

Directors: Older and Wiser, or Too Old to Govern?

Ronald Masulis 

School of Banking and Finance, UNSW Business School, University of New South Wales ABFER and ECGI
ron.masulis@unsw.edu.au (corresponding author)

Cong Wang

School of Management and Economics, The Chinese University of Hong Kong, Shenzhen
wangcong@cuhk.edu.cn

Fei Xie

Lerner College of Business and Economics, University of Delaware and ECGI
xiefei@udel.edu

Shuran Zhang

Hong Kong Polytechnic University Faculty of Business School of Accounting and Finance
shuran.zhang@polyu.edu.hk

Abstract

An unintended consequence of recent governance reforms in the United States is firms' greater reliance on older director candidates, resulting in noticeable board aging. We investigate this phenomenon's implications for corporate governance. We document that older independent directors exhibit poorer board meeting attendance, are less likely to serve on or chair key board committees, and receive less shareholder support in annual elections. These directors are associated with weaker board oversight in acquisitions, CEO turnovers, executive compensation, and financial reporting. However, they can also provide particularly valuable advice when they have specialized experience or when firms have greater advisory needs.

I. Introduction

The past two decades have witnessed drastic changes to the composition of corporate boards of directors. Several rounds of major corporate governance reforms and the rise of institutional shareholder activism have enhanced director independence, qualifications, and accountability.¹ These changes also significantly increased the time demands and responsibilities of independent directors, which

We thank an anonymous referee, Jack Bao, Bernard Black, Dan Bradley, Jennifer Conrad (the editor), Francois Derrien, Ran Duchin, Charles Elson, Laura Field, Dirk Jenter, Feng Jiang, Tao Shu, Stefan Zeume, and participants at the 2017 American Finance Association annual meetings, the 2016 China International Conference in Finance, the 2016 Conference on Empirical Legal Studies in Europe, the 2018 Financial Intermediation Research Society Conference, Tsinghua University, and the University of Connecticut for valuable comments. We also extend our gratitude to Dirk Jenter for sharing data on CEO turnovers, Tracie Woidtke and Matthew Serfling for sharing their director-specific quality measures, and Zonghe Guo and Nicholas Turner for outstanding research assistance.

¹These 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.

undercuts the incentives of active senior corporate executives, the most sought-after candidates, to serve on outside boards.² Faced with a reduced supply of willing executives and heightened pressure to find qualified independent directors, firms increasingly rely on the pool of older director candidates.³ As a result, 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 61 to 64. More importantly, the percentage of firms with a majority of independent directors who are 65 or older has nearly doubled from 27% to 50% over this same time period (see [Table 1](#)).

The trend in boardroom aging raises a critical issue of whether older independent directors (OIDs) are as effective as younger ones, which is a serious concern for many institutional investors and governance practitioners.⁴ Thus, it is important to understand the consequences of this trend for board performance. Unfortunately, director age is rarely a focal point in studies of corporate boards, so there is very limited and inconclusive evidence on its impacts.⁵ In this study, we seek to fill this gap in the literature.

Ex ante, it is not clear how OIDs affect overall board performance because there can be both costs and benefits associated with having them on the board. On the one hand, the presence of OIDs can undermine board effectiveness for several reasons. In particular, long-standing research in psychology documents that as people age, their energy, physical health, and mental acumen gradually decline (Horn (1968), Fair (1994), (2004), Salthouse (2000), and Schroeder and Salthouse (2004)). Aging also adversely affects memory and attention spans, leading to erosion in general intelligence (Lindenberger and Baltes (1994), Baltes and Lindenberger (1997), Rönnlund, Nyberg, Bäckman, and Nilsson (2005), and Schaie (2005)). Additionally, older individuals are less effective in processing and integrating new information (Spaniol and Bayen (2005)). While OIDs may well be in the upper tail of their age group in terms of physical health or intellectual ability, these general physiological factors can nonetheless hinder their ability to meet the heavy demands of boardroom duties, especially those requiring the acquisition and analysis of new information.

In addition, from an incentive perspective, older directors can expect fewer opportunities in the directorial labor market as they approach the retirement age for directors, so their expected payoff from future directorships may no longer outweigh the costs they must incur to build and maintain their reputation. Thus, older directors may have greater incentives to either enjoy the quiet life or seek to

²According to Spencer Stuart, only about 1/3 of active CEOs in S&P 500 companies sit on any outside boards in 2017, compared with about 50% 10 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.

³This 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&P 1500 firms; see details in [Section II](#)). The mandatory retirement age for directors has risen, with 42% of S&P 500 companies setting it at 75 or older, compared with only 11% in 2007 (Spencer Stuart).

⁴See, e.g., "The One Place It's OK to Be Old Is in the Boardroom," Aug. 21, 2015, Bloomberg.com.

⁵See our discussion of the related literature on pages 6–7.

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

Table 1 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 1 if at least 50% of a firm's independent directors are 65 or older, and 0 otherwise.

Year	INDEPENDENT_DIRECTOR_AGE			No. of Firms	OID_%		OID_MAJORITY_(0/1)	
	No. of Directors	Mean	Median		Mean	Median	Mean	Median
1998	5,683	60.10	61	999	0.327	0.333	0.267	0
1999	6,368	60.11	60	1,079	0.319	0.333	0.256	0
2000	6,715	60.02	60	1,135	0.318	0.300	0.262	0
2001	7,101	60.07	60	1,163	0.310	0.286	0.251	0
2002	7,275	60.18	60	1,182	0.310	0.286	0.244	0
2003	7,628	60.27	61	1,202	0.304	0.286	0.237	0
2004	8,000	60.36	61	1,230	0.313	0.286	0.239	0
2005	8,063	60.60	61	1,206	0.318	0.300	0.245	0
2006	8,077	61.08	62	1,194	0.343	0.333	0.281	0
2007	7,358	61.12	62	1,058	0.347	0.333	0.283	0
2008	9,093	61.34	62	1,247	0.367	0.375	0.319	0
2009	9,312	61.75	62	1,291	0.387	0.375	0.349	0
2010	9,548	62.07	63	1,301	0.402	0.400	0.380	0
2011	9,432	62.37	63	1,284	0.417	0.400	0.407	0
2012	9,404	62.63	63	1,273	0.442	0.429	0.455	0
2013	9,546	62.81	64	1,283	0.458	0.444	0.479	0
2014	8,035	63.12	64	1,260	0.466	0.455	0.495	0
Total	136,638	61.18	62	20,387	0.362	0.350	0.320	0

maximize current incomes by accepting additional board seats without expending much incremental effort to fulfill their director duties. These incentives can weaken board effectiveness as well.⁶

On the other hand, OIDs can be valuable assets to firms and their frequency on boards suggests that they may be highly valued. The knowledge and experience they have accumulated over their long careers can give them an advantage in analyzing and advising the board about rare, complex, and unexpected crises and opportunities faced by firms and making informed judgments and recommendations. They are also likely to have developed extensive networks of connections, which can provide access to information or advice. As a result, they may be able to play a more effective advisory role on boards. In fact, such reasoning is reportedly behind some companies' decisions to retain older directors on their boards and to lift or waive the mandatory retirement age requirements for directors. In addition, because older directors likely no longer hold full-time executive positions, they may have more time to devote to their board duties.

Of course, the same physical and mental challenges that impede OIDs' monitoring capability can also negatively affect their advisory function. A crucial factor that may enable them to be more effective in their advising role than in their monitoring role is firm management's incentives (or disincentive) to share information with boards. The difficulties that OIDs face in acquiring and analyzing

⁶A counter-argument could be that directors approaching the end of their careers in the directorial labor market may work harder to protect their legacy. It is ultimately an empirical question of how directors' career horizons affect their incentives.

information and keeping up with major changes or developments at firms present more of a challenge for their monitoring role than for their advisory role, because firm management has different incentives in supplying information to the board for performing these two distinct roles. On the one hand, when managers need board advice, they are more willing to share pertinent information with the board in order to obtain their valuable counsel on important firm decisions. Equipped with information provided by firm management, OIDs can leverage their own knowledge, experience, and connections to enhance firm value through their advisory function. On the other hand, managers are less inclined to furnish information to the board to support its monitoring role. As a result, the board needs to proactively and independently gather information about firm and industry conditions, evaluate management performance, and, if necessary, intervene in managerial decision-making. These tasks are especially challenging for OIDs given their diminished physical and mental capacity and weaker career-concern incentives.

To shed new light on the potential costs and benefits associated with boardroom aging, we examine the behavior of OIDs at the individual level and then relate their prominence on boards to key corporate policies and overall firm performance. We define an independent director as an OID if he or she is at least 65 years old.⁷ To measure the extent of boardroom aging, we construct a variable, *OID_%*, as the fraction of all independent directors who are OIDs. Unlike the average director age measure used in most of the prior literature, our measure is less influenced by outliers, and more importantly, it directly captures the right tail of the director age distribution, which is much more affected by recent boardroom aging trends.

Our first line of investigation evaluates individual director performance by comparing board meeting attendance records, major board committee responsibilities, and shareholder support in board elections between older and younger independent directors. Controlling for a battery of director and firm characteristics and 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 a chair of more important and time-consuming board committees. These results suggest that OIDs are either less able or less willing to fulfill their board duties. Consistent with this interpretation, we find that OIDs more often receive a negative recommendation from the Institutional Shareholders Services (ISS) and garner significantly less shareholder support at annual board elections than other independent directors at the same firm.

Next, we undertake 3 separate event studies to assess the shareholder value impact of OIDs. In particular, we focus on firm announcements of OID appointments, OID deaths, and mandatory director retirement age changes. The event study approach has the advantage of concentrating on very short periods in time during which new information about OID representation on the board is released and shareholder reactions are observable. We find that the stock market reacts negatively to firms appointing OIDs and increasing the mandatory director retirement

⁷We explain the rationale for using age 65 as our primary cutoff point in Section II.

age, while it reacts positively to OID deaths. All these results indicate that on average shareholders view OIDs skeptically.

We then conduct a firm-level analysis of how OIDs affect a number of major corporate policies. The results are more nuanced. On the one hand, we find evidence consistent with OIDs displaying weaker monitoring effectiveness. In particular, firms with a larger proportion of OIDs on their boards exhibit stronger empire-building tendencies in that they make less profitable acquisitions that generate lower shareholder returns. We also find that OIDs are associated with significantly lower CEO turnover performance sensitivity, suggesting that OIDs are more lenient or less willing to discipline poorly performing CEOs. Furthermore, as the percentage of OIDs on compensation committees rises, we find that the equity-based portion of CEO pay decreases, accompanied by evidence of higher total CEO pay. Finally, a greater proportion of OIDs on audit committees is associated with lower financial reporting quality, measured by the likelihood of financial statement misrepresentation.

Consistent with the previous evidence of monitoring deficiencies, we find that on average, firm performance is significantly lower when boards include a larger fraction of OIDs. We also confirm that this relation is not driven by reverse causality, that is, poorly performing firms appointing more OIDs to their boards or major shareholders proposing OID appointments to turn around poorly performing firms.

Counterbalancing some of these results, we uncover evidence that OIDs provide valuable advisory services to some firms. In particular, we find in acquisitions that when acquirer OIDs have prior general acquisition experience or work experience in the target's industry, the relation between OIDs and acquirer announcement returns becomes nonnegative. The previously documented negative relationship between OIDs and acquirer returns is confined to OIDs without either type of experience. In addition, we find in a separate subsample of firms with high advisory needs that the relationship between OIDs and firm performance is no longer significantly negative. Together, these results suggest that OID experience and networks can at key times provide valuable counsel to senior management.

Identification is an important consideration in our empirical analysis. We undertake a number of strategies to address this issue in addition to the event study approach mentioned earlier. First, we control for a wide array of director, CEO, and firm characteristics, including i) director busyness, tenure, equity ownership, cooperation, professional directors, gender, and ethnic diversity;⁸ ii) CEO and top management team age; and iii) firm age and growth opportunities, and so forth. This is to ensure that our results are not the artifact of other board attributes, a trend toward more diversity on corporate boards over our sample period, aging of the CEO and management team, or the endogenous matching between directors and firms at different stages of their life cycles.

