Do Director Ownership Plans Change Director Behavior?

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Abstract

We find evidence that director ownership plans further align directors' interests with shareholders, especially in the presence of influential institutional investors. In a propensity score-based matched sample difference-in-differences framework, we find directors in adopting firms are associated with greater ownership increases, a reduction in net sales of shares, and increased engagement relative to directors in non-adopting firms. Results are similar when examining directors with multiple directorships in director-fixed effects regressions. We also find disinterested directors depart firms after adoption. These findings indicate that ownership plans can be effective governing mechanisms, giving shareholders means to offset weak director reputation incentives.

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Abstract

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"Wow, with Jack departing, the Twitter (ticker: TWTR) board collectively owns almost no shares! Objectively, their economic interests are simply not aligned with shareholders"
Tweet by Elon Musk April 16, 2022 during his bid to acquire Twitter.

Introduction

The alignment of interests between independent directors and shareholders has long been a focus of corporate governance research (Jensen and Meckling (1976)) and, as the opening quote indicates, has important implications in practice today. Jensen (1993) emphasizes the importance of director ownership as an incentive mechanism and notes that "[m]any problems arise from the fact that neither managers nor nonmanager board members typically own substantial fractions of their firm's equity" (p. 864). Director target ownership plans directly address this concern. As of 2022, almost 80% of the boards in our sample had adopted plans requiring directors to obtain and maintain specified ownership levels. However, it is not clear if these plans actually impact director actions or if they simply are for show. In our sample, about 72% of the directors already meet the plan requirement at the time of adoption. Are such plans really meaningful if most directors already hold the targeted level of shares? Understanding whether these plans are effective or are merely a form of "governance-washing" has significant policy implications because these mechanisms purport to alter director incentives. Prior research has shown that other mechanisms either have too small of an effect (i.e., pecuniary incentives-Yermack (2004); Adams and Ferreira (2008)) or are outside of shareholders' control (i.e., reputation incentives - Masulis and Mobbs (2014)). If director ownership plans do alter director incentives in a way that changes director behavior, it represents an important tool for shareholders. In this paper, we evaluate the effectiveness of ownership plans adopted between 2007-2022 in changing director behavior.

A target ownership plan, or guidelines, usually requires directors to accumulate and

maintain a certain threshold of shares of the firm. The threshold can be a specific number of shares, a specific dollar value of shareholdings, or a certain multiple of their cash salary. Such ownership plans for directors can strengthen board monitoring in at least three ways. The most obvious mechanism is by increasing director ownership, which strengthens their incentive alignment with shareholders. But two often overlooked features of ownership plans are that they deter directors from selling shares and they incentivize disinterested directors to either be more engaged or to depart. While there is little research on director ownership plans, which is perhaps understandable given the vast research on the importance of ownership, these last two important aspects of director ownership plans, to our knowledge, have not received any attention.

Directors' ownership stake in the firm creates greater monitoring incentives through increased alignment with shareholder interests (Jensen and Meckling (1976)). Consistent with this argument Cornelli, Kominek and Ljungqvist (2013) find that boards with at least one director who is a large shareholder engage in more active monitoring. Similarly, Bhagat and Bolton (2013) find a positive relation between the dollar value of the median director's holdings and firm performance. Thus, if an ownership plan requires all directors to achieve a minimum ownership stake, the full board is incentivized to actively monitor.

Merely achieving a minimum level of ownership in and of itself may not be sufficient because from an agency perspective, self-interested directors have incentives to alter their ownership. When directors are aware of upcoming poor performance, they have an incentive to trade on that information and sell their shares. Once directors sell, they have less incentive to put forth the extra effort to monitor and advise the firm when it is needed the most. Furthermore, it makes departure less costly, especially prior to and during turbulent times (Fahlenbrach, Lo and Stulz (2010)). For these reasons, Jensen (1993) argues that discouraging board members from

selling their stake is vital for the effectiveness of director ownership. In line with this reasoning, Johnson & Johnson disclose on their corporate governance web page discussion of their ownership plan that "In the event there is a significant decline in the J&J stock price that causes a director's or executive's holdings to fall below the applicable threshold, the director or executive will not be required to purchase additional shares to meet the threshold, but such director or executive shall not sell or transfer any shares until the threshold has again been achieved."[3] Thus, having a minimum holding requirement to prevent directors from selling shares will strengthen their monitoring and advisory incentives during periods of poor performance, which can mitigate any negative impact to shareholders.

Finally, director ownership plans can create incentives for disinterested or distracted directors to depart. For example, a director for whom a directorship is relatively small compared to the other directorships where she serves, has relatively less incentive to put forth effort toward diligent monitoring, and her lack of attention can lower firm value (Masulis and Mobbs (2014)). A mandatory director ownership plan, by increasing the cost of this directorship, creates incentives for this weak monitor either to depart or to give more effort, either choice benefits shareholders.

Since the board is responsible for monitoring managers, it is reasonable for the board to put in place and enforce a manager ownership plan (Core and Larcker (2002)). However, director ownership plans are self-imposed by the board itself,[4] which further complicates our understanding of whether these plans are meaningful or are simply for show. If the majority of directors adopt a plan and impose its requirements on all the directors, such actions could strengthen board incentives, but this endogenous choice may convey more about the current

[3] http://files.shareholder.com/downloads/JNJ/2405216418x0x184415/323d2df3-9815-4388-a758-c1b5b66d271d/Stock_Ownership_Guidelines.pdf

[4] See Appendix 1 for examples of these target ownership plans.

directors (at least those in the majority) than any effect from the ownership plan itself. To address this concern, we recognize that proxy advisory firms strongly encourage the use of director ownership plans.[5] Since institutional investors follow the guidance of these organizations (e.g. Ertimur, Ferri and Oesch (2013)), we examine the role of institutional shareholders as influential monitors of director actions and their association with the adoption of director ownership plans.

Using director data from Institutional Shareholder Services (ISS) and target ownership plan data from IncentiveLab for the sample period 2006 to 2022, we first study the factors associated with firms adopting director ownership plans and the corresponding influence of institutional investors. We then examine director-level outcomes associated with the adoption of the director ownership plan. We obtain institutional holdings data from the 13f form through Thompson. Within our sample, 79.75% of the firm-year observations have a director target-ownership plan, and of the independent directors associated with an ownership plan, 71.96% of them meet their plan requirements. During this period, 658 firms adopted a director ownership plan. Similar to firms with a plan, 72% of the directors in these newly adopting firms already meet the plan requirement. Thus, the primary constraint imposed by most plans is deterrence to selling shares.

We begin our analysis by examining these new adopters and the factors associated with plan adoption. Relative to firms that do not have a plan, firms adopting a director ownership plan are similar in size but exhibit higher sales growth and higher R&D expenditures. The CEOs of these firms are more likely to be the chair of the board and have less ownership. These firms are more likely to have a manager ownership plan already in place and a greater portion of their shares are held by dedicated or active institutional investors. Lastly, we find a there is a greater likelihood

[5] For example, the ISS 2010 Governance Risk Indicators list not disclosing whether or not directors are subject to stock ownership guidelines as a risk indicator. Similarly, the Council of Institutional Investors Governance Policies (6.1) states that "The cornerstone of director compensation programs should be alignment of interests through the attainment of significant equity holdings."

of plan adoption when the board has weak reputation incentives. This effect is even greater in the presence of active institutional investors, which suggests that influential shareholders may use director ownership plans to offset weak reputation incentives among directors.

Next, we study changes in director behavior around the board's adoption of a director ownership plan. To reduce the concern that director characteristics cause both plan adoption and the outcomes we observe, we create a sample of independent directors adopting a plan matched with independent directors not under a plan but with similar ownership, stock trading patterns and engagement. Using this matched sample in a difference-in-differences framework around plan adoption, we find evidence of a significantly greater increase in director stock holdings,[6] a larger reduction in net sales of their shares, and improved board engagement in treated directors after plan adoption relative to control directors. These results provide initial assurance that the outcomes are likely caused by the plan adoption rather than these observable director characteristics. Moreover, these results are stronger in the presence of greater holdings by dedicated institutions.

It is possible that unobserved director characteristics may cause the outcomes we observe. For example, directors more inclined to monitor diligently may support imposing a director ownership plan. To address this, we focus on the subsample of directors with multiple directorships where some directorships adopt a plan and others do not, and employ director fixed effects regressions. We find greater director stock holdings, lower net sales of shares and improved engagement in the directors' directorships that adopt ownership plans relative to the directors' directorships that do not. This provides more assurance of causation from ownership plans rather than director characteristics.

In addition, consistent with the retention benefit of ownership plans, we find evidence that

[6] In unreported analysis we also examine the residual stock value using the error term from a regression model of ownership, comparable to Core and Larcker (2002), and find similar results.

directors who left the board after plan adoption are those with lower reputation incentives, smaller share holdings, are relatively older and are longer tenured. Finally, we find evidence that each of these director behavior changes are elevated when the adopted plan immediately impacts more than 50% of the independent directors (i.e. more stringent plans).

Lastly, we find evidence of a contagion effect around the 2006 regulatory change requiring firms to disclose their director ownership plans. Consistent with our main results, we find that directors in firms that adopt plans after 2006 are more likely to increase their ownership relative to firms with plans in place prior to 2006. Moreover, we find evidence that directors in firms that did not adopt after the disclosure also increased their ownership levels faster than those that had a plan in place before 2006. Thus, the increased disclosure and corresponding greater awareness of the widespread use of director ownership plans appears to have been associated with increased director ownership even among firms that did not immediately adopt a plan.

These findings contribute to the broader literature focused on agency concerns. While there is a vast literature on managerial ownership (e.g. Demsetz and Lehn (1985), Morck, Shleifer and Vishny (1988), McConnell, and Servaes (1990), Core and Larcker (2002), Quinn (2018)), there is much less research on the role of mandated corporate director ownership. Chen, Goldstein and Jiang (2008) document a positive relationship between mutual fund director ownership and fund performance, but they also note that "directors' monitoring has a very different nature and different implications in the mutual fund industry" as compared to corporate directors. Regarding corporate director ownership, Bhagat and Bolton (2008, 2013, 2019) document that director ownership is associated with better corporate operating performance. Given the endogenous relation between board characteristics, such as director ownership, and firm performance (e.g. Hermalin and Weisbach (2003) and Adams, Hermalin and Weisbach (2010)), the fact that Bhagat and Bolton

observe a positive relation suggests that frictions exist that can keep boards from achieving optimal levels of corporate director ownership without a mandatory plan. If frictions either deter directors from holding enough shares or do not deter them from selling shares, then director ownership plans can create value by ensuring directors' incentives stay aligned with those of shareholders. This is consistent with recent findings on mandatory executive ownership plans (Quinn (2018)).

Our findings also contribute to the literature on director reputation incentives (e.g. Fama and Jensen (1983) and Masulis and Mobbs (2014)) by showing that director ownership plans do alter director incentives in meaningful ways, which can offset weak director reputation incentives.

Finally, our findings contribute to the literature on the governance role of institutional investors, particularly dedicated institutional investors. Institutional investors, both active (e.g. Brav, Jiang, Partnoy and Thomas (2008)) and passive (e.g. Appel, Gormley and Keim (2016)), can affect corporate governance decisions. Appel, Gormely and Keim (2019) show that the presence of passive institutions can facilitate greater influence by active institutions. Our findings suggest that director ownership plans represent another mechanism through which dedicated institutions can exert their influence over firm corporate governance.

I. Ownership Plans, Sample and Descriptive Statistics

Our sample comes from the IncentiveLab database for the period 2006 to 2022.[7] For each firm-year observation, the database provides information on whether the firm has a target ownership plan in place, whether the plan is based on salary multiples, number of shares or total value of the director's holdings, the minimum level requirement, and the number of years to achieve the requirement. We also obtain information on directors' salary, equity-based

[7] The number of firms covered each year by IncentiveLab grew throughout our sample as follows: it started with around 800 firms from 2006 to 2008 and increased to more than 1000 firms after 2011.

compensation, total compensation, and shares of stock holdings from IncentiveLab. Firm level financial data for these firms is obtained from Compustat. After merging these data sets, we have 11,610 firm-year observations in the sample. We define all variables in Appendix 2.

