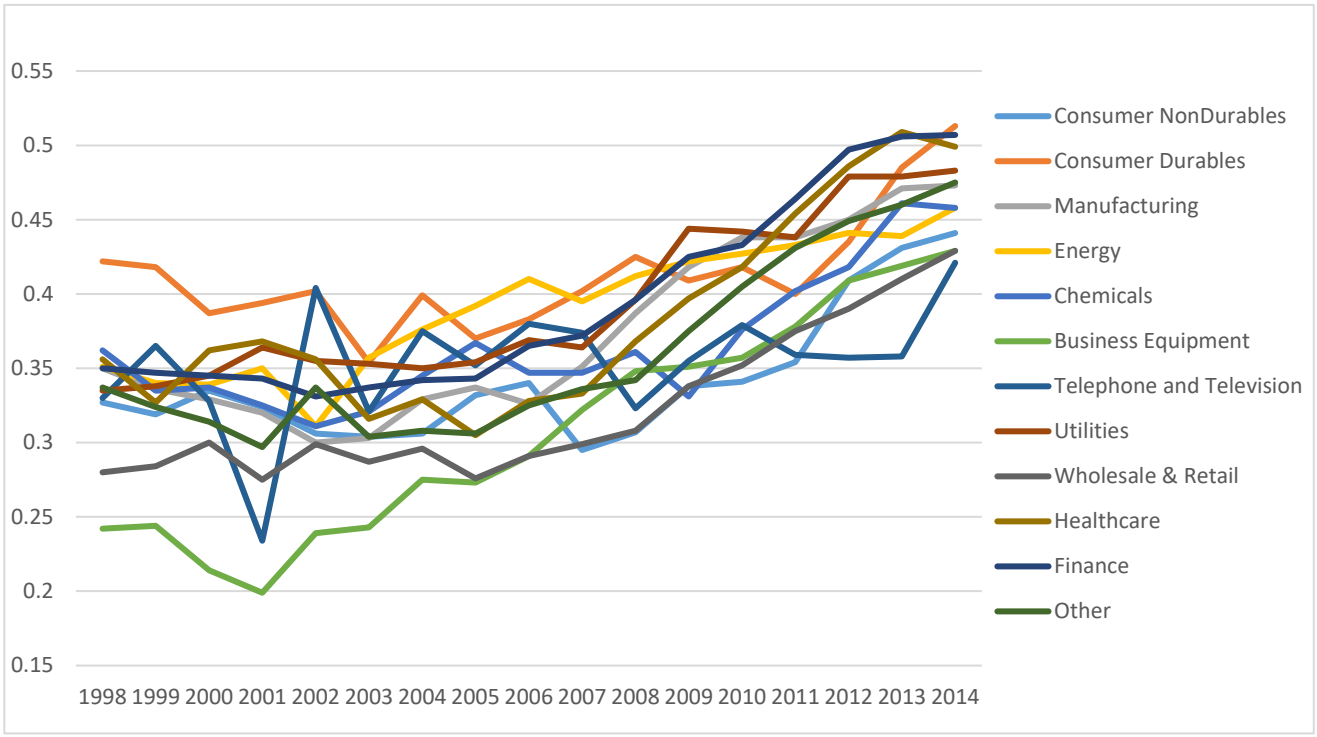
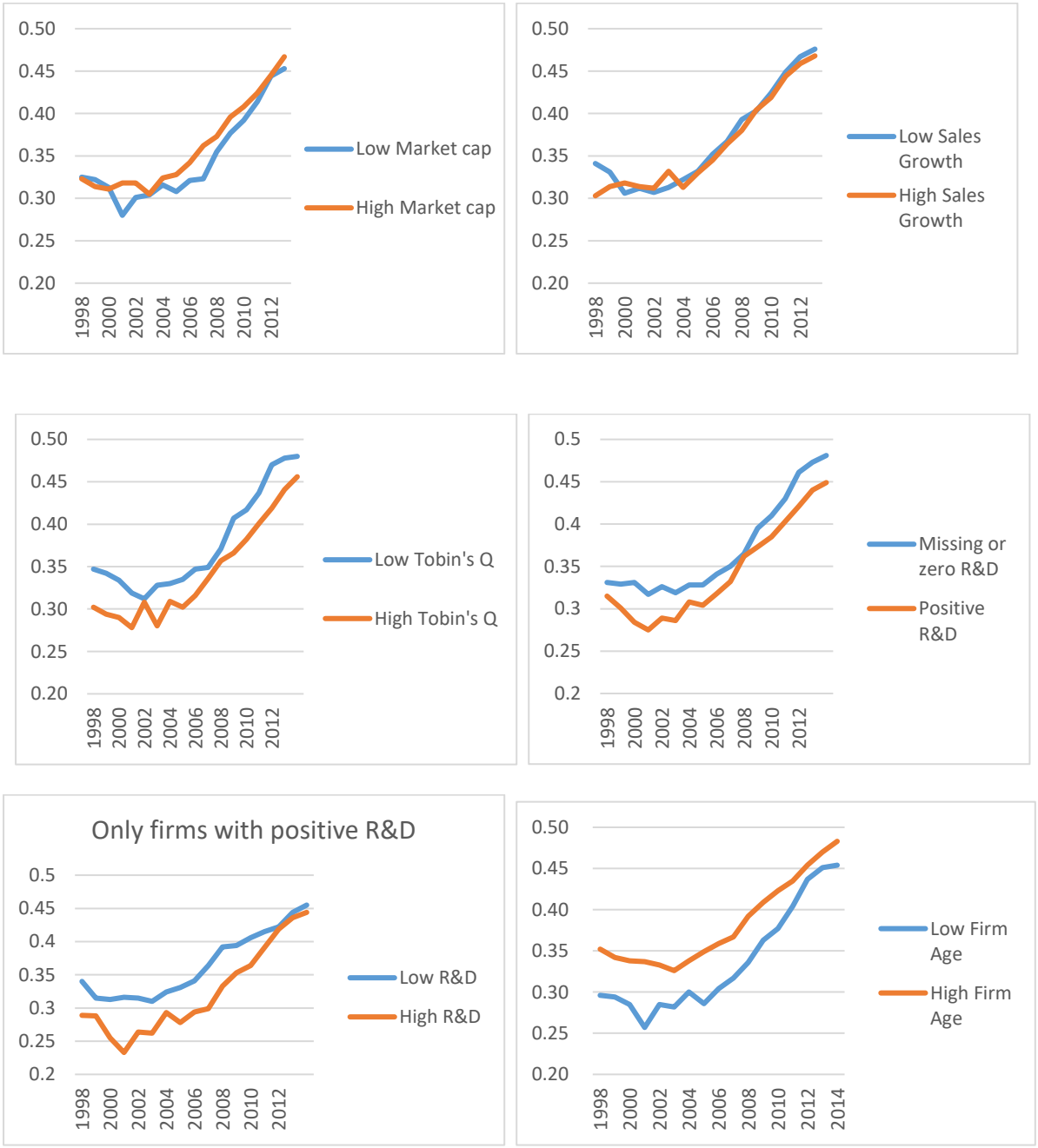
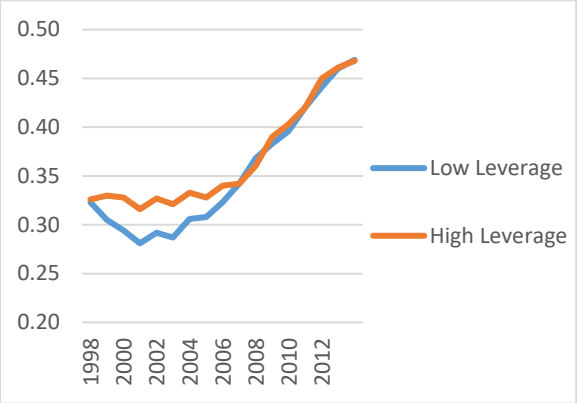
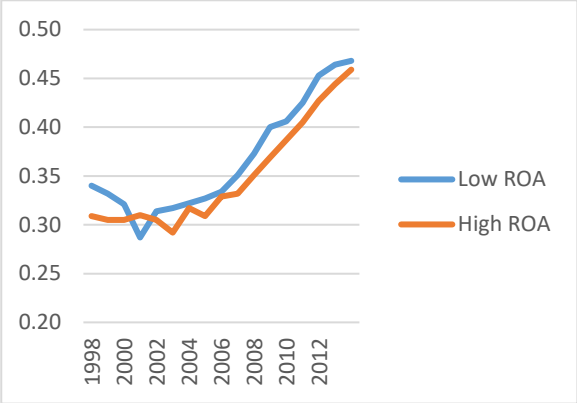


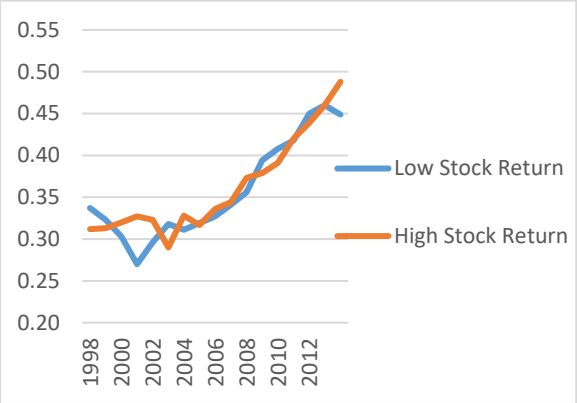
Figure 5. Time Trend of Older Independent Directors by Firm Characteristics

Each plot in this figure compares the time trend of the average percentage of older independent directors (OID %) between subsamples of firms created based on the following firm characteristics: *Market cap*, *Sales Growth*, *Tobin's Q*, *RND, Leverage*, *ROA*, *Stock Return*, *Volatility* and *Firm Age*. In the case of *R&D*, we first divide firms into two groups based on whether a firm reports positive *R&D* or not. Then for firms with positive *R&D*, we divide them into two more groups based on the annual median value of *R&D*. For all other characteristics, we partition our sample firms into two groups based on the annual median of each characteristic.









