Disagreement-induced CEO turnover

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ABSTRACT

We propose and test a new explanation for forced CEO turnover, and examine its implications for the impact of firm performance on CEO turnover. Investors may disagree with management on optimal decisions due to heterogeneous prior beliefs. Theory suggests that such disagreement may be persistent and costly to firms; we document that this induces them to sometimes replace CEOs who investors disagree with, controlling for firm performance. A lower level of CEO-investor disagreement serves to partially "protect" CEOs from being fired, thus reducing turnover-performance sensitivity, which we also document. We also show that firms are more likely to hire an external CEO as a successor if disagreement with the departing CEO is higher. Disagreement declines following forced CEO turnover. Using various empirical strategies, we rule out other confounding interpretations of our findings. We conclude that disagreement, independently of firm performance, affects forced CEO turnover.

1. Introduction

An important question in corporate governance is: what factors determine the firing of CEOs? It is well known that firm performance is an important factor. In this paper we propose and test a new explanation for forced CEO turnover that is *not directly* related to firm performance, and thereby illuminate another determinant of this corporate governance practice. We also seek to shed light on the cross-sectional heterogeneity in CEO turnover-performance sensitivity and provide an explanation for the weak turnover-performance relation in some firms, even after controlling for corporate governance.

Our analysis builds on the prior theoretical literature on investor-management disagreement (e.g., Garmaise, 2001; Van den Steen, 2004, 2005, 2010b; Boot et al., 2006, 2008; Boot and Thakor, 2011; Dicks and Fulghieri, 2015; Bayar et al., 2017; Thakor, 2015a) to generate testable hypotheses about how this disagreement will affect CEO turnover. The basic idea is simple. Assuming the board is acting in the best interests of shareholders, the decision of whether to continue with a CEO or force the CEO out depends on the ramifications of the decision for the wealth of the firm's existing shareholders. This wealth depends on the cost of capital associated with the financing needed for the project(s) the firm

has. The cost of capital is a function of the investors' assessment of how the firm will perform in the *future*, something that hinges on the CEO's current project choice. The cash flow implications of this project choice cannot be unambiguously determined *ex ante* because they are estimates that depend on assumptions that have limited justification based on historical data. This means rational agents may disagree on whether a particular choice will enhance or destroy firm value (see Kurz, 1994). An example of this may be a proposed acquisition. Investors may disagree with the CEO that it is a good idea based either on their view about the challenges involved in post-acquisition integration of two disparate cultures[1] (see Van den Steen, 2010a for a theory of this), or the timing of the acquisition (see Bouwman et al., 2009 for evidence on how acquisition timing affects success).

When investors have a high degree of confidence in the CEO's decisions, as reflected in a high level of agreement, they are more likely to endorse the CEO's choice of project and assign a high value to the firm, thereby lowering its cost of capital. However, low levels of agreement with the CEO can induce "second guessing" of the CEO's decisions by investors who may view the CEO's chosen project as value-destroying. Anticipating such disagreement, investors will assign a lower value to the firm *ex ante*, thereby raising the cost of capital for financing the

project. Since the wealth of the existing shareholders is decreasing in the firm's cost of capital for financing the new project, these shareholders are better off when CEO-investor agreement is higher. This means it may pay for the board, acting on behalf of shareholders, to fire a CEO with whom investors have a sufficiently low level of agreement.[2] This leads to our first testable hypothesis — controlling for firm performance, CEOs are more likely to be fired when the level of investor-management disagreement is higher, *ceteris paribus*.

A related implication of this idea is that a high level of agreement would cause shareholders to put *less* weight on adverse past performance in their evaluation of a CEO because of greater confidence in the quality of the CEO's *future* decisions and performance[3]. This suggests that CEO-investor agreement may act as a "security blanket" for the CEO, reducing the responsiveness of CEO turnover to poor firm performance.[4] This leads to our second hypothesis — controlling for CEO entrenchment, firms are more tolerant of poor past firm performance in deciding whether to fire the CEO when the level of agreement is higher.

The discussion above leads naturally to two additional testable hypotheses. First, to the extent that those within the executive suite of the firm are more likely to have similar beliefs among each other than with investors, firms with higher levels of investor-management disagreement are more likely to hire replacement CEOs from outside the firm because an internal successor is likely to be burdened, like her predecessor, with a high level of disagreement with investors. Second, disagreement declines following forced CEO turnover. We further discuss these hypotheses in Section 2.

Using various measures of investor-management disagreement used in the prior literature, we find strong empirical support for these four hypotheses. First, disagreement is positively associated with forced CEO turnover and has a significant incremental effect that goes beyond those well-known factors, including firm performance. The probability of forced CEO turnover is 0.3%–0.9% higher following a one-standard-deviation increase in the levels of different disagreement measures, while the unconditional probability of forced CEO turnover in our sample is around 2.1%.[5] Consistent with the impact of CEO entrenchment, the turnover-disagreement sensitivity is lower when CEOs are more entrenched.

Second, the sensitivity of forced CEO turnover to past firm performance is significantly weaker for firms with a lower level of investor-management disagreement. It suggests that past firm performance becomes less important in the board's evaluation of a CEO for dismissal when beliefs over the firm's future actions are more aligned.

We also find that an external replacement for the departing CEO is more likely when the level of investor-management disagreement is higher. Specifically, the probability of an external CEO hire is 1.11%–1.86% higher for a one-standard-deviation increase in the level of different disagreement measures.

Lastly, we find that investor-management disagreement declines following forced CEO turnover, and the decline in disagreement is greater if the fired CEO is replaced by an external hire. We also examine whether the improvement in agreement following CEO replacement is anticipated and thus priced by the stock market upon turnover

announcements. We find an answer in the affirmative.

We next deal with two issues associated with the empirical analysis. One is about the extent to which the effect of disagreement on CEO turnover that we measure is contaminated by the effect of firm performance. We control for firm performance in our baseline analysis by using prior-year stock and industry returns as controls. But then we go beyond this and use additional performance measures as controls. The results survive all the robustness checks. To the extent that these performance measures capture managerial ability or effort that is expected to affect the firm's future performance, these exercises enable us to more sharply disentangle the effect of disagreement due to heterogeneous prior beliefs from the effect of firm performance related to managerial ability/effort. Moreover, an additional test involving a shock to agreement due to distressed mutual fund fire sales, that we describe below, also helps to more clearly delineate the effect of disagreement from that of firm performance.

The other issue is that one might be concerned that both disagreement and CEO turnover are related to an omitted variable, and thus their correlation might be spurious.[6] We conduct two tests to address this concern. First, we conduct a falsification test by examining the relationship between disagreement and voluntary CEO turnover that is not due to mandatory or planned retirement.[7] If it is an omitted variable (e.g., uncertainty) that generates the relation between disagreement and forced CEO turnover, then we should expect a similar relation between disagreement and voluntary CEO turnover because uncertainty increases voluntary management turnover too. In contrast, our disagreement hypothesis does not predict such a correlation.