We focus on the independent directors of the 11,610 firm-years, resulting in 107,976 director-firm-year observations for which 81.87% have an ownership plan. Of the director-firm-years with plans, 71.96% meet their firms' minimum requirements. Interestingly, of the firms adopting a plan during our sample period, 72.03% of the directors meet the plan's requirements at the time of adoption. Director board meeting attendance data is obtained from Institutional Shareholder Services (ISS). We merge the IncentiveLab director data with ISS, to obtain additional director information, by matching on director full name and company name. This results in 67,781 director-firm-year observations.

Table 1 Panel A compares independent directors in firms with a target ownership plan to independent directors in firms without such plans. Statistically, directors with plans are different from those without plans in several dimensions. For example, directors under plans are older, miss fewer meetings, serve on fewer committees, own less stock in the directorship firm and have fewer directorships than independent directors without plans. However, in each of these cases, the economic difference is small. For example, the difference in age is only three months, and the difference in the number of directorships is only 0.02.

Table 1 Panel B compares firms with target ownership plans to those without. Firms with plans are larger, have lower sales growth, lower stock returns, higher industry-adjusted ROA, and lower industry-adjusted stock returns. Firms with plans on average have lower CEO ownership but are also more likely to have a CEO ownership plan in place. Lastly, firms with director ownership plans in place have a significantly greater portion of their shares held by institutions.

In Table 1 Panel C we report common plan characteristics for the 11,610 firm-year observations with director ownership plans. In addition, for comparison we also report the ownership plan characteristics for other executives and the chairman of the board. While most firms with ownership plans use only one type of requirement, 17.9% of these firms utilize more than one form of these requirements.

The most common requirement, used by 65.09% of firms with a plan, is to require independent directors to hold company stock worth a specified multiple of their base salary. The mean and median multiples for these director plans is 4.48 and 5 times the base salary, respectively. These are comparable to the multiples used in CEO ownership plans (mean of 5.41 and median of 5). However, since the CEO's base salary is likely much greater than the directors' salary, the resultant CEO holdings, and thus incentives, are likely much greater than that for directors.

While independent directors and CEOs have similar required salary multiples, in firms that instead require a specific number of shares to be held, the average requirement is higher for CEOs. Only 12.17 % of the firms require their independent directors to hold a specified minimum number of their company shares. The mean and median number for independent directors is 20,975.21 and 8,616 shares, respectively. Whereas, the mean and median for CEOs in these firms is 201,511 and 120,000 shares, respectively.

Finally, 17.46% of firms' target ownership is value based. Of these, the mean and median minimum dollar amount of stock holdings required for independent directors is$380,679.02 and $350,000, respectively. These values are an order of magnitude smaller than that for CEOs, although only a few firms have value- based targets for non-directors.

On average, firms with plans require directors to achieve the minimum requirement within 51.9 months with the median being 60 months. Finally, 20.25% of the firm-year observations do

not have a target ownership plan for independent directors.

II. The Determinants of Plan Adoption

The impetus for a director ownership plan could come from the directors themselves or from shareholders. In the former case, a majority of directors may enact a director ownership plan to signal to the shareholders their commitment to monitoring managers and/or to create incentives for a few disinterested directors.[8] In either case, the adoption of the plan provides insight into director intentions. When a plan adoption is motivated by an influential shareholder, such an adoption can have an even greater impact on director incentives and behavior across the full board. We report the number of firms adopting a director ownership plan each year in Appendix 3.

To account for firm characteristics that are likely associated with plan adoption, we include firm size, sales growth, performance, volatility and growth opportunities as potential determinants. We control for firm size with the logarithm of total assets and firm market value with industry-adjusted Tobin's Q. Requiring ownership levels in larger firms can be costly and thus may deter such adoptions. Furthermore, larger firms are also more visible for the directors, which can create stronger reputation incentives and render ownership incentives less important. We control for firm sales growth because slow-growing firms can benefit from stronger monitoring to prevent manager entrenchment and encourage well-reasoned advice and guidance from directors. Better-performing firms can benefit from plan adoption by encouraging stronger monitoring of managers' use of the increased cash flow. We measure performance with industry-adjusted ROA. Because volatile firms

[8] Many boards state in their proxy statement their reason for adopting director ownership plans. For example, in the 2007 Lockheed Martin proxy statement the board states, "To further encourage a link between director and stockholder interests, the Board has adopted stock ownership guidelines for directors." Similarly, the 2008 proxy for Walgreens states, "To formalize further the Company's philosophy of aligning the interests of nonemployee directors and senior executives with the interests of shareholders, on October 8, 2008 the Board of Directors adopted Executive and Director Share Ownership Guidelines."

require greater monitoring effort, we control for stock return volatility. However, high stock return volatility makes equity holdings a less attractive tool to align director incentives due to directors' risk aversion, which makes ownership plans more costly for directors. We also control for growth opportunities with R&D intensity. Firms with many growth options can benefit from greater monitoring and advice by directors to ensure managers maximize the firm's potential.

We control for governance quality with board independence, board size, CEO duality, CEO ownership, current director ownership (Bhagat and Bolton (2013)) and board reputation incentives (Fama and Jensen (1983) and Masulis and Mobbs (2014)). We measure current director ownership with the median level of the percentage of shares owned among the independent directors on the board. In addition, given our focus on director ownership plans, we also control for the presence of a CEO ownership plan. A board that values CEO ownership may also value director ownership and thus view such plans as complementary. Alternatively, firms may view director ownership plans as substitutionary if they have fewer agency concerns due to high CEO ownership caused by a CEO ownership plan, making director incentives relatively less important. Furthermore, controlling for CEO ownership plan adoption also helps to control for the possibility of other policy adoptions that may influence director incentives.

Based on Masulis and Mobbs (2014), directors in firms that are relatively less (more) prestigious have weak (strong) reputation incentives to be active monitors. We capture a board's reputation incentives by first identifying directors with weak (strong) reputation incentives on a given board as those for whom this directorship is their lowest (highest) ranking directorship by market capitalization. We then measure the overall board's strong (weak) reputation incentive with an indicator variable that equals one if the percentage of independent directors with strong (weak) reputation incentive is above the sample median.

Finally, to account for the presence of influential shareholders, we include measures of institutional ownership. Prior research shows that institutional investors play an important monitoring role in corporate governance (e.g. Hartzell and Starks (2003) and Iliev and Lowry (2015)). Moreover, proxy advisor companies, such as ISS and Council of Institutional Investors, view lack of director ownership as a corporate governance quality concern.[9] Because institutional investors follow the advice of proxy advisor companies, they likely play a key role in encouraging companies to adopt director ownership plans. Furthermore, institutional investors' incentive to impose such policies can be stronger when they have substantial shareholdings. However, not all institutional investors have the same incentives to intervene in firm governance.

To account for these differing incentives, we decompose institutional investors into three groups, *Dedicated, Transient,* and *Quasi-indexer*, using the approach outlined in Bushee (1998). First, we construct nine measures capturing each institutional investor's portfolio concentration/diversification, degree of portfolio turnover, and institutions' trading sensitivity to earnings. We then decompose these nine measures into three common factors using principal factor analysis. We use the three common factors, named Concentration, Turnover, and Momentum, to classify all institutions into Dedicated, Transient, and Quasi-indexers by using k-means cluster analysis. Dedicated institutions have a high Concentration score, a low Turnover score, and an almost zero Momentum score. Transient institutions have high Turnover, high Momentum and low Concentration, while Quasi-indexers have low Concentration, low Turnover,

[9] ISS in its 2010 Governance Risk Indicators publication explicitly lists "It is not disclosed whether or not directors are subject to stock ownership guidelines" as a practice that increases concerns on governance risk. Council of Institutional Investors (CII) also lists in its governance policy that "The cornerstone of director compensation programs should be alignment of interests through the attainment of significant equity holdings" and "CII believes that equity obtained with an individual's own capital provides the best alignment of interests with other shareowners. However, compensation plans can provide supplemental means of obtaining long-term equity holdings through equity compensation, long-term holding requirements and ownership requirements."

and low Momentum. We expect Quasi-indexers and Dedicated institutions, because of their long-term focus, and thus incentive to intervene in firm governance, to have a stronger association with the likelihood of a board adopting a director ownership plan. Conversely, given their short-term focus, we expect transient institutions to not be associated with a greater likelihood of a director ownership plan adoption. Of the institutions in the regression sample, 51% are quasi-indexers, 32% are transient institutions, and 17% are dedicated institutions. We control for the percentage of shares held by each type of these institutional investors.

We report the results of logit regression models in Table 2. The dependent variable equals one if the firm reports to have a director ownership plan in year t in its proxy statement and is zero otherwise. The explanatory variables are in year t-1. We only consider firms that adopted a target ownership plan during the sample period and those that never adopted such plans. We exclude firms with director ownership plans in place throughout the sample period since we cannot identify their exact time of plan adoption. Likewise, once a firm adopts a plan during our sample, we exclude the firm-years after the adoption year. Thus, we examine the factors that influence a firm's plan adoption relative to firms without a plan.[10]

In model 1, we find evidence that firms with greater monitoring needs, as proxied by sales growth, R&D intensity, and low CEO ownership are associated with a higher likelihood of adopting director ownership plans. We also find that having a CEO ownership plan in place is significantly associated with a greater likelihood of the board adopting a director ownership plan, which suggest such plans are complementary rather than substitutionary. In subsequent analyses we control for both the presence of a CEO ownership plan as well as the level of CEO ownership.

[10] In unreported analysis, we find qualitatively similar results when we include the firm-years after adoption or only considered the adoption years of the adopting firms relative to non-adopting firms in the same year. In further unreported results, we also use the full sample of firm-year observations, thus the coefficient for the determinants of plan adoptions are relative to firms with a plan in place and those without a plan, and we find similar results.

We do not find a significant association between the median director ownership and the likelihood of the board adopting a plan in the following year. Lastly, we find the percentage holdings by dedicated institutional investors is associated with a significantly greater likelihood that the firm adopts a director ownership plan, while the shareholdings of transient institutions and quasi-indexers have no significant relation to plan adoption. Economically, increasing the holdings of dedicated institutions from 25th percentile to 75th percentile of the sample increases the estimated likelihood of plan adoption by 7.9 percentage points. Thus, institutions that are more likely to engage the board are positively associated with the adoption of a director ownership plan, whereas institutions that are more likely to "vote with their feet" (Parrino, Sias and Starks (2003)) are not.

Finally, we examine the effect of board reputation incentives on the adoption of a director ownership plan. The results are in Table 2 models 2-4. In model 2, we find a positive and significant coefficient estimate for the indicator for boards with weak reputation incentives. The marginal effect of this estimate reveals that boards in which directors have weak reputation incentives are about 5.1 percentage-points more likely to adopt a director target ownership plan. In model 3, we consider boards with strong reputation incentives and here we find no significant association with director ownership plan adoption.

Next, given the result in model 1, that different institutional shareholders view ownership plans differently, in model 4, we examine whether different institutional shareholders view ownership plans differently when conditioning on the board having weak reputation incentives. Specifically, we consider whether the presence of dedicated institutions, transient institutions or quasi-index institutions affects the use of director ownership plans when the board has weak reputation incentives. We continue to find that dedicated institutional holdings are associated with a significantly greater likelihood of the board adopting a director ownership plan. In addition, we

find this likelihood is even greater when the board has weak reputation incentives. Specifically, the coefficient on the interaction of the percentage holdings of dedicated institutions and the indicator for weak reputation incentives on the board is positive and significant at the 5% level. Economically, the marginal effect for an increase in dedicated institutional holdings from the 25th percentile to the 75th percentile in a firm where the board has weak reputation incentives is a 12.1 percentage-point greater likelihood that the board will adopt a director ownership plan. It is also interesting that the main effect for the weak board reputation indicator is insignificant, which contrasts with model 2 that did not condition on dedicated institutional holdings. Thus, when an influential shareholder is not present, boards with weak reputation incentives are no more likely than another firm to self-impose a director ownership plan. It is the presence of dedicated institutions that, in the presence of weak board incentives, drives the greater likelihood of adopting a director ownership plan. We find no evidence that other types of institutional investors are associated with director ownership plans when the board has weak reputation incentives.