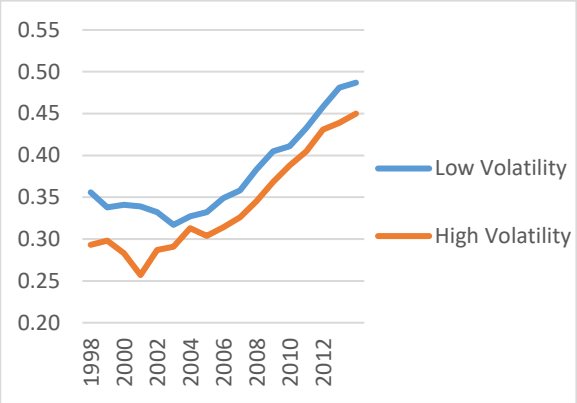


Table 1. Time Trends of Independent Director Age and the Frequency of Older Independent Directors

Panel A reports the annual mean and median of *independent director age* at the director level, and the percentage of older independent directors (*OID %*) and the instance of *OID majority* at the firm level. OIDs are defined as independent directors who are at least 65 years old. *OID %* is defined as the percentage of a firm's independent directors who are at least 65 years old. *OID Majority* is an indicator variable equal to one if at least 50% of a firm's independent directors are 65 or older, and zero otherwise. Panel B reports the annual mean of *OID %* for firms in each of the Fama-French 12-industry groups.

Panel A: Full sample								
	Independent director age				*OID %*		*OID Majority (0/1)*	
Year	N (# of directors)	Mean	Median	N (# of firms)	Mean	Median	Mean	Median
1998	9,393	59.98	60	1,409	0.324	0.333	0.266	0.000
1999	9,711	60.02	60	1,437	0.317	0.300	0.260	0.000
2000	9,359	59.89	60	1,409	0.311	0.286	0.255	0.000
2001	9,650	59.74	60	1,438	0.298	0.267	0.248	0.000
2002	8,311	60.16	61	1,264	0.310	0.286	0.245	0.000
2003	8,802	60.26	61	1,274	0.304	0.286	0.233	0.000
2004	8,977	60.51	61	1,288	0.319	0.300	0.243	0.000
2005	8,987	60.62	61	1,295	0.319	0.300	0.248	0.000
2006	8,979	60.85	61	1,272	0.332	0.333	0.259	0.000
2007	9,600	61.03	62	1,289	0.343	0.333	0.275	0.000
2008	10,658	61.32	62	1,363	0.365	0.364	0.319	0.000
2009	10,175	61.71	62	1,306	0.387	0.375	0.346	0.000
2010	10,335	62.06	63	1,305	0.401	0.400	0.381	0.000
2011	10,285	62.35	63	1,306	0.421	0.400	0.416	0.000
2012	10,448	62.67	64	1,308	0.447	0.444	0.466	0.000
2013	10,689	62.85	64	1,310	0.460	0.444	0.483	0.000
2014	10,602	63.01	64	1,296	0.469	0.500	0.501	1.000
Total	164,961	61.18	62	22,569	0.360	0.333	0.319	0.000

Panel B. Time Trend of the Frequency of Older Independent Directors by Industry

Year	1 Consumer Nondurables	2 Consumer Durables	3 Manufacturing	4 Energy	5 Chemicals	6 Business Equipment	7 Telephone& Television	8 Utilities	9 Wholesale& Retail	10 Healthcare	11 Finance	12 Other
1998	0.327	0.422	0.350	0.351	0.362	0.242	0.330	0.335	0.280	0.356	0.350	0.337
1999	0.319	0.418	0.336	0.340	0.335	0.244	0.365	0.338	0.284	0.327	0.347	0.324
2000	0.335	0.387	0.329	0.339	0.337	0.214	0.328	0.345	0.300	0.362	0.345	0.314
2001	0.324	0.394	0.320	0.350	0.325	0.199	0.234	0.364	0.275	0.368	0.343	0.297
2002	0.306	0.402	0.300	0.311	0.311	0.239	0.404	0.355	0.299	0.356	0.331	0.337
2003	0.304	0.354	0.303	0.357	0.321	0.243	0.321	0.353	0.287	0.316	0.337	0.304
2004	0.306	0.399	0.329	0.376	0.345	0.275	0.375	0.350	0.296	0.329	0.342	0.308
2005	0.332	0.370	0.337	0.392	0.367	0.273	0.352	0.354	0.276	0.305	0.343	0.306
2006	0.340	0.383	0.326	0.410	0.347	0.291	0.380	0.369	0.291	0.328	0.365	0.325
2007	0.295	0.402	0.351	0.395	0.347	0.322	0.374	0.364	0.299	0.333	0.372	0.336
2008	0.307	0.425	0.387	0.412	0.361	0.348	0.323	0.396	0.308	0.368	0.396	0.342
2009	0.338	0.409	0.418	0.422	0.331	0.351	0.355	0.444	0.338	0.397	0.425	0.375
2010	0.341	0.418	0.438	0.427	0.376	0.357	0.379	0.442	0.352	0.418	0.433	0.405
2011	0.354	0.400	0.438	0.433	0.402	0.378	0.359	0.438	0.375	0.454	0.464	0.431
2012	0.409	0.435	0.450	0.441	0.418	0.409	0.357	0.479	0.390	0.486	0.497	0.449
2013	0.431	0.485	0.471	0.439	0.461	0.419	0.358	0.479	0.410	0.509	0.506	0.460
2014	0.441	0.513	0.473	0.458	0.458	0.429	0.421	0.483	0.429	0.499	0.507	0.475
All years	0.336	0.407	0.371	0.395	0.360	0.309	0.342	0.386	0.320	0.381	0.404	0.360

Table 2. Regression analysis of the Frequency of Older Independent Directors

This table reports the multivariate regressions of the percentage of older independent directors at a firm. The dependent variable is OID %, defined as the percentage of a firm's independent directors who are 65 or older. The time trend variable *Year* is equal to 1 for 1998, 2 for 1999 and so on. *Dum1 - Dum11* are the indicators for the Fama-French 12-industry classification, with Industry 12 (Others) as the omitted industry group. In column (4), the industry fixed effects are based on the Fama-French 48 industry classification. In parentheses are *t*-statistics based on standard errors adjusted for heteroskedasticity and clustering at the firm level. Superscripts ***, **, and * denote significance at 1%, 5%, and 10%, respectively.

	(1)	(2)	(3)	(4)
Year	0.013***	0.012***	0.012***	
	(22.25)	(22.34)	(18.81)	
Dum1: Consumer NonDurables		-0.015	-0.024	
		(-0.82)	(-1.22)	
Dum2: Consumer Durables		0.061**	0.057*	
		(2.05)	(1.80)	
Dum3: Manufacturing		0.018	0.009	
		(1.33)	(0.63)	
Dum4: Energy		0.029	0.030	
		(1.42)	(1.45)	
Dum5: Chemicals		0.009	-0.008	
		(0.47)	(-0.42)	
Dum6: Business Equipment		-0.055***	-0.021	
		(-4.06)	(-1.33)	
Dum7: Telephone & Television		-0.011	0.011	
		(-0.44)	(0.39)	
Dum8: Utilities		0.040**	-0.002	
		(2.47)	(-0.11)	
Dum9: Wholesale & Retail		-0.039***	-0.039***	
		(-2.72)	(-2.62)	
Dum10: Healthcare		0.023	0.041**	
		(1.37)	(2.20)	
Dum11: Finance		0.032**	0.021	
		(2.39)	(1.35)	
Log market cap			-0.001	-0.001
			(-0.30)	(-0.22)
ROA			-0.084*	-0.081*
			(-1.77)	(-1.68)
Stock return			0.002	0.003
			(0.40)	(0.54)
Sales growth			0.007	0.005
			(1.37)	(1.03)
Tobin's Q			0.002	0.001
			(0.43)	(0.22)
R&D			-0.134**	-0.242***
			(-1.97)	(-3.45)
Leverage			0.008	-0.011
			(0.38)	(-0.49)
Volatility			-0.288***	-0.274***
			(-4.05)	(-3.50)
Log firm age			0.028***	0.025***
			(4.23)	(3.64)
CEO quality			-0.000	-0.001
			(-0.02)	(-0.49)
Industry fixed effects	No	Yes	Yes	Yes
Year fixed effects	No	No	No	Yes
N	22,569	22,569	22,569	22,569
Adjusted R^2	0.069	0.090	0.100	0.120

Table 3. Summary Statistics of Independent Director Attributes and Firm Characteristics

Panel A reports the summary statistics (mean values) of independent director attributes, with column (1) for independent directors below 65 years old and column (2) for those aged 65 or above. The last two columns show the simple mean-comparison tests between the two groups of independent directors. Superscripts ***, **, and * denote significance at 1%, 5%, and 10%, respectively. Panel B reports the summary statistics for key firm characteristics, governance characteristics and outcome variables. Detailed definitions of all variables are in Appendix Table A1.