Second, we employ a shock, caused by distressed mutual fund fire sales, to the composition of the firm's investor base and thus investor-management agreement, and examine how it affects forced CEO turnover. In mutual fund fire sales induced by extreme capital outflows, distressed funds are forced to sell their equity holdings with significant discounts to liquidity providers (Coval and Stafford, 2007). Existing shareholders who are not distressed are unlikely to absorb all these shares due to the holding-capacity limitations, risk aversion, or both. It follows that, in equilibrium, the new marginal investors in the stock are other liquidity providers who have a lower level of agreement than the existing shareholders (but trade to avail of a liquidity premium). Empirically, we confirm that the level of agreement declines following the fire sales. Such a shock is unlikely to be related to changes in firm fundamentals for the affected stocks because fund fire sales are driven by extreme capital outflows at the fund level (and the resulting need for liquidity). It is thus a test that is designed to not only deal with the omitted variable problem, but also to provide a further delineation of the effect of disagreement from that of firm performance.[8] We find that the decline in agreement leads to an increased occurrence of forced CEO turnover. The results of both tests provide strong support for our disagreement hypothesis and show that the omitted variable bias is not likely to be a serious concern.

The rest of the paper is organized as follows. Section 2 develops the testable hypotheses, discusses the related literature, and delineates the paper's marginal contribution. Section 3 describes the data and the variables. The main empirical analysis appears in Section 4. Section 5 takes up issues about the robustness of the empirical analysis. Section 6 concludes.

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[2] Theoretically, disagreement between the board and a CEO is equivalent to disagreement between shareholders and the CEO.

[3] This may be due to learning by investors over time about their level of agreement with the CEO's decisions, suggesting that CEO-specific factors may affect the firm's stock price. Botsch and Vanasco (2018) provide evidence that the learning channel induces banks to incorporate CEO-specific information in setting loan prices, so it is plausible that similar effects exist in stock prices.

[4] This does not negate the effect of firm performance on CEO turnover. Agreement is viewed simply as a mediating variable in the performance-turnover relationship.

[5] So the probability of forced CEO turnover increases by 10 to 33 percent following a one-standard-deviation increase in the levels of different disagreement measures.

[6] For example, an elevation in uncertainty about a firm's growth opportunities or technological development may increase the possibility of different interpretations of the same information by investors and management, and this elevated uncertainty may also induce higher management turnover.

[7] It is natural to not expect any relation between disagreement and mandatory or planned retirement that is predetermined. Our results are nonetheless unaffected if retirement is included in defining voluntary CEO turnover.

[8] Note that this test does *not* rely on any empirical measures of disagreement or firm performance, and thus also enables us to circumvent any confounding interpretations of the measures.

2. Hypotheses development and delineation of marginal contribution

2.1. Development of hypotheses

There is ample anecdotal evidence of forced CEO departures due to disagreement between management and shareholders on the optimal course of corporate decisions. For instance, Associated Press Newswires reported on November 9, 2000, that Lloyd Ward resigned as Maytag Corp's Chairman and CEO over "a difference (of opinion) on the company's strategic outlook and direction". Similarly, Curtis Huff was ousted as CEO from Grant Prideco over frictions during the implementation of its predetermined acquisition strategy, although analysts credited Huff with "leaving the company in good shape".[9] There are numerous other reports of CEOs being forced out due to difference of opinion over corporate strategy, direction, and implementation.[10]

As suggested by these anecdotes, investors and managers can have divergent opinions about the optimal course of actions based on the same evidence. Such a difference in opinions is rooted in the theory of heterogeneous priors as "rational beliefs" developed by Kurz (1994).[11] With rational beliefs, disagreeing agents will not revise their beliefs even though it is common knowledge that different prior beliefs exist (Kreps, 1990a); nor will they converge to a common prior even with sufficient additional information provision (Andreoni and Mylovanov, 2012).[12]

The costly persistence of investor-management disagreement may induce some firms to replace their CEOs. However, the board's ability to do this may be constrained by the "power" of the CEO and the level of entrenchment.[13] Each firm will trade off the benefit of reduced investor-management disagreement when the CEO is fired against the entrenchment-induced costs/difficulties of dismissing the CEO. Cross-sectional heterogeneity in entrenchment-related costs means that firms will differ in the extent to which disagreement leads to the CEO dismissal. Thus, we have:

Hypothesis 1. *Ceteris paribus (controlling for CEO ability perceptions), forced CEO turnover is more likely in firms with higher investor-management disagreement.*

This effect is more pronounced in firms with less entrenched CEOs. It should also be noted that our analysis does not yield a similar prediction for *voluntary* CEO turnover. Such turnover is unaffected by investor-management disagreement because the CEO believes that her decisions are value-maximizing and thus will not necessarily depart voluntarily.[14]

It follows from the above that when there is a high level of agreement and thus investors have a high degree of confidence in the CEO's future decisions (and expected performance), the firm's past performance becomes less important in determining whether the CEO should be fired. Thus, we have:

Hypothesis 2. *Firms are more tolerant of poor recent firm performance in their turnover decisions if the level of disagreement is lower, i.e., the lower is the disagreement level, the less sensitive is the forced turnover decision to firm performance.*

It is plausible to postulate that those within the executive suite of the firm will share similar views and beliefs due to constant interactions and being part of the same corporate culture (e.g., Kreps, 1990b; Van den Steen, 2010b; Bouwman, 2013; Lo, 2015; Song and Thakor, 2019), making them more likely to agree with each other than with investors. An immediate implication of this is that when investor have a relatively high level of agreement with a departing CEO, they are more likely to endorse an insider to succeed the departing CEO, since they expect the high agreement to persist with the successor. When agreement with the departing CEO is relatively low, investors are likely to prefer an outsider to be the successor. This is consistent with the evidence of management turnover, shown by Fee and Hadlock (2004), that senior executive managers are evaluated as a group. Although it might be more costly to search for an external CEO than to select one from an internal talent pool (due to search frictions on the labor market), the benefit of having an external CEO with a higher level of agreement with investors may outweigh the search costs. We therefore have our third testable prediction below.

Hypothesis 3. *Firms are more likely to select an external replacement CEO if investors' disagreement with the existing CEO is higher.*

It follows that investor-management disagreement is likely to decline when a new external CEO successor is selected subsequent to a CEO being forced out. Even if an internal CEO is selected to replace the fired CEO in some of the cases (possibly due to a high external search cost or the importance of firm-specific knowledge), we expect firms to select an internal successor with a higher level of agreement with investors than that enjoyed by the departing CEO *ceteris paribus*. Indeed, given any cost to the firm of replacing the incumbent CEO based on disagreement, the board will not fire the CEO until the level of disagreement has risen above that it can expect to have with a random draw from the population of replacement CEO candidates.[15] This means that investor-management disagreement is expected to decline following forced CEO turnover, leading to our fourth testable prediction.

Hypothesis 4. *Investor-management disagreement declines following forced CEO turnover.*

Also, our discussion above indicates that the decline in disagreement will be greater if the replacement CEO is selected externally.

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[9] See "Grant Prideco Shake-up Has BJ's McShane in Charge" by *Platts Oilgram News* on June 25, 2002.

[10] For examples, see the resignations of CEO Richard White from Veritas DGC, of CEO Warren Musser from Wayne, and of CEO Edwin Russell from Allete Inc., among others.