In summary, the shareholders with the greatest incentives to monitor the board, dedicated institutional investors, have the strongest association with the use of director ownership plans. Moreover, this relation is strongest, when director reputation incentives are weaker. Finally, we find similar results when we incorporate firm fixed effects in a conditional logit specification.

III. The Impact of Ownership Plans

A. Empirical Methodology

To assess the effects of target ownership plans on directors' behaviors, we implement two empirical approaches. The first approach is to conduct a difference-in-differences (DiD) analysis around the adoption of a director ownership plan among a group of treatment and control directors.

Specifically, treatment directors are in firms that adopt a plan for the first time in our sample period. Control directors are similar to treatment directors along several dimensions but are in firms that do not have a plan and do not adopt a plan within the next four years. Since we have time-varying treatment, this definition of potential control group avoids the concern of utilizing a previously treated director as a control director (Goodman-Bacon (2021), Sun and Abraham (2021) and Baker, Larcker and Wang (2022)). We match treatment directors to multiple control directors with replacement using propensity score matching (PSM) based on the likelihood of the directors being under a target ownership plan. The propensity score is estimated using the director characteristics of age, gender and tenure and all the firm characteristics utilized in the Table 2 analysis.[11, 12] We then pick the best matches for each treatment director based on the distance between the treatment and the control observation propensity scores in the year before the adoption of a director ownership plan (treatment). The distance must be within the smallest quartile. Controlling for various firm characteristics in our regression model reduces concerns of selection bias stemming from those observable characteristics. Furthermore, by matching treatment director to control directors along several observable characteristics, it reduces the likelihood that any misspecification of these characteristics in any of our outcome regression models contribute to biases (Shipman, Swanquist and Whited (2017)).

In our sample, 1,423 treatment directors are matched to 58,337 control directors (1,795 unique control directors). Each control director on average is used 32 times, median is 18, and the

[11] For our reported results, we use the variables in Table 2 model 1 and include director age, gender and tenure. All of these variables are also included in our subsequent outcome regressions (Shipman, Swanquist and Whited (2017)). The results are unchanged if we use Table 2 model 4 and include all of the interaction terms in the PSM model and our subsequent outcome regressions.

[12] We control for the presence of a CEO ownership plan in the determinants model used to generate the propensity score. However, in unreported analysis we find similar results when, in addition to propensity score, we also directly match on whether or not the firm has a CEO ownership plan and results remain unchanged.

standard deviation is 11. Since we use matching with replacement and each control observation can be used multiple times in matching, we use weighted regressions in the following empirical analysis. Each observation is weighted using the inverse of their frequency in the regression (Stuart (2010)). To check the parallel condition for the DiD analysis, we first compare the average growth rate of director ownership, net sales, director disengagement, and the rate of director turnover across the treatment and control directors in the years prior to plan adoption. The statistics reported in Table 3 Panel A suggest that there are no significant differences in the trends between the two groups of directors in any of the four outcomes. Figure 1 reveals the pre-treatment parallel trends. In panels A-D, we plot each of these outcomes for the years [-3,3] around the plan adoption year.

In Table 3 Panel B, we report the differences in the means of key firm and director characteristics between the treatment and control directors pre- and post-matching. Prior to matching, treatment and control firms are significantly different along most of all dimensions. However, after the matching process, we find that the matched sample achieves good covariate balance. There are no significant differences across director characteristics (e.g. age, tenure and gender) and across most firm characteristics. The only firm-level differences are only marginally significant (10% level). Namely, treatment directors' firms have a slightly lower Tobin's Q and CEO ownership, and higher industry-adjusted ROA and stock return volatility, though the difference in stock volatility is economically trivial. Nonetheless, when we examine changes in director incentives and behaviors three years before and after the plan adoption, we will control for these characteristics to further ensure differences in director or firm characteristics are not causing the observed relations. Furthermore, since there are parallel trends between the two groups prior to plan adoption, any difference between these groups of otherwise similar directors after plan adoption is likely due to the plan.

Our second approach considers unobserved time-invariant director characteristics. If treatment directors are willing to hold greater ownership stakes in firms where they serve, they may self-select to the firms that offer plans and thus the differences in behavior could be driven by unobserved director characteristics. To address this possibility, we examine how the same director may behave differently on different boards. Specifically, we restrict the sample to directors with multiple directorships where at least one of their directorships is in a firm that has a director ownership plan and at least one is in a firm that does not adopt a director ownership plan. Thus, this sample matches each director-firm under a plan to the same director but in a different firm for each year, which accounts for all unobserved director characteristics. Hence, any differences in behaviors of the same director across different boards are likely attributed to the variation in the adoption of a director ownership plan in the director's directorships.

B. Director Ownership and Director Ownership Plan Adoption

Because director ownership plans are intended to increase director monitoring incentives through greater alignment with shareholders, we first examine whether these plans are associated with greater levels of director ownership. The effect of target ownership plans on director ownership is estimated in Table 4 Panel A where the dependent variable is the percentage of shares outstanding held by the director. We report results from the DiD analysis around the adoption of a director ownership plan using the matched sample of treated directors under a plan and control directors without a plan in model 1. The coefficient of interest is the interaction between the treatment indicator and the post indicator (the DiD effect). The post indicator variable equals one in the three years following the adoption and zero in the three years prior to the adoption (including the adoption year).[13] We also control for various firm, board, and director-level characteristics

[13] The results are robust to excluding the plan adoption year.

likely associated with director ownership levels, including lagged individual director ownership. Thus, any DiD effect associated with ownership plan adoption is incremental to any effect from a director's prior ownership. We also include firm and year fixed effects. Because the treatment effect time varies across firms, the post indicator is not subsumed by the year-fixed effects.

In model 1, we find a negative and significant coefficient estimate on the treatment indicator. This suggests that prior to adopting an ownership plan, directors in these firms have lower levels of ownership than the matched sample of directors in firms that do not adopt a plan within the next four years. Next, we find a negative and significant coefficient estimate on the post indicator, which suggests there is a general decreasing time-trend in the level of director ownership around plan adoptions. The coefficient estimate on the interaction between the treatment and post indicators (the DiD effect) is positive and significant. Thus, relative to control directors, directors in firms adopting a plan significantly increase their ownership after plan adoptions. In Figure 1, Panel A, we plot the annual average ownership for both control and treatment directors for each year in the [-3, 3] years window around the treatment directorships' plan adoption. Consistent with the DiD estimates, prior to plan adoption, ownership by treatment directors is significantly lower than that for control directors. The general decreasing trend is driven largely by the control directors. After the treatment, we see an increasing trend in treatment director ownership. By the third year after the plan adoption treatment director ownership increases to levels insignificantly different from those of control directors.

Model 2 uses the subsample of directors who hold multiple directorships with at least one directorship having a target ownership plan and at least one directorship without a target ownership plan. This model also incorporates director-fixed effects. Thus, in this context, a director's directorships that do not have an ownership plan serve as the control observations. We use a *With*

Plan indicator that equals one for the directorship-years that have a target ownership plan. In model 2, we find weak evidence that having a plan is significantly related to greater ownership making it unlikely that our results are driven by director self-selection. In unreported results, we also repeat model 2 incorporating director x firm fixed effects to account for time-invariant *directorship* characteristics. Thus, we are exploring variation within a directorship around the adoption of a plan. We continue to find a positive and significant coefficient estimate for the *With Plan* indicator.

In addition to requiring directors to increase their ownership levels, director ownership plans also create incentives by deterring director sales, which can be more binding and thus impactful. When directors sell shares their incentive alignment with shareholders is reduced. Thus, for directors with sufficiently high shareholdings instituting a plan can ensure those directors maintain those strong incentives by reducing the selling activity of these directors. To examine this possibility, we examine director net sales. The results are reported in Table 4 Panel B. The dependent variable is the total shares sold minus total shares purchased over the next year standardized by the number of shares outstanding. Model 1 reports results from DiD analysis of net sales using our matched sample. The coefficient estimate for treatment directors is positive and significant, which is consistent with directors having generally higher net sales in the firms where plans are later adopted and indicates that plans can impose a meaningful constraint on treated directors. Consistent with this imposing constraint, after the firms where these directors work adopt a director ownership plan, the magnitude of director net sales reduces significantly more than that for control directors (i.e. the DiD effect).

Figure 1 Panel B plots annual average net sales for each of the three years surrounding the adoption year. In the years prior to the adoption, net sales of treatment and control directors exhibit similar trends but net sales by treatment directors are significantly higher. However, following

adoption there is a noticeable change in the trends, namely net sales for treated directors exhibit a steeper decline. By the third year after the plan adoption treatment directors exhibit significantly lower levels of net sales (95% confidence level) relative to matched control director net sales. [14]

In models 2, we control for director-fixed effects, and we find that directors in their directorships with a plan in place exhibit significantly less selling activity. In unreported results, we again find similar results when examining within *directorship* variation, when incorporating director x firm fixed effects.

The results thus far indicate that director ownership plans significantly affect director ownership and do so through restricting director sales. However, the intent of increased ownership is to change director behavior. In the next section, we explore director actions to see if these plans indeed change behavior beyond restricting sales.

C. Director Engagement and Departure

Meeting attendance and committee membership are two measures of director attention to their monitoring duties at a given directorship. While it is difficult to measure a director's true monitoring efforts, if a director does not attend meetings or if they are not involved with the various committees it is less likely they are contributing to the board's discussions and corresponding actions. Thus, meeting attendance and committee memberships, or lack thereof, serve as an indirect indicator of a director's effort. Firms are required to report if a director attended less than 75% of the board meetings during the year. We follow prior studies (e.g. Adams and Ferreira (2008) and Masulis and Mobbs (2014)) and use this indicator as a measure for director attendance. Firms also report committee membership. We use both variables to create a measure of director disengagement that is equal to one if the director missed more than 25% of the board meetings

[14] To ensure the net sales results are not driven entirely by a potential increase in purchases, in unreported analysis we find similar results when using gross sales.

during the year or was not a member of any board committees. In Table 5, we examine the determinants of director disengagement using this indicator variable in the DiD framework employed in Table 4. If director ownership plans indeed change behavior, and are not just for show, we expect to see a reduction in director disengagement following plan adoption.

In Table 5 model 1, we find weak evidence (10%-level statistical significance) that treatment directors are associated with a higher level of disengagement relative to that of matched control directors before their firm adopts a director ownership plan. The post indicator is insignificant, indicating no contemporaneous trend in director disengagement. However, we are most interested in the coefficient of the interaction term. Here we find a negative and significant coefficient estimate, consistent with ownership plan adoptions improving director engagement at a significantly faster rate than directors not under ownership plans. Figure 1 Panel C plots the mean director disengagement for control and treatment directors around the plan adoption. Consistent with the regression estimates, in the years prior to plan adoption, treatment directors exhibit higher levels of disengagement, but after plan adoption, there is a decreasing trend in director disengagement among treatment directors, which suggests that plans can alter director behavior.

In model 2, we report results using only the sample of directors with multiple directorships. We find further evidence that having a director ownership plan is associated with significantly greater director engagement in those directorships relative to the same director in their other directorships without an ownership plan. In unreported results, we again find similar results when examining within *directorship* variation, when incorporating director x firm fixed effects.

Another potential benefit to target ownership plans is that they can force disinterested directors to depart. If the director is distracted by other directorships that they view as more important, they are likely to pay less attention to this directorship (Masulis and Mobbs (2014)) and

their presence on the board can actually be detrimental to board performance. Next, we examine director departures around plan adoptions in the same DiD framework and report the results in Table 6. The dependent variable equals one if the director departs the directorship next year and zero otherwise. We again are most interested in the coefficient of the interaction term. In model 1, we report results for the full sample of matched treatment and control directors and find a positive and significant coefficient estimate for the interaction term, indicating that treatment directors are associated with greater increases in director departures relative to control directors.