⁸Our results are robust to controlling for board ethnic diversity, which is defined as the Herfindahl index of director ethnicity. However, it is not included in the reported model specifications because information on the variable is missing for about 30% of our sample. Our results are also robust to controlling for an aggregate board diversity index that is equal to the average of standardized gender diversity and ethnic diversity measures.

Second, we include firm and director fixed effects wherever applicable to control for unobservable time-invariant firm and director attributes. Third, 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 younger director candidates in the firm's headquarters state. The motivation for the instrument is that firms are likely to have more OIDs on their boards when they face a shortage of younger director candidates located nearby. Fourth, we exploit a regulatory shock to firms' board composition created by the 2003 revisions to the NYSE/Nasdaq listing standards, which require firms' boards to have a majority of independent directors. Firms noncompliant with the new rule have a greater demand for independent directors and may need to seek out a new supply of candidates such as older and retired executives. Indeed, we find that these firms experienced a significantly larger increase in the percentage of OIDs over the 2001–2005 period than compliant firms. A major reason for the difference is that noncompliant firms appointed more OIDs to comply with the new listing standards.⁹ 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 board representation.

Despite our multipronged approach to tackling the endogeneity issue, we acknowledge that it is virtually impossible to completely rule out the possibility that any firm outcome and performance results can be driven at least partially by some omitted variables. For example, managers who are incompetent, poorly governed, or intent on extracting large private benefits may choose to keep or install more OIDs on their boards. Yet, even these alternative explanations are predicated on the notion that managers believe that OIDs on average are weaker monitors. It is also worth noting that our analysis of individual director behavior and shareholder voting outcomes is not subject to similar omitted variable concerns.

Our research provides the first investigation of the recent trend in boardroom aging at large U.S. corporations and its impacts on director behavior and board effectiveness. We present the first comprehensive set of evidence on both the costs and benefits associated with OIDs. Despite the pronounced pattern of boardroom aging in recent years, director age has rarely been a focal point in studies of corporate boards. Even those studies that do touch upon it have not subjected it to the rigorous econometric treatment needed for drawing causal inferences. Also, in contrast to our study, evidence in the extant literature is both fragmented in terms of board effectiveness measures studied and decidedly mixed in its conclusions.

Prior research by Core, Holthausen, and Larcker (1999) analyzes a sample of 495 observations for 205 U.S. firms from 1982 to 1984 and documents a positive relationship between CEO compensation and the proportion of older outside (independent and gray) directors on a board. In a more recent and larger sample of S&P 1500 firms from 1998 to 2013, Dou, Sahgal, and Zhang (2015) find no significant relationship between mean independent director age and CEO compensation, the probability of financial restatements, or acquisition returns. In other work, Minnick and Zhao (2009) show that the mean age of independent director is associated with a higher likelihood of option backdating, while Cai and Sevilir (2012) find that the

⁹This issue is discussed in more detail in Section V.F.2.

mean age of acquirer directors is positively related to acquirer announcement returns. With respect to firm performance, Faleye (2007) finds that mean director age has a negative relationship with Tobin's Q , but Francis, Hasan, and Wu (2012) report that it has a positive relationship with firm stock returns. Further complicating the interpretation of these mixed findings, some prior studies construct their average age measure using all directors (Faleye (2007), Cai and Sevilir (2012), and Francis et al. (2012)), while other studies focus on either outside directors (Core et al. (1999)) or independent directors (Minnick and Zhao (2009), Dou et al. (2015)).¹⁰

We differ from these prior studies in several key dimensions. First, we construct a measure that more effectively captures the presence of OIDs on corporate boards by focusing on the right tail of the director age distribution. Second, we examine a broader set of corporate policies 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. Third, we develop our hypotheses while recognizing that boardroom aging can have both costs and benefits, which can vary across directors and across firms. Fourth, we present the first empirical evidence on the types of OIDs who should be especially valuable advisors and the types of firms that can especially benefit from the presence of OIDs. Finally, we subject our results concerning the impact of OIDs 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 offer important and timely policy guidance. In particular, 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 willing independent director candidates 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 attain. Interestingly, in more recent years boardroom aging appears to have declined or even reversed, as more firms respond to institutional investors' call for reinvigorating boards by appointing diverse or first-time directors with non-CEO experience, who tend to be younger. In particular, both average and median OID percentages on firm boards have declined (the average decreased from 46.6% in 2014 to 44.1% in 2020; the median declined from 45.5% to 42.9% over the same period). Moreover, the fraction of firms where OIDs represent more than 50% of independent directors declined from 49.4% to 44.7%. Also, among newly appointed independent directors, the fraction of OIDs dropped from a peak of

¹⁰As we discuss in Section II, some prior evidence on director age may be contaminated by age data errors in the widely used ISS (formerly Investor Responsibility Research Center (IRRC) or RiskMetrics) database.

19.7% in 2014 to an average of 15.7% between 2015 and 2020. These trends are consistent with institutional investors and firms recognizing the patterns we uncover regarding OID monitoring deficiencies.

II. Sample Construction

Our initial sample includes the universe of firms in the Institutional Shareholder Services (ISS, formerly IRRC or RiskMetrics) database during the 1998–2014 period.¹¹ The sample period begins in 1998 because before 1998 important director information such as director shareholdings and the number of outside board seats held is largely missing from ISS. We then merge the ISS sample with the Compustat and CRSP databases to obtain financial and stock return data. We remove dual-class firms where board monitoring is unlikely to matter given insiders' disproportionate control of voting rights.¹² 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 2006. What alerted us to these errors is that from 2005 to 2006 the median director age rose by 3 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 1 to 3 years. We manually checked the director age information for a random sample of firms before 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 firm proxy statements. For directors who entered the ISS database before 2006, we used their pre-2006 age information to determine their correct age in the later years. Our analysis is all based on corrected director age information.

We define an independent director as an "OID" if 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, the cognitive aging literature shows that declines in physical and cognitive functions are commonly detected among older adults, especially after age 65. For example, studies using longitudinal data provide evidence that episodic and semantic memory performance remains relatively stable until about 60–65, and after that, it declines sharply (Rönnlund et al. (2005), Schaie (2005)).¹³

Figure 1 shows the overall time trend for the percentage of OIDs. To examine whether the trend of board aging over our sample period is due to changing firm composition, we also separately report the change in the board's OID percentage for firms that are incumbent members of the S&P 1500 index as of the beginning of our sample period and new entrants to the index. We observe that both incumbent firms and new entrant firms exhibit a similar trend over time toward older boards. Figure 2 further shows that over our sample period, independent directors are also older at

¹¹Firms in the ISS database are current and past members of the S&P 1500 index.

¹²Our results are robust to excluding firms with insider equity ownership above 50%.

¹³We obtain similar results using alternative age cutoffs, such as 66 and 67, to define OIDs.

FIGURE 1
Overall Time Trend of Older Independent Directors

Figure 1 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 2 years.

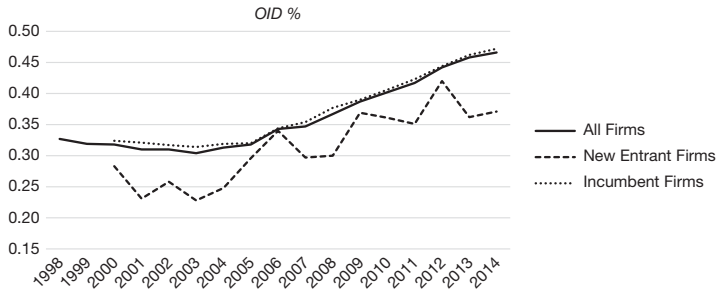
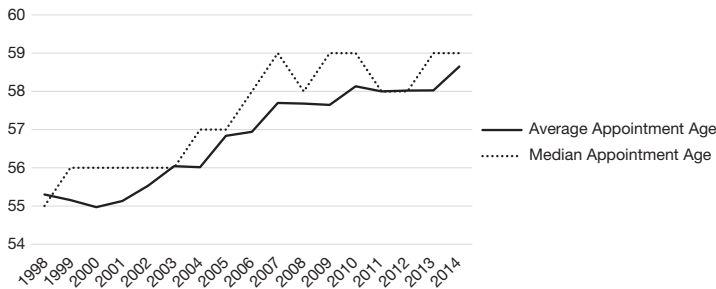


FIGURE 2
Time Trend of Independent Director Age at the Initial Appointment

Figure 2 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.



the time of their initial board appointments. 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 clearly indicate that the board aging trend is not simply due to directors growing older as firms age.

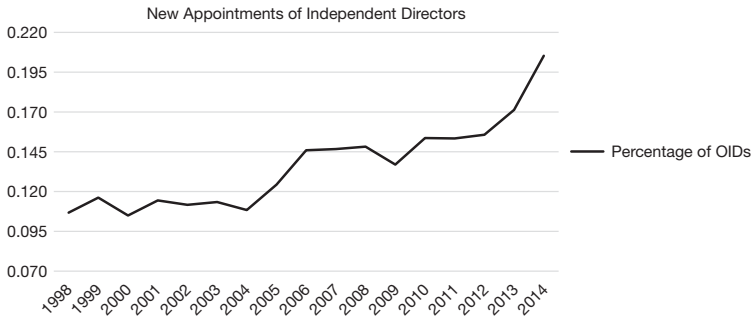
Next, we compare the personal attributes of older and younger independent directors in Panel A of Table 2. We find that OIDs are older at their initial appointment dates, more likely to be retired, and less likely to be a sitting CEO or senior executive of another firm. They hold more board seats,¹⁴ have longer tenure, and are less likely to be coopted (i.e., initially appointed under the current CEO). They are less likely to be blockholders and more likely to be former firm employees, but these differences, albeit statistically significant, are quite small in

¹⁴This can be an indicator of either greater director busyness or more connections and experience.

FIGURE 3

Time Trend of the Percentage of Older Independent Directors at Appointments

Figure 3 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.



size. OIDs are also less likely to be female and more likely to be professional directors, defined as independent directors without concurrent employment.

Panel B of Table 2 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 triggered debate is director tenure. Longer-serving board members may accumulate more experience and knowledge about the firms, but they can also become less independent from firm management.¹⁵ As director age and tenure are often positively correlated, it is important that we isolate the effects of director age. For this purpose, we control for an independent director's tenure in director-level analyses, the average tenure of independent directors, and the percentage of independent directors with at least 15 years of board tenure in firm-level analysis.¹⁶ We further control for CEO age and firm age (as a proxy for a firm's life cycle) in our analysis given that they may be related to director age.¹⁷

III. Analysis of Board Meeting Attendance, Board Committee Service, and Director Elections

In this section, we conduct director-level tests to assess whether OIDs actively participate in the governance of firms and contribute to more effective boards. In particular, we compare board meeting attendance records of older and younger

¹⁵Dou et al. (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 relationship between board tenure and firm performance and governance outcomes.

¹⁶Results are robust to replacing the 15-year cutoff with a 10-year cutoff.

¹⁷Our results are robust to controlling for the average age of named executives in ExecuComp, in place of CEO age.

TABLE 2
Summary Statistics of Independent Director Attributes and Firm Characteristics

Panel A of Table 2 reports the summary statistics (mean values) of independent director attributes, with column 1 for independent directors aged 65 or above (OIDs) and column 2 for independent directors below 65 years old (non-OIDs). Column 3 presents the simple mean-comparison tests between the two groups of independent directors. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively. Panel B reports the summary statistics for key firm characteristics, governance characteristics, and outcome variables. Detailed definitions of all variables are in the Appendix.