[11] See Van den Steen (2010a, 2010b, 2010c, and 2010d) for applications of heterogeneous beliefs to a variety of organizational issues.

[12] Therefore, our disagreement hypothesis is fundamentally different from the agency hypothesis in the empirical literature (e.g., literature on shareholder activism) that shows that CEO dismissal is more likely when performance-related concerns cause shareholders to be more concerned with agency issues in the firm. Indeed, the disagreement hypothesis suggests that CEOs may be fired even without any agency concerns from shareholders.

[13] The prior literature suggests that involuntary CEO turnover is less likely and also more costly if the CEO is more entrenched and governance is weaker (e.g., Weisbach, 1988; Borokhovich et al., 1996; Denis et al., 1997; Hermalin and Weisbach, 1998; Huson et al., 2001; Taylor, 2010). A recent study by Chemmanur et al. (2017) uses transaction data on institutional trading to analyze the information flows around CEO turnovers and suggests that information production and trading act as an effective corporate governance mechanism.

[14] One may argue that a talented CEO in disagreement with the current firm's shareholders can voluntarily jump ship to another firm whose investors are more aligned with her. While this is possible, the CEO will incur search costs in finding a new firm with higher alignment, given the frictions on the labor market. Therefore, disagreement is unlikely to affect the likelihood of voluntary CEO turnover in a systematic way, which itself depends on such factors like a CEO's outside employment options and the investor composition. Our hypothesis suggests that, everything else being equal, disagreement is associated more with forced turnover than with voluntary turnover. A full analysis of the impact of labor market frictions on our disagreement hypothesis is beyond the scope of this paper.

[15] To the extent that the board has the ability to screen and select a successor with a lower level of disagreement than with a random draw, this disagreement threshold for firing the incumbent will change, but the prediction remains that disagreement will decline following forced CEO turnover.

2.2. Marginal contribution

Our study has several intended contributions. First, it seeks to add to the literature on corporate governance and CEO turnover by showing that investor-management disagreement is an important and previously-ignored factor in the firm's CEO turnover decision, and that the impact of this factor is lessened by governance variables like CEO entrenchment. Consistent with Taylor (2010), the latter finding explains the low forced CEO turnover rate despite the wide existence of investor-management disagreement in practice. Our study departs from the conventional focus of the prior literature on firm performance in examining CEO turnover. Consistent with the finding in Jenter and Lewellen (2014) that about half of the CEO turnovers may not be performance related, we show that the impact of investor-management disagreement persists even in well-performing firms. This occurs because investors and management can disagree on the firm's optimal course of future actions (and thus future performance), despite recent good performance.

Our paper also sheds light on an interesting puzzle in the empirical corporate governance literature that the sensitivity of forced CEO turnover to firm performance is rather modest (e.g., Coughlan and Schmidt, 1985; Warner et al., 1988; Weisbach, 1988; Denis et al., 1997; Huson et al., 2001; Brickley, 2003; Engel et al., 2003). In a related but fundamentally different paper, Chemmanur and Fedaseyeu (2018) relate CEO firing decisions to board size and composition, and show that disagreement *among directors* of the board in their assessment of CEO quality may lead to lower-quality CEOs remaining in place even when directors may collectively decide to fire them if they were able to pool their information efficiently. Our finding indicates that it may be due to a high level of investor-management agreement in some firms, and thus suggests an interesting interaction between agreement and firm performance in CEO turnover.

Moreover, our paper seeks to improve our understanding of a firm's choice between an internal and an external CEO. Specifically, it shows that CEO selection is a process that seeks a *CEO-firm match*, consistent with the literature in which CEO turnover is an efficient outcome in a competitive assignment framework in which CEOs and firms match on multiple dimensions (e.g., Eisfeldt and Kuhnen, 2013). We provide suggestive evidence that belief-alignment is a consideration in this matching process.

Lastly, our paper contributes to another strand of the literature that has used the idea of disagreement based on differences in beliefs to examine a variety of issues in finance, accounting, and contracting. They include financing of new industries and technologies (Allen and Gale, 1999)[16]; the entrepreneur's choice of private versus public ownership (Boot et al., 2006, 2008); optimal capital structure (Boot and Thakor, 2011); financial intermediation (Coval and Thakor, 2005); "endogenous optimism" (Van den Steen, 2004); corporate culture (Van den Steen, 2010b); the firm's choice of debt versus equity financing (Dittmar and Thakor, 2007); security design (Garmaise, 2001; Ortner and Schmalz, 2016); share repurchase (Huang and Thakor, 2013); trade around public announcements (Kandel and Pearson, 1995); the co-evolution of banks and market in financial system (Song and Thakor, 2010); financial innovation and crises (Thakor, 2012); strategic information disclosure (Thakor, 2015a); corporate investment (Thakor and Whited, 2011); the allocation of control (Van den Steen, 2010c; Dicks and Fulghieri, 2015); and the theory of firms (Van den Steen, 2010d).

3. Data and variables

3.1. Data and sample

Our sample construction starts with all U.S. firms in ExecuComp from 1993 to 2017 that list their common stock in NYSE, NASDAQ, or AMEX. We exclude all financial (primary SIC codes 6000 – 6999) and utility (primary SIC codes 4900 – 4999) firms. We include data on CEO characteristics (age, tenure, chairmanship, and stock ownership), firm-level accounting variables (e.g., assets, leverage, book value of equity, and net income), stock price, institutional ownership, and proxies for investor-management disagreement.

Turnover data: We identify CEO turnover from ExecuComp and use news reports, Boardex, and other public sources to classify the turnover as voluntary or involuntary.

Disagreement proxies: We construct proxies for disagreement using management's and analysts' earnings forecast data from I/B/E/S, and using data on shareholder proxy proposals (1996–2017), shareholder voting (2003–2017), and Institutional Shareholder Services (ISS) vote recommendations in director elections (2003–2017) from Voting Analytics.[17] We follow Del Guercio et al. (2008) and search news reports to collect data on shareholders' "just vote no" campaign from 2003 to 2017.

CEO attributes: We obtain data on CEO age, tenure, chairmanship, and stock ownership from ExecuComp and whenever needed, supplement it with data from Boardex.

Firm attributes: We obtain firm-level accounting data from COMPUSTAT, stock price and return data from CRSP, institutional ownership data from CDA/Spectrum, and board and director characteristics data from RiskMetrics and Boardex.

3.2. Key variable construction

3.2.1. CEO turnover

As discussed earlier, our disagreement hypothesis predicts forced, but not voluntary, CEO turnover. In this section, we describe the classification of CEO turnover as voluntary or forced. We start with identifying turnover from changes in CEO designation as documented in ExecuComp. We then search using Factiva and LexisNexis for news reports coincident with the change in designation to identify the causes for the change. We drop instances that are due to misclassification in ExecuComp, takeovers or spinoffs, sudden death, or departures from interim positions. To classify a turnover as voluntary or involuntary, we start by using an algorithm similar to that in Parrino (1997). Any turnover for which the press reports that the CEO is fired, is forced out, or resigns is classified as forced. Of the remaining instances of turnover, if the departing CEO is under age 60, it is classified as forced if either: (1) the reported reason for the departure does not involve death, poor health, or acceptance of another position elsewhere or within the firm, or (2) the CEO is reported to be retiring but there is no announcement about the retirement made at least two months prior to the departure.