Looking at the annual mean director departure rates around the plan adoption year in Figure 1 Panel D, we see treatment directors have a lower departure rate, consistent with the estimates from the regression model 1. Both treatment and control director departure rates are increasing, also consistent with the coefficient estimate for the Post indicator in model 1. Furthermore, consistent with the DiD estimate from model 1, the slope for treatment directors becomes steeper after plan adoption and treatment directors exhibit higher departure rates after plan adoption. Next, in model 2, we include director fixed effects and consider only directors with multiple directorships. Here we continue to find evidence of a significant positive effect of having an ownership plan on within director departure rates, albeit statistically weaker (10% level).

If directors are more likely to depart following a director target ownership plan adoption, it is important to understand what type of directors are departing. In Table 7, we examine the departing-director (departing within three years of plan adoption) characteristics relative to the remaining-director characteristics in firms that adopt a plan and firms that do not have a plan now and do not adopt a plan in the next four years. In the treated firms, we find that the fraction of departing directors from whom this is their smallest directorship is significantly greater than for the fraction of directors who remain. We also find that departing directors have a higher likelihood

of being disengaged prior to their departure, relative to directors who stay. Moreover, departing directors have significantly lower stock holdings, even though they are older and have greater tenure. These results are consistent with ownership plans serving as a mechanism for removing disinterested directors who are likely to be weak monitors and simply did not want to be held to meeting the target ownership level instituted by the plan adoption. This is especially valuable if the firm does not have a strong influential shareholder presence.

In the control firms, those that do not have a plan within the next four years, we find no statistical differences between directors who stay and those who depart in terms of their age, tenure, attendance, number of directorships held, and stock ownership. In contrast with what we find in adopting firms, a smaller portion of the departing directors in firms that do not adopt plans were leaving their smallest directorship or were less engaged. Thus, the evidence does not support the conjecture that directors who depart control firms are weaker monitors.

In summary, the evidence in Tables 5 through 7 suggests that required director ownership plans do improve director incentives and change director behavior. First, they are associated with improved meeting attendance and committee membership, which is consistent with the director putting forth more effort in the directorship. Second, the less motivated and less engaged directors tend to depart boards following ownership plan adoption.

D. Expanded Pre- and Post-Trend Analysis

While Panels A-C of Figure 1, show little evidence of differences in the pre-treatment trends of each outcome variable between treatment and control firms, in this section we expand the DiD specification to allow for the separate years before and after treatment. This expanded specification does two things. First, it gives greater statistical insight into the pre-treatment differences between treatment and control directors. Second, it provides additional insight into the

speed of the treatment effect (i.e. how long after plan adoption is the outcome affected). We report the results in Table 8.

In model 1 we report the results for director ownership percentage. Similar to the results in Table 4A we find a negative and significant coefficient for the treatment indicator. We also find a negative and significant coefficient for the interaction between the treatment indicator and the indicators for the years (t-1) and years (t-2). Thus, there is no sign of an increasing trend of the director ownership among the treatment firms prior to the treatment. However, following plan adoption we find a positive and significant coefficient estimate for the interaction terms between the treatment indicator and the indicators for years (t+2) and years (t+3). Thus, it takes two years for the plan to affect noticeable increases in director ownership.

In model 2, we examine directors' net sales and we find again similar patterns to those of our earlier results (Table 4B). Specifically, the coefficient estimate on the treatment indicator is positive and significant, indicating that prior to treatment, treatment firm directors have significantly higher net sales. Moreover, treatment firm directors, prior to treatment, have significantly greater net sales in each of the three years prior to treatment, as is evident by the significantly positive coefficient estimates for the interaction between the treatment indicator and each year indicator prior to treatment. However, the interactions for the treatment indicator in each of the three years after plan adoption are negative and significant, suggesting significantly lower net sales by directors in treatment firms. While it can take time to build up ownership (model 1), the limitation on sales is immediate.

When we examine director disengagement in model 3, we find an effect similar to net sales. Namely, we find that treatment directors prior to the adoption of a plan have a significantly greater likelihood of being more disengaged than other directors. There is no evidence of a decreasing

trend prior to plan adoption. However, after plan adoption, we find a significantly lower likelihood of director disengagement in treatment firms in each of the three years following adoption. Interestingly, the economic effect strengthens each year, which suggests that over time ownership plans incentivize directors to either become more involved or to ultimately decide to leave the board. Relatedly, in model 4, we find no evidence of greater turnover before plan adoption. However, in the first year after plan adoption, we find a significantly greater likelihood of director turnover. We also find a significantly greater likelihood of director turnover in the second year after plan adoption, although the economic effect is slightly smaller.

Overall, the results in table 8 provide insight into the timing of how director ownership plans affect behavior. The effects on director ownership and director engagement appear to slowly manifest, whereas the effects on director net sales and director turnover are more immediate.

E. Presence of an Influential Shareholder – Dedicated Institutional Holdings

In this section, we consider the presence of influential shareholders by focusing on treatment and control directors in firms with greater than the median holdings of dedicated institutional investors. We repeat our DiD analysis from Tables 4-6 using the matched sample of directors from firms that adopt an ownership plan and also have above (below) the median level of holdings by dedicated institutional investors and directors from firms that do not have a plan but have above (below) the median level of dedicated institutional investor holdings. The results are reported in Table 9.

In models 1 and 2, the dependent variable is the director's percentage of stock ownership in the firm. In model 1, we report results for the subsample of firms with above-the-median holdings by dedicated institutional investors. We find that treatment directors experience a significantly greater increase in their stock ownership after the adoption of a plan relative to control

directors. In model 2, we focus on those firms with below-the-median holdings by dedicated institutional investors. We find that after plan adoption treatment directors continue to have significantly *less* stock holdings.

In models 3 and 4, the dependent variable is the director's net sales. In model 3, using the subsample of firms with high dedicated institutional holdings, we continue to find evidence of a significantly negative DiD effect. In model 4, using the subsample of firms with low dedicated institutional holdings, we find no evidence of reduced selling activity after plan adoption.

In models 5 and 6, we examine director disengagement and we find that the significantly negative DiD effect of the plan adoption is driven primarily by firms with a strong presence of a dedicated institutional investor (model 5) rather than by firms with less of a presence by these influential investors (model 6).

Finally, in models 7 and 8, we examine director turnover across these two subsamples of firms with high and low dedicated institutional holdings, respectively. Here we find evidence that director target ownership plan adoption is associated with significantly greater director departure after adoption relative to control directors in both subsamples. While the two coefficient estimates for the DiD effect are not statistically different, the coefficient estimate for the DiD effect in model 7 is 33% greater than the corresponding coefficient estimate for the DiD effect in model 8. In general, the results in Table 8 underscore the importance of influential shareholders in making director ownership plans meaningful.

F. Quasi-Natural Experiment: Ownership Plan Disclosure

To provide further evidence in support of a causal relationship, we use the SEC's 2006 changes to disclosure requirements concerning executive and director compensation as a shock to having a plan. While this regulatory change did not mandate firms to adopt an ownership plan, it

did require a new disclosure in the form of a compensation discussion and analysis and provided greater transparency. Following the disclosure, firms and shareholders can see which boards have director ownership plans and which ones do not. Thus, shareholders of firms without a plan may put greater pressure on their boards to respond in kind either by adopting their own plan or, if not adopting a plan, encouraging directors to increase ownership and thus achieve some of the benefits of having a plan. Conversely, boards with a plan already in place at the time of the disclosure would not be affected by the shock. If the disclosure of ownership plans causes boards/directors to respond by increasing ownership, we expect directors on boards without a plan in place to increase director ownership after 2006 to a greater degree than those on boards with a plan in place prior to 2006. We test this using a DiD specification and report the results in Table 10.

In 2006, 501 firms in our sample had a director ownership plan in place. We consider these as the control firms in these tests. In Table 10 model 1, the treatment firms are the 301 firms that do not have a director ownership plan in place in 2006. We find a significantly greater increase in ownership in years 2009 and 2010 in treatment firm directors relative to control firm directors. This increase could be due to treatment firms adopting plans or simply due to greater pressure to increase ownership after the disclosure rule revealed the use of director ownership plans by other firms, or both. In model 2, we limit the treatment firms to those firms that adopt a plan between 2007 and 2010. We again find evidence consistent with the plans significantly increasing ownership, but we notice the effect sooner. Treatment firms are significantly more likely to have a greater increase in ownership in years 2007-2010, relative to firms that had a plan in place in 2006. Thus, adopting a plan had a meaningful impact on director ownership beyond that due to greater pressure arising from greater transparency.

Next, to focus on the effects of transparency on director ownership market-wide, in model

3, we limit the treatment firms to those firms that did not adopt a director ownership plan through 2010. Despite the lack of a required ownership plan, we find evidence that directors in firms without a plan increased their ownership by a significantly greater amount in 2009 and 2010. The increase in director ownership among firms without a plan may reflect their intention to eventually adopt a plan but only after their directors have increased ownership to levels closer to an expected plan's requirements. Thus, greater transparency arising from the disclosure benefited shareholders of all firms, but those firms that adopted a formal director ownership plan experienced the swiftest and greatest response.

G. Strict Ownership Plans

Lastly, we examine the most meaningful or impactful ownership plans. As we reported earlier, many directors already meet the plan ownership requirements at adoption. While we continue to find significant effects associated with these plans despite the greater conformity at adoption, we expect plans in firms with less conformity at adoption to be more impactful. In this section, we separately consider plans where more than 50% of the independent directors do not meet the plan requirements at the time of adoption. We repeat our analysis from the models from Tables 4A, 4B, 5 and 6 that incorporate director fixed effect and condition on these strict plans. Specifically, we introduce an interaction term *With Plan * Strict Plan* to capture the incremental effect from a more meaningful plan. The results are in Table 11. For director ownership, we continue to find a similar result for plan adoptions generally, however, when less than 50% of the independent directors meet the plan's requirements initially, the incremental effect of the plan is 35% greater. For net sales, the *With Plan* indicator is insignificant, but the coefficient on the interaction term is negative and significant, which suggests that the impact on Net Sales from plan adoption is driven largely by the adoption at firms where there is substantially less compliance at

adoption. We find a similar effect for director disengagement and director turnover. Thus, when fewer directors are in compliance, there are greater effects from plan adoption on director behavior.

IV. Conclusion

Director reputation incentives are a strong motivating force in the director labor market. Unfortunately, shareholders and firms have little ability to alter the relative reputation incentives their directorships provide. However, shareholders can use other incentive mechanisms to offset weak reputation incentives or other disincentives for directors to exert greater effort in their monitoring and advisory roles. Compensation can be helpful, but empirically its effects appear small. Ownership, on the other hand, can be useful in aligning incentives and can provide firms and shareholders with a mechanism for offsetting weak director incentives.

We find evidence that the adoption of target ownership plans (1) increases alignment with shareholders, (2) deters selling of shares (3) creates incentives for directors to be more engaged with the firm and (4) creates incentives for disinterested directors to depart, especially in the presence of influential investors.

In summary, the evidence suggests that director ownership plans do effectively alter the incentives and the behavior of directors, leading them to give more attention to the firm and to shareholders' interests through stronger monitoring. Thus, director ownership plans can be a useful mechanism for offsetting weak governance structures within a firm, which makes them a powerful tool for firms and an important component for policymakers to consider.

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Appendix 1 Examples of Target Ownership Plan Disclosure in the Proxy Statements

Arrow Electronics proxy statement year 2011

The board recognizes that stock ownership by its directors may strengthen their commitment to the long-term future of the company and further align their interests with those of the shareholders generally. As a result, the corporate governance guidelines specifically state that directors are expected over time to own beneficial shares of the company's common stock having a value of at least three times their annual retainer (including shares owned outright, vested shares of restricted stock or restricted stock units and common stock units in a deferred compensation account). All directors are in compliance with this requirement.