Panel A. Summary Statistics (Mean Values) of Independent Directors

	1. OIDs	2. Non-OIDs	3 = 1 - 2
AGE	68.390	56.040	12.350***
RETIRED	0.379	0.161	0.218***
AGE_AT_APPOINTMENT	58.020	50.210	7.810***
TENURE	10.340	5.836	4.504***
COOPTED	0.335	0.348	-0.013***
OWNERSHIP	0.002	0.002	0.000
BLOCKHOLDER	0.005	0.007	-0.002***
NO_OF_BOARD_SEATS	1.652	1.586	0.066***
FINANCIAL_EXPERTISE	0.240	0.234	0.006
FORMER_EMPLOYEE	0.004	0.002	0.002***
CEO_OF_OTHER_FIRMS	0.044	0.163	-0.119***
EXECUTIVE_OF_OTHER_FIRMS	0.079	0.207	-0.128***
FEMALE	0.067	0.196	-0.129***
PROFESSIONAL_ID	0.452	0.218	0.234***

Panel B. Summary Statistics

Variable	No. of Obs.	Mean	Std. Dev.	P25	Median	P75
<i>Firm Characteristics</i>						
log(MARKET_CAP)	20,387	7.754	1.547	6.659	7.618	8.751
STOCK_RETURN	20,176	0.128	0.418	-0.118	0.094	0.319
R&D	20,387	0.037	0.074	0.000	0.000	0.033
VOLATILITY	20,387	0.116	0.052	0.080	0.106	0.140
FIRM_AGE	20,387	28.010	16.920	14.000	23.000	43.000
CEO_QUALITY	20,387	0.496	1.881	-0.080	0.266	0.784
CEO_AGE	20,387	55.890	7.015	51.000	56.000	60.000
AVE_EXECUTIVE_AGE	20,368	52.490	4.212	49.800	52.500	55.170
<i>Governance Characteristics</i>						
OID_%	20,387	0.364	0.230	0.200	0.333	0.500
E-INDEX	20,387	2.928	1.334	2.000	3.000	4.000
BOARD_SIZE	20,387	9.430	2.520	8.000	9.000	11.000
BOARD_INDEPENDENCE	20,387	0.736	0.149	0.667	0.769	0.857
BOARD_OWNERSHIP	20,387	0.067	0.103	0.010	0.026	0.073
DUALITY	20,387	0.563	0.496	0.000	1.000	1.000
BUSY_BOARD	20,387	0.251	0.219	0.000	0.222	0.400
ID_BLOCKHOLDER	20,387	0.040	0.196	0.000	0.000	0.000
AVE_ID_TENURE	20,387	7.974	17.300	5.455	7.400	9.625
LONG_TENURED_ID_%	20,387	0.142	0.175	0.000	0.100	0.250
COOPTION	20,387	0.512	0.361	0.200	0.500	0.875
GENDER_DIVERSITY	20,387	0.110	0.094	0.000	0.111	0.167
PROFESSIONAL_ID_%	20,387	0.295	0.221	0.125	0.286	0.429
<i>Outcome Variables</i>						
ATTEND_LESS75_PCT	112,157	0.012	0.110	0.000	0.000	0.000
NUMBER_OF_COMMITTEE_MEMBERSHIPS	112,157	1.959	1.079	1.000	2.000	3.000
COMMITTEE_CHAIR	112,157	0.338	0.473	0.000	0.000	1.000
AUDIT_AND_COMPENSATION_COMMITTEE_MEMBER	112,157	0.180	0.384	0.000	0.000	0.000
AUDIT_OR_COMPENSATION_COMMITTEE_CHAIR	112,157	0.261	0.439	0.000	0.000	1.000
%WITHHELD	43,293	0.047	0.077	0.010	0.022	0.047
ISS_AGAINST	43,617	0.049	0.216	0.000	0.000	0.000
ACQUIRER_CAR	3,116	0.006	0.068	-0.026	0.004	0.037
FORCED_TURNOVER	9,956	0.025	0.156	0.000	0.000	0.000
TOTAL_COMPENSATION	14,833	8.201	0.985	7.531	8.253	8.894
CASH_INTENSITY	14,054	0.345	0.249	0.153	0.266	0.468
EQUITY_INTENSITY	14,054	0.470	0.256	0.311	0.514	0.661
RESTATEMENT	16,929	0.072	0.258	0.000	0.000	0.000
IRREGULARITY	16,929	0.013	0.112	0.000	0.000	0.000
ROA	18,152	0.128	0.088	0.076	0.122	0.176
TOBINS_Q	18,174	1.835	1.103	1.133	1.461	2.098

independent directors, their frequency of serving on time-consuming committees and taking on time-intensive committee chair positions, and the extent of shareholder support in director elections.

A. Board Meeting Attendance

Board behavior is largely unobservable, but publicly listed firms in the United States 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 1 if an independent director attended less than 75% of a firm's board meetings in a given year, and 0 otherwise. The key explanatory variable is an indicator variable that equals 1 if a director is 65 or older, and 0 otherwise. We control for a large array of director attributes and firm financial and governance characteristics and 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 she reaches the age 65 threshold. Given that only 1.2% 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 significance.

Column 1 of [Table 3](#) 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 with 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 (1.2%) of a director missing more than 25% of board meetings in a year in our sample. For the director-level controls, we observe that independent directors who have a higher level of ownership stake in the firm are less likely to miss board meetings, while those who are current CEOs of other firms 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 , larger boards, or higher board independence 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 OIDs exhibit deficiencies in fulfilling their duties and contribute to weaker board effectiveness.

¹⁸The very large number of director fixed effects necessitates the use of the linear probability model.

TABLE 3
 Regressions of Independent Directors' Board Meeting Attendance,
 Committee Membership, and Chair

Table 3 reports a regression analysis of board meeting attendance, board committee membership, and chair. 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 1 if an independent director attended less than 75% of a firm's board meetings in a year, and 0 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 1 if a director is the chair of any committee, and 0 otherwise. The dependent variable for column 4 is an indicator variable equal to 1 if a director sits on both the audit and compensation committees, and 0 otherwise. The dependent variable for column 5 is an indicator variable equal to 1 if a director is the chair of the audit or compensation committee, and 0 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 heteroscedasticity and director-level clustering. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

	ATTEND_ LESS75_PCT	NUMBER_OF_ COMMITTEE_ MEMBERSHIPS	COMMITTEE_ CHAIR	AUDIT_AND_ COMPENSATION_ COMMITTEE_MEMBER	AUDIT_OR_ COMPENSATION_ COMMITTEE_CHAIR
	1	2	3	4	5
<i>Director Characteristics</i>					
OID	0.003** (2.01)	0.004 (0.53)	-0.014** (-2.01)	-0.008* (-1.72)	-0.020*** (-3.24)
NUMBER_OF_BOARD_ SEATS	0.001 (1.45)	0.006* (1.70)	0.007** (2.32)	0.003 (1.32)	0.009*** (2.71)
CEO_DIRECTOR	0.005*** (2.62)	0.035*** (4.13)	-0.020** (-2.49)	-0.001 (-0.25)	-0.022*** (-3.03)
OWNERSHIP	-0.144* (-1.84)	0.212 (0.44)	0.495 (1.14)	-0.358 (-1.16)	0.222 (0.51)
TENURE	-0.000 (-0.14)	0.007*** (5.71)	0.015*** (14.73)	0.001 (0.88)	0.010*** (10.22)
COOPTED	-0.001 (-0.60)	-0.005 (-0.64)	0.001 (0.15)	-0.004 (-0.73)	0.001 (0.17)
PROFESSIONAL_ID	-0.001 (-0.75)	-0.002 (-0.27)	0.019*** (3.02)	0.002 (0.52)	0.019*** (3.41)
<i>Firm Characteristics</i>					
log(MARKET_CAP)	-0.004*** (-5.91)	-0.019*** (-3.82)	-0.004 (-0.98)	-0.002 (-0.43)	-0.001 (-0.13)
ROA	-0.006 (-0.65)	0.102** (2.37)	0.090** (2.15)	-0.001 (-0.03)	0.082** (2.07)
STOCK_RETURN	0.000 (0.40)	-0.007** (-2.00)	-0.000 (-0.09)	-0.008*** (-3.11)	-0.001 (-0.46)
TOBINS_Q	0.002** (2.46)	0.008** (2.05)	-0.007** (-1.98)	0.009*** (2.66)	-0.007** (-2.03)
R&D	-0.001 (-1.27)	-0.003* (-1.90)	-0.001 (-1.31)	-0.001 (-0.51)	-0.000 (-0.60)
VOLATILITY	-0.020 (-1.56)	-0.018 (-0.21)	-0.082 (-0.97)	0.088 (1.36)	-0.031 (-0.40)
log(FIRM_AGE)	0.001 (0.38)	-0.015 (-1.26)	-0.016 (-1.62)	0.014* (1.66)	-0.003 (-0.32)
log(CEO_AGE)	-0.005 (-0.88)	0.082*** (2.63)	-0.000 (-0.01)	0.106*** (4.55)	0.017 (0.67)
CEO_QUALITY	-0.000 (-0.99)	-0.003*** (-3.35)	-0.001 (-0.94)	-0.000 (-0.21)	-0.001 (-1.53)
E-INDEX	-0.000 (-0.28)	0.001 (0.17)	0.003 (1.01)	-0.004* (-1.92)	0.000 (0.10)
BOARD_SIZE	0.001*** (4.16)	-0.027*** (-14.10)	-0.014*** (-9.57)	-0.018*** (-14.77)	-0.013*** (-9.09)
BOARD_INDEPENDENCE	0.013** (2.37)	-0.242*** (-8.76)	-0.162*** (-6.60)	-0.290*** (-13.90)	-0.158*** (-6.80)
BOARD_OWNERSHIP	0.010 (1.10)	-0.026 (-0.49)	-0.009 (-0.20)	0.009 (0.23)	0.020 (0.48)
DUALITY	-0.001 (-0.96)	0.008 (1.37)	-0.011** (-2.11)	-0.008* (-1.84)	-0.005 (-0.92)

(continued on next page)

TABLE 3 (continued)
 Regressions of Independent Directors' Board Meeting Attendance,
 Committee Membership, and Chair

	ATTEND_ LESS75_PCT	NUMBER_OF_ COMMITTEE_ MEMBERSHIPS	COMMITTEE_ CHAIR	AUDIT_AND_ COMPENSATION_ COMMITTEE_MEMBER	AUDIT_OR_ COMPENSATION_ COMMITTEE_CHAIR
	1	2	3	4	5
BUSY_BOARD	0.000 (0.12)	0.042*** (2.66)	-0.040*** (-2.83)	0.015 (1.24)	-0.024* (-1.78)
ID_BLOCKHOLDER	-0.003 (-1.04)	0.040** (2.42)	0.035** (2.28)	0.017 (1.34)	0.030** (2.09)
AVE_ID_TENURE	0.000 (1.48)	-0.000 (-0.02)	-0.000 (-1.41)	-0.000 (-0.61)	-0.000* (-1.65)
LONG_TENURED_ID_%	0.001 (0.37)	-0.034* (-1.69)	-0.073*** (-3.96)	-0.017 (-1.13)	-0.045*** (-2.66)
COOPTION	0.001 (0.73)	-0.028** (-2.42)	0.019* (1.85)	-0.008 (-0.98)	0.007 (0.71)
GENDER_DIVERSITY	0.002 (0.24)	-0.077* (-1.77)	0.035 (0.92)	-0.047 (-1.48)	0.019 (0.53)
PROFESSIONAL_ID_%	0.000 (0.02)	-0.030** (-2.01)	-0.084*** (-5.98)	-0.022** (-1.98)	-0.072*** (-5.47)
Industry fixed effects	Yes	Yes	Yes	Yes	Yes
Director fixed effects	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes
No. of obs.	109,631	108,236	109,631	109,631	109,631
Adj. R ²	0.102		0.456	0.496	0.483

B. Board Committee Services

Another measure of a director's contribution of time and energy to board duties is 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 chair position 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 major committees a director serves on in a given firm-year, and the other is a binary variable that is equal to 1 if a director chairs at least one of these major committees in a given firm-year. As 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 chair position on these two committees.

We regress these four variables against the OID indicator while controlling for a number of director and firm characteristics and director, industry, and year fixed effects. The coefficient estimates are reported in columns 2–5 of Table 3. We find that the coefficient on the OID indicator is insignificant in column 2 and significantly negative in columns 3–5. 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 a committee, especially the more time-intensive audit and compensation committees. In terms of economic importance, the coefficient of OID in column 5 is -0.020 , which represents a 7.7% decline in the probability of chairing either the audit or compensation committee. This magnitude is

economically meaningful given that the unconditional probability is 26% for our sample. Taken together, the results in Table 3 are consistent with OIDs being less likely to hold committee chair positions or serve on the relatively time-intensive audit and compensation committees.