Panel A. Summary Statistics (mean values) of Independent Directors				
	(1) Non-OIDs	(2) OIDs	(2) - (1)	
	Age<65	Age≥65	Difference	*t*-stat
Age	56.530	69.250	12.720***	(480.00)
Retired	0.213	0.433	0.220***	(85.72)
Age at appointment	50.620	58.340	7.720***	(220.00)
Tenure	5.918	10.800	4.882***	(160.00)
Coopted	0.502	0.331	-0.171***	(-68.39)
Ownership	0.200%	0.187%	-0.013%***	(-3.18)
Blockholder	0.009	0.006	-0.003***	(-6.51)
No. of board seats	1.913	2.025	0.112***	(18.91)
Financial expertise (available since 2007)	0.237	0.241	0.004	(1.55)
Former employee	0.002	0.003	0.002***	(6.07)
CEO of other firms	0.153	0.037	-0.116***	(-73.75)
Executive of other firms	0.196	0.073	-0.123***	(-68.03)

Panel B. Summary Statistics of Sample Firms						
Variable	N	Mean	Std.	P25	Median	P75
Firm characteristics						
ROA	22,569	0.127	0.091	0.073	0.122	0.176
Tobin's Q	22,569	1.853	1.162	1.127	1.455	2.102
Log market cap	22,569	7.679	1.571	6.583	7.547	8.676
R&D	22,569	0.037	0.075	0.000	0.000	0.032
Volatility	22,569	0.117	0.053	0.080	0.106	0.141
Firm age	22,569	27.558	16.873	13.000	22.000	42.000
CEO quality	22,569	0.508	1.926	-0.084	0.268	0.798
Governance characteristics						
OID %	22,569	0.360	0.309	0.200	0.333	0.500
E-index	22,569	2.471	1.425	1.000	2.000	4.000
Board size	22,569	9.405	2.555	8.000	9.000	11.000
Board independence	22,569	0.728	0.155	0.636	0.750	0.857
Board ownership	22,569	0.070	0.108	0.010	0.027	0.075
Duality	22,569	0.562	0.496	0.000	1.000	1.000
Busy board	22,569	0.249	0.221	0.000	0.222	0.400
ID-blockholder	22,569	0.041	0.199	0.000	0.000	0.000
Long-tenured ID %	22,569	0.139	0.176	0.000	0.100	0.250
Cooption	22,569	0.455	0.367	0.122	0.500	0.800
Outcome variables						
Attend_less75_pct	149,558	0.014	0.117	0.000	0.000	0.000
Number of committee memberships	149,558	1.838	1.104	1.000	2.000	3.000
Committee chairman	140,980	0.310	0.462	0.000	0.000	1.000
Audit and compensation committee member	149,558	0.186	0.389	0.000	0.000	0.000
Audit or compensation committee chairman	140,980	0.240	0.427	0.000	0.000	0.000
Total compensation	20,220	8.124	1.012	7.423	8.157	8.841
Cash intensity	20,220	0.374	0.267	0.164	0.294	0.521
Equity intensity	20,220	0.453	0.269	0.268	0.500	0.659
Discretionary accruals	17,870	0.000	0.047	-0.024	0.000	0.025
Restatement	22,569	0.090	0.287	0.000	0.000	0.000
Irregularity	22,569	0.050	0.218	0.000	0.000	0.000
Dividend	22,569	0.014	0.018	0.000	0.007	0.022
Repurchase	22,569	0.024	0.040	0.000	0.000	0.033
Total payout	22,569	0.037	0.044	0.000	0.024	0.050
Acquirer CAR	3,643	0.002	0.718	-0.033	0.001	0.037
Forced turnover	12,382	0.027	0.161	0.000	0.000	0.000

Table 4. Regressions of Independent Directors' Board Meeting Attendance, Committee Membership and Chairmanship

This table reports regression analysis of board meeting attendance, board committee membership and chairmanship. The sample is restricted to independent directors. Each observation is a director-firm-year. The dependent variable for column (1) is *Attend_less75_pct*, an indicator equal to one if an independent director attended less than 75% of a firm's board meetings in a year, and zero otherwise. The dependent variable for column (2) is the number of committee memberships on the audit committee, compensation committee, nominating committee and governance committee. The dependent variable for column (3) is an indicator variable equal to one if a director is the chairman of any committee, and zero otherwise. The dependent variable for column (4) is an indicator variable equal to one if a director sits on either the audit committee or the compensation committee, and zero otherwise. The dependent variable for column (5) is an indicator variable equal to one if a director is the chairman of the audit committee or the compensation committee, and zero otherwise. Column (2) estimates a Poisson count regression. Columns (1) and (3)-(5) estimate a linear probability model. In parentheses are *t*-statistics based on standard errors adjusted for heteroskedasticity and director-level clustering. Superscripts ***, **, and * denote significance at 1%, 5%, and 10%, respectively.

	(1) *Attend_less75_pct*	(2) *Number of committee memberships*	(3) *Committee chairman*	(4) *Audit or compensation committee member*	(5) *Audit or compensation committee chairman*
Director characteristics					
OID	0.003**	0.004	-0.014***	-0.007**	-0.019***
	(2.25)	(0.64)	(-3.27)	(-2.04)	(-5.04)
Number of board seats	0.002*	0.005	0.008***	0.003*	0.009***
	(1.78)	(1.45)	(4.11)	(1.92)	(5.22)
CEO director	0.005***	0.036***	-0.020***	-0.002	-0.021***
	(2.58)	(4.38)	(-4.12)	(-0.41)	(-4.90)
Ownership	-0.155*	-0.078	0.237	-0.521***	-0.053
	(-1.87)	(-0.17)	(1.11)	(-2.97)	(-0.28)
Tenure	-0.000	0.008***	0.015***	0.001**	0.010***
	(-0.27)	(6.34)	(33.65)	(2.42)	(25.83)
Coopted	-0.002	0.016*	-0.001	0.005	-0.001
	(-1.40)	(1.84)	(-0.21)	(1.35)	(-0.33)
Firm characteristics					
Log market cap	-0.005***	-0.019***	-0.003*	-0.003*	-0.000
	(-6.26)	(-4.07)	(-1.79)	(-1.83)	(-0.08)
ROA	-0.007	0.102**	0.101***	0.014	0.081***
	(-0.66)	(2.46)	(3.58)	(0.60)	(3.17)
Tobin's Q	0.002***	0.007*	-0.007***	0.005***	-0.006***
	(3.15)	(1.81)	(-3.58)	(3.29)	(-3.63)
R&D	-0.001*	-0.003*	0.000	-0.001	0.000
	(-1.94)	(-1.71)	(0.13)	(-0.89)	(0.30)
Volatility	-0.011	-0.072	-0.096**	0.099***	-0.044

	(-0.79)	(-0.85)	(-2.33)	(2.86)	(-1.18)
Log firm age	0.002	-0.007	-0.017***	0.013***	-0.005
	(1.16)	(-0.60)	(-4.05)	(3.68)	(-1.33)
CEO quality	-0.000	-0.003***	-0.001	0.000	-0.001
	(-0.84)	(-2.92)	(-1.08)	(0.42)	(-1.61)
E-index	0.000	0.002	0.002	-0.006***	-0.000
	(0.69)	(0.73)	(1.29)	(-5.76)	(-0.13)
Board size	0.001***	-0.027***	-0.014***	-0.021***	-0.012***
	(3.80)	(-14.86)	(-16.44)	(-28.84)	(-15.95)
Board independence	0.015**	-0.258***	-0.152***	-0.325***	-0.154***
	(2.43)	(-9.69)	(-10.59)	(-27.06)	(-11.79)
Board ownership	-0.001	-0.017	-0.009	0.036*	0.013
	(-0.09)	(-0.35)	(-0.38)	(1.89)	(0.61)
Duality	-0.002*	0.011*	-0.009***	-0.005*	-0.003
	(-1.65)	(1.89)	(-2.92)	(-1.78)	(-0.98)
Busy board	-0.001	0.085***	-0.063***	0.016	-0.048***
	(-0.28)	(3.01)	(-4.60)	(1.39)	(-3.80)
ID-blockholder	-0.000	0.038**	0.033***	0.018**	0.027***
	(-0.02)	(2.38)	(3.77)	(2.44)	(3.45)
Long-tenured ID %	0.002	-0.031	-0.077***	-0.004	-0.045***
	(0.66)	(-1.56)	(-7.44)	(-0.46)	(-4.82)
Cooption	-0.001	0.016	-0.019***	-0.003	-0.008
	(-0.25)	(1.37)	(-3.10)	(-0.65)	(-1.51)
Industry fixed effects	Yes	Yes	Yes	Yes	Yes
Director fixed effects	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes
N	149,558	149,558	140,980	149,558	140,980

Table 5. Regressions of Acquirer Returns

This table reports the OLS regression analysis of acquirer returns. The dependent variable is the cumulative abnormal returns over the 5-day window (-2, 2), where day 0 is the announcement date of the acquisition. In parentheses are *t*-statistics based on standard errors adjusted for heteroskedasticity and firm-level clustering. Superscripts ***, **, and * denote significance at 1%, 5%, and 10%, respectively.