Johnson & Johnson proxy statement year 2007

In 2006, the Board of Directors approved stock ownership guidelines for Directors and executive officers to further align their interests with the interests of the Company's shareholders. Under these guidelines, the Chairman/CEO will be required to directly or indirectly own Company Common Stock equal in value to five times his or her annual salary, and the other executive officers will be required to own stock equal to three times his or her annual base salary. Non-Employee Directors will be required to own stock equal to three times his or her annual retainer, in addition to the stock initially granted upon joining the Board. The Board may designate other executive officers to be subject to specific stock ownership thresholds. Stock ownership for the purpose of these guidelines does not include shares underlying unvested stock options. Individuals subject to these guidelines will be required to achieve the relevant ownership threshold within five years after first becoming subject to the guidelines. If an individual becomes subject to a higher ownership threshold due to promotion or increase in base salary, that individual will be expected to meet the higher ownership threshold within three years. The Nominating & Corporate Governance Committee of the Board will review compliance with these guidelines on an annual basis.

Lockheed Martin proxy statement 2007

Equity Ownership by Directors. The Board believes that directors and management should hold meaningful equity ownership positions in Lockheed Martin. To further encourage a link between director and stockholder interests, the Board has adopted stock ownership guidelines for directors. Similar guidelines apply to our management. Directors receive half of their compensation in the form of Lockheed Martin common stock units or stock options (with the potential to defer the remaining cash portion in stock units). In addition, directors are expected to own shares or stock units equal to two times the annual retainer within five years of joining the Board. Until a director has achieved these stock ownership guidelines, a director is expected to select common stock units as the form of any annual equity compensation award.

To formalize further the Company's philosophy of aligning the interests of nonemployee directors and senior executives with the interests of shareholders, on October 8, 2008 the Board of Directors adopted Executive and Director Share Ownership Guidelines. Under the Guidelines for nonemployee directors, within five years of the later of commencement of Board membership and November 1, 2008, each director is expected to accumulate at least the lesser of 20,000 shares of Walgreen Co. common stock and the number of shares valued at three times the director's total annual cash and equity compensation.

Appendix 2 Variable Definitions

Variable	Definition	Source
Adj Tobin's Q	Firm Tobin's Q - median industry Tobin's Q where industry is defined as all the other firms in the same Fama-French 49 industry based on the Compustat universe of firms. (Total book assets – book value of equity +market value of equity)/Total book assets	Compustat
Adj ROA	Firm ROA - median industry ROA where industry is defined as all the other firms in the same Fama-French 49 industry based on the Compustat universe of firms. ROA= data items NI / lag AT	Compustat
Adj stock return	firm's stock return adjusted by the value-weighted CRSP index return cumulated over the prior 12-months	CRSP
Ln (Board size)	Natural log of number of directors on the board	ISS
% CEO ownership	Percentage of shares the CEO owns	Execucomp
CEO ownership plan	Indicator variable that equals one if the firm has a CEO ownership plan in place, and zero otherwise	IncentiveLab
CEO Chair	Indicator variable that equals one if the CEO is also the chair of the board, and zero otherwise	
Disengagement	An indicator equals one if the director attended less than 75% of the meetings or was not on any board committee membership in a year, and zero otherwise.	ISS
Director turnover	An indicator variable equals one if a director leaves the company next year, and zero otherwise	
Firm age	The number of years a firm has been listed as a public firm	CRSP
Leverage	(Long term debt + debt in current liability)/(long term debt + debt in current liability + market value of equity)	Compustat
Pct of board independence	Percentage of directors being independent directors	ISS
R&D/TA	Total R&D expenses over book value of total assets	Compustat
Director Ownership	% of shares held by a director relative to the firm's total shares outstanding	Incentive Lab and Compustat
Sales growth	Percentage of sales grows since previous year	Compustat
Stock volatility	The standard deviation of monthly stock return over the prior five years	CRSP
Total Assets	Book value of total assets	Compustat
% holding of dedicated institutions	% of shares held by dedicated institutions. Dedicated institutions are defined based on Bushee (1998) and the process is outlined in the text.	Thompson
% holding of transient institutions	% of shares held by transient institutions. Transient institutions are defined based on Bushee (1998) and the process is outlined in the text.	Thompson
% holding of quasi-index institutions	% of shares held by quasi-index institutions. Quasi-index institutions are defined based on Bushee (1998) and the process is outlined in the text.	Thompson

Appendix 3. Adoption by Year

Adoption Year	Number of New Adopters
2007	68
2008	41
2009	50
2010	41
2011	46
2012	42
2013	31
2014	22
2015	34
2016	66
2017	51
2018	39
2019	37
2020	39
2021	27
2022	24

Table 1 Summary Statistics

The sample consists of 107,976 independent director-firm-year observations for 14,558 firm-year observations of 1,725 unique firms during the fiscal year of 2006-2022. The target ownership plan data and director compensation data are from the IncentiveLab database, while other director characteristics are from the ISS database.

Panel A: Director level descriptive statistics

# of director-firm-year observations	107,976
# of directors with plans	88,402 (81.87%)
% of directors meet plan requirements	71.96%

	Directors without Plans			Directors with Plans			T-stat
	Mean	Median	N	Mean	Median	N	
Age	63.01	64	13322	63.26	64	75931	-3.46***
Tenure	8.38	6	10919	8.31	6	69014	1.03
% of being less engaged	17.55%	0	10123	19.63%	0	57658	-4.43***
% of attend less than 75% of meetings	0.8%	0	10123	0.45%	0	57658	4.40***
# of committee memberships	1.70	2	10123	1.60	1	57658	7.08***
% of director turnover	26.70%	0.00	17681	21.83%	0.00	76175	13.91***
% of female	20.40%	0	13322	25.91%	0	75931	-13.43***
Pct of ownership	0.37%	0.01%	17503	0.18%	0.01%	81915	21.77***
# of directorships	1.02	1.000	10123	0.97	1.00	57658	2.89***

Panel B: Firm level descriptive statistics

	Firms without Plans			Firms with Plans			
	Mean	Median	N	Mean	Median	N	T stat
Total assets	26014.09	4887.87	2948	29357.45	7766.59	11610	-2.05**
Sales growth	11.38%	7.21%	2819	8.97%	6.09%	11509	4.58***
Leverage	26.70%	20.56%	2941	26.84%	22.58%	11578	-0.32
Stock volatility	10.59%	9.03%	2783	9.49%	8.28%	11472	10.44**
R&D/total assets	3.30%	0	2948	2.59%	0	11610	5.83***
Adjusted Q	0.31	-0.11	2941	-2.20	0.09	-0.19	7.32***
Adjusted ROA	6.48%	3.74%	2948	8.68%	4.88%	11609	-8.02***
Adjusted stock return	7.42%	0.35%	2671	3.60%	-0.60%	11372	2.17**
% CEO ownership	3.15%	0.67%	2777	1.28%	0.44%	11178	21.37***
CEO ownership plan	56.77%	100%	2948	94.75%	100%	11610	-61.05***
CEO-Chair duality	36.77%	0	2948	38.29%	0	11610	-1.52
% holdings of dedicated inst.	4.55%	4.80%	2175	5.13%	5.32%	9134	-12.28***
% holdings of transient inst.	14.56%	10.08%	2175	19.30%	12.14%	9134	-12.54***
% holdings of quasi-index inst.	9.40%	8.72%	2175	10.21%	9.77%	9134	-6.24***
Pct of board independence	84.24%	85.71%	2948	84.05%	88.88%	11610	0.32
Board size	9.36	9	2948	10.22	10	11610	-16.35***

Table 1. (continued)

Panel C: Ownership plans descriptive statistics

Required Salary Multiples	Mean	Median	N
Independent directors (non-chair)	4.48	5	11610
CEO	5.41	5	11621
CFO	2.86	3	11621
NEO	2.63	3	11621
Chair of the Board	4.99	5	11610

Required Number of Shares	Mean	Median	N
Independent directors (non-chair)	20975.21	8616	1771
CEO	201511.20	120000	1384
CFO	64428.39	35000	1384
NEO	44778.00	25000	1384
Chair of the Board	99079.89	25000	1771

Required Dollar Value of Holdings	Mean	Median	N
Independent directors (non-chair)	380,679.02	350,000	2542
CEO	3,793,483.56	4,500,000	475
CFO	1,707,515.41	1,586,440	475
NEO	1,393,321.56	1,100,000	475
Chair of the Board	866,989.87	400,000	2542

Months to Achieve Holdings	Mean	Median	N
Independent directors (non-chair)	51.99	60	2822
CEO	55.60	60	2549
CFO	55.56	60	2549
NEO	55.56	60	2549
Chair of the Board	52.13	60	2822

Table 2. Firm Level Determinants of Adopting A Plan

This table reports the logit regression estimates on the likelihood of a firm adopting a target ownership plan. In model 1, we report results using the subsample of firms who adopted a target ownership plan during the sample period (excluding firm-years after the adoption) and firms who never have a target ownership plan in our sample period. The dependent variable equals one if a firm adopts a target ownership plan in year t. All independent variables are measured at year t-1. All models incorporate the percentage of holdings by various types of institutions (*Dedicated, Transient and Quasi-indexers)*, along with other key firm and board characteristics. Models 2-4 incorporate the impact of board reputation incentive. *Board has low (high) reputation incentive* is an indicator variable equals one if the percentage of directors with low (high) reputation incentive is above the sample median. A director is considered as having low (high) reputation incentive on a board if it is the director's smallest (largest) directorship by market capitalization. All models have year and industry fixed effects. The definitions of all control variables are in Appendix 1. Standard errors are reported in the parenthesis. They are robust to heteroscedasticity and clustered at firm level. ***, **, and * denote the statistical significance at 1%, 5% and 10% level.

Table 2. (continued)

	Model 1	Model 2	Model 3	Model 4
% holding of dedicated institutions	1.694***	1.545***	1.632***	1.034*
	(0.487)	(0.943)	(0.492)	(0.546)
% holding of transient institutions	0.560	0.689	0.628	0.487
	(0.817)	(0.824)	(0.820)	(0.886)
% holding of quasi-index institutions	-0.472	-0.985	-0.613	-0.039
	(1.593)	(1.614)	(1.601)	(1.877)
Board has low reputation incentive		0.464***		-0.672
		(0.158)		(0.708)
Board has high reputation incentive			0.170	
			(0.160)	
% holding of dedicated institutions * Board has low reputation incentive				2.046**
				(0.950)
% holding of transient institutions * Board has low reputation incentive				1.395
				(1.365)
% holding of quasi-index institutions * Board has low reputation incentive				-1.970
				(3.108)
Log(AT)	0.034	0.080	0.030	0.077
	(0.075)	(0.077)	(0.075)	(0.077)
Adj ROA	0.194	-0.026	0.074	-0.132
	(0.919)	(0.093)	(0.927)	(0.937)
Adj Tobin's Q	0.075	0.080	0.077	0.085
	(0.064)	(0.065)	(0.064)	(0.065)
Leverage	0.917*	0.931*	0.944*	0.910*
	(0.511)	(0.513)	(0.512)	(0.513)
Adj Stock Return	-0.185	-0.205	-0.182	-0.209
	(0.151)	(0.154)	(0.151)	(0.154)
Stock Volatility	-0.177	0.060	-0.012	-0.115
	(1.885)	(1.892)	(1.892)	(1.898)
Sales Growth	0.511**	0.565**	0.520**	0.565
	(0.235)	(0.237)	(0.235)	(0.237)
RD/TA	4.356**	4.656**	4.326**	4.525**
	(1.922)	(1.925)	(1.922)	(1.934)
Pct of Board Independence	-0.338	-0.254	-0.321	-0.246
	(0.350)	(0.353)	(0.351)	(0.353)
Ln (board size)	-0.058	-0.096	-0.050	-0.075
	(0.308)	(0.309)	(0.309)	(0.310)
CEO Chair	0.262	0.235	0.260	0.279*
	(0.165)	(0.165	(0.165)	(0.167)
%CEO Ownership	-2.624***	-2.435	-2.596	-2.526
	(1.559)	(1.609)	(1.600)	(1.610)
CEO ownership plan	2.316***	2.318***	2.312***	2.333***
	(0.221)	(0.213)	(0.213)	(0.214)
Median of %dir.ownership	-0.983	-0.886	-0.565	-0.567
	(9.092)	(9.168)	(9.111)	(9.128)
Obs	2055	2055	2055	2055
Likelihood ratio	616	621	613	616
Pseudo R-squared	0.26	0.26	0.26	0.27

Table 3: Director Matched Sample: Parallel Trends and Covariate Balance

Panel A of this table examines the parallel conditions of the key outcome variables for adopting firm directors and matched non-adopting firm directors prior to the adoption of target ownership plans. We report and compare the average year-to-year changes in these variables in the three years prior to adoption from year t-3 to t=0. Panel B reports the differences in means of the covariates across treatment and control groups before and after the matching process. The treatment group includes independent directors in firms that adopt a director ownership plan during the sample period (new adopters), while the control group includes independent directors in firms that do not have a plan and do not adopt a plan within four years (non-adopters). In the pre-match comparison, the mean of the covariates for treatment directors are reported one year prior to the adoption of director ownership plan. Since we focus on the characteristics of the treatment directors and their firms immediately before the adoption, each treatment director only has one observation. In the pre-match comparison, the control group is all director- firm-year observations of directors in firms that do not have a plan and do not adopt a plan within four years (non-adopters). In the post-match comparison, we report the mean of these covariates one year before the treatment firm adopting a plan for matched treatment directors and control directors. ***, **, and * denote the statistical significance at 1%, 5% and 10% level.