We then complement the above algorithm with a modification – reclassify a forced turnover (identified using the steps described above) as voluntary if the press reports convincingly explain that the departure is due to previously undisclosed personal or business reasons that are unrelated to the firm's activities.[18] All instances of CEO turnover not classified as forced are classified as voluntary, some of which are due to

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[16] Brown et al. (2017) document that better-developed stock markets support faster growth of innovative, high-technology industries. This is consistent with Allen and Gale (1999) who provide a theory of how investor-management disagreement can lead to a preference for the stock market over banks for financing new technologies.

[17] We thank Stuart Gillan for sharing the shareholder proxy proposal data before 1996.

[18] Such a modification has also been used in Huson et al. (2001) and in more recent studies (e.g., Taylor, 2010; Hazarika et al., 2012). We repeat our empirical tests without this modification and find that our main results, are robust.

mandatory or planned retirements.[19]

We classify a new CEO as being external to the firm if she has been with the firm for no more than one year before the succession. We do this by relying on ExecuComp and Boardex for information on a manager's career path, supplemented by Marquis Who's Who publications, Bloomberg Businessweek, and Standard & Poor's register of corporations, directors, and executives.

3.2.2. Investor-management disagreement

Following the existing literature (e.g., Thakor and Whited, 2011; Huang and Thakor, 2013), we use five proxies for investor-management disagreement: (1) Management's forecast of earnings per share for the fiscal year end minus the mean analyst estimate reported no more than 30 days after the reporting date of management's forecast ("*Earnings disagreement*"), (2) related to the first proxy, the fraction of analysts (who reported estimates no more than 30 days after the reporting date of management's forecast) with estimates being less than the management's forecast ("*Earnings disagreement-2*"), (3) the number of proxy proposals that a firm receives in a year ("*Proxy proposal*"), (4) the vote recommendation in directors' elections ("*Vote recommendation*"), and (5) actual voting that director candidates receive in directors' elections ("*Actual voting*"). Details on these variables, along with a discussion of the economic rationale for viewing each variable as a proxy for investor-management disagreement, are provided in the Appendix.

3.3. Summary statistics

As we explain in the Appendix while discussing the construction of our disagreement proxies, our final sample size varies with our disagreement proxies due to different degrees of data availability. The resulting samples of CEO turnover corresponding to different disagreement proxies are smaller than the universe of CEO turnover for firms in ExecuComp during the sample period. However, as we discuss below, the rate of CEO turnover and the rate of forced versus voluntary turnover in our samples are consistent with those reported in the prior literature. Due to its most complete coverage of sample firms, we take the sample corresponding to the *Proxy proposal* measure of disagreement in presenting the yearly distribution of the number and frequency of CEO turnover between 1993 and 2016.[20] Overall, there are 2295 CEO successions that occur in about 10% of the sample firm-years. Among them, 499 (about 21% of all successions) are forced, and in 707 (about 31%) of all successions, the new CEOs are hired from outside the firm. There exists some time-series variation in the number and frequency of overall, forced, and external successions. We include year dummies in all of our regressions to control for possible time effects.

Table 2 reports summary statistics of the key variables we use in our analysis. All variables are winsorized at the 1% and 99% levels to mitigate the potential impact of outliers. Detailed definitions of these variables (except CEO turnover that is discussed earlier) are provided in the Appendix. The upper part of Panel A provides summary data on disagreement proxies and on forced CEO turnover in each of the four samples with different disagreement proxies. Similar to the finding in the prior literature (e.g., Huson et al., 2001; Taylor, 2010; Kaplan and

Minton, 2012), the unconditional probability of forced CEO turnover in a year is between 2.1% and 2.2% across the four samples. The sample firm's mean (median) *Earnings disagreement* is −0.201 (−0.062). Among firms that have received at least one shareholder proxy proposal during the sample years 1993–2016, an average of 0.55 proposals are submitted in a year. On average, 21.2% of director candidates in a firm-year receive objections from shareholders or unfavorable recommendations from independent proxy advisors before the director election. Also, 23.4% of director candidates in an average sample firm-year receive a below-yearly-median percentage of yes-votes in the election.[21]

In the lower part of Panel A, we conduct a univariate test of the relation between forced CEO turnover and disagreement. We classify the CEO years into two groups – those involving forced turnover and those not involving forced turnover, and compare the disagreement parameters in the two groups as of the year prior to turnover. We find a higher level of disagreement in the forced-turnover group, and the *t*-test conducted on the difference of the mean disagreement parameters shows that the difference is significant at 5% level or better for all five disagreement proxies.[22] This is consistent with *Hypothesis 1*. For example, on average, 27.3% of candidates receive objections from shareholders or unfavorable voting recommendations from independent proxy advisors before the director election in the year prior to forced CEO turnover, while that number is only 21.1% during other years. Also, 32.9% of candidates in our sample receive a below-yearly-median percentage of yes-votes in the director election in the year prior to forced CEO turnover, a number significantly higher than 23.2%, the counterpart statistic during other years.

In Panels B and C, we present summary statistics of firm and CEO characteristics, respectively. As in Table 1, we take the sample corresponding to the *Proxy proposal* measure of disagreement due to its most complete coverage of sample firms. On average, 10% of CEOs have over 5% of stock ownership in the firm and 68% of CEOs are also Chairmen of the board. The average tenure of the CEOs is about 8.5 years. Since we obtain sample firms from ExecuComp (which covers S&P 1500 firms), the firm characteristics of our sample are similar with those in the prior literature on CEO turnover since those papers also use ExecuComp as the major data source.

4. Main empirical analysis of disagreement and turnover

4.1. Test of Hypothesis 1

4.1.1. Baseline analysis

We test *Hypothesis 1* by relating investor-management disagreement to the likelihood of forced CEO turnover while controlling for a number of firm and CEO characteristics that the prior literature has shown to affect CEO turnover. We follow previous studies (e.g., Hazarika et al., 2012) and employ the Cox proportional hazard model (Cox, 1972) to

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[19] Kaplan and Minton (2012) suggest that the usual approach of CEO turnover classification tends to misclassify some forced turnovers as voluntary. We note that such a misclassification, if present, results in a smaller sample of forced CEO turnovers and thus causes a downward bias in the estimated effect of disagreement on forced turnover. That is, the documented impact of investor-management disagreement on forced CEO turnover may be an underestimate of the actual impact.

[20] Data on CEO turnover end in 2016 instead of 2017 because our analysis requires one more year of data on disagreement proxies in examining the change in disagreement following forced CEO turnover.

[21] As discussed in the construction of the *Actual voting* measure in the Appendix, the yearly median percentage of yes-votes is defined based on the universe of firms with available actual voting data during 2003–2016, but not on our final sample firms. The smaller fraction (23.4%) of directors in our sample firms receiving below-yearly-median percentage of yes-votes than 50% (by construction) suggests a higher average percentage of yes-votes received by director candidates in our sample firms (i.e., relatively large firms in ExecuComp) than in firms in the universe.