	(1)	(2)
OID %	-0.015***	-0.024**
	(-2.88)	(-2.44)
Relative deal size	-0.015***	-0.016**
	(-3.06)	(-2.52)
Public target	-0.019***	-0.021***
	(-5.40)	(-4.89)
Private target	-0.006**	-0.004
	(-2.11)	(-1.14)
% Deal value paid by cash	0.001*	0.000**
	(1.84)	(2.26)
Tender offer	0.006	0.008
	(1.12)	(1.27)
Hostile deal	-0.013	-0.010
	(-0.72)	(-0.48)
Diversifying deal	-0.004*	-0.001
	(-1.69)	(-0.28)
Log market cap	-0.003***	-0.002
	(-3.04)	(-0.53)
ROA	-0.046***	0.017
	(-2.67)	(0.52)
Tobin's Q	0.003***	0.005***
	(3.34)	(3.07)
R&D	-0.081***	0.038
	(-4.87)	(1.02)
Volatility	0.039	0.120**
	(1.34)	(2.15)
Log firm age	0.002	0.010
	(0.97)	(0.74)
CEO quality	-0.001	0.001
	(-1.11)	(0.86)
E-index	-0.001*	-0.004*
	(-1.82)	(-1.75)
Board size	-0.001	0.000
	(-0.79)	(0.04)
Board independence	0.007	0.021
	(0.76)	(1.32)
Board ownership	0.006	0.011
	(0.38)	(0.32)

Duality	-0.003	-0.004
	(-1.32)	(-0.95)
Busy board	0.005	0.009
	(0.92)	(0.88)
ID-blockholder	-0.001	0.002
	(-0.19)	(0.18)
Long-tenured ID %	0.011	0.002
	(1.51)	(0.13)
Cooption	0.002	-0.008
	(0.47)	(-1.25)
Industry fixed effects	Yes	No
Firm fixed effects	No	Yes
Year fixed effects	Yes	Yes
N	3,643	3,643
Adjusted R^2	0.082	0.173

Table 6. Regressions of Dividend, Repurchase and Total Payout

This table reports the OLS regression analysis of firms' payout. The dependent variable is repurchases divided by market cap for columns (1)-(3), dividends divided by market cap for columns (4)-(6) and the sum of repurchases and dividends divided by market cap for columns (7)-(9). In parentheses are *t*-statistics based on standard errors adjusted for heteroskedasticity and firm-level clustering. Superscripts ***, **, and * denote significance at 1%, 5%, and 10%, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
		Repurchase			*Dividend*			*Total payout*	
OID %	-0.007***	-0.005*	-0.110***	-0.001*	-0.001	-0.001	-0.008**	-0.006	-0.092***
	(-2.70)	(-1.79)	(-4.26)	(-1.95)	(-1.46)	(1.59)	(-2.47)	(-1.55)	(-3.14)
Excess cash			0.006***			0.001			0.005**
			(2.65)			(1.37)			(2.18)
*OID % * Excess cash*			-0.297***			-0.003**			-0.348***
			(-3.69)			(-2.42)			(-3.86)
Log market cap	0.004***	0.008***	0.003***	-0.001	0.001***	-0.001	0.003***	0.010***	0.003***
	(8.94)	(7.70)	(8.54)	(-0.37)	(3.95)	(-0.43)	(8.12)	(8.78)	(7.68)
ROA	0.096***	0.050***	0.101***	0.006**	0.005*	0.006**	0.103***	0.055***	0.108***
	(13.96)	(6.47)	(14.68)	(2.15)	(1.87)	(2.11)	(14.71)	(6.67)	(15.49)
Tobin's Q	-0.005***	-0.006***	-0.005***	-0.001***	-0.002***	-0.001***	-0.006***	-0.007***	-0.006***
	(-11.07)	(-8.83)	(-11.49)	(-3.26)	(-7.65)	(-3.27)	(-11.96)	(-11.04)	(-12.41)
Capex	-0.083***	-0.079***	-0.082***	-0.028***	-0.015***	-0.028***	-0.112***	-0.095***	-0.110***
	(-10.89)	(-7.32)	(-10.72)	(-7.11)	(-4.32)	(-7.03)	(-13.42)	(-8.25)	(-13.24)
Leverage	-0.007**	-0.036***	-0.006**	-0.001	0.002	-0.001	-0.007**	-0.034***	-0.007**
	(-2.39)	(-8.27)	(-2.15)	(-0.54)	(1.47)	(-0.52)	(-2.41)	(-7.20)	(-2.15)
R&D	0.044***	-0.008	0.032***	-0.001	0.008**	-0.002	0.042***	0.001	0.029***
	(5.32)	(-0.42)	(3.61)	(-0.35)	(2.06)	(-0.59)	(4.91)	(0.00)	(3.14)
Volatility	-0.020*	-0.037**	-0.024**	-0.078***	-0.052***	-0.078***	-0.099***	-0.092***	-0.103***
	(-1.93)	(-2.39)	(-2.31)	(-15.79)	(-8.93)	(-15.76)	(-8.90)	(-5.46)	(-9.26)
Log firm age	-0.002**	0.004	-0.002**	0.004***	0.001	0.004***	0.001	0.005	0.001
	(-2.56)	(0.98)	(-2.54)	(7.78)	(1.03)	(7.82)	(1.50)	(1.31)	(1.53)
CEO quality	-0.001	-0.001	-0.001	-0.001***	-0.001**	-0.001***	-0.001**	-0.001	-0.001**
	(-0.92)	(-0.49)	(-0.87)	(-4.46)	(-2.15)	(-4.58)	(-2.54)	(-0.08)	(-2.52)
E-index	0.001	0.001	0.001	-0.001	0.001	-0.001	0.001	0.001	0.001
	(0.75)	(0.58)	(0.99)	(-0.73)	(0.45)	(-0.71)	(0.25)	(0.76)	(0.49)
Board size	-0.001***	-0.001**	-0.001***	0.001***	0.001	0.001***	-0.001	-0.001	-0.001
	(-3.10)	(-2.04)	(-2.84)	(3.75)	(1.59)	(3.75)	(-0.58)	(-1.15)	(-0.35)

Board independence	0.009***	0.001	0.009***	0.005***	0.004***	0.005***	0.014***	0.005	0.014***
	(3.07)	(0.24)	(2.97)	(3.39)	(2.69)	(3.38)	(4.34)	(1.11)	(4.26)
Board ownership	0.001	0.007	0.001	0.006**	0.003	0.006**	0.007	0.010	0.006
	(0.16)	(0.88)	(0.06)	(2.36)	(1.15)	(2.37)	(1.37)	(1.19)	(1.28)
Duality	0.001	-0.001	0.001	0.001	0.001	0.001	0.001	-0.001	0.001
	(1.04)	(-0.59)	(0.98)	(0.70)	(1.16)	(0.68)	(1.47)	(-0.24)	(1.40)
Busy board	0.002	0.001	0.002	-0.001	-0.001	0.001	0.002	0.001	0.002
	(1.03)	(0.60)	(1.09)	(-0.03)	(-1.16)	(0.01)	(1.01)	(0.29)	(1.07)
ID-blockholder	0.003	0.001	0.003	-0.001	0.001	-0.001	0.002	0.001	0.002
	(1.23)	(0.25)	(1.27)	(-0.80)	(0.42)	(-0.82)	(0.71)	(0.29)	(0.74)
Long-tenured ID %	-0.005**	-0.002	-0.005**	0.001	0.001	0.001	-0.004*	-0.001	-0.004
	(-2.18)	(-0.52)	(-2.10)	(0.26)	(1.00)	(0.29)	(-1.67)	(-0.03)	(-1.58)
Cooption	0.002	-0.001	0.002	-0.001	0.001	-0.001	0.001	-0.001	0.002
	(1.38)	(-0.16)	(1.46)	(-0.97)	(0.06)	(-0.93)	(1.01)	(-0.05)	(1.10)
Industry fixed effects	Yes	No	Yes	Yes	No	Yes	Yes	No	Yes
Firm fixed effects	No	Yes	No	No	Yes	No	No	Yes	No
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	22,569	22,569	22,569	22,569	22,569	22,569	22,569	22,569	22,569
Adjusted R^2	0.153	0.378	0.156	0.372	0.692	0.373	0.189	0.412	0.191

Table 7. Regressions of Forced CEO Turnovers

This table reports the regression analysis of CEO turnover. The dependent variable is *Forced turnover*, an indicator equal to one if a firm experiences a forced CEO turnover, and zero otherwise. *Performance* is measured by the *industry-adjusted ROA* in columns (1)-(2) and the *market-adjusted stock returns* in columns (3)-(4). Columns (1) and (3) estimate a Probit regression, and columns (2) and (4) estimate a conditional Logit regression. In parentheses are *t*-statistics based on standard errors adjusted for heteroskedasticity and firm-level clustering. Superscripts ***, **, and * denote significance at 1%, 5%, and 10%, respectively.

	(1)	(2)	(3)	(4)
	Industry-adjusted ROA		*Market-adjusted stock return*	
OID %	-0.078	0.327	-0.102	0.695
	(-0.40)	(0.49)	(-0.75)	(1.11)
Performance	-2.675*	-1.741	-0.825	-0.308
	(-1.71)	(-0.97)	(-1.43)	(-0.84)
*OID % * Performance*	3.185**	7.935**	0.502*	1.328*
	(2.31)	(2.02)	(1.83)	(1.89)
Log market cap	0.005	-0.583***	-0.016	-0.846***
	(0.23)	(-2.99)	(-0.64)	(-4.03)
Tobin's Q	-0.099***	-0.169	-0.150***	-0.183
	(-2.84)	(-1.00)	(-4.24)	(-1.04)
R&D	-0.925**	-4.022	-0.304	-1.873
	(-2.02)	(-1.40)	(-0.71)	(-0.79)
Volatility	1.739***	-1.659	2.463***	-1.076
	(2.97)	(-0.52)	(4.31)	(-0.37)
Log firm age	-0.004	-0.571	-0.005	-0.667
	(-0.09)	(-0.56)	(-0.10)	(-0.67)
CEO quality	-0.001	0.030	-0.002	0.014
	(-0.10)	(0.83)	(-0.20)	(0.42)
E-index	-0.013	-0.112	-0.006	-0.100
	(-0.58)	(-0.81)	(-0.30)	(-0.74)
*E-index * Performance*	-0.260	0.639	0.013	-0.096
	(-1.55)	(0.88)	(0.26)	(-0.85)
Board size	0.011	0.067	0.019	0.096*
	(0.92)	(1.12)	(1.60)	(1.65)
*Board size * Performance*	-0.082	-0.815**	-0.003	0.039
	(-0.85)	(-2.31)	(-0.11)	(0.62)
Board independence	0.335*	-0.509	0.217	-0.419
	(1.83)	(-0.69)	(1.21)	(-0.57)
*Board independence * Performance*	2.234	-4.846	0.206	1.342
	(1.38)	(-0.75)	(0.54)	(1.32)
Board ownership	-0.613*	-1.689	-0.530*	-1.129
	(-1.77)	(-1.10)	(-1.65)	(-0.98)
*Board ownership * Performance*	-1.203	-10.837	-1.136	-2.530
	(-0.45)	(-0.94)	(-1.43)	(-1.31)
Duality	-0.243***	-0.524***	-0.193***	-0.447**