Panel A: Parallel Trend

	Treatment Director	Control Director	T-stat
Average change in mean Director % Ownership	0.0167%	0.0167%	0
Average change in mean Net sales	-0.0017%	-0.001%	-0.554
Average change in the rate of being less engaged	-1.10%	-0.63%	-1.07
Average change in the rate of Director turnover	5.62%	4.47%	0.407

Panel B: Covariate balance between treatment and control directors before and after match process

	Pre-match			Post-match		
	Control	Treatment	Diff in Means	Control	Treatment	Diff in Means
Director age	63.53	62.17	1.36***	63.46	62.78	0.68
Director tenure	8.60	8.28	0.32	8.50	8.43	0.06
Female indicator	20.14%	17.53%	2.61%**	16.55%	17.92%	-1.37%
% Director ownership	0.31%	0.18%	0.13%***	0.17%	0.19%	-0.02%
Log(AT)	9.20	8.81	0.39	9.27	9.20	0.07
Adj ROA	0.08	0.10	-0.02***	0.08	0.09	-0.01*
Adj Tobin's Q	0.32	0.21	0.11***	0.05	0.03	0.02*
Leverage	0.23	0.23	-0.00	0.24	0.24	0.00
Adj Stock Return	7.86%	8.57%	-0.71%**	7.94%	8.37%	-0.43%
Stock Volatility	9.4%	8.3%	1.1%***	8.0%	8.0%	-0.0%*
Sales Growth	13.81%	10.30%	3.51***	12.46%	10.52%	1.95%
RD/TA	2.7%	2.6%	0.10%	2.66%	2.67%	-0.01%
Pct of Board Independence	84.47%	87.44%	-2.97%***	88.09%	87.23%	0.86%
Board Size	9.97	10.48	-0.51***	10.59	10.38	0.21
CEO Chair	57.62%	49.05%	8.57%***	68.14%	68.21%	-0.07%
% CEO Ownership	2.21%	1.44%	0.77%***	1.82%	1.51%	0.31%*
CEO ownership plan	71.02%	74.23%	-3.21%**	83.94%	82.94%	1.00%
% holding of dedicated institutions	5.08%	5.34%	-0.26%***	5.32%	5.32%	0.00%
% holding of transient institutions	14.31%	13.21%	1.10%***	13.71%	13.37%	0.34%
% holding of quasi-index institutions	10.01%	9.73%	0.28%**	9.51%	9.71%	-0.20%
Number of director-year obs	6004	1529		58337	1423	
Unique director-year obs	6004	1529		1795	1423	

Table 4. Director Ownership Plan Adoption: Director % Ownership and Sales

This table reports the results of regression models of the percentage of director ownership (Panel A) and director net sales (Panel B). Director ownership is the percentage of shares outstanding of the firm owned by the director. Director net sales is the number of shares sold minus the number of shares purchases all divided by the total shares outstanding. Model 1 uses the matched sample, a director in a firm that adopts target ownership plan during the sample period is matched to directors in firms that do not have a plan and do not adopt a plan within four years using propensity score matching. The effect of adopting a target ownership plan is examined within three years before and after plan adoption. *Treat* is an indicator variable equals to one for the treatment directors. *Post* is an indicator variable equals to one for years after the plan adoption and zero for years before the adoption (including the year of adoption). Model 2 uses the sample of directors who have multiple directorships in firms with plans and firms without plans. *With plan* is an indicator variable that equals to one if this directorship has a target ownership plan. The definitions of all control variables are reported in Appendix 1. All independent variables are measured at year t-1. Model 1 has year and firm fixed effects. Model 2 includes year and director fixed effects. Standard errors (in the parenthesis) are robust to heteroscedasticity and clustered at firm level. Since control observations enter the regression sample in model 1 repeatedly, we weigh each observation using the inverse of their frequency in the regression (Stuart (2010)). ***, **, and * denote the statistical significance at 1%, 5% and 10% level.

Table 4. (continued)

Panel A: Director % stockholdings

	Model 1 Full Matched Sample	Model 2 Same director Full sample
Treatment	-0.061***	
	(0.005)	
Post	-0.019***	
	(0.003)	
Post*Treatment	0.007***	
	(0.002)	
With plan		0.017*
		(0.010)
Director Tenure	0.002***	0.004***
	(0.000)	(0.001)
Director age	-0.001**	-0.013
	(0.000)	(0.010)
Female director	0.004**	-0.020
	(0.002)	(0.073)
Log (total assets)	-0.007*	-0.010*
	(0.004)	(0.006)
Adj ROA	0.062***	-0.129*
	(0.018)	(0.077)
Adj Tobin's Q	0.011***	-0.007
	(0.001)	(0.005)
Leverage	-0.057***	0.021
	(0.013)	(0.037)
Adj Stock Return	-0.027***	0.010
	(0.002)	(0.011)
Stock Volatility	0.065**	0.233
	(0.031)	(0.156)
Sales Growth	-0.004	0.002
	(0.004)	(0.019)
RD/TA	0.965***	0.207
	(0.066)	(0.153)
Pct of Board Independence	0.009	-0.017
	(0.008)	(0.054)
Ln (board size)	-0.030***	0.018
	(0.008)	(0.027)
CEO Chair	-0.033***	-0.010
	(0.003)	(0.011)
% CEO Ownership	0.896***	0.268*
	(0.084)	(0.148)
CEO ownership plan	0.016***	-0.031*
	(0.003)	(0.016)
% Director .ownership	0.877***	0.740***
	(0.001)	(0.08)
% holding of quasi-index institutions	0.160***	-0.059
	(0.030)	(0.119)
% holding of transient institutions	-0.067***	0.021
	(0.017)	(0.067)
% holding of dedicated institutions	0.058***	0.002
	(0.012)	(0.037)
Year fixed effects	Yes	Yes
Director fixed effects	No	Yes
Firm fixed effects	Yes	No
Obs	154,657	8009
R squared	0.33	0.35

Table 4. (continued)

Panel B. Director Net Sales	Model 1 Full Matched Sample	Model 4 Same director Full sample
Treatment	0.029***	
	(0.004)	
Post	-0.003	
	(0.002)	
Post*Treatment	-0.005***	
	(0.002)	
With plan		-0.003***
		(0.000)
Director tenure	0.001***	0.001***
	(0.000)	(0.000)
Director age	0.001**	-0.003
	(0.000)	(0.003)
Female director	-0.002	-0.006
	(0.001)	(0.021)
Log (total assets)	-0.009***	-0.002
	(0.003)	(0.002)
Adj ROA	-0.138***	-0.004
	(0.013)	(0.022)
Adj Tobin's Q	-0.001	-0.001
	(0.001)	(0.001)
Leverage	-0.073***	0.009
	(0.010)	(0.011)
Adj Stock Return	0.029***	0.007**
	(0.001)	(0.003)
Stock Volatility	0.124***	0.011
	(0.023)	(0.045)
Sales Growth	0.021***	0.005
	(0.003)	(0.006)
RD/TA	-0.181***	-0.009
	(0.049)	(0.044)
Pct of Board Independence	0.012**	0.003
	(0.006)	(0.015)
Ln (board size)	0.035***	-0.004
	(0.006)	(0.008)
CEO Chair	-0.021***	0.000
	(0.002)	(0.003)
% CEO Ownership	-0.258***	-0.011
	(0.062)	(0.043)
CEO ownership plan	-0.017***	0.006
	(0.003)	(0.005)
% Director ownership	0.028***	0.028***
	(0.001)	(0.002)
% holding of quasi-index institutions	0.214***	0.071**
	(0.022)	(0.034)
% holding of transient institutions	-0.079***	-0.007
	(0.006)	(0.019)
% holding of dedicated institutions	-0.013	-0.011
	(0.009)	(0.011)
Year fixed effects	Yes	Yes
Director fixed effects	No	Yes
Firm fixed effects	Yes	No
Obs	154,657	6,253
R squared	0.33	0.38

Table 5. Multivariate Regressions on Director Disengagement

This table reports results from logit regressions of directors' disengagement on the board. The dependent variable of being disengaged equals one if the director attended less than 75% of the meetings or did not serve on any board committee during the year. Model 1 uses the matched sample, a director in a firm that adopts target ownership plan during the sample period (treatment director) is matched to directors in firms that do not have a plan and do not adopt a plan within four years (control director). The effect of adopting a target ownership plan is examined within three years before and after plan adoption. *Treatment* is an indicator variable equals to one for treatment directors. *Post* is an indicator variable equals to one for years after the plan adoption and zero for years before the adoption (including the year of adoption). Model 2 uses the sample of directors who have multiple directorships in firms with plans and firms without plans. *With plan* is an indicator variable equals to one if this directorship requires target ownership plan. The definitions of all control variables are reported in Appendix 1. All independent variables are measured at year t-1. All models have year fixed effects. Model 1 incorporates industry fixed effects. Model 2 incorporates director fixed effects. Standard errors are reported in the parenthesis. They are robust to heteroscedasticity and clustered at firm level. Since control observations enter into the regression sample repeatedly, we weigh each observation using the inverse of their frequency in the regression (Stuart (2010)). ***, **, and * denote the statistical significance at 1%, 5% and 10% level.

Table 5. (continued)

	Model 1 Full Matched Sample	Model 2 Same director Full sample
Treatment	0.081*	
	(0.049)	
Post	-0.078	
	(0.170)	
Post*Treatment	-0.101***	
	(0.023)	
With plan		-0.297**
		(0.131)
Director Tenure	0.073***	0.085***
	(0.006)	(0.009)
Director Age	-0.016***	-0.027***
	(0.006)	(0.009)
Female director	-0.664***	-0.601***
	(0.126)	(0.134)
Log (total assets)	0.215***	-0.024
	(0.049)	(0.058)
Adj ROA	1.020	0.869
	(0.856)	(1.062)
Adj Tobin's Q	-0.027	-0.121*
	(0.042)	(0.059)
Leverage	-0.194	0.579
	(0.345)	(0.433)
Adj Stock Return	-0.163	-0.087
	(0.118)	(0.168)
Stock Volatility	3.010***	3.697*
	(1.221)	(1.972)
Sales Growth	-0.048	0.455*
	(0.232)	(0.273)
RD/TA	2.650**	0.507
	(1.242)	(1.677)
Pct of Board Independence	-0.606*	-1.030
	(0.366)	(0.654)
Ln (board size)	0.571**	1.014***
	(0.232)	(0.371)
CEO Chair	-0.281**	-0.249**
	(0.113)	(0.122)
%CEO Ownership	0.673	-0.510
	(1.487)	(2.369)
CEO ownership plan	-0.173	-0.360*
	(0.124)	(0.097)
% Director ownership	-0.370***	-0.315***
	(0.042)	(0.052)
% holding of quasi-index institutions	-1.634	1.157
	(1.336)	(1.514)
% holding of transient institutions	-1.765***	-0.072
	(0.683)	(0.843)
% holding of dedicated institutions	1.252***	-0.491***
	(0.432)	(0.205)
Industry and year fixed effects	Yes	Yes
Director fixed effects	No	Yes
Obs	131,242	7,789
Likelihood ratio	985	592

Table 6. Multivariate Regressions on Director Turnover

This table reports the results of logit regression models of directors' turnover likelihood. The dependent variable equals one if the director leaves the board next year. Model 1 uses the matched sample, a director in a firm that adopts a target ownership plan during the sample period (treatment director) is matched to directors in firms that do not have a plan and do not adopt a plan within four years (control director). The effect of adopting a target ownership plan is examined within three years before and after plan adoption. *Treatment* is an indicator variable equals to one for treatment directors. *Post* is an indicator variable equals to one for years after the plan adoption and zero for years before the adoption (including the year of adoption). Model 2 uses the sample of directors who have multiple directorships in firms with plans and firms without plans. *With plan* is an indicator variable equals to one if this directorship requires target ownership plan. The definitions of all control variables are reported in Appendix 1. All independent variables are measured at year t-1. All models have year fixed effects. Model 1 incorporates industry fixed effects. Model 2 incorporates director fixed effects. Standard errors are reported in the parenthesis. They are robust to heteroscedasticity and clustered at firm level. Since control observations enter into the regression sample repeatedly, we weigh each observation using the inverse of their frequency in the regression (Stuart (2010)). ***, **, and * denote the statistical significance at 1%, 5% and 10% level.