C. Shareholder Voting at Director Elections

Given the previous evidence on OIDs' board meeting attendance and committee services, a natural question is how shareholders perceive their contribution to corporate governance. We examine this issue by analyzing the extent to which shareholders support older versus younger independent directors at annual board elections. Toward that end, we construct a variable, %WITHHELD, for each director candidate that is equal to $(\text{shares voted against} + \text{shares voted abstain}) / (\text{shares voted for} + \text{shares voted against} + \text{shares voted abstain})$. To control for factors that can lead to shareholder dissent at the firm-year level, we follow Aggarwal, Dahiya, and Prabhala (2019) and demean %WITHHELD by subtracting the average value of %WITHHELD across all director candidates up for election in each firm-year. The key explanatory variable is the OID indicator. The control variables include director characteristics used in the board meeting attendance and committee service regressions. We also control for ISS voting recommendations for or against director candidates. In particular, we construct a variable ISS_AGAINST that equals 1 if ISS recommends a "withhold," "against," or "no" vote for a director, and 0 otherwise.

We estimate OLS regressions of the demeaned %WITHHELD and report the results in Table 4. In columns 1–3, we find that the OID indicator has significantly positive coefficients, suggesting that all else being equal, OIDs receive significantly less shareholder support than their younger counterparts at the same firm in the same year. Results are robust even with controls for director fixed effects. In columns 4–6, we augment the regressions by controlling for ISS recommendations. The percentage of dissenting votes for a director is significantly higher with a negative ISS recommendation. More importantly, for our purpose, the coefficient on the OID indicator remains positive and significant, suggesting that OIDs facing higher dissenting votes do not merely reflect shareholders' passive adherence to ISS recommendations. In terms of economic significance, the percentage of dissenting votes for OIDs is about 0.3% higher than that for non-OIDs (column 6). While this is not a large number in absolute terms, it is substantial considering the small cross-sectional variation in dissenting votes typically received by directors, where the mean (median) %WITHHELD is only 4.7% (2.2%) in our sample.

As an alternative approach for assessing investor attitudes toward OIDs, we examine determinants of ISS voting recommendations against a director candidate in columns 7–9. The dependent variable is EXCESS_ISS_AGAINST, defined as the ISS_AGAINST for the director minus the average ISS_AGAINST for all the firm's directors in the year. We find a significantly positive coefficient for the OID indicator. This implies that ISS is significantly more likely to recommend a shareholders vote against OIDs. Overall, our findings in this section show that both shareholders and proxy advisors on average view OIDs as less effective board members, which is consistent with our earlier evidence that OIDs have poorer board meeting attendance and are less likely to serve as a chair or member of key board committees.

TABLE 4
Regressions of Shareholder Votes in Independent Director Elections

Table 4 reports a regression analysis of shareholder votes in director elections. The sample is restricted to independent directors. Each observation is a director-firm-year. The dependent variable for columns 1–6 is EXCESS_%WITHHELD, defined as %WITHHELD in excess of the average %WITHHELD across all directors in each firm-year. %WITHHELD is the sum of shares voted against and shares voted abstain, scaled by all shares voted. The dependent variable for columns 7–9 is EXCESS_ISS_AGAINST, defined as ISS_AGAINST in excess of the average ISS_AGAINST across all directors in each firm-year. ISS_AGAINST is an indicator equal to 1 if ISS recommends a withhold, against, or no vote for the director, and 0 otherwise. In parentheses are *t*-statistics based on standard errors adjusted for heteroscedasticity and director-level clustering. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

	EXCESS_%WITHHELD						EXCESS_ISS_AGAINST		
	1	2	3	4	5	6	7	8	9
OID	0.004*** (6.68)	0.001** (2.52)	0.001* (1.73)	0.004*** (7.07)	0.001** (2.03)	0.003*** (3.79)	0.002* (1.65)	0.003** (2.08)	0.006** (2.38)
ISS_AGAINST				0.088*** (37.12)	0.085*** (35.42)	0.089*** (34.59)			
NUMBER_OF_ BOARD_SEATS		0.003*** (8.00)	0.001 (0.95)		0.004*** (8.87)	0.001 (0.95)		0.002** (2.16)	-0.001 (-0.43)
CEO_DIRECTOR		0.007*** (5.34)	0.003* (1.90)		0.003*** (2.91)	-0.000 (-0.29)		0.026*** (5.02)	0.017*** (3.40)
OWNERSHIP		0.099*** (2.84)	0.005 (0.06)		0.080*** (2.66)	-0.007 (-0.09)		0.030 (0.31)	0.067 (0.31)
TENURE		0.001*** (15.47)	0.001*** (8.39)		0.001*** (15.83)	0.001*** (11.06)		0.000** (2.51)	0.001*** (3.58)
COOPTED		0.001 (1.14)	-0.001 (-1.36)		-0.001 (-1.31)	-0.001** (-2.04)		-0.000 (-0.24)	-0.001 (-0.22)
PROFESSIONAL_ID		-0.002*** (-3.50)	-0.002*** (-2.65)		-0.002*** (-3.03)	-0.002** (-2.21)		-0.003* (-1.88)	-0.002 (-0.94)
Director fixed effects	No	No	Yes	No	No	Yes	No	No	Yes
No. of obs.	47,297	46,831	43,212	47,297	46,831	43,212	47,634	47,162	43,543
Adj. R ²	0.002	0.018	0.181	0.198	0.200	0.349	0.000	0.003	0.095

IV. OID Appointments, OID Deaths, and Director Retirement Policy Changes

We start the analysis of OIDs' impact on firm value by first using a model-free approach. In particular, we conduct 3 separate event studies to gauge the stock price reactions to the announcements of i) firms appointing OIDs, ii) the deaths of OIDs, and iii) firms changing their director retirement policies.

A. Announcements of OID Appointments

To construct the sample of OID appointment announcements, we gather information from the ISS database on independent directors who were 65 or older when they joined the board. 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 IA1 in the Supplementary Material. 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

TABLE 5
Event Studies

Table 5 presents 3 event studies. Panel A reports the announcement returns of old independent director appointments. Panel B reports the announcement returns of independent director deaths based on 8-K filing dates. Observations are excluded if the interval between the filing date and the director death date exceeds 20 trading days. Panel C reports the announcement returns of firms' director retirement policy changes. Mean and median CARs are based on 3-day announcement period cumulative abnormal returns with event date 0 being the announcement date. Abnormal returns are computed based on the coefficients of a standard 1-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. *P*-values are based on *t*-statistics for mean CARs and Wilcoxon signed-rank tests for median CARs.

Panel A. Announcement Effects of Old Independent Director Appointments

	Full Sample	Nonproxy Sample	Clean Sample
Mean CAR	-0.205%**	-0.187%*	-0.197%*
<i>p</i> -Value	(0.023)	(0.065)	(0.078)
Median CAR	-0.229%***	-0.212%**	-0.217%**
<i>p</i> -Value	(0.008)	(0.035)	(0.042)
No. of obs.	1,127	973	676

Panel B. Announcement Effects of Independent Director Deaths

	OID Sample	Non-OID Sample	Difference
Mean CAR	1.409%**	-1.909%	3.318%**
<i>p</i> -Value	(0.036)	(0.184)	(0.028)
Median CAR	0.541%**	-1.260%	1.800%**
<i>p</i> -Value	(0.024)	(0.195)	(0.042)
No. of obs.	106	27	

Panel C. Announcement Effects of Director Retirement Policy Changes

	Full Sample	Clean Sample
Mean CAR	-0.907%***	-0.620%**
<i>p</i> -Value	(0.001)	(0.023)
Median CAR	-0.764%***	-0.685%***
<i>p</i> -Value	(0.001)	(0.001)
No. of obs.	91	59

confounding events such as multiple appointments of directors, executive turn-overs, and announcements of dividends, repurchases, earnings, and mergers and acquisitions. Our final sample contains 676 uncontaminated appointment announcements.

We estimate appointing firms' cumulative abnormal returns (CAR) over a 3-day event window centered on the appointment announcement date and report the results in Panel A of Table 5. We find that mean and median CARs are -0.20% and -0.22%, both statistically significant.¹⁹ These estimates suggest 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. While we recognize that OID appointments are likely to be endogenous firm decisions, this evidence is consistent with a broad set of other OID findings we uncover.

B. Announcements of OID Deaths

OID deaths afford a relatively exogenous setting to study the shareholder value impact of OIDs. We begin by undertaking keyword searches in Capital IQ and

¹⁹We obtain similarly significant results when we limit our analysis to 232 OID appointments without other director exits from the board in the same year.

Factiva for director deaths.²⁰ We only retain the deaths of independent directors using the information from ISS and Audit Analytics to identify inside and gray directors. We then search Factiva, FactSet, and Edgar for the earliest news releases of independent director deaths and excluded announcements contaminated by material firm news releases. We find that most initial announcements overlap with firm 8-K filings about director deaths and that abnormal daily trading volume is also concentrated in the 2 trading days following the 8-K filing dates. Director deaths most frequently occur the day before the 8-K filings. We obtain a sample of 106 OID death announcements and 27 non-OID death announcements that are free of confounding events.²¹ Sample construction is detailed in Table IA2 in the Supplementary Material.

Panel B of Table 5 reports the stock market reactions to announcements of independent director deaths. We find that the announcements of OID deaths generate significantly positive abnormal stock returns. The mean and median CARs over a 3-day event window beginning on the date of the firm's 8-K filing announcing a director's death are 1.41% and 0.54% (p -values: 0.04 and 0.02). In contrast, the mean and median CARs around the announcements of non-OID deaths are negative, albeit insignificant, which is consistent with the finding on independent director deaths by Nguyen and Nielsen (2010). The differences in announcement CARs between OID and non-OID deaths are statistically significant at the 5% level.²² These results indicate that investors react favorably to these unexpected departures of OIDs and are consistent with our earlier findings of negative stock market reactions to OID appointments.

C. 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. In particular, 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 the 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.²³ Table IA3 in the Supplementary Material provides details on the full and clean samples.

We measure the announcement period cumulative abnormal returns (CARs) over a 3-day event window $(-1, 1)$ with event date 0 being the announcement date.

²⁰We also consult Table C1 in Fedaseyev, Linck, and Wagner (2018). We wish to thank Hannes Wagner and his coauthors for sharing their director deaths' data with us to check for missing independent director deaths.

²¹Very few director deaths include replacement director news, and our results are invariant to including them.

²²We find qualitatively similar results using the earliest news date of director deaths and their board affiliations.

²³We exclude announcements contaminated by events such as the annual general meetings, director appointments, earnings announcements, dividend declaration, and other bylaws changes.

The results are reported in Panel C of Table 5. The mean CAR is -0.62% and the median is -0.69% , both statistically 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 increases as value destroys.

During our keyword and news search, we uncover 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 0.98% . The effect is equivalent to a \$91.3 million gain in shareholder value for the average event firm in our sample.

V. 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, 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. In particular, the presence of OIDs is likely to be determined by factors related to both OID supply and demand and these factors can be related to the outcome variables we examine.

We take multiple approaches to address these endogeneity concerns. First, we include an exhaustive set of control variables in our regressions, including many important aspects of corporate governance, managerial incentives, CEO age, and CEO quality, as well as a firm's growth opportunities and age as proxies for a firm's life cycle.²⁴ To account for time-invariant unobservable firm characteristics that could drive the relationship between OIDs and corporate outcome measures, we also control for firm fixed effects wherever feasible. Second, we use a 2-stage least-squares (2SLS) framework in which we instrument for the presence of OIDs with the supply of younger director candidates in a 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 the resulting change in OID presence on boards to changes in firm performance around the shock.

A. Analysis of Corporate Acquisition Decisions

Acquisitions are among the largest corporate investments, and boards play a major role in devising, evaluating, and ultimately approving firm 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

²⁴We use a logarithmic transformation of firm age as 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 include firm age squared as an additional control variable.