	(-4.63)	(-2.72)	(-3.72)	(-2.35)
*Duality * Performance*	-0.695	-1.448	-0.145	-0.203
	(-1.45)	(-1.02)	(-1.24)	(-0.68)
Busy board	0.076	0.452	0.137	0.414
	(0.61)	(0.81)	(1.13)	(0.78)
*Busy board * Performance*	-0.809	0.830	0.325	0.674
	(-0.88)	(0.26)	(1.34)	(1.04)
ID-blockholder	0.102	0.445	0.027	0.273
	(0.74)	(0.88)	(0.19)	(0.54)
*ID-blockholder * Performance*	1.202	4.572	0.321	0.502
	(0.95)	(1.39)	(1.03)	(0.68)
Long-tenured ID %	-0.203	-0.006	-0.195	0.003
	(-1.24)	(-0.01)	(-1.22)	(0.00)
*Long-tenured ID % * Performance*	-1.380	3.868	-0.415	-0.082
	(-1.02)	(0.75)	(-1.18)	(-0.10)
Cooption	0.418***	-1.159***	0.496***	-1.056***
	(4.71)	(-3.45)	(5.71)	(-3.30)
*Cooption * Performance*	-0.967	0.964	-0.279	-0.533
	(-1.42)	(0.35)	(-1.59)	(-1.15)
Industry fixed effects	Yes	No	Yes	No
Firm fixed effects	No	Yes	No	Yes
Year fixed effects	Yes	Yes	Yes	Yes
N	12,382	2,369	12,382	2,336

Table 8. Regressions of CEO Compensation

This table reports the OLS regression analysis of CEO compensation. The dependent variable for columns (1)-(3) is *Total compensation*, the natural logarithm of the dollar value of the CEO's total annual compensation. The dependent variable for columns (4)-(6) is *Cash intensity*, the proportion of total annual CEO compensation that comes from cash. The dependent variable for columns (7)-(9) is *Equity intensity*, the proportion of total annual CEO compensation that comes from option grants and stocks. In parentheses are *t*-statistics based on standard errors adjusted for heteroskedasticity and firm-level clustering. Superscripts ***, **, and * denote significance at 1%, 5%, and 10%, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	Total compensation			*Cash intensity*			*Equity intensity*		
OID %	0.115**			0.047**			-0.044**		
	(2.47)			(2.06)			(-2.36)		
Compensation committee OID %		0.083***	0.051**		0.049**	0.024**		-0.045**	-0.026**
		(2.61)	(2.03)		(2.18)	(2.02)		(-2.35)	(-1.97)
Log market cap	0.431***	0.432***	0.227***	-0.058***	-0.057***	-0.033***	0.054***	0.054***	0.039***
	(32.76)	(32.63)	(9.18)	(-15.80)	(-15.62)	(-4.29)	(14.73)	(14.56)	(4.55)
ROA	1.103***	1.091***	0.478***	-0.122***	-0.120***	-0.048	0.145***	0.142***	0.108**
	(6.50)	(6.40)	(3.47)	(-2.64)	(-2.61)	(-0.96)	(2.86)	(2.78)	(2.15)
Stock return	0.225***	0.225***	0.168***	-0.033***	-0.033***	-0.022***	0.017***	0.017***	0.010*
	(13.16)	(13.28)	(11.34)	(-6.28)	(-6.26)	(-4.33)	(3.07)	(3.01)	(1.79)
Tobin's Q	0.076***	0.076***	0.072***	-0.017***	-0.017***	-0.017***	0.020***	0.020***	0.021***
	(5.11)	(5.02)	(5.24)	(-4.54)	(-4.60)	(-4.14)	(4.61)	(4.63)	(4.61)
R&D	1.071***	1.052***	-0.153	-0.371***	-0.369***	-0.060	0.513***	0.517***	0.143
	(4.81)	(4.70)	(-0.50)	(-5.87)	(-5.80)	(-0.60)	(7.84)	(7.84)	(1.29)
Volatility	1.338***	1.320***	-0.042	-0.342***	-0.343***	-0.190**	0.388***	0.391***	0.162*
	(5.35)	(5.36)	(-0.15)	(-5.01)	(-5.05)	(-2.31)	(5.54)	(5.60)	(1.81)
Log firm age	0.015	0.014	-0.083	0.019***	0.019***	0.070***	-0.034***	-0.034***	-0.110***
	(0.81)	(0.75)	(-1.24)	(3.46)	(3.49)	(3.11)	(-5.66)	(-5.64)	(-4.38)
CEO quality	0.007	0.007	0.003	-0.001	-0.001	-0.001	0.002	0.002	0.001
	(1.53)	(1.54)	(0.85)	(-1.17)	(-1.12)	(-0.40)	(1.52)	(1.54)	(0.47)
E-index	0.040***	0.038***	0.032***	-0.013***	-0.013***	-0.005*	0.011***	0.010***	0.004

	(5.32)	(5.08)	(3.65)	(-6.08)	(-5.98)	(-1.67)	(4.57)	(4.43)	(1.24)
Board size	0.009	0.008	0.001	-0.001	-0.001	-0.001	0.001	0.001	0.001
	(1.46)	(1.36)	(0.23)	(-0.83)	(-0.85)	(-0.44)	(0.62)	(0.68)	(0.40)
Board independence	0.287***	0.280***	0.207**	-0.120***	-0.127***	-0.060**	0.093***	0.099***	0.041
	(3.47)	(3.42)	(2.50)	(-4.97)	(-5.31)	(-2.15)	(3.59)	(3.81)	(1.41)
Board ownership	-0.864***	-0.823***	-0.642***	0.300***	0.288***	0.195***	-0.315***	-0.308***	-0.188***
	(-5.39)	(-5.15)	(-4.37)	(6.63)	(6.36)	(3.38)	(-6.93)	(-6.62)	(-3.33)
Duality	0.095***	0.094***	0.014	-0.004	-0.006	0.001	-0.004	-0.004	-0.005
	(4.46)	(4.45)	(0.79)	(-0.73)	(-0.93)	(0.12)	(-0.69)	(-0.59)	(-0.83)
Busy board	0.165***	0.163***	0.012	-0.049***	-0.049***	-0.017	0.041***	0.041***	0.007
	(3.66)	(3.64)	(0.28)	(-3.71)	(-3.77)	(-1.16)	(2.85)	(2.81)	(0.39)
ID-blockholder	0.088*	0.081*	0.063	-0.031**	-0.030**	-0.020	0.039**	0.039**	0.025
	(1.90)	(1.73)	(1.42)	(-2.06)	(-1.98)	(-1.24)	(2.42)	(2.38)	(1.51)
Long-tenured ID %	-0.161***	-0.154**	-0.046	0.076***	0.072***	0.036*	-0.048**	-0.054***	-0.038*
	(-2.63)	(-2.57)	(-0.86)	(4.13)	(3.97)	(1.91)	(-2.58)	(-2.88)	(-1.94)
Cooption	-0.006	-0.010	-0.083***	-0.034***	-0.034***	-0.011	0.037***	0.036***	0.036***
	(-0.18)	(-0.29)	(-2.76)	(-3.67)	(-3.71)	(-1.02)	(3.74)	(3.68)	(3.30)
Industry fixed effects	Yes	Yes	No	Yes	Yes	No	Yes	Yes	No
Firm fixed effects	No	No	Yes	No	No	Yes	No	No	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	20,220	20,220	20,220	20,220	20,220	20,220	20,220	20,220	20,220
Adjusted R^2	0.536	0.535	0.726	0.332	0.327	0.522	0.200	0.196	0.412