[22] One might be concerned that the t-statistics on the difference of the mean disagreement parameters could be overstated because these parameters are correlated over time for the same firm. We address this concern as follows. Each year, we estimate the difference of the mean parameters between the two groups, take the average value of this difference, and then test if the mean value over time is different from 0, using Newey–West standard errors with one lag. The resulting t-statistics, reported in the last column of the panel, are similar to the t-statistics obtained from the t-test.

Table 1
Year-wise distribution of CEO turnover.

Year	All successions		Forced successions		External successions	
	N	% of all firms	*N*	% of succession firms	*N*	% of succession firms
1993	51	6.26%	5	9.80%	11	21.57%
1994	60	7.06%	9	15.00%	9	15.00%
1995	91	10.50%	13	14.29%	21	23.08%
1996	77	8.18%	15	19.48%	24	31.17%
1997	88	9.15%	18	20.45%	26	29.55%
1998	91	9.05%	16	17.58%	18	19.78%
1999	121	12.12%	21	17.36%	24	19.83%
2000	108	11.04%	35	32.41%	34	31.48%
2001	95	9.57%	12	12.63%	26	27.37%
2002	96	9.42%	20	20.83%	29	30.21%
2003	86	8.06%	22	25.58%	33	38.37%
2004	96	9.05%	15	15.63%	34	35.42%
2005	124	11.87%	22	17.74%	37	29.84%
2006	98	8.97%	32	32.65%	36	36.73%
2007	123	10.64%	31	25.20%	48	39.02%
2008	117	10.48%	32	27.35%	42	35.90%
2009	83	7.63%	15	18.07%	32	38.55%
2010	79	7.42%	20	25.32%	24	30.38%
2011	72	6.78%	16	22.22%	27	37.50%
2012	114	10.97%	34	29.82%	32	28.07%
2013	97	9.53%	24	24.74%	30	30.93%
2014	107	10.78%	25	23.36%	35	32.71%
2015	114	11.88%	20	17.54%	35	30.70%
2016	107	11.44%	27	25.23%	40	37.38%
Total	2295	9.51%	499	21.26%	707	30.81%

This table presents the distribution by year of the number and frequency of overall, forced, and external CEO successions for sample firms with no missing *Proxy proposal* data and covered in ExecuComp between 1993 and 2016. Successions due to mergers, spin-offs, and interim CEO changes are excluded. *Proxy proposal* is the number of proxy proposals a firm receives in a given year.

conduct our test. The hazard model presents a CEO's hazard rate (the dependent variable) – approximately, the likelihood that the incumbent CEO will be dismissed in the next year – as a function of the CEO's tenure and other CEO as well as firm characteristics. It thus takes into account both the occurrence and timing of forced turnover. The model also accounts for the right-censoring of the data that arises from the fact that some CEOs in our sample remain in office by the end of 2016. We allow baseline hazards to vary across industries to capture the difference in turnover patterns in different industries.

Our key independent variable is investor-management disagreement, proxied by the five disagreement measures, lagged by one year relative to the dependent variable because it is the disagreement parameter in place at the end of the previous year that drives the turnover decision this year. A positive coefficient on the disagreement measures implies a positive marginal impact on the hazard and thus a shorter expected time as CEO. The firm characteristics we include as controls in the regressions, also lagged by one year, are *Firm size, Market-to-Book, Stock return, EW Industry stock return, Leverage, Stock volatility* and *Institutional blockholding*. When *Earnings disagreement* and *Earnings disagreement-2* are used as the disagreement measures, we also include *Analyst dispersion* to control for difference of opinions among analysts. In the case of *Earnings disagreement-2*, we further control for the number of analysts that provided forecasts (*Total analysts*) to account for the difference in analyst coverage across firms. We include *Total directors* to control for the number of director candidates up for elections when the last two disagreement measures regarding director election are used. The set of CEO characteristics we include are *Age, Age square, CEO blockholding*, and *CEO-Chair Duality*. In all regressions, we also include year fixed effects, and the standard errors we estimate are robust to heteroskedasticity and clustered at the firm level.

The results are reported in Table 3. Consistent with *Hypothesis 1*, we find that the coefficients of all five disagreement measures are positive and statistically significant. This indicates that the likelihood of forced CEO turnover increases when investors are more likely to disagree with management. From the coefficient estimates of the control variables, we find that the likelihood of forced CEO turnover is higher in poorly-performing firms and in firms with greater stock volatility or lower valuation. Also, CEOs who are also chairmen of the board of directors are less likely to be forced out. One might be concerned that the firm performance-turnover relation may be non-linear and it is possible that our disagreement measures are capturing the effect of extremely poor firm performance. To address this issue, we conduct a robustness check by including higher-order polynomials of *Stock return* in the regressions. We find that the results remain almost intact (untabulated for brevity).

Overconfidence? To address the concern that our first two disagreement measures might be capturing managerial overconfidence, we include a measure of CEO overconfidence using the CEO's holding of in-the-money options (defined following Malmendier and Tate, 2005) as an additional control and find that the coefficient estimates on the two disagreement measures remain similar (results not tabulated). Interestingly, the coefficients on the overconfidence measure are negative and significant, suggesting that an overconfident CEO is less likely to be fired.[23]

Forecast Error? Lee et al., (2012) show that the likelihood of CEO turnover is positively associated with management EPS forecast error and suggest that management forecast accuracy signals managerial ability to anticipate and respond to future events. One might thus be concerned that our finding of the relation between the first disagreement proxies and CEO turnover can be driven by management's poor forecast ability. To address this issue, we control for the forecast error (constructed as the absolute difference between management forecast of EPS and its actual value following Lee et al. 2012) in the regressions.[24] In results that are not tabulated, the coefficient estimates on the two disagreement measures are barely affected by the introduction of this additional control.

Supplementary Disagreement Measures: We next test *Hypothesis 1* using two supplementary disagreement measures associated with management forecasts, SED1 and SED2, which are intended to capture the persistence of disagreement (The construction of the two measures is presented in Appendix A.1.1). We first conduct a univariate test of the relation between forced CEO turnover and SED1/SED2, as what we do in Panel A of Table 2 for our main disagreement measures. We find a higher level of disagreement in the forced-turnover group than in the non-forced-turnover group (0.358 vs. 0.251 for SED1 and 0.371 vs. 0.271 for SED2), and the t-test conducted on the difference of the mean disagreement parameters shows that the difference is significant at 1% level for both measures. We then conduct the multivariate regression analysis as what we do in Table 3. The results, presented in Table O-1 of the online Appendix, are consistent with the results obtained with the main measures. It suggests that the more persistent the disagreement, the more likely is CEO dismissal.[25]

Linear Probability Model: We also repeat all of our estimates using a

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[23] This is consistent with the theory in Goel and Thakor (2008) that moderately overconfident CEOs are preferred by the shareholders to rational CEOs. Huang et al. (2018) document that banks with more optimistic CEOs create more liquidity.

[24] The pairwise correlation between *Earnings Disagreement* (*Earnings Disagreement-2*) and management forecast error is −0.035 (0.035) and statistically significant. And the pairwise correlation between *Earnings Disagreement* (*Earnings Disagreement-2*) and earnings surprise (absolute value) is 0.019 (0.086) and statistically significant.