TABLE 6
Regressions of Acquirer Announcement Returns

Table 6 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. The firm characteristics controls are identical to those included in Table 3 regressions. In parentheses are t -statistics based on standard errors adjusted for heteroscedasticity and industry-level clustering. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

	1	2
OID_%	-0.011** (-2.31)	-0.030*** (-2.96)
<i>Deal Characteristics Controls</i>		
RELATIVE_DEAL_SIZE	-0.008 (-0.87)	-0.006 (-0.49)
PUBLIC_TARGET	-0.019*** (-6.10)	-0.021*** (-4.95)
PRIVATE_TARGET	-0.006* (-1.73)	-0.003 (-0.72)
%_DEAL_VALUE_PAID_BY_CASH	0.000 (1.54)	0.000* (1.81)
TENDER_OFFER	0.004 (0.92)	0.008 (0.87)
HOSTILE_DEAL	-0.014 (-1.20)	-0.008 (-0.61)
DIVERSIFYING_DEAL	-0.004 (-1.38)	0.002 (0.43)
Firm characteristics controls	Yes	Yes
Industry fixed effects	Yes	No
Firm fixed effects	No	Yes
Year fixed effects	Yes	Yes
No. of obs.	3,116	3,116
Adj. R^2	0.054	0.155

(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 firm acquisition decisions in relation to the presence of OIDs.

We obtain 3,116 acquisitions made by firms in our sample during the sample period drawn 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 before the announcement date, iii) the acquirer controls less than 50% of target shares before transaction and owns 100% of target shares afterward, and iv) the acquirer has financial data available from Compustat, governance data available from ISS for the year before the acquisition announcement, and stock return data available from CRSP for the period from the 210th trading day before 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 1-factor market model, whose coefficients are estimated using daily stock returns over the period $(-210, -11)$ with the daily market return represented by the CRSP value-

weighted return. The average 5-day CAR for acquirers is 0.6%, and the median is 0.4%.

We next regress acquirer CARs 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 6](#) show that the `OID_%` coefficient is negative and statistically significant across both model specifications, even after we include firm fixed effects to control for time-invariant firm attributes. Depending on the model used, a 1-standard-deviation increase in the `OID_%` is associated with a decline in acquirer CAR of 0.25 to 0.69 percentage points, equivalent to a \$7–19 million loss in shareholder value for our average acquirer. Our findings indicate that firms with greater OID board representation tend to make acquisitions that generate lower shareholder value,²⁵ which supports our conjecture that boards with more OIDs are less effective at reining in CEO empire-building activities.

B. Analysis of CEO Turnover Decisions

CEO retention or replacement is another major board decision that indicates monitoring effectiveness. A board's ability to stay informed about managerial decision-making and its readiness to replace managers when necessary provide powerful *ex ante* incentives for CEOs to act in shareholders' best interests. 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 247 forced CEO turnovers, which translate into a 2.5% unconditional probability of forced CEO turnover in a given firm-year. We estimate a linear probability model where the dependent variable is equal to 1 if a firm experiences a forced CEO turnover in the year, and 0 otherwise. There are two key explanatory variables. One is firm performance, and the other is an interaction term between firm performance and the `OID_%`. We use a firm's industry-adjusted ROA as our primary performance measure. We control for other corporate governance variables and their interaction terms with firm performance. Also, some model specifications include firm fixed effects to focus on within-firm time-series variation.

We present the regression results for forced CEO turnovers in [Table 7](#), where we control for the interaction terms between all governance variables and firm performance in columns 2 and 4 and firm fixed effects in columns 3 and 4. Across all model specifications, the coefficient on firm performance is significantly negative, indicating that CEOs are more likely to be terminated following poorer firm performance. More importantly, we find that the coefficient of the interaction term between firm performance and `OID_%` is always positive and statistically significant, suggesting that the forced 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

²⁵Dou et al. (2015) use the average age of independent directors as a control variable and find no significant relation to acquirer announcement returns.

TABLE 7
Regressions of Forced CEO Turnovers

Table 7 reports the regression analysis of CEO turnover. The dependent variable is FORCED_TURNOVER, an indicator equal to 1 if a firm experiences a forced CEO turnover, and 0 otherwise. PERFORMANCE is measured by industry-adjusted ROA. The firm characteristics controls are identical to those included in Table 3 regressions. In parentheses are *t*-statistics based on standard errors adjusted for heteroscedasticity and firm-level clustering. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

	1	2	3	4
PERFORMANCE	-0.292*** (-4.92)	-1.939** (-2.01)	-0.364*** (-4.55)	-2.942** (-2.24)
OID_%	-0.012 (-1.57)	-0.014* (-1.91)	0.006 (0.49)	-0.002 (-0.15)
OID_% × PERFORMANCE	0.192* (1.84)	0.332*** (2.64)	0.271* (1.73)	0.399** (2.24)
Firm characteristics controls	Yes	Yes	Yes	Yes
Firm characteristics controls × PERFORMANCE	No	Yes	No	Yes
Industry fixed effects	Yes	Yes	No	No
Year fixed effects	Yes	Yes	Yes	Yes
Firm fixed effects	No	No	Yes	Yes
No. of obs.	9,752	9,752	9,626	9,626
Adj. R^2	0.018	0.022	0.032	0.036

percentile level (the interquartile range). Using column 3 as an example, if all independent directors on the board are under 65 (i.e., the OID_% is equal to 0), the change in the estimated probability of forced CEO turnover is 2.0%. When all the independent directors are aged 65 or above (i.e., the OID_% is equal to 1), the change in the estimated probability of CEO-forced turnover declines to only 0.5%. The difference between the probability changes is economically meaningful given that the unconditional probability of forced CEO turnover is 2.5%. Overall, the evidence in this section is consistent with the interpretation that OIDs reduce board effectiveness in disciplining poorly performing managers.

C. Analysis of CEO Compensation

Setting CEO pay is one of the board's most important decisions. To the extent that ineffective OID monitoring 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 risk bearing in terms of pay sensitivity to shareholder wealth. To test this proposition, we use CEO compensation data from ExecuComp. We remove firm-year observations in which CEOs are in office for under a year, since their compensation is for only part of the year. Given that CEO pay is under the direct purview of compensation committees, we focus particularly on the compensation committee's composition. We construct a variable, COMPENSATION_COMMITTEE_OID_%, that is the percentage of OIDs on the compensation committee.

Panel A of Table 8 presents the regression results. The dependent variables are the level of CEO total compensation in columns 1 and 2, the percentage of cash in CEO total pay (CASH_INTENSITY) in columns 3 and 4, and the percentage of equity in CEO total pay (EQUITY_INTENSITY) in columns 5 and 6. In columns 1, 3, and 5, which control for industry and year fixed effects, we find that the coefficient on COMPENSATION_COMMITTEE_OID_% is significantly positive

TABLE 8
Regressions of CEO Compensation and Financial Restatements

Panel A of Table 8 reports the OLS regression analysis of CEO compensation. The dependent variable for columns 1–2 is TOTAL_COMPENSATION, the natural logarithm of the dollar value of the CEO's total annual compensation. The dependent variable for columns 3–4 is CASH_INTENSITY, the proportion of total annual CEO compensation that comes from cash. The dependent variable for columns 5–6 is EQUITY_INTENSITY, the proportion of total annual CEO compensation that comes from option grants and stocks. Panel B reports the regression analysis of financial restatements. The dependent variable for columns 1–2 is RESTATEMENT, an indicator equal to 1 if the firm subsequently restated the financial statements for that fiscal year. The dependent variable for columns 3–4 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 and 3 estimate a probit regression, and columns 2 and 4 estimate a conditional logit regression. The firm characteristic controls are identical to those included in Table 3 regressions. In parentheses are *t*-statistics based on standard errors adjusted for heteroscedasticity and firm-level clustering. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

Panel A. Regressions of CEO Compensation Variables

	TOTAL_COMPENSATION		CASH_INTENSITY		EQUITY_INTENSITY	
	1	2	3	4	5	6
COMPENSATION_COMMITTEE_OID_%	0.070** (2.02)	0.009 (0.32)	0.019** (2.07)	0.010 (1.12)	-0.030*** (-2.92)	-0.020** (-2.05)
Firm characteristics controls	Yes	Yes	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	No	Yes	No	Yes	No
Firm fixed effects	No	Yes	No	Yes	No	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
No. of obs.	14,522	14,386	13,808	13,644	13,808	13,644
Adj. R^2	0.558	0.742	0.341	0.517	0.202	0.407

Panel B. Regressions of Financial Restatements

	RESTATEMENT		IRREGULARITY	
	1	2	3	4
AUDIT_COMMITTEE_OID_%	0.167*** (2.86)	0.507*** (2.70)	0.203** (1.97)	1.135** (2.46)
Firm characteristics controls	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	No	Yes	No
Firm fixed effects	No	Yes	No	Yes
Year fixed effects	Yes	Yes	Yes	Yes
No. of obs.	16,721	7,117	14,545	1,322

in columns 1 and 3 and significantly negative in column 5. These results suggest that CEOs receive significantly higher compensation at firms with a higher proportion of OIDs on their compensation committees and that the higher compensation is accompanied by a pay structure composed of more cash and less equity. When we replace industry fixed effects with firm fixed effects in columns 2, 4, and 6, all the coefficients on COMPENSATION_COMMITTEE_OID_% retain their original signs, but only the one in column 6 remains statistically significant. Overall, the evidence in this section is consistent with OIDs undermining board effectiveness in incentivizing CEOs to maximize shareholder wealth.²⁶

²⁶One could argue that the negative relationship between OIDs and CEO equity-based compensation may reflect OIDs' greater risk aversion and their attempt to limit younger CEOs' risk-taking. To examine this possibility, we interact COMPENSATION_COMMITTEE_OID_% with an OLD_CEO indicator and a YOUNG_CEO indicator, respectively. We define old and young CEOs based on two CEO age cutoffs: 65 (the same as how we define OID) and 55 (the median CEO age in our sample). We reestimate the EQUITY_INTENSITY regression with the two newly created interaction terms as the key explanatory variables. We do not find that the negative effect of OIDs on CEO equity compensation is stronger for young CEOs. In fact, there is some evidence that the effect is stronger for old CEOs. To the extent younger CEOs tend to take more risk than older CEOs, these results do not support the conjecture that OIDs constrain younger CEOs' risk-taking by awarding them lower equity-based compensation.

D. Analysis of Financial Restatements

Boards are responsible for overseeing and ensuring the quality of firm financial reporting. In this section, we examine the relationship 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 the percentage of OIDs on the audit committee.

We obtain a sample of restatements from two sources. The first source is two reports issued by the U.S. General Accounting Office (GAO) in 2003 and 2007, which include a list of firms that restated their financial statements during the period from Jan. 1997 to June 2006. The second source is the Audit Analytics (AA) restatement database, which covers all SEC registrants who disclose a financial restatement in their electronic filings. The AA database defines a restatement as a revision of a previously filed financial statement due to an error, fraud, or GAAP principle misapplication. Revisions due to mergers and acquisitions or accounting principle changes such as the adoption of SFAS 123 are omitted in the AA database. 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 classify restatements as irregularities (intentional misreporting) or accounting errors (unintentional misreporting).²⁷ We use the GAO sample for earlier years covered by the GAO reports (1998–2005) and the AA sample for more recent years (2006–2014).

We regress the restatement and irregularity indicators against the proportion of OIDs and report the results in Panel B of Table 8. We find that firms with a higher percentage of OIDs on their audit committees are associated with a significantly higher likelihood of restatements (column 1) or irregularities (column 3). These results continue to hold when we control for firm fixed effects (columns 2 and 4). The average marginal effect of `AUDIT_COMMITTEE_OID_%` in column 4 is 0.037, suggesting that a 1-standard-deviation increase in the OID percentage on the audit committee is associated with a 1% rise in the probability of intentional misreporting. This is economically meaningful given that the unconditional probability of intentional misreporting for our sample is only 1.3%. Overall, the evidence in this section suggests that OIDs on audit committees weaken board oversight of a firm's financial reporting, allowing managers to engage in more aggressive earning manipulations.

E. 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

²⁷Hennes 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 4 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 previous three criteria.

incentives and greater agency problems. We next examine how the presence of OIDs is related to overall firm performance. Based on the evidence in our earlier event studies and the analysis of specific corporate policies, we expect a negative relationship between firm performance and the proportion of OIDs on boards. We test this prediction by first estimating OLS regressions of firm performance, measured by either a firm's industry-adjusted ROA or Tobin's Q .

Panel A of [Table 9](#) presents the results. Consistent with our expectation, the associations between $OID_%$ and the two performance measures are negative and statistically significant, even when we control for firm fixed effects. Based on the coefficient estimates from columns 2 and 4, a 1-standard-deviation increase in $OID_%$ is associated with a 0.15 percentage point decline in industry-adjusted ROA and a 0.04 decline in Tobin's Q .