Table 9. Regressions of Earnings Management and Restatements

This table reports the regression analysis of earnings management and restatements. The dependent variable for columns (1)-(3) is *Discretionary accruals*, the performance-adjusted discretionary accruals. The dependent variable for columns (4)-(6) is *Restatement*, an indicator equal to 1 if the firm subsequently restated the financial statements for that fiscal year. The dependent variable for columns (7)-(9) is *Irregularity*, an indicator equal to 1 if the firm subsequently restated the financial statements for that fiscal year and the restatement is classified as irregularity. Columns (1)-(3) estimate an OLS regression. Columns (4), (5), (7), and (8) estimate a Probit regression and columns (6) and (9) estimate a conditional Logit regression. In parentheses are *t*-statistics based on standard errors adjusted for heteroskedasticity and firm-level clustering. Superscripts ***, **, and * denote significance at 1%, 5%, and 10%, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	Discretionary accruals			*Restatement*			*Irregularity*		
OID %	0.006***			0.129**			0.080*		
	(3.13)			(2.52)			(1.93)		
Audit committee OID %		0.004***	0.003*		0.156**	0.603***		0.157**	0.571**
		(2.96)	(1.95)		(2.17)	(3.10)		(2.46)	(2.41)
ROA	-0.035***	-0.035***	0.012	-1.036***	-1.020***	-2.427***	-1.075***	-1.054***	-2.541**
	(-4.10)	(-4.08)	(1.04)	(-3.61)	(-3.55)	(-3.40)	(-3.02)	(-2.95)	(-2.35)
Tobin's Q	0.002***	0.002***	0.003***	-0.019	-0.018	-0.022	0.002	0.003	0.028
	(3.66)	(3.57)	(2.95)	(-0.82)	(-0.77)	(-0.38)	(0.09)	(0.13)	(0.34)
Log market cap	-0.001	-0.001	0.002*	-0.006	-0.006	0.314***	0.025	0.025	0.447***
	(-0.41)	(-0.34)	(1.65)	(-0.29)	(-0.31)	(3.84)	(0.93)	(0.91)	(3.65)
R&D	-0.052***	-0.052***	0.024	-0.935**	-0.901**	-4.468***	-1.182**	-1.145**	-5.476**
	(-5.54)	(-5.51)	(1.11)	(-2.24)	(-2.15)	(-3.09)	(-2.20)	(-2.13)	(-2.52)
Volatility	-0.047***	-0.048***	-0.001	1.035**	1.050**	-0.291	2.195***	2.216***	2.754
	(-4.30)	(-4.33)	(-0.08)	(2.11)	(2.15)	(-0.25)	(3.53)	(3.58)	(1.51)
Log firm age	0.002***	0.002***	0.009**	0.008	0.009	-0.447	-0.016	-0.015	0.490
	(2.75)	(2.78)	(2.20)	(0.18)	(0.20)	(-1.33)	(-0.28)	(-0.26)	(0.87)
CEO quality	-0.001**	-0.001**	-0.001**	0.016**	0.016**	0.030	0.016*	0.016*	0.045*
	(-2.29)	(-2.33)	(-2.43)	(2.08)	(2.10)	(1.61)	(1.85)	(1.88)	(1.70)
E-index	0.001	0.001	-0.001	-0.031**	-0.030**	0.013	-0.044**	-0.043**	-0.058
	(0.81)	(0.86)	(-0.89)	(-2.03)	(-2.01)	(0.28)	(-2.08)	(-2.06)	(-0.73)

Board size	-0.001*	-0.001*	-0.001*	-0.010	-0.010	0.015	0.006	0.006	0.022
	(-1.85)	(-1.84)	(-1.67)	(-0.92)	(-0.93)	(0.53)	(0.44)	(0.41)	(0.52)
Board independence	-0.006	-0.006*	-0.006	-0.325**	-0.327**	-1.279***	-0.174	-0.180	-0.334
	(-1.47)	(-1.67)	(-1.15)	(-2.07)	(-2.09)	(-3.37)	(-0.90)	(-0.93)	(-0.59)
Board ownership	-0.001	-0.002	0.008	-0.127	-0.143	0.246	-0.092	-0.107	1.835*
	(-0.22)	(-0.29)	(0.85)	(-0.60)	(-0.68)	(0.37)	(-0.36)	(-0.42)	(1.81)
Duality	0.001	0.001	-0.001	-0.029	-0.029	0.172*	-0.032	-0.032	0.283**
	(0.29)	(0.29)	(-0.09)	(-0.71)	(-0.73)	(1.83)	(-0.62)	(-0.62)	(2.00)
Busy board	-0.002	-0.002	-0.001	-0.082	-0.088	-0.289	-0.254*	-0.255*	-1.166***
	(-1.03)	(-0.99)	(-0.03)	(-0.81)	(-0.88)	(-1.24)	(-1.89)	(-1.91)	(-3.26)
ID-blockholder	-0.001	-0.001	-0.001	-0.152	-0.150	-0.089	0.052	0.054	0.384
	(-0.36)	(-0.34)	(-0.17)	(-1.48)	(-1.47)	(-0.35)	(0.39)	(0.40)	(1.07)
Long-tenured ID %	0.001	0.002	0.001	-0.038	-0.081	-0.118	-0.052	-0.092	0.009
	(0.31)	(0.65)	(0.12)	(-0.33)	(-0.69)	(-0.40)	(-0.33)	(-0.59)	(0.02)
Cooption	0.001	0.001	0.001	-0.142**	-0.143**	-0.040	-0.124	-0.122	0.180
	(0.59)	(0.54)	(0.67)	(-2.23)	(-2.25)	(-0.27)	(-1.44)	(-1.42)	(0.80)
Industry fixed effects	Yes	Yes	No	Yes	Yes	No	Yes	Yes	No
Firm fixed effects	No	No	Yes	No	No	Yes	No	No	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	17,870	17,870	17,870	22,569	22,569	8,177	22,569	22,569	4,239

Table 10. Regressions of Firm Performance

This table reports the OLS regression analysis of firm performance. The dependent variable is a firm's *ROA* for columns (1) and (2) and *Tobin's Q* for columns (3) and (4). In parentheses are *t*-statistics based on standard errors adjusted for heteroskedasticity and firm-level clustering. Superscripts ***, **, and * denote significance at 1%, 5%, and 10%, respectively.

	(1)	(2)	(3)	(4)
	ROA		*Tobin's Q*	
OID %	-0.015***	-0.007**	-0.168**	-0.149***
	(-3.03)	(-1.99)	(-2.49)	(-2.60)
Log market cap	0.017***	0.023***	0.277***	0.248***
	(15.68)	(13.37)	(18.87)	(11.25)
R&D	-0.317***	-0.231***	1.880***	-1.241**
	(-11.46)	(-5.80)	(5.34)	(-1.97)
Volatility	-0.265***	-0.019	-0.522	1.612***
	(-9.13)	(-0.69)	(-1.39)	(3.92)
Log firm age	-0.013***	-0.005	-0.229***	-0.476***
	(-5.55)	(-0.75)	(-7.25)	(-4.56)
CEO quality	0.002***	0.001	0.026***	0.005
	(4.32)	(0.64)	(4.13)	(0.99)
E-index	-0.001	-0.001	-0.015	0.009
	(-0.77)	(-1.03)	(-1.38)	(0.81)
Board size	-0.005***	-0.001***	-0.077***	-0.040***
	(-8.82)	(-3.09)	(-10.85)	(-5.80)
Board independence	-0.014	-0.005	-0.158	-0.136
	(-1.56)	(-0.72)	(-1.38)	(-1.42)
Board ownership	0.078**	0.041	1.651***	0.701
	(2.30)	(1.33)	(3.77)	(1.60)
Board ownership^2	-0.124**	-0.064	-2.587***	-1.200*
	(-1.97)	(-1.13)	(-2.90)	(-1.65)
Duality	-0.006**	-0.003**	-0.070***	-0.044**
	(-2.57)	(-1.98)	(-2.64)	(-1.98)
Busy board	-0.026***	-0.009**	-0.278***	-0.079
	(-5.04)	(-2.06)	(-4.03)	(-1.34)
ID-blockholder	0.014**	0.008*	0.129*	0.078
	(2.06)	(1.76)	(1.77)	(1.63)
Long-tenured ID %	0.023***	-0.003	0.348***	0.015
	(3.14)	(-0.61)	(3.36)	(0.19)
Cooption	0.003	-0.001	0.002	0.010
	(0.79)	(-0.09)	(0.06)	(0.28)
Industry fixed effects	Yes	No	Yes	No
Firm fixed effects	No	Yes	No	Yes
Year fixed effects	Yes	Yes	Yes	Yes
N	22,362	22,362	22,393	22,393
Adjusted R^2	0.325	0.713	0.313	0.693

Table 11. Regressions with Instrumental Variable

This table presents excerpts of the second-stage estimation results of instrumental variable regressions of all the firm outcome variables. The first stage regression results are in Appendix Table A2. We estimate two-stage least square (2SLS) regressions in columns (1), (2)-(4), (7)-(9), (10), (13) and (14), and Probit regressions with instrumental variables using the maximum likelihood estimation in columns (5), (6), (11) and (12). In columns (5) and (6), *performance* is measured by the industry-adjusted ROA and market-adjusted stock returns, respectively. The control variables are omitted for brevity. In parentheses are *t*-statistics based on standard errors adjusted for heteroskedasticity and firm-level clustering. Superscripts ***, **, and * denote significance at 1%, 5%, and 10%, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)
	Acquirer CAR	*Repurchase*	*Dividend*	*Total payout*	*Forced turnover*	
OID %	-0.082**	-0.062***	-0.024**	-0.067**	-0.943***	-0.907*
	(-2.20)	(-2.70)	(-1.99)	(-2.37)	(-5.25)	(-1.68)
*OID % * Performance*					18.770**	3.758*
					(2.41)	(1.84)
Control variables	Yes	Yes	Yes	Yes	Yes	Yes
Industry and year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
N	3,643	22,569	22,569	22,569	12,382	12,382

	(7)	(8)	(9)		(10)	(11)	(12)
	Total compensation	*Cash intensity*	*Equity intensity*		*Discretionary accruals*	*Restatement*	*Irregularity*
Compensation committee OID %	0.977***	0.146*	-0.167*	*Audit committee OID %*	0.061**	1.085***	1.559***
	(3.04)	(1.88)	(-1.87)		(2.42)	(2.66)	(3.09)
Control variables	Yes	Yes	Yes	Control variables	Yes	Yes	Yes
Industry and year fixed effects	Yes	Yes	Yes	Industry and year fixed effects	Yes	Yes	Yes
N	20,220	20,220	20,220	N	17,870	22,569	22,569

	(13)	(14)
	ROA	*Tobin's Q*
OID %	-0.232***	-0.914*
	(-3.05)	(-1.75)
Control variables	Yes	Yes
Industry and year fixed effects	Yes	Yes
N	22,362	22,393

Table 12. 2SLS Regressions of Firm Performance: Evidence from a Regulatory Shock

This table presents the second-stage estimation results of instrumental variable regressions of firm performance around the NYSE and Nasdaq regulation issuance in 2003. The sample is restricted to firms that are listed on NYSE or Nasdaq. The specifications are similar to those in the firm performance regressions in Panel A of Table 12 except that all the variables are measured as changes over the event period 2000-2005. The dependent variable is the change in *ROA* for column (1) and the change in *Tobin's Q* for column (2). We define compliant firms as firms that had a majority of independent directors on the board in 2000 and noncompliant firms as the rest of firms. We instrument *Change in OID %* with *Noncompliance,* an indicator variable that equals one if the firm was noncompliant and zero otherwise. The coefficients of *Noncompliance* in the first-stage regressions are reported in the bottom. In parentheses are *t*-statistics based on standard errors adjusted for heteroskedasticity and firm-level clustering. Superscripts ***, **, and * denote significance at 1%, 5%, and 10%, respectively.