Table 6. (continued)

	Model 1 Full Matched Sample	Model 4 Same director Full sample
Treatment	-0.561***	
	(0.132)	
Post	0.236***	
	(0.148)	
Post*Treatment	0.818***	
	(0.179)	
With plan		0.181*
		(0.102)
Director tenure	0.016**	-0.019***
	(0.007)	(0.007)
Director age	0.010*	0.029***
	(0.006)	(0.007)
Female director	-0.124	-0.109
	(0.114)	(0.111)
Log (total assets)	0.103**	0.053
	(0.049)	(0.045)
Adj ROA	1.206*	1.143
	(0.725)	(0.782)
Adj Tobin's Q	0.142***	0.001
	(0.051)	(0.050)
Leverage	-0.061	0.178
	(0.339)	(0.330)
Adj Stock Return	-0.247*	-0.024
	(0.136)	(0.147)
Stock Volatility	3.068**	0.453
	(1.210)	(1.378)
Sales Growth	-0.180	-0.270
	(0.226)	(0.218)
RD/TA	-4.537***	-2.566*
	(1.350)	(1.325)
Pct of Board Independence	1.434***	1.695***
	(0.287)	(0.462)
Ln (board size)	0.590**	1.062***
	(0.245)	(0.242)
CEO Chair	0.243**	-0.111
	(0.108)	(0.105)
%CEO Ownership	-4.183**	1.344
	(1.636)	(1.397)
CEO ownership plan	-0.366***	-0.392***
	(0.127)	(0.143)
% Director ownership	-0.094*	0.046
	(0.05)	(0.041)
% holding of quasi-index institutions	0.642	-1.352
	(1.331)	(1.327)
% holding of transient institutions	-0.385	1.631**
	(0.697)	(0.721)
% holding of dedicated institutions	-1.011**	-0.059
	(0.402)	(0.344)
Industry and year fixed effects	Yes	Yes
Director fixed effects	No	Yes
Obs	148,432	7,752
Log likelihood	3049	1482

Table 7. Departing Director Characteristics

This table compares the directors who leave the board within three years after the firm adopts a director target ownership plan and directors who stay. The mean of each variable is reported and a t-test is conduct on the mean values across groups. These statistics are calculated one year prior to the plan adoption. The statistics are then compared to directors in firms that do not have a plan and do not adopt a plan within four years . ***, **, and * denote the statistical significance at 1%, 5% and 10% level.

	Firms adopting plans			Firms not adopting a plan		
	Directors who left	Directors who stay	T stat	Directors who left	Directors who stay	T stat
Age	64.31	62.37	1.79*	64.62	63.73	0.84
Tenure	9.08	7.57	3.15***	9.68	8.97	0.18
Smallest directorship	84.13%	68.35%	8.64***	64.94%	75.47%	-7.38***
% with less attendance	1.16%	0.42%	1.15	0.65%	0.66%	-0.85
% being less engaged	20.00%	14.45%	1.92*	10.85%	17.65%	-3.21***
# of directorships	1.03	0.81	2.61*	1.34	1.14	0.61
% stockholding	0.22%	0.41%	2.79***	0.16%	0.15%	0.16

Table 8: The Impact of Ownership Plans Around the Plan Adoption

This table reports the impact of ownership adoption on various outcome variables across each event year. The dependent variables in each set of models is as described in previous tables and in Appendix 1. *Treatment* is an indicator variable equals to one for treatment directors. *EY-3*, *EY-2* and *EY-1* are indicator variables representing three years, two years, and one year prior to the plan adoption, respectively. *EY+1*, *EY+2* and *EY+3* are indicator variables representing one year, two years and three years after plan adoption, respectively. We use the same set of control variables as in previous tables. The definitions of all control variables are reported in Appendix 1. All independent variables are measured at year t-1. All models have year fixed effects. Model 1 and 2 have firm fixed effects. Model 3 and 4 are logit regressions with industry fixed effects. Standard errors are reported in the parenthesis. They are robust to heteroscedasticity and clustered at firm level. Since control observations enter into the regression sample repeatedly, we weigh each observation using the inverse of their frequency in the regression (Stuart (2010)). ***, **, and * denote the statistical significance at 1%, 5% and 10% level.

	Director %Ownership	*Director Net Sales*	*Director Disengagement*	*Director Turnover*
Treatment	-0.054***	0.015***	0.258*	-0.106
	(0.006)	(0.005)	(0.131)	(0.181)
Treatment * EY-3	0.008	0.013**	0.106*	-0.380
	(0.008)	(0.006)	(0.057)	(0.839)
Treatment *EY -2	-0.023***	0.010**	0.087*	-0.234
	(0.006)	(0.005)	(0.043)	(0.768)
Treatment *EY -1	-0.031***	0.006***	0.101	-0.980***
	(0.005)	(0.002)	(0.072)	(0.259)
Treatment *EY +1	-0.006	-0.016**	-0.108**	0.637***
	(0.004)	(0.008)	(0.053)	(0.234)
Treatment *EY+2	0.015**	-0.015*	-0.121***	0.24**
	(0.006)	(0.008)	(0.051)	(0.115)
Treatment *EY+3	0.019***	-0.019***	-0.154***	-0.010
	(0.005)	(0.005)	(0.057)	0.337
EY-3	0.005	0.002***	0.099	-1.797
	(0.006)	(0.001)	(0.506)	(0.697)
EY-2	0.017***	0.007**	0.119	-1.705
	(0.004)	(0.003)	(0.287)	(1.600)
EY-1	0.032***	0.002***	0.120*	-0.276
	(0.004)	(0.001)	(0.067)	(0.201)
EY+1	-0.004	0.010***	0.067	0.175
	(0.004)	(0.004)	(0.079)	(0.209)
EY+2	-0.008	0.007**	0.058	0.708**
	(0.006)	(0.003)	(0.092)	(0.320)
EY+3	-0.015**	0.008***	0.053	0.661**
	(0.006)	(0.003)	(0.119)	(0.326)
Other Control Variables	Yes	Yes	Yes	Yes
Firm Fixed Effects	Yes	Yes	No	No
Year Fixed Effects	Yes	Yes	Yes	Yes
Industry Fixed Effects	No	No	Yes	Yes
Number of Obs	154,657	154,657	131,242	148,432
R-Squared/Likelihood Ratio	0.33	0.33	990	3112

Table 9. Dedicated Institutional Holdings: Subsample Analyses

This table reports the results of various regression models on director ownership (models 1 and 2), director net sales (models 3 and 4), director disengagement (models 5 and 6) and director turnover (models 7 and 8). The dependent variables in each set of models is as described in previous tables and in Appendix 1. The odd (even) numbered models drop adopting firms and non-adopting firms whose % holding of dedicated institutions are below (above) the median and then matches the directors in remaining adopting firms to directors in remaining non-adopting firms. The effect of adopting a target ownership plan is examined within three years before and after plan adoption. *Treatment* is an indicator variable equals to one for treatment directors. *Post* is an indicator variable equal to one for years after the plan adoption and zero for years before the adoption (including the year of adoption). The definitions of all control variables are reported in Appendix 1. All independent variables are measured at year t-1. All models have year and industry fixed effects. Standard errors are reported in the parenthesis. They are robust to heteroscedasticity and clustered at firm level. Since control observations enter into the regression sample repeatedly, we weigh each observation using the inverse of their frequency in the regression (Stuart (2010)). ***, **, and * denote the statistical significance at 1%, 5% and 10% level.

	Director Ownership		*Director Net Sales*		*Director Disengagement*		*Director Turnover*	
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8
	High dedicated inst. Holdings	Low dedicated inst. Holdings	High dedicated inst. Holdings	Low dedicated inst. Holdings	High dedicated inst. Holdings	Low dedicated inst. Holdings	High dedicated inst. Holdings	Low dedicated inst. Holdings
Treatment	-0.009	-0.209***	0.005***	0.146***	0.205	0.249	-1.059***	0.811***
	(0.007)	(0.025)	(0.001)	(0.020)	(0.198)	(0.215)	(0.176)	(0.270)
Post	-0.005*	0.001	0.001*	0.020***	-0.090	0.075	0.308	0.190
	(0.003)	(0.009)	(0.000)	(0.007)	(0.257)	(0.272)	(0.203)	(0.277)
Post*Treatment	0.009***	-0.025**	-0.001**	0.005	-0.122***	-0.478	1.108***	0.827***
	(0.003)	(0.010)	(0.000)	(0.008)	(0.027)	(0.325)	(0.249)	(0.358)
Director Tenure	0.000	0.004***	0.000***	-0.001**	0.081***	0.072***	0.007	0.023**
	(0.000)	(0.000)	(0.000)	(0.000)	(0.009)	(0.009)	(0.009)	(0.012)
Director age	-0.001***	0.000	0.000***	0.002***	-0.028***	-0.011	0.016*	0.006
	(0.000)	(0.000)	(0.000)	(0.001)	(0.009)	(0.009)	(0.008)	(0.011)
Female director	0.000	-0.004	0.002**	-0.002	-0.975***	-0.716***	0.023	-0.405**
	(0.002)	(0.005)	(0.000)	(0.004)	(0.201)	(0.189)	(0.154)	(0.203)
Log (total assets)	0.002	-0.010	0.000	-0.028***	0.378***	0.141	0.016	-0.133
	(0.017)	(0.012)	(0.001)	(0.010)	(0.098)	(0.091)	(0.081)	(0.099)
Adj ROA	-0.018	0.418***	-0.014***	-0.344***	3.044**	1.434	0.236	2.690*
	(0.018)	(0.058)	(0.003)	(0.047)	(1.215)	(1.607)	(1.003)	(1.531)
Adj Tobin's Q	-0.003**	0.027***	0.000**	0.005	-0.126*	0.065	0.273***	-0.099
	(0.001)	(0.004)	(0.000)	(0.003)	(0.068)	(0.064)	(0.070)	(0.098)
Leverage	-0.030**	-0.099***	-0.001	-0.059*	0.234	-0.147	-1.017**	-0.298
	(0.013)	(0.038)	(0.002)	(0.031)	(0.606)	(0.593)	(0.507)	(0.672)
Adj Stock Return	0.012***	-0.040***	0.002***	0.041***	-0.024	-0.208	-0.437*	-0.316
	(0.003)	(0.005)	(0.000)	(0.004)	(0.224)	(0.147)	(0.230)	(0.235)
Stock Volatility	0.050*	0.051	0.015***	0.153**	0.581	1.784	4.829***	2.008
	(0.030)	(0.094)	(0.005)	(0.077)	(1.944)	(2.216)	(1.789)	(2.368)
Sales Growth	0.006	-0.020	-0.002**	0.040***	-0.261	-0.204	-0.180	0.143
	(0.004)	(0.147)	(0.001)	(0.010)	(0.353)	(0.375)	(0.362)	(0.347)
RD/TA	0.207***	-0.735***	-0.067***	0.063	4.863***	-2.271	-5.691***	-11.558***
	(0.060)	(0.249)	(0.009)	(0.207)	(1.604)	(4.346)	(1.709)	(4.278)
Pct of Board Independence	-0.005	-0.022	-0.005***	0.026	-0.907*	-0.993	1.278***	3.395***
	(0.007)	(0.025)	(0.001)	(0.021)	(0.511)	(0.707)	(0.404)	(0.619)
Ln (board size)	-0.054***	-0.079***	0.000	0.072***	-0.291	1.038*	0.829**	2.203***
	(0.008)	(0.023)	(0.001)	(0.018)	(0.364)	(0.417)	(0.356)	(0.522)
CEO Chair	-0.018***	-0.024***	0.003***	-0.023***	-0.374**	-0.354*	0.218	-0.100
	(0.003)	(0.008)	(0.001)	(0.006)	(0.161)	(0.199)	(0.147)	(0.221)
% CEO Ownership	0.275**	1.259***	-0.175***	-0.502***	-0.080	-1.060	-3.400*	-18.683***
	(0.125)	(0.215)	(0.020)	(0.176)	(1.897)	(3.479)	(1.967)	(4.553)
CEO ownership plan	-0.017***	0.044***	-0.002***	-0.055***	-0.243	-0.368	0.269	-1.452***
	(0.003)	(0.011)	(0.001)	(0.009)	(0.184)	(0.231)	(0.191)	(0.280)
% Director ownership	0.960***	0.837***	0.006***	0.046***	-0.372***	-0.327***	-0.144*	-0.161*
	(0.001)	(0.002)	(0.010)	(0.001)	(0.060)	(0.053)	(0.082)	(0.084)
% holding of quasi-index institutions	0.042	0.383***	0.014***	0.213***	-1.798	-3.299	-2.552	-2.335
	(0.029)	(0.086)	(0.005)	(0.071)	(1.902)	(2.276)	(1.952)	(3.416)
% holding of transient institutions	-0.048***	-0.146***	-0.001	-0.171***	-0.627	-2.754	-0.335	-0.953
	(0.016)	(0.049)	(0.003)	(0.040)	(1.173)	(2.070)	(0.989)	(1.480)
% holding of dedicated institutions	0.058***	-0.032	0.005***	-0.056*	2.634***	0.104	-0.545	-1.161
	(0.011)	(0.039)	(0.002)	(0.032)	(0.749)	(0.85)	(0.683)	(1.049)
Obs	53,851	36,328	55,696	37,186	45,612	31,462	53,008	31,949
R squared/Likelihood ratio	0.27	0.31	0.14	0.14	565	534	1880	1412