While a firm fixed effects specification ensures that the negative relationship 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, networks, or 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 likely to appoint a larger number of younger and OIDs. Therefore, the negative relationship 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 OID equity ownership in firms to gauge the extent to which they are appointed to boards of poorly performing firms to act 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 0.48% in our sample. At the individual director level, only 2.3% or 0.5% of OIDs hold more than 1% or 5% of a firm's equity ownership, respectively. Given their typically minimal equity ownership level, an overwhelming majority of OIDs are not blockholders. Our results are also robust to removing OIDs with at least 1% or 5% equity ownership.

F. Additional Identification Strategies

So far, we have relied on firm fixed effects 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 employ two additional identification strategies to further alleviate such endogeneity concerns.

TABLE 9
 OLS and Instrument Variable (IV) Regressions of Firm Performance

Panel A of Table 9 reports the OLS regressions of firm performance, in which the dependent variable is a firm's industry-adjusted ROA in columns 1 and 2 and TOBINS_Q in columns 3 and 4. Panel B reports the IV regressions of firm performance, in which we instrument $OID_ \%_ WITH_ LOCAL_ POOL_ OF_ YOUNGER_ DIRECTORS$, defined as the number of directors and executives aged below 65 from firms headquartered in the same state as the sample firm scaled by the number of firms in the state. Columns 1 and 2 report the first- and second-stage estimation results for industry-adjusted ROA. Columns 3 and 4 report the first- and second-stage estimation results for the regression of TOBINS_Q. The IV regressions in Panel C include a number of additional control variables, including the average quality of the independent directors on the board of the focal firm, the characteristics of other firms headquartered in the same state, and the economic conditions of the focal firm's headquarters state. The firm characteristics controls are identical to those included in Table 3 regressions. In parentheses are *t*-statistics based on standard errors adjusted for heteroscedasticity and firm-level clustering. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

Panel A. OLS Regressions

	INDUSTRY_ADJUSTED_ROA		TOBINS_Q	
	1	2	3	4
OID_ %	-0.014*** (-2.86)	-0.007* (-1.86)	-0.140** (-2.05)	-0.184*** (-3.32)
Firm characteristics controls	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	No	Yes	No
Year fixed effects	Yes	Yes	Yes	Yes
Firm fixed effects	No	Yes	No	Yes
No. of obs.	18,152	18,035	18,174	18,055
Adj. R ²	0.165	0.653	0.321	0.697

Panel B. IV Regressions with Standard Control Variables

	INDUSTRY_ADJUSTED_ROA		TOBINS_Q	
	First Stage	Second Stage	First Stage	Second Stage
	1	2	3	4
LOCAL_POOL_OF_YOUNGER_DIRECTORS	-0.019*** (-3.44)		-0.019*** (-3.47)	
OID_ %		-0.254** (-1.98)		-3.300* (-1.80)
Cragg-Donald Wald <i>F</i> -stat (weak identification test)	45.51		46.76	
Stock-Yogo critical values (10% maximal IV size)	16.38		16.38	
Firm characteristics controls	Yes	Yes	Yes	Yes
Industry and year fixed effects	Yes	Yes	Yes	Yes
No. of obs.	16,676	16,676	16,697	16,697

Panel C. IV Regressions with Augmented Control Variables

	INDUSTRY_ADJUSTED_ROA		TOBINS_Q	
	First Stage	Second Stage	First Stage	Second Stage
	1	2	3	4
LOCAL_POOL_OF_YOUNGER_DIRECTORS	-0.034*** (-4.93)		-0.034*** (-4.92)	
OID_ %		-0.172** (-2.17)		-2.778** (-2.42)
Firm characteristics controls	Yes	Yes	Yes	Yes
Additional controls	Yes	Yes	Yes	Yes
Industry and year fixed effects	Yes	Yes	Yes	Yes
No. of obs.	12,459	12,459	12,462	12,462

1. The Instrumental Variable Approach

We first employ a 2-stage least-squares (2SLS) regression framework in which we instrument for the presence of OIDs on a firm's board by the supply of younger 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 further away from firms, the local supply of

directors significantly affects a firm's ability to hire qualified independent directors. Therefore, we posit that firms are more likely to tap into the pool of older directors when there is a lower supply of younger candidates locally. As a firm's headquarters location is generally determined early in its life and rarely changes (Pirinsky and Wang (2006)), we consider the supply of younger directors in the vicinity of a firm as a plausibly exogenous source of variation.²⁸ We recognize that no formal econometric tests exist for testing the validity of the exclusion restriction. However, to the extent that younger director candidates are more diverse in gender or ethnicity, we control for board gender diversity, which can help minimize other potential channels through which a younger local director pool might affect firm outcomes. To measure the local supply of younger candidates, we use the number of directors and executives aged below 65 from firms headquartered in the same state as the focal firm scaled by the number of firms in the state.

We estimate 2SLS regressions of firm performance and present results of the first- and second-stage estimation in Panel B of Table 9. 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 younger director candidates. Consistent with our expectation, the coefficient of the local supply of younger directors is negative and statistically significant at the 1% level, supporting the instrument's strength and relevance. The Cragg–Donald Wald F -statistic is around 45, rejecting the null hypothesis of a weak instrument. In the second-stage estimation, the coefficient of `OID_%` remains significantly negative. Thus, we conclude that our findings are robust to an endogeneity correction based on this IV approach.²⁹

To further ensure the validity of our instrumental variable approach, we augment the previous regression models with additional control variables, including the average quality of independent directors on the focal firm's board, various characteristics of other firms headquartered in the same state, and economic conditions in the focal firm's headquarters state. We obtain our director quality measure from Bhattarai, Serfling, and Woidtke (2023), who estimate a director-specific quality (DSQ) measure that encompasses transferrable value-relevant attributes unique to a director. They show that directors with higher DSQ receive more shareholder support at elections, elicit favorable investor reactions upon initial appointment to boards, and are associated with better firm decision-making in multiple dimensions. The characteristics of same-state firms include their average R&D intensity, the percentage of these firms that are in the same industry as the focal firm, the percentage of the focal firm's primary industry peers that are headquartered in the same state, the percentage of same-state firms in the focal firm's

²⁸Information on firms' historical headquarters state is from the Wharton Research Data Services' (WRDS) 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.

²⁹To the extent that large firms tend to have high national or international visibility and are less constrained in their director recruitment by the local director labor market, we exclude from our analysis firms in the top quartile or decile based on market capitalization as a robustness check. We find that our results continue to hold.

related (upstream or downstream) industries,³⁰ and the percentage of firms in the focal firm's related industries that are headquartered in the same state. We measure a state's economic conditions by the state's per capita income and GDP growth rate. The results of our instrumental variable estimations continue to hold and in fact become statistically more significant with these additional controls (see Panel C of Table 9).

2. A 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 U.S. 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 before its issuance were not affected. Only noncompliant firms were forced to increase their 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 sudden increase in aggregate demand for independent directors, noncompliant firms were likely to view recently retired officers and directors of other firms as an attractive source of director talent. Therefore, they are likely to 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 instrumented change in the OID percentage to the change in firm performance.

Following Chhaochharia and Grinstein (2009) and Guo and Masulis (2015), we use the period between 2001 and 2005 as our event window. We choose 2001 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 must comply with the new listing rule by that year end.³¹ We define compliant firms as those with a majority of independent directors on their boards in 2001. Firms not satisfying the previous criteria are classified as noncompliant. For robustness, to ensure compliant and noncompliant firms are similar, we match each compliant firm with a noncompliant firm in the same industry and with the closest firm size (measured by equity market value). Our results continue to hold.

³⁰Using the Bureau of Economic Analysis's (BEA) input-output tables, we classify 2 industries as related if the maximum of the input requirement coefficients between them exceeds 5%.

³¹In particular, firms with unitary boards are required to comply by the earlier of i) the firm's first annual shareholder meeting after Jan. 15, 2004, or ii) Oct. 31, 2004. Firms with classified boards must comply with the regulation by their first annual meeting after Jan. 15, 2005, but no later than Dec. 31, 2005.

TABLE 10
2SLS Regressions of Firm Performance: Evidence from a Regulatory Shock

Table 10 presents the results of 2SLS regressions of firm performance changes 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 previous table except that all the variables are measured as changes over the event period 2001–2005. We define compliant firms as firms that had a majority of independent directors on the board in 2001 and noncompliant firms as the rest of the firms. We instrument $\Delta\text{OID}_{\%}$ with NONCOMPLIANCE , an indicator variable that equals 1 if the firm was noncompliant, and 0 otherwise. Columns 1 and 2 report the first- and second-stage estimation results for the regression of $\Delta\text{INDUSTRY_ADJUSTED_ROA}$. Columns 3 and 4 report the first- and second-stage estimation results for the regression on $\Delta\text{TOBINS_Q}$. In parentheses are *t*-statistics based on standard errors adjusted for heteroscedasticity. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

	$\Delta\text{INDUSTRY_ADJUSTED_ROA}$		$\Delta\text{TOBINS_Q}$	
	First Stage	Second Stage	First Stage	Second Stage
	1	2	3	4
NONCOMPLIANCE	0.061** (2.48)		0.061** (2.48)	
$\Delta\text{OID}_{\%}$		-0.358** (-2.00)		-3.294* (-1.70)
Δ Firm characteristic controls	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes
No. of obs.	845	845	845	845

To assess the impact of this regulatory shock, we estimate the change in $\text{OID}_{\%}$ separately for compliant firms and noncompliant firms. In a univariate comparison, we find that noncompliant firms and compliant firms had similar levels of $\text{OID}_{\%}$ in 2001 (34% for noncompliant firms and 30% for compliant firms). However, noncompliant firms increased their $\text{OID}_{\%}$ by 3 percentage points (9% on a relative scale) over the event window, while compliant firms experienced a much smaller increase of 1 percentage points (4% on a relative scale). A major reason behind the larger rise in $\text{OID}_{\%}$ at noncompliant firms is that they appoint significantly more OIDs in this period to comply with the new listing standards. Indeed, the $\text{OID}_{\%}$ among newly appointed independent directors at noncompliant firms increased from 13% to 18%, while it held steady at about 9% 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 $\text{OID}_{\%}$. We use model specifications similar to those in Table 10, except that we measure all variables as changes over the event window 2001–2005. We instrument for $\text{CHANGE_IN_OID}_{\%}$ with NONCOMPLIANCE , an indicator variable that equals 1 if the firm's board structure was not compliant with the new rule in 2001, and 0 otherwise.

Table 10 presents the first- and second-stage estimation results. In the first-stage estimation reported in columns 1 and 3, the coefficient on NONCOMPLIANCE is positive and statistically significant at the 5% level. In the second-stage estimation, the dependent variable is $\text{CHANGE_IN_INDUSTRY_ADJUSTED_ROA}$ in column 2 and $\text{CHANGE_IN_TOBINS_Q}$ in column 4. The instrumented version of $\text{CHANGE_IN_OID}_{\%}$ has a negative and statistically significant coefficient in both columns.³² These results reinforce our findings in Table 9 that firm performance decreases with the percentage of OIDs on the board.

³²To 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.

G. Separating Director Age from Tenure and Obsolete Experience

1. Age Versus Tenure

In this section, we conduct several additional analyses to further separate the effect of age from tenure. First, we augment our baseline specification by adding a logarithmic transformation and a squared term of average director tenure as additional controls. Our results remain robust. Second, we examine whether OID behavior changes from the first few years after the initial appointment to later years on the board. In particular, we rerun the regressions reported in Table 3 by focusing only on OIDs who are aged 65 or above at the initial appointment. We find little change in these OIDs' board meeting attendance records and their total number of committee memberships or audit/compensation committee memberships from the first 2 (or 3) years to later years on the board. The only difference we find is that these OIDs are less likely to serve as committee chair in their first few years on the board compared with later years, which makes sense because it is uncommon for new board members to chair committees, especially important and time-consuming committees, such as the audit and compensation committees. Third, we compare the performance of OIDs who are in the first few (3 or 5) years of their tenure on the board vis-à-vis younger IDs with similarly short tenure. Given the large number of firm outcome variables we examine, we choose to focus on firm performance (ROA and Tobin's Q) as a summary measure of board and director efficacy. We find that OIDs with short tenures have significantly negative effects on firm performance, whereas younger IDs with short tenure exhibit mostly insignificant effects. The difference is especially pronounced when we measure firm performance by Tobin's Q and when we focus on directors with no more than 5 years of tenure. Overall, these additional results lend further support that age has distinctly different effects on director effectiveness than tenure.