	(1) *Change in ROA*	(2) *Change in Tobin's Q*
Change in OID %	-0.188**	-1.199**
	(-2.04)	(-2.30)
Change in Log market cap	0.039***	1.005***
	(8.84)	(14.09)
Change in R&D	-0.563***	-2.674
	(-4.37)	(-1.43)
Change in Volatility	-0.090	2.278*
	(-1.09)	(1.67)
Change in Log firm age	0.010	-0.942***
	(0.49)	(-2.89)
Change in CEO quality	0.002	-0.002
	(1.50)	(-0.08)
Change in E-index	0.004	-0.011
	(0.92)	(-0.16)
Change in Board size	-0.002	-0.025
	(-1.57)	(-1.20)
Change in Board independence	0.024*	-0.160
	(1.71)	(-0.51)
Change in Board ownership	0.132	-0.148
	(1.63)	(-0.10)
Change in Board ownership^2	-0.161	-1.328
	(-1.22)	(-0.55)
Change in Duality	-0.003	0.131
	(-0.34)	(0.74)
Change in Busy board	-0.002	-0.020
	(-0.25)	(-0.10)
Change in ID-blockholder	0.001	0.310
	(0.02)	(1.22)
Change in Long-tenured ID %	0.012	1.128
	(0.25)	(1.21)
Change in Cooption	0.004	0.190
	(0.54)	(1.05)
Noncompliance in first-stage	0.091***	0.084***
	(2.96)	(2.72)
Industry fixed effects	Yes	Yes
N	926	926

Table 13. Event Studies

This table presents two event studies. Panel A reports the announcement returns of firms' director retirement policy changes. The details of the retirement policy change sample are described in Appendix Table A3. Panel B reports the announcement returns of old independent director appointments. The detailed construction of the OID appointment announcement sample is described in Appendix Table A4. CAR is the announcement-period cumulative abnormal returns over a 3-day event window (-1, 1) with event date 0 being the announcement date. Abnormal returns are computed based on the coefficients of a standard one-factor market model estimated using daily stock returns over the 200-day window (-210, -11) and the CRSP value-weighted return as the market return.

Panel A: Announcement Effects of Director Retirement Policy Changes		
	Full sample	Clean sample
Mean CAR	-0.907%***	-0.620%**
p-value	(0.001)	(0.023)
Median CAR	-0.764%***	-0.685%***
p-value	(0.001)	(0.001)

Panel B: Announcement Effects of Old Independent Director Appointments			
	Full sample	Non-proxy sample	Clean sample
Mean CAR	-0.205%**	-0.187%*	-0.197%*
p-value	(0.023)	(0.065)	(0.078)
Median CAR	-0.229%***	-0.212%**	-0.217%**
p-value	(0.008)	(0.035)	(0.042)

Table 14. Advisory Benefits of Old Independent Directors

This table reports analysis of the advisory benefits of OIDs. In Panel A, an OID is defined as having acquisition experience if he/she has participated in at least one acquisition made by another firm where he/she served as a director or an executive during the previous 10 years. An OID is defined as having target industry experience if he/she has previously served as a director or an executive at another firm in the same 3-digit SIC industry as the acquisition target. In Panel B, *Tariff Cut* is an indicator equal to one if a firm's industry experiences a tariff cut that year and zero otherwise. In Panel C, industry volatility is defined as the average standard deviation of annual stock returns for all firms in the industry. Log firm age is defined as the logarithm of the number of years that a firm exists in Compustat. Sales growth is defined as the annual growth rate of sales. Number of segments is the number of business segments reported in Compustat. The indicator *High advisory need* is equal to one if (1) a firm's industry volatility is above the median of all industries; or (2) a firm's age is below the annual median; or (3) a firm's sales growth is above the annual median; or (4) a firm has more than one business segment, and zero otherwise. The *Low advisory need* indicator is equal to one minus *High advisory need*. In Panel D, an OID is defined as busy if he/she holds 3 or more directorships in public firms. In parentheses are *t*-statistics based on standard errors adjusted for heteroskedasticity and firm-level clustering. Superscripts ***, **, and * denote significance at 1%, 5%, and 10%, respectively.

Panel A. Regressions of Acquirer Returns: OID Experience		
Definition of experience:	Acquisition experience	Target industry experience
Inexperienced OID %	-0.022***	-0.014***
	(-3.42)	(-2.95)
Experienced OID %	0.001	0.023***
	(0.10)	(4.42)
Difference in coefficients	-0.023**	-0.037***
	(-2.20)	(-4.93)
Control variables	Yes	Yes
Industry and year fixed effects	Yes	Yes
N	3,643	3,643
Adjusted R^2	0.062	0.057

Panel B. Regressions of Firm Performance: Import Tariff Cuts				
	ROA		*Tobin's Q*	
OID %	-0.016**	-0.011*	-0.045	-0.367*
	(-2.06)	(-1.67)	(-0.38)	(-1.84)
Tariff Cut	-0.006*	-0.015*	-0.294**	-0.248**
	(-1.76)	(-1.80)	(-2.27)	(-2.15)
*OID % * Tariff Cut*	0.032*	0.048**	0.316**	0.412**
	(1.74)	(2.24)	(2.35)	(2.15)
Control variables	Yes	Yes	Yes	Yes
Industry and year fixed effects	Yes	No	Yes	No
Firm and year fixed effects	No	Yes	No	Yes
N	3,895	3,895	4,153	4,153
Adjusted R^2	0.358	0.691	0.565	0.699

Panel C. Regressions of Firm Performance: Firms' Advisory Need

Proxy for advisory need:	*Industry volatility*				*Log firm age*			
	ROA		*Tobin's Q*		*ROA*		*Tobin's Q*	
*OID % * Low advisory need*	-0.023***	-0.010***	-0.214***	-0.206***	-0.024***	-0.009***	-0.212***	-0.217***
	(-4.20)	(-3.79)	(-3.81)	(-3.86)	(-6.90)	(-2.74)	(-2.89)	(-2.90)
*OID % * High advisory need*	0.014	0.019***	0.055	-0.015	-0.004	0.004	-0.013	-0.049
	(1.42)	(3.43)	(0.36)	(-0.19)	(-1.18)	(0.88)	(-0.22)	(-0.30)
Advisory need					-0.013***	-0.009*	-0.131***	-0.466***
					(-8.04)	(-1.94)	(-4.20)	(-4.06)
Difference in coefficients	-0.037***	-0.029***	-0.269***	-0.191***	-0.020***	-0.013***	-0.199**	-0.168*
	(-3.34)	(-4.91)	(-3.79)	(-3.10)	(-4.63)	(-2.97)	(-2.23)	(-1.74)
Control variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry and year fixed effects	Yes	No	Yes	No	Yes	No	Yes	No
Firm and year fixed effects	No	Yes	No	Yes	No	Yes	No	Yes
N	22,362	22,362	22,393	22,393	22,362	22,362	22,393	22,393
Adjusted R^2	0.309	0.713	0.333	0.720	0.301	0.672	0.676	0.688

Proxy for advisory need:	*Sales growth*				*Number of segments*			
	ROA		*Tobin's Q*		*ROA*		*Tobin's Q*	
*OID % * Low advisory need*	-0.034***	-0.014***	-0.321***	-0.202***	-0.015***	-0.011**	-0.248**	-0.308***
	(-6.45)	(-3.23)	(-4.94)	(-3.26)	(-2.66)	(-2.39)	(-2.60)	(-3.22)
*OID % * High advisory need*	0.004	0.007	0.014	-0.087	0.001	0.001	-0.014	-0.034
	(0.72)	(1.57)	(0.16)	(-1.41)	(0.19)	(0.11)	(-0.20)	(-0.56)
Advisory need	-0.013***	-0.009	0.033	0.029	-0.015***	-0.013***	-0.310***	-0.226***
	(-5.12)	(-1.15)	(1.11)	(1.17)	(-5.16)	(-4.48)	(-5.88)	(-4.54)
Difference in coefficients	-0.038***	-0.021***	-0.335***	-0.115***	-0.016**	-0.012**	-0.234**	-0.274***
	(-11.61)	(-8.49)	(-7.79)	(-3.14)	(-2.46)	(-2.15)	(-2.08)	(-2.88)
Control variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry and year fixed effects	Yes	No	Yes	No	Yes	No	Yes	No
Firm and year fixed effects	No	Yes	No	Yes	No	Yes	No	Yes
N	22,362	22,362	22,393	22,393	22,362	22,362	22,393	22,393
Adjusted R^2	0.337	0.729	0.318	0.724	0.534	0.723	0.395	0.706