Table 10. Impact of Compensation Plan Disclosure

This table examines how firms without a director ownership plan in year 2006 (treatment firms) react after the regulation on compensation disclosure, relative to companies that already have ownership plans in 2006 (control firms). In particular, we examine directors' ownership in the years 2006 through year 2010. Model 1 includes the 501 firms that have plans in place in 2006 (control firms) and the 301 firms (treatment) that do not have ownership plan in 2006 and their subsequent firm-year observations through year 2010. Model 2 includes all control firm observations and the subset of the treatment firms that adopted director ownership plans between the time of 2007 and 2010. Model 3 includes all control firm observations and the subset of the treatment firms that did not adopt director ownership plans through 2010. The dependent variable is individual director's stock ownership. The same set of control variables are included here as in prior tables. Standard errors (in the parenthesis) are robust to heteroscedasticity and clustered at firm level. ***, **, and * denote the statistical significance at 1%, 5% and 10% level.

	Model 1	Model 2	Model 3
Treatment	0.032	-0.178	-0.193
	-0.186	-0.192	-0.154
Treatment * Y 2007	0.282	0.241	0.227
	-0.224	-0.275	-0.233
Treatment * Y2008	0.237	0.564**	0.286
	-0.22	-0.264	-0.237
Treatment * Y2009	0.668***	0.890***	0.692***
	-0.209	-0.253	-0.226
Treatment * Y2010	0.664***	0.697***	0.738***
	-0.211	-0.252	-0.232
Y 2007	-0.594***	-0.565***	-0.563***
	-0.132	-0.131	-0.132
Y 2008	-0.563	-0.490***	-0.527***
	-0.133	-0.133	-0.135
Y 2009	-0.758***	-0.700***	-0.8
	-0.132	-0.132	-0.134
Y 2010	-0.321**	-0.338**	-0.393***
	-0.143	-0.144	-0.146
Number of Obs	16,697	14,746	14,047
R-Squared	0.05	0.05	0.05

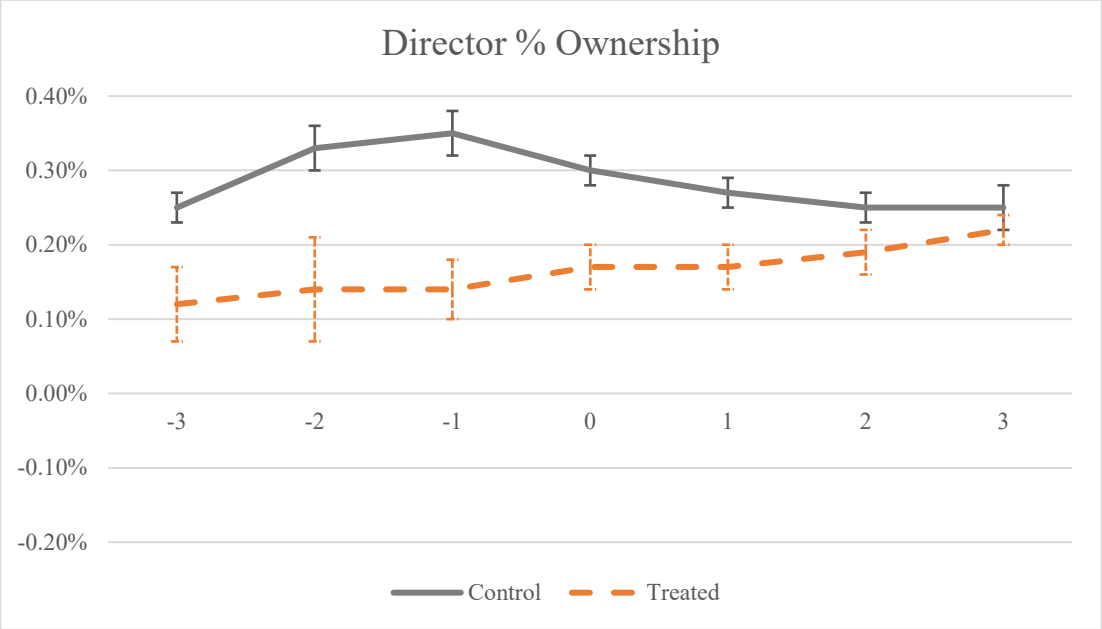
Table 11. The Impact of Meaningful Director Ownership Plans

This table tests the impact of having a stricter and more meaningful director ownership plan on the outcomes at the individual director level. A director ownership plan is defined as meaningful and stricter if at the time of adoption less than 50% of the independent directors meet the plan requirement. This table examines the impact of stricter ownership plans on individual director's ownership, net sales, level of disengagement, and director turnover using the sample of directors who have multiple directorships in firms with plans and firms without plans. For brevity, this table only reports the estimated coefficients on variables of interests. Control variables are the same as those used in prior tables. Standard errors (in the parenthesis) are robust to heteroscedasticity and clustered at firm level. ***, **, and * denote the statistical significance at 1%, 5% and 10% level.

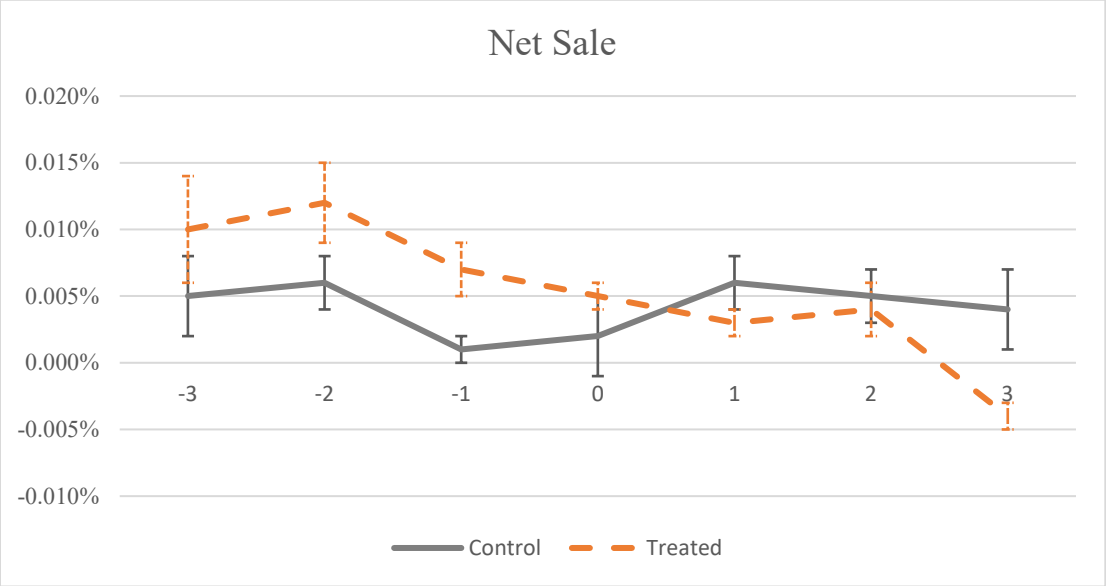
	Dependent variable			
	Director % Ownership	Director Net Sale	Director Disengagement	Director Turnover
Estimated coefficients on variables of interests:				
With Plan	0.017***	0.003	0.234	0.141
	(0.004)	(0.003)	(0.230)	(0.104)
With Plan * Strict Plan	0.006***	-0.007***	-0.647***	0.742*
	(0.002)	(0.003)	(0.225)	(0.433)
Number of Obs	8009	6253	7789	7752
Rsquared/likelihood ratio	0.35	0.38	594	1485

Figure 1. Director Outcomes Around Ownership Plan Adoption

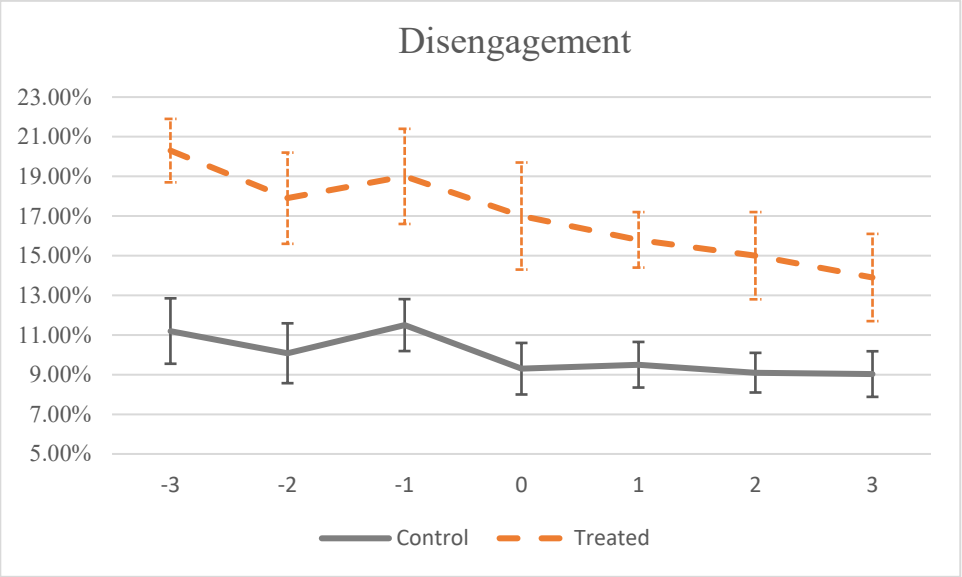
Panel A. Director % Ownership



Panel B. Net Sales



Panel C. Director Disengagement



Panel D. Director Turnover