2. Age Versus Obsolete Experience

One potential alternative explanation for OID ineffectiveness is that they retired from active employment long ago, and as a result, their experience and knowledge have become less relevant. To evaluate this possibility, we identify OIDs with obsolete knowledge or experience based on the number of years since their retirement from active employment as an executive. ISS does not have a variable that directly captures director retirement. Thus, we identify retired directors using information from several variables, such as employment categories and primary employers. These variables sometimes have the label "retired." We define the retirement year as the first year when the director is identified as retired.

We first repeat the director-level analysis of board meeting attendance, committee membership, and committee chair positions while including an additional control variable "RETIRE," which is equal to 1 for directors who are retired and thus more likely to possess obsolete knowledge. We find that even with this additional control, all of our previous results on OIDs continue to hold.

At the firm level, we separate OIDs into nonretired, newly retired (for no more than 3 years), and long retired (for more than 3 years). The 3-year cutoff roughly splits retired OIDs into two equal halves. We again choose firm performance as a summary measure of board effectiveness and regress firm performance measures

against the percentages of the previous three groups of OIDs on a firm's board. We find that nonretired OIDs, who are less likely to have obsolete knowledge, still have significant negative effects on firm performance, suggesting that our results are not entirely driven by knowledge or experience obsolescence. For robustness, we combine nonretired OIDs and OIDs who retired within the past 3 years and find that these OIDs also have a significant and negative relation to firm performance.

VI. Advisory Benefits of Older Independent Directors

In this section, we explore whether at least some OIDs can provide valuable advisory benefits to firms. We focus primarily on OID expertise and on economic settings where firms have a greater need for board expertise and advice. First, we differentiate between OIDs with and without specialized experience pertinent to the acquisition decisions. For this purpose, we identify OIDs with prior acquisition experience or who have worked in a target's industry. Such OIDs should be able to provide more valuable counsel on these 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 public 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 3-digit SIC industry as the target over the prior 10 years. We obtain director experience from ISS and executive experience from ExecuComp.

We find that OIDs have more M&A experience and target industry experience at both extensive and intensive margins compared with younger IDs.³³ These experiences are more important for OIDs because they may have a greater difficulty in acquiring and analyzing new information about acquisitions given their declining physical and mental states. This can be compounded by their weaker career incentives in the director labor market.

We reestimate acquirer return regressions after 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 11 presents the results. We find that OIDs with prior acquisition experience or target industry experience are unrelated to acquirer returns, possibly because the benefits of their better advice offset the costs of their poorer monitoring. On the other hand, OIDs without either type of experience continue to exhibit a significantly negative association with acquirer returns.³⁴

³³For example, 29.4% of OIDs have M&A experience and 8.2% have target industry experience, compared with 23.7% and 6.7%, respectively, among younger independent directors.

³⁴In untabulated analysis, we examine whether OIDs with a larger network of connections are able to play a more valuable advisory role. We focus on a director's network comprised of his/her prior board connections at other firms. First, we find that OIDs have a larger number of director connections than their younger counterparts, and the difference is significant at both the mean and the median. We then reestimate the acquirer returns regressions by separating OIDs into those with higher and lower numbers of connections relative to the median. We find that the significantly negative relation previously documented between OIDs and acquirer announcement returns is concentrated in OIDs with fewer connections. This is consistent with more connections allowing OIDs to play a more effective advisory role, which offsets any negative effect due to their age.

TABLE 11
Advisory Benefits of Old Independent Directors

Table 11 reports an analysis of the advisory benefits of OIDs. In Panel A, an OID is defined as having acquisition experience if she has participated in at least one acquisition made by another firm where she served as a director or an executive during the previous 10 years. An OID is defined as having target industry experience if 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 1 if a firm's industry experiences a tariff cut during the past 5 years, and 0 otherwise. In Panel C, the indicator HIGH_ADVISORY_NEED is equal to 1 if ADVISORY_NEED is above the annual median, where ADVISORY_NEED is the average of INDUSTRY_VOLATILITY (the average standard deviation of annual stock returns for all firms in the industry), negative FIRM_AGE (the number of years that a firm exists in Compustat), SALES_GROWTH (the annual growth rate of sales), and MULTIPLE_SEGMENT (an indicator variable equal to 1 for firms with more than one business segment reported in Compustat). The four variables are standardized to have a mean of 0 and a standard deviation of 1. The LOW_ADVISORY_NEED indicator is equal to 1 minus HIGH_ADVISORY_NEED. In Panel D, an OID is defined as busy if she holds 3 or more directorships in public firms. In Panels B–D, the dependent variable is either industry-adjusted ROA or TOBINS_Q. In parentheses are t-statistics based on standard errors adjusted for heteroscedasticity and firm-level clustering. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

Panel A. Regressions of Acquirer Returns: OID Experience

Definition of Experience:	Acquisition Experience	Target Industry Experience
INEXPERIENCED_OID_%	-0.014*** (-3.17)	-0.012*** (-2.97)
EXPERIENCED_OID_%	0.001 (0.13)	0.009 (0.72)
Difference in coefficients	-0.015* (-1.73)	-0.021* (-1.79)
Control variables	Yes	Yes
Industry fixed effects	Yes	Yes
Year fixed effects	Yes	Yes
No. of obs.	3,088	3,088
Adj. R ²	0.054	0.054

Panel B. Regressions of Firm Performance: Import Tariff Cuts

	INDUSTRY_ADJUSTED_ROA		TOBINS_Q	
OID_%	-0.016* (-1.77)	-0.014 (-1.44)	-0.087 (-0.55)	-0.333** (-2.05)
TARIFF_CUT	-0.018** (-1.98)	-0.017** (-2.05)	-0.177 (-1.34)	-0.192 (-1.55)
OID_% × TARIFF_CUT	0.046* (1.83)	0.066*** (3.43)	0.519 (1.29)	0.687** (2.28)
Control variables	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	No	Yes	No
Firm fixed effects	No	Yes	No	Yes
Year fixed effects	Yes	Yes	Yes	Yes
No. of obs.	3,338	3,282	3,338	3,283
Adj. R ²	0.314	0.685	0.385	0.691

Panel C. Regressions of Firm Performance: Firm Advisory Needs

	INDUSTRY_ADJUSTED_ROA		TOBINS_Q	
OID_% × LOW_ADVISORY_NEED	-0.018*** (-3.35)	-0.009** (-2.22)	-0.237*** (-3.32)	-0.212*** (-3.82)
OID_% × HIGH_ADVISORY_NEED	-0.008 (-1.44)	-0.005 (-1.19)	0.001 (0.01)	-0.112* (-1.70)
Difference in coefficients	-0.010** (1.96)	-0.004 (1.03)	-0.238*** (3.38)	-0.100* (1.91)
Control variables	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	No	Yes	No
Firm fixed effects	No	Yes	No	Yes
Year fixed effects	Yes	Yes	Yes	Yes
No. of obs.	16,348	16,204	16,363	16,218
Adj. R ²	0.177	0.669	0.334	0.724

(continued on next page)

TABLE 11 (continued)
 Advisory Benefits of Old Independent Directors

Panel D. Regressions of Firm Performance: <i>OID Busyess</i>				
	INDUSTRY_ADJUSTED_ROA		TOBINS_Q	
BUSY_OID_%	-0.039*** (-3.83)	-0.027*** (-3.28)	-0.508*** (-3.84)	-0.317*** (-3.03)
NONBUSY_OID_%	-0.013** (-2.48)	-0.004 (-1.11)	-0.119 (-1.64)	-0.159*** (-2.70)
Difference in coefficients	-0.026** (-2.56)	-0.023*** (-2.87)	-0.389*** (-2.98)	-0.158 (-1.52)
Control variables	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	No	Yes	No
Firm fixed effects	No	Yes	No	Yes
Year fixed effects	Yes	Yes	Yes	Yes
No. of obs.	18,152	18,035	18,174	18,055
Adj. R^2	0.162	0.653	0.320	0.697

Next, we investigate the possibility that firms under certain circumstances may benefit from OIDs. 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 entering U.S. product markets and, as a result, increase the competitive pressure on U.S. firms in affected 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).³⁵ The tariff data are only available for manufacturing industries from 1998 to 2005 in our sample period. For each year and each 3-digit SIC industry, 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 deviations of yearly changes in industry tariffs from their median level. In particular, a tariff cut occurs in an industry-year when an industry has a negative tariff change that is 3 times larger than the median change in the industry's tariff during the sample period. We exclude tariff cuts followed by similar reversals over the subsequent 2 years. We construct an indicator, *TARIFF_CUT*, which equals 1 if a firm's industry experiences a tariff cut in the prior 5 years, and 0 otherwise. We repeat the firm performance regressions after adding *TARIFF_CUT* and its interaction term with the *OID_%*.

Panel B of Table 11 presents the results. Consistent with prior research on tariff cuts, the coefficient on *TARIFF_CUT* is negative in both the ROA and *TOBINS_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

³⁵The tariff data are available at <https://faculty.som.yale.edu/peterschott/international-trade-data/>.

significant for both firm performance measures when we control for firm fixed effects (columns 2 and 4), indicating that the presence of OIDs is beneficial when firms face more intense product market competition.³⁶ 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 services. Following Coles, Daniel, and Naveen (2008) and Field, Lowry, and Mkrtchyan (2013), we 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. Our rationale is that 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, fast-growing firms often face uncertain futures and changing business conditions, and their managers may be inexperienced in dealing with many of these challenges, and therefore, they can greatly benefit from OID advice. Firms operating in multiple industry sectors usually have more complex business operations and could benefit from OIDs' extensive experience.

While firms with the previous characteristics can present challenges to OIDs in gathering information and staying abreast of major developments and technological advances, OIDs can rely on information from firm management to perform their advisory role. Because managers at these firms are in greater need of board advice to compete and survive, they will be more willing to share pertinent information with the board in order to receive higher-quality advice. Equipped with such information, OIDs can leverage their knowledge, experience, and connections to add more value through their advisory function. However, managers have much less incentive to furnish information to the board for performing its monitoring role. This will compound the challenges facing OIDs given their diminished physical and mental capacity and lower career-concern incentives, especially at firms that are young, fast-growing, and operate in volatile environments. However, the potential negative effects stemming from OIDs' weaker monitoring may be limited at these firms because agency problems between managers and shareholders are likely to be less severe given these firms' abundant growth opportunities and their need to raise capital and compete and survive in a challenging business environment. Based on these arguments, we expect the advisory benefits of OIDs to offset, if not outweigh, the costs of their monitoring deficiency at these high advisory needs firms.

For each industry, we compute `INDUSTRY_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 and construct `MULTIPLE_SEGMENT` as an indicator variable equal to 1 for firms with more than one business segment reported in Compustat. Using these firm characteristics, we construct two indicators, `LOW_ADVISORY_NEED` and `HIGH_ADVISORY_NEED`.

³⁶The results are qualitatively similar if we define a tariff cut in alternative ways, such as using 2 times the median change as the cutoff, or using 2 (or 3) times the median reduction as the cutoff.

HIGH_ADVISORY_NEED equals 1 if ADVISORY_NEED is above its annual median, where ADVISORY_NEED is the average of standardized values of INDUSTRY_VOLATILITY, SALES_GROWTH, MULTIPLE_SEGMENT, and negative FIRM_AGE. The four variables are standardized to have a zero mean and a standard deviation of 1. The LOW_ADVISORY_NEED indicator is equal to 1 minus HIGH_ADVISORY_NEED. We reestimate firm performance regressions and separately interact $OID_%$ with these two indicators to control for a firm's advisory needs.³⁷

Panel C of Table 11 reports the results. We find a significantly negative relation between OID presence and firm performance only in firms with low advisory needs. For firms with high advisory needs, no significant relation between firm performance and OID presence exists in most specifications. The difference in the coefficient estimates of the two interactions is generally statistically significant.