[25] Our other findings in the paper continue to hold with these two supplementary disagreement measures. The results, not tabulated for brevity, are available upon request.

Table 2
Summary statistics.

	Mean	Median	S.D.	N
Panel A: Forced CEO turnover and measures of investor-management disagreement				
Earnings disagreement	−0.201	−0.062	1.290	14,159
Earnings disagreement-2	0.328	0.133	0.385	14,159
Forced CEO turnover	0.022	0	0.147	14,159
Proxy proposal	0.549	0	1.093	24,126
Forced CEO turnover	0.021	0	0.142	24,126
Voting recommendation	0.212	0	0.409	20,257
Actual voting	0.234	0	0.328	20,257
Forced CEO turnover	0.021	0	0.144	20,257

	Forced CEO turnover		Other firm-years		Difference	Difference
	N	Mean	N	Mean		Newey–West
Earnings disagreement	315	0.374	13,844	−0.214	0.588***	0.812***
Earnings disagreement-2	315	0.473	13,844	0.325	0.148***	0.178***
Proxy proposal	499	0.788	23,627	0.544	0.244***	0.120***
Voting recommendation	429	0.273	19,828	0.211	0.062***	0.062***
Actual voting	429	0.329	19,828	0.232	0.097***	0.087***

	Mean	Median	S.D.	N
Panel B: Firm characteristics				
Firm size (log)	8.076	8.002	1.681	24,126
Market-to-Book	1.535	1.157	1.282	24,126
Leverage	0.252	0.203	0.215	24,126
Stock return	0.023	−0.01	0.41	24,126
Stock volatility	0.329	0.281	0.191	24,126
ROA	0.044	0.046	0.084	24,125
Institutional blockholding	0.715	1	0.452	24,126
EW Industry stock return	0.149	0.125	0.31	24,126
Panel C: CEO characteristics				
CEO blockholding	0.096	0	0.294	24,126
Age	56.287	56	7.052	24,126
Tenure	8.503	6.319	7.491	24,126
CEO-Chair Duality	0.679	1	0.467	24,126

The upper part of Panel A presents summary statistics for the five measures of investor-management disagreement and for forced CEO turnover in each sample of the five measures. The lower part of Panel A reports the univariate evidence of the relation between disagreement and forced CEO turnover. The last two columns of it report the difference of the mean disagreement measure for firm-years prior to forced CEO turnover and other firm-years in the sample, with simple t-test and Newey–West t-test conducted respectively. *, **, and *** indicate significance at 10%, 5% and 1%, respectively. *Earnings disagreement* is management's forecast of earnings per share for the fiscal year end minus the mean analyst estimate reported no more than 30 days after the reporting date of management's forecast, scaled by the absolute value of the actual EPS for the fiscal year. *Earnings disagreement-2* is the fraction of analysts (who reported estimates no more than 30 days after the reporting date of management's forecast) with estimates being less than the management's forecast. *Proxy proposal* is the number of proxy proposals a firm receives in a given year. *Voting recommendation* is an indicator of whether a firm's director candidates receive objections from shareholders or unfavorable recommendations from independent proxy advisors before the election. *Actual voting* is defined as the fraction of directors receiving less than the yearly median yes-vote casted in all firms with available actual voting data, among all candidates in the firm who are up for election in a given year. Panels B and C provides summary statistics of firm and CEO characteristics for an unbalanced panel of firms from 1993 to 2016 that have non-missing *Proxy proposal* data. Definitions of these variables are in Appendix.

linear probability model.[26] We do this for three reasons. First, one of the critical assumptions underlying the Cox hazard model is that the covariates have the same effect on CEO turnover through time, which may not be the case for some firm characteristics. Second, the linear probability model helps us estimate the economic significance of our results more easily and in an intuitive manner. Third, with the linear probability model, we can control for firm or industry fixed effects. This allows us to purge out the impact of all time-invariant firm and industry characteristics. We are unable to include firm or industry fixed effects in the non-linear COX hazard model because of the incidental parameters problem (Neyman and Scott, 1948). In this linear model, we estimate with both industry and firm fixed effects together with year fixed effects, respectively.[27] The results are qualitatively similar under the two specifications.

The results, presented in Table O-2 of the online Appendix, are consistent with those obtained using the Cox hazard model that CEOs are more likely to be forced out when the level of disagreement is higher. The impact of disagreement is also economically significant. Specifically, when firm and year fixed effects are included, a one-

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[26] We include CEO tenure (*Ln(Tenure)*) in the linear regressions as an additional control to account for the impact of tenure on the likelihood of CEO dismissal. Unlike the Cox proportional hazard model, the linear model by itself does not take into account the effect of CEO tenure.

[27] Year fixed effects are important for various reasons, including the fact that bank credit supply tends to be higher in economic booms (see Thakor, 2015b, 2016 for recent theories) and is affected by bank competition (see Chu, 2018 for evidence), and the financing decisions of firms are sensitive to fluctuations in bank credit supply (see Bergbrant et al., 2017 for recent empirical evidence).

Table 3
The effect of disagreement on forced CEO turnover.

	Disagreement proxies				
	Earnings disagreement	Earnings disagreement-2	Proxy proposal	Voting recommendation	Actual voting
Disagreement$_{t-1}$	0.212***	0.843***	0.111***	0.264***	0.536***
	(0.036)	(0.180)	(0.037)	(0.108)	(0.137)
Stock return$_{t-1}$	−0.846***	−0.745***	−0.901***	−0.485***	−0.473***
	(0.118)	(0.128)	(0.167)	(0.173)	(0.155)
EW Industry stock return$_{t-1}$	−0.116	−0.104	−0.304	0.600	0.593
	(0.318)	(0.332)	(0.314)	(0.368)	(0.380)
CEO blockholding$_{t-1}$	−0.666*	−0.662*	−1.007***	−0.771**	−0.751***
	(0.392)	(0.378)	(0.248)	(0.375)	(0.282)
Age$_t$	0.210	0.181	0.040	−0.123	−0.126
	(0.154)	(0.152)	(0.083)	(0.095)	(0.079)
Age squared$_t$	−0.002	−0.001	−0.000	0.001	0.001
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
CEO-Chair duality$_t$	−0.968***	−1.001***	−0.734***	−0.738***	−0.755***
	(0.178)	(0.188)	(0.092)	(0.114)	(0.116)
Firm size$_{t-1}$	0.092*	0.106*	0.060	0.116**	0.115***
	(0.057)	(0.066)	(0.040)	(0.055)	(0.044)
Institutional blockholding$_{t-1}$	0.008	0.010	−0.125	−0.066	−0.066
	(0.126)	(0.116)	(0.092)	(0.135)	(0.139)
Market-to-Book$_{t-1}$	−0.133***	−0.127***	−0.104**	−0.149*	−0.138*
	(0.050)	(0.052)	(0.053)	(0.080)	(0.072)
Stock volatility$_{t-1}$	1.649***	1.526***	1.134***	1.486***	1.402***
	(0.313)	(0.341)	(0.281)	(0.372)	(0.298)
Leverage$_{t-1}$	−0.169	−0.273	0.450*	0.271	0.244
	(0.422)	(0.425)	(0.266)	(0.478)	(0.318)
Analyst dispersion$_{t-1}$	0.187***	0.153***			
	(0.045)	(0.044)			
Total analysts$_{t-1}$		0.004			
		(0.011)			
Total directors$_{t-1}$				0.003	0.014
				(0.019)	(0.016)
Observations	14,019	14,019	23,978	20,098	20,098