Panel D. Regressions of Firm Performance: OID Busyness				
	ROA		*Tobin's Q*	
Busy OID %	-0.039***	-0.014***	-0.355***	-0.327***
	(-5.51)	(-3.57)	(-4.59)	(-3.85)
Non-busy OID %	-0.013**	-0.001	-0.136**	-0.122**
	(-2.35)	(-0.17)	(-2.20)	(-2.20)
Difference in coefficients	-0.026***	-0.013***	-0.219***	-0.205*
	(-3.48)	(-3.19)	(-2.83)	(-1.70)
Control variables	Yes	Yes	Yes	Yes
Industry and year fixed effects	Yes	No	Yes	No
Firm and year fixed effects	No	Yes	No	Yes
N	22,362	22,362	22,393	22,393
Adjusted R^2	0.323	0.713	0.408	0.704

Appendices

Table A1. Variable Definitions

Variable	Definition
Firm characteristics	
ROA	Ratio of operating income before depreciation to total assets. (source: Compustat)
Tobin's Q	Ratio of market value of assets to book value of assets. (source: Compustat)
Log market cap	The natural logarithm of the market value of equity. (source: Compustat)
R&D	Ratio of research and development expenses to net sales. (source: Compustat)
Volatility	Standard deviation of monthly stock returns during the last five fiscal years. (source: CRSP)
Log firm age	The natural logarithm of the number of years that a firm exists in Compustat. (source: Compustat)
CEO quality	Industry-adjusted operating income growth over the 3 years. (source: Compustat)
Governance characteristics	
OID %	The number of independent directors aged 65 or above divided by the total number of independent directors. (source: ISS)
Local pool of OIDs	Top 5 senior officers and directors, who are at least 65 years old, at other S&P 1500 firms with headquarters within 100 miles of the subject firm's headquarters. (source: Execucomp and ISS)
E-index	The Bebchuk et al. (2009) entrenchment index of six takeover defenses. (source: ISS)
Board size	The number of directors sitting on the board. (source: ISS)
Board independence	The percentage of directors who are independent. (source: ISS)
Board ownership	The aggregate percentage of shares owned by all directors. (source: ISS)
Duality	An indicator equal to one if CEO is also the chairman of the board, and 0 otherwise. (source: ISS)
Busy board	The percentage of independent directors who hold 3 or more directorships of public firms. (source: ISS)
ID-blockholder	An indicator equal to one if at least one independent director is a blockholder and 0 otherwise. Blockholders are investors with at least 5% share ownership in the firm. (source: ISS)
Long-tenured ID %	The percentage of independent directors who have at least 15 years of tenure. Tenure is measured as the number of years between current year and the year when the director's board service began. (source: ISS)
Cooption	The percentage of independent directors who are appointed after the current CEO assumes office. (source: Execucomp and ISS)
Outcome variables	
Attend_less75_pct	An indicator equal to one if an independent director attended less than 75% of a firm's board meetings, and zero otherwise. (source: ISS)
Number of committee memberships	The number of committee memberships on the audit committee, compensation committee, nominating committee and governance committee. (source: ISS)
Committee chairman	An indicator variable equal to one if a director is the chairman of any committee, and zero otherwise. (source: ISS)
Audit or compensation committee member	An indicator variable equal to one if a director sits on the audit committee or the compensation committee, and zero otherwise. (source: ISS)
Audit or compensation committee chairman	An indicator variable equal to one if a director is the chairman of the audit committee or the compensation committee, and zero otherwise. (source: ISS)
Total compensation	The natural logarithm of the dollar value of the CEO's total annual compensation. (source: Execucomp)
Cash intensity	The proportion of total annual CEO compensation that comes from cash. This is the amount of total current compensation (salary and bonus) scaled by total compensation. (source: Execucomp)
Equity intensity	The proportion of total annual CEO compensation that comes from option grants and stocks. This is the value of annual option awards plus the value of annual

	stock grants scaled by total compensation. (source: Execucomp)
Discretionary accruals	Performance-adjusted discretionary accruals, defined as the residual from a modified Jones model (Jones, 1991): $\frac{TA_{i,t}}{Asset_{i,t-1}} = \beta + \beta\frac{1}{Asset_{i,t-1}} + \frac{\Delta SALE_{i,t}-\Delta AR_{i,t}}{Asset_{i,t-1}} + \frac{PPE_{i,t}}{Asset_{i,t-1}} + ROA_{i,t-1} + \mu_{i,t}$ We estimate the model within each fiscal year and Fama-French 48 industry and require at least 10 observations to perform each estimation. Variable definitions follow Kothari et al. (2005). (source: Compustat)
Restatement	An indicator equal to 1 if the firm subsequently restated the financial statements for that fiscal year, and 0 otherwise. (source: GAO and Audit Analytics)
Acctg irregularity	An indicator equal to 1 if the firm subsequently restated the financial statements for that fiscal year and the restatement is classified as irregularity, and 0 otherwise. (source: GAO and Audit Analytics)
Repurchase	The amount of repurchases scaled by market capitalization. We compute share repurchases as the purchase of common and preferred stock minus any reduction in the value of the net number of preferred stocks outstanding. If the repurchase amount is less than 1% of the previous year's market capitalization, the repurchase amount is set to zero. (source: Compustat)
Dividend	The total amount of dividends declared on the common/ordinary capital of the firm, scaled by market capitalization. (source: Compustat)
Total payout	The sum of repurchases and dividends, scaled by market capitalization. (source: Compustat)
Acquirer CAR	Cumulative abnormal returns over the 5–day window (-2, 2), where day 0 is the announcement date. To calculate expected returns, we estimate a market model using the value-weighted market return over the 200-day period (-11, -210). (source: SDC and CRSP)
Forced turnover	An indicator equal to one if a firm experiences a forced CEO turnover, and zero otherwise. (source: Factiva)

Table A2. First-stage Estimates of 2SLS regressions

This table reports the specific first-stage estimates for the 2SLS regressions from Table 11. Column (1) corresponds to column (13) in Table 11 and column (2) corresponds to column (14) in Table 11. The dependent variable is *OID %* and is regressed against the local old director pool and all second-stage controls. *Local pool of OIDs* is the natural logarithm of the number of senior executives and directors age 65 or above from firms headquartered in the same state as the sample firm scaled by the number of firms in the state. The null hypothesis of weak instruments is rejected. In parentheses are *t*-statistics based on standard errors adjusted for heteroskedasticity and firm-level clustering. Superscripts ***, **, and * denote significance at 1%, 5%, and 10%, respectively.

	(1)	(2)
Local pool of OIDs	0.044***	0.045***
	(2.93)	(2.95)
Log market cap	-0.002	-0.002
	(-0.69)	(-0.72)
R&D	-0.199***	-0.197***
	(-2.91)	(-2.88)
Volatility	-0.189**	-0.191**
	(-2.43)	(-2.46)
Log firm age	0.001	0.001
	(0.13)	(0.13)
CEO quality	-0.001	-0.001
	(-1.42)	(-1.36)
E-index	0.001	0.001
	(0.18)	(0.17)
Board size	0.002	0.002
	(1.28)	(1.28)
Board independence	-0.073***	-0.074***
	(-2.76)	(-2.80)
Board ownership	0.227**	0.223**
	(2.30)	(2.27)
Board ownership^2	-0.270	-0.261
	(-1.36)	(-1.32)
Duality	0.009	0.009
	(1.48)	(1.45)
Busy board	0.075***	0.075***
	(4.93)	(4.95)
ID-blockholder	-0.034**	-0.033*
	(-1.97)	(-1.95)
Long-tenured ID %	0.339***	0.340***
	(16.53)	(16.59)
Cooption	0.019*	0.018*
	(1.83)	(1.80)
Industry fixed effects	Yes	Yes
Year fixed effects	Yes	Yes
Cragg-Donald Wald *F*-stat (Weak identification test)	33.89	34.11
Stock-Yogo critical values (10% maximal IV size)	16.38	16.38
N	22,362	22,393
Adjusted R^2	0.187	0.187

Table A3. Details of Sample of Firm Director Retirement Policy Changes

Event type	Full sample	Clean sample
1. Increase mandatory retirement age	51	35
2. Remove mandatory retirement age	21	9
3. Extend the exact retirement date (e.g. from "upon 72th birthday" to "upon the next annual meeting following 72th birthday"	11	8
4. Waive mandatory retirement age for certain directors	4	3
5. Grant the board the discretion to waive mandatory retirement age	2	2
6. Allow the board to appoint emeritus directors beyond mandatory retirement age	2	2
Total number of events	91	59

Table A4. Details of Sample Construction for Older Independent Director Appointment Announcements

Directors 65 or older at first appearance on a firm's board in ISS	**2,213**
- Appointment news is not available in the Factiva database	747
- Appointments by dual class firms	178
- Appointment news are several years earlier than first appearance in ISS (probably appointment age below 65) or later than first appearance in ISS (probably reelection of incumbent directors)	39
- Age is marginally below 65 in news if news contains information on age (mostly for first appearance at the age of 65 or 66)	86
- Data around appointment is not available in CRSP/ISS/COMPUSTAT	36
Full sample	**1,127**
- Directors are elected in annual shareholder meetings	154
Non-proxy sample	**973**
- Multiple appointment of directors	200
- Dividend/repurchase/stock split	36
- Top officer turnover (CEO/CFO/Chairman/President/Vice President)	22
- Merger/acquisition/spinoff	15
- Earnings announcement	13
- Proxy contest	5
- Executive pay	2
- Raising capital	1
- Strategic plan to cut expenses	1
- Separation of CEO and Chairman titles	1
- Move headquarters	1
Clean sample	**676**

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