Finally, we differentiate between busy and nonbusy OID s, where an OID is defined as busy if she holds 3 or more directorships (Fich and Shivdasani (2006)).³⁸ 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 OID s.

We reestimate the firm performance regressions after decomposing the key variable $OID_%$ into two components: $BUSY_OID_%$ and $NONBUSY_OID_%$.³⁹ Panel D of Table 11 presents the regression results. We find that while the coefficient on $BUSY_OID_%$ is negative and highly significant across all columns, the coefficient on $NONBUSY_OID_%$ is significantly negative in 2 of 4 columns. Moreover, the coefficients of $BUSY_OID_%$ are significantly more negative than those of $NONBUSY_OID_%$. This evidence does not support the view that busy OID s are on average of higher quality and thus provide more valuable advisory services. Instead, it suggests that the deficiencies associated with OID s are compounded when they become overly busy.

In sum, this section uncovers interesting cross-sectional variations in the relation between OID s and firm performance. When OID s have specialized experience useful for specific firm decisions or firms have greater advisory needs, they are able to provide valuable advisory benefits that offset their monitoring deficiencies.

VII. Conclusion

We explore the implications of OID s for board effectiveness and corporate governance. Our director and firm-level analyses reveal that OID s are associated with both monitoring deficiencies and advisory benefits. With respect to the former,

³⁷The variables SALES_GROWTH and MULTIPLE_SEGMENT are included in the regressions, while INDUSTRY_VOLATILITY is absorbed by industry fixed effects.

³⁸The results remain qualitatively the same if we use 2 or 4 directorships to define busy directors.

³⁹Given 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 3 or more directorships.

we find that OIDs are more likely to miss board meetings, less likely to be a member or chair of important board committees, and less likely to receive strong shareholder support at annual board elections. Investors tend to react negatively to firm policy changes that increase the mandatory director retirement age and firm appointments of OIDs, while the deaths of OIDs generate positive stock market reactions. The presence of OIDs on corporate boards or key committees is associated with worse acquisition decisions, lower CEO turnover performance sensitivity, a lower percentage of equity-based CEO compensation, and poorer financial disclosure. On average, a greater representation of OIDs on corporate boards is negatively associated with firm performance. However, we also find evidence suggestive of OIDs' advisory value. For example, when OIDs have prior acquisition experience or professional experience in the target's industry, their presence on the acquirer's board is no longer negatively related to acquirer returns. In addition, unlike in firms with low advertising needs, the negative relationship between OIDs and firm performance no longer holds when managers are in greater need of board advice.

In sum, our study sheds light on the recent board aging phenomenon in the United States 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.

Appendix. Variable Definitions

Firm Characteristics

log(MARKET_CAP): The natural logarithm of the market value of equity. Source: Compustat.

STOCK_RETURN: The stock return over the year. Source: CRSP.

R&D: Ratio of research and development expenses to net sales. Source: Compustat.

VOLATILITY: Standard deviation of monthly stock returns during the last 5 fiscal years. Source: CRSP.

FIRM_AGE: 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.

CEO_AGE: The age of the CEO. Source: ExecuComp.

AVE_EXECUTIVE_AGE: The average age of the executive team. Source: ExecuComp.

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_YOUNGER_DIRECTORS: The number of directors and executives aged below 65 from firms headquartered in the same state as the sample firm scaled by the number of firms in the state. Source: ExecuComp and ISS.

- E-INDEX:** The Bebchuk, Cohen, and Ferrell (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 1 if CEO is also the board chair, 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 1 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.
- AVE_ID_TENURE:** The average tenure of independent directors. 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 the 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.
- GENDER_DIVERSITY:** The percentage of female directors on the board. Source: ISS.
- PROFESSIONAL_ID_%:** The percentage of professional independent directors, who are defined as independent directors without concurrent employment. Source: ISS.

Outcome Variables

- ATTEND_LESS75_PCT:** An indicator equal to 1 if an independent director attended less than 75% of a firm's board meetings, and 0 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_CHAIR:** An indicator variable equal to 1 if a director is the chair of any committee, and 0 otherwise. Source: ISS.
- AUDIT_AND_COMPENSATION_COMMITTEE_MEMBER:** An indicator variable equal to 1 if a director sits on both the audit committee and the compensation committee, and 0 otherwise. Source: ISS.
- AUDIT_OR_COMPENSATION_COMMITTEE_CHAIR:** An indicator variable equal to 1 if a director is the chair of the audit committee or the compensation committee, and 0 otherwise. Source: ISS.
- %WITHHELD:** The sum of shares voted against and shares voted abstain, scaled by all shares voted. Source: ISS.
- ISS_AGAINST:** An indicator equal to 1 if ISS recommends a withhold, against, or no vote for the director, and 0 otherwise. Source: ISS.

- 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 1 if a firm experiences a forced CEO turnover, and 0 otherwise. Source: Factiva.
- 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.
- 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.
- 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.
- ROA: Ratio of operating income before depreciation to total assets. Source: Compustat.
- TOBINS_Q: Ratio of market value of assets to book value of assets. Source: Compustat.

Supplementary Material

To view supplementary material for this article, please visit <http://doi.org/10.1017/S0022109023001151>.

References

- Aggarwal, R.; S. Dahiya; and N. R. Prabhala. "The Power of Shareholder Votes: Evidence from Uncontested Director Elections." *Journal of Financial Economics*, 133 (2019), 134–153.
- Armstrong, C. S.; J. E. Core; and W. R. Guay. "Do Independent Directors Cause Improvements in Firm Transparency?" *Journal of Financial Economics*, 113 (2014), 383–403.
- Baltes, P. B., and U. Lindenberger. "Emergence of a Powerful Connection Between Sensory and Cognitive Functions Across the Adult Life Span: A New Window to the Study of Cognitive Aging?" *Psychology and Aging*, 12 (1997), 12–21.
- Bebchuk, L.; A. Cohen; and A. Ferrell. "What Matters in Corporate Governance?" *Review of Financial Studies*, 22 (2009), 783–827.
- Bhattarai, D.; M. Serfling; and T. Woidtke. "Unveiling the Role of Director-Specific Quality in Firm Value Creation." Working Paper, available at https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4216979# (2023).
- Cai, Y., and M. Sevilir. "Board Connections and M&A Transactions." *Journal of Financial Economics*, 103 (2012), 327–349.
- Chhaochharia, V., and Y. Grinstein. "CEO Compensation and Board Structure." *Journal of Finance*, 64 (2009), 231–261.
- Coles, J. L.; N. D. Daniel; and L. Naveen. "Boards: Does One Size Fit All?" *Journal of Financial Economics*, 87 (2008), 329–356.

- Core, J.; R. L. Holthausen; and D. F. Larcker. "Corporate Governance, Chief Executive Officer Compensation, and Firm Performance." *Journal of Financial Economics*, 51 (1999), 371–406.
- Dou, Y.; S. Sahgal; and E. J. Zhang. "Should Independent Directors Have Term Limits? The Role of Experience in Corporate Governance." *Financial Management*, 44 (2015), 583–621.
- Fair, R. C. "How Fast Do Old Men Slow Down?" *Review of Economics and Statistics*, 76 (1994), 103–118.
- Fair, R. C. "Estimated Age Effects in Athletic Events and Chess." *Experimental Aging Research*, 33 (2004), 37–57.
- Faleye, O. "Classified Boards, Firm Value, and Managerial Entrenchment." *Journal of Financial Economics*, 83 (2007), 501–529.
- Fedaseyev, V.; J. Linck; and H. Wagner. "Do Qualifications Matter? New Evidence on Board Functions and Director Compensation." *Journal of Corporate Finance*, 48 (2018), 816–839.
- Feenstra, R. C. "U.S. Imports, 1972–1994: Data and Concordances." NBER Working Paper No. 5515 (1996).
- Feenstra, R. C.; J. Romalis; and P. K. Schott. "U.S. Imports, Exports, and Tariff Data, 1989–2001." NBER Working Paper No. 9387 (2002).
- Fich, E. M., and A. Shivdasani. "Are Busy Boards Effective Monitors?" *Journal of Finance*, 61 (2006), 689–724.
- Field, L.; M. Lowry; and A. Mkrtychyan. "Are Busy Boards Detrimental?" *Journal of Financial Economics*, 109 (2013), 63–82.
- Francis, B. B.; I. Hasan; and Q. Wu. "Do Corporate Boards Affect Firm Performance? New Evidence from the Financial Crisis." Working Paper, available at https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2041194# (2012).
- Fresard, L. "Financial Strength and Product Market Behavior: The Real Effects of Corporate Cash Holdings." *Journal of Finance*, 65 (2010), 1097–1122.
- Guo, L., and R. W. Masulis. "Board Structure and Monitoring: New Evidence from CEO Turnovers." *Review of Financial Studies*, 28 (2015), 2770–2811.
- Harford, J., and K. Li. "Decoupling CEO Wealth and Firm Performance: The Case of Acquiring CEOs." *Journal of Finance*, 62 (2007), 917–949.
- Hennes, K. M.; A. J. Leone; and B. P. Miller. "The Importance of Distinguishing Errors from Irregularities in Restatement Research: The Case of Restatements and CEO/CFO Turnover." *Accounting Review*, 83 (2008), 1487–1519.
- Horn, J. L. "Organization of Abilities and the Development of Intelligence." *Psychological Review*, 75 (1968), 242–259.
- Huang, S., and G. Hilary. "Zombie Boards: Board Tenure and Firm Performance." *Journal of Accounting Research*, 56 (2018), 1285–1329.
- Jenter, D., and F. Kanaan. "CEO Turnover and Relative Performance Evaluation." *Journal of Finance*, 70 (2015), 2155–2183.
- Knyazeva, A.; D. Knyazeva; and R. W. Masulis. "The Supply of Corporate Directors and Board Independence." *Review of Financial Studies*, 26 (2013), 1561–605.
- Lindenberger, U., and P. B. Baltes. "Sensory Functioning and Intelligence in Old Age: A Strong Connection." *Psychology and Aging*, 9 (1994), 339–355.
- Masulis, R. W.; C. Wang; and F. Xie. "Corporate Governance and Acquirer Returns." *Journal of Finance*, 62 (2007), 1851–1889.
- Minnick, K., and M. Zhao. "Backdating and Director Incentives: Money or Reputation?" *Journal of Financial Research*, 32 (2009), 449–477.
- Moeller, S. B.; F. P. Schlingemann; and R. M. Stulz. "Wealth Destruction on a Massive Scale? A Study of Acquiring-Firm Returns in the Recent Merger Wave." *Journal of Finance*, 60 (2005), 757–782.
- Nguyen, B. D., and K. M. Nielsen. "The Value of Independent Directors: Evidence from Sudden Deaths." *Journal of Financial Economics*, 98 (2010), 550–567.
- Pirinsky, C., and Q. Wang. "Does Corporate Headquarters Location Matter for Stock Returns?" *Journal of Finance*, 61 (2006), 1991–2015.
- Rönnlund, M.; L. Nyberg; L. Bäckman; and L. G. Nilsson. "Stability, Growth and Decline in Adult Life Span Development of Declarative Memory: Cross-Sectional and Longitudinal Data from a Population-Based Study." *Psychology and Aging*, 20 (2005), 3–18.
- Salthouse, T. A. "Aging and Measures of Processing Speed." *Biological Psychology*, 54 (2000), 35–54.
- Schaie, K. W. *Developmental Influences on Adult Intelligence: The Seattle Longitudinal Study*. Oxford: Oxford University Press (2005).
- Schott, P. K. "U.S. Manufacturing Exports and Imports by SIC and NAICS Category and Partner Country, 1972–2005." Working Paper, available at https://spinup-000d1a-wp-offload-media.s3.amazonaws.com/faculty/wp-content/uploads/sites/47/2019/06/sic_naics_trade_20100504.pdf (2010).

- Schroeder, D. H., and T. A. Salthouse. "Age-Related Effects on Cognition Between 20 and 50 Years of Age." *Personality and Individual Differences*, 36 (2004), 393–404.
- Spaniol, J., and U. J. Bayen. "Aging and Conditional Probability Judgements: A Global Matching Approach." *Psychology and Aging*, 20 (2005), 165–181.
- Valta, P. "Competition and the Cost of Debt." *Journal of Financial Economics*, 105 (2012), 661–682.