This table presents coefficient estimates from Cox proportional hazard regressions that examine the likelihood of forced CEO turnovers. The investor-management disagreement proxy used in each regression is indicated at the top of the table. *Earnings disagreement* is management's forecast of earnings per share for the fiscal year end minus the mean analyst estimate reported no more than 30 days after the reporting date of management's forecast, scaled by the absolute value of the actual EPS for the fiscal year. *Earnings disagreement-2* is the fraction of analysts (who reported estimates no more than 30 days after the reporting date of management's forecast) with estimates being less than the management's forecast. *Proxy proposal* is the number of proxy proposals a firm receives in a given year. *Voting recommendation* is an indicator of whether a firm's director candidates receive objections from shareholders or unfavorable recommendations from independent proxy advisors before the election. *Actual voting* is defined as the fraction of directors receiving less than the yearly median yes-vote casted in all firms with available actual voting data, among all candidates in the firm who are up for election in a given year. *Total analysts* is the natural log of one plus the number of analysts that report estimates no more than 30 days after the reporting date of management's EPS forecast. All other explanatory variables are defined in Appendix. Year fixed effects are included in all regressions. Different industries (defined using Fama–French 48 industries) are allowed to have different baseline hazards. Robust standard errors are clustered by firm and reported in parentheses. *, **, and *** indicate significance at 10%, 5%, and 1%, respectively.

standard-deviation (1.29/0.39) increase in *Earnings disagreement/ Earnings disagreement-2* is associated with a 0.9% /0.51% increase in the probability of forced turnover. There is a 0.33%/0.29% increase in the probability of forced turnover after a one-standard-deviation (1.09/ 0.41) increase in the number of proxy proposals received/the proportion of director candidates receiving less than the yearly-median percentage of yes-votes. Also, the probability of forced turnover increases by 1.2% following director candidates receiving an unfavorable vote recommendation. In comparison, the unconditional probability of a CEO being forced out in our sample is 2.1–2.2%. Thus, our estimates are very significant.

4.1.2. Is the effect robust to controls for various measures of firm performance?

CEOs are often fired for poor performance, and it is plausible to conjecture that poor firm performance is accompanied by high investor-management disagreement. In our benchmark analysis, we have attempted to control for firm performance by controlling for prior-year stock returns and industry returns. However, this may not be enough. The literature suggests that firms may use measures of firm performance other than prior-year stock returns in their decisions of CEO firing.[28] We thus control for a complete set of past firm performance metrics based on the prior studies in additional regression specifications to examine the robustness of the effect of disagreement.

Specifically, we add to the regressions of the benchmark analysis two different versions of accounting performance based on return on assets (ROA) – namely, the prior-year ROA, and the change in ROA during the past two years. Also, we include as controls various measures of a CEO's tenure-long firm stock performance with different weights placed in different time along the tenure. Following Malmendier and Nagel (2011) and Jenter and Lewellen (2014), we construct a CEO's tenure-long stock performance as the weighted average abnormal

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[28] For instance, Engle et al. (2003) find interesting cross-sectional variation in the weights placed on accounting-based and market-based firm performance measures and relate it to the properties of these performance measures. Denis and Denis (1995) find in an early sample of top management turnover that forced CEO turnover is preceded by a significant decline in operating performance. Jenter and Lewellen (2014) examine the relation between CEO turnover and firm stock performance along CEOs' tenures and find evidence that boards assign larger weights to more recent performance signals than to past ones in making CEO turnover decisions.

return from her first month in office as CEO through the end of year $t − 1$, where t is the year of turnover. Details on the construction of this variable are in the Appendix.[29]

We present the results with these alternative measures of firm performance in Table O-3 of the online Appendix. We find that the effect of disagreement on the likelihood of forced CEO turnover is robust to controls involving these performance measures. The coefficient estimates of the five disagreement proxies remain largely unchanged in both statistical significance and economic magnitude (even larger in some cases), compared with the results in Table 3. In tests that include both accounting and stock performance measures in one regression, we find that the results, not tabulated for brevity, remain similar. To the extent that these firm performance measures capture managerial ability that would affect firms' future performance, these robustness checks enable us to more sharply disentangle the effect of disagreement from the effect of expected future firm performance in CEO turnover decisions.

While we find it implausible that changes in ROA over a two-year time horizon would be related to investor-management disagreement perceptibly, one may nonetheless argue that even the tests in this section do not go far enough in distinguishing between the effects of fundamental disagreement and performance shortcomings on CEO turnover. We address this concern in Section 5.2.2 where we exploit an exogenous shock to investment-management agreement that does *not* involve changes in firm fundamentals. The findings, to be discussed later, get directly at the effect of disagreement on forced CEO turnover that is orthogonal to the effect of firm performance.

4.1.3. Is the effect weaker in firms with more-entrenched CEOs?

As discussed in Section 2, our disagreement hypothesis predicts that the turnover-disagreement sensitivity is weaker in firms with more-entrenched CEOs. To measure the extent of which a firm's CEO is entrenched, we construct an index of CEO entrenchment based on the following observations. There is greater entrenchment when: (i) the CEO is also the chairman of the board; (ii) the fraction of outsiders on the board (board independence) is below the sample average;[30] and (iii) the stock ownership by executive directors is greater than the sample average. To the extent that executive directors are more likely to be aligned with the CEO and their higher stock ownership gives them greater voice on the board, it is intuitive that higher ownership by executive directors is associated with greater CEO entrenchment.[31] The entrenchment index takes a value of zero to three, depending on the number of the three observations that are true. Therefore, a firm's CEO is regarded as least entrenched when the index equals zero and most entrenched when the index equals three. We divide our sample into two groups based on the entrenchment index. Firms with the index being two or three are grouped and labeled as "Entrenched", and other firms are grouped and labeled as "Less entrenched". In testing our prediction, we run the baseline regressions in Table 3 on the two groups of firms, respectively.

In Table O-4 of the online Appendix, we present the results that are consistent with our predictions on the impact of CEO entrenchment. Although the effect of disagreement on forced CEO turnover is mostly consistent across the subsamples of "Entrenched" and "Less entrenched", it is only statistically significant in the subsample of "Less entrenched". All other explanatory variables are included in the regressions but are not tabulated.

To sum up, we find that the likelihood of forced CEO turnover is positively related to the level of investor-management disagreement. Moreover, the effect is more pronounced in firms that have less-entrenched CEOs.

4.2. Test of Hypothesis 2

To test this hypothesis, we augment the baseline test of *Hypothesis 1* by interacting an indicator of high agreement with past firm performance. The hypothesis predicts that the coefficient on the interaction term is positive, while the coefficients on the high-agreement indicator and firm performance are negative. We define the *High-agreement* indicator for each proxy of investor-management agreement such that it equals one if: (1) *Earnings disagreement* is less than the sample's yearly median; (2) *Earnings disagreement-2* is less than the sample's yearly median; (3) *Proxy proposal* equals zero; (4) *Vote recommendation* equals zero; or (5) *Actual voting* equals zero. All variables included in the specifications of Table 3 are also included here.

Table 4 presents the results of this augmented test. Consistent with *Hypothesis 2*, we find that the coefficient estimates of the interaction term of *High-agreement* and past stock returns are positive and statistically significant for all the agreement measures, while both the coefficient estimates of *High-agreement* and past stock returns are significantly negative. In economic magnitudes, when compared to CEOs with low agreement, the sensitivity of turnover to firm performance for *High-agreement* CEOs drops by at least two thirds or even completely disappears, depending on specific agreement measures. Therefore, CEOs who have high agreement with investors are less likely to be fired due to poor recent firm performance.

4.3. Test of Hypothesis 3

We test this hypothesis by examining the effect of disagreement on a firm's choice of an external CEO, conditional on CEO succession. To do this, we apply a logit estimation model where the dependent variable is an indicator that identifies if a new CEO has been with the firm for less than a year prior to the CEO appointment. The main independent variable is disagreement. Prior research suggests that firms are more likely to hire an outsider if the predecessor was forced out (e.g., Parrino, 1997). We thus include as a control variable, *Forced turnover*, a dummy that equals one if the departing CEO is forced out. Those firm-level variables that are used to estimate the likelihood of forced turnover in Table 3 are also included as controls here in addition to the yearly and industry dummies. Robust standard errors are clustered at the firm level in all regressions.

The results presented in Table 5 strongly support *Hypothesis 3*. The reported coefficients of the marginal effect are positive and statistically significant for all the disagreement proxies except *Earnings disagreement* (whose coefficient is positive but insignificant). It suggests that an external replacement CEO is more likely to be selected when the level of disagreement between investors and incumbent management is higher. This finding holds even after we control for *Forced turnover*, the coefficient estimate of which itself is significantly positive. As in testing Hypothesis 1, we run a linear probability regression to gauge the economic magnitude of the impact of disagreement on external CEO hiring.[32] In results that are presented in Table O-5 of the online Appendix, we find that the effect is not only statistically significant but also economically meaningful. Specifically, a one-standard-deviation

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[29] Note that Λ in the formula determines the relative weights that the board places on recent firm performance, with a higher value of Λ implying more emphasis on the performance in more recent months. A value of Λ being zero implies that the board assigns the same weights on the performances of all past months. We take the values of Λ from zero through three to examine the robustness of the effect of disagreement to this market-based performance measure.

[30] For the impact of outside directors on CEO succession, see Weisbach (1988), Borokhovich et al. (1996), Knyazeva et al. (2013), and Guo and Masulis (2015) for examples.

[31] Denis et al. (1997) find that top executive turnover is less likely when the ownership of officers and directors in the firm is higher.

[32] We conduct this test with industry and year fixed effects only, because there is little within-firm variation in external CEO hiring in the sample firms.

Table 4

High agreement and the sensitivity of forced CEO turnover to firm performance.

	Disagreement proxies				
	Earnings disagreement	Earnings disagreement-2	Proxy proposal	Voting recommendation	Actual voting
High-agreement	−0.308**	−0.495***	0.019	−0.214*	−0.207**
	(0.138)	(0.134)	(0.121)	(0.126)	(0.111)
High-agreement X Stock return$_{t-1}$	0.611***	0.541**	0.457*	0.438*	0.610**
	(0.258)	(0.257)	(0.290)	(0.277)	(0.313)
Stock Return$_{t-1}$	−1.036***	−0.962***	−1.245***	−0.780***	−0.766***
	(0.180)	(0.156)	(0.295)	(0.241)	(0.251)
EW Industry stock return$_{t-1}$	−0.189	−0.138	−0.342	0.574	0.623*
	(0.331)	(0.334)	(0.279)	(0.383)	(0.377)
CEO blockholding$_{t-1}$	−0.670*	−0.659*	−0.979***	−0.769***	−0.742***
	(0.379)	(0.377)	(0.267)	(0.287)	(0.284)
Age$_t$	0.180	0.183	0.040	−0.125	−0.136*
	(0.151)	(0.153)	(0.080)	(0.082)	(0.079)
Age squared$_t$	−0.001	−0.001	−0.000	0.001	0.001*
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
CEO-Chair duality$_t$	−0.982***	−0.996***	−0.723***	−0.739***	−0.748***
	(0.190)	(0.185)	(0.101)	(0.121)	(0.116)
Firm size$_{t-1}$	0.093	0.098	0.094***	0.117***	0.111***
	(0.060)	(0.068)	(0.040)	(0.042)	(0.044)
Institutional blockholding$_{t-1}$	−0.037	−0.011	−0.126	−0.073	−0.082
	(0.119)	(0.113)	(0.108)	(0.139)	(0.138)
Market-to-Book$_{t-1}$	−0.129***	−0.125**	−0.106*	−0.149***	−0.149**
	(0.051)	(0.055)	(0.057)	(0.060)	(0.073)
Stock volatility$_{t-1}$	1.576***	1.564***	1.116***	1.498***	1.414***
	(0.337)	(0.330)	(0.257)	(0.298)	(0.302)
Leverage$_{t-1}$	−0.241	−0.242	0.408	0.271	0.235
	(0.444)	(0.432)	(0.273)	(0.308)	(0.314)
Analyst dispersion$_{t-1}$	0.187***	0.162***			
	(0.041)	(0.042)			
Total analysts$_{t-1}$		−0.003			
		(0.012)			
Total directors$_{t-1}$				0.003	0.003
				(0.016)	(0.016)
Observations	14,019	14,019	23,978	20,098	20,098

This table presents coefficient estimates from Cox proportional hazard regressions that examine the likelihood of forced CEO turnovers. The investor-management disagreement proxy used in each regression is indicated at the top of the table. *High-agreement* is an indicator for each proxy of investor-management agreement, such that it equals one if (1) *Earnings disagreement* is less than the sample's yearly median; (2) *Earnings disagreement-2* is less than the sample's yearly median; (3) *Proxy proposal* equals zero; (4) *Vote recommendation* equals zero; or (5) *Actual voting* equals zero. Year and industry dummies are included but not reported for brevity. Robust standard errors are clustered by firm and reported in parentheses. *, **, and *** indicate significance at 10%, 5% and 1% respectively.

(1.29/0.39) increase in *Earnings disagreement/Earnings disagreement-2* is associated with a 0.9% /1.93% increase in the probability of external CEO hiring. There is a 1.97%/1.72% increase in the probability of external CEO hiring after a one-standard-deviation (1.09/0.41) increase in the number of proxy proposals received/the proportion of director candidates receiving less than the yearly-median percentage of yes-votes. Also, the probability of external CEO hiring increases by 1.54% following director candidates receiving an unfavorable vote recommendation.

Note that we include both voluntary and forced CEO successions in the above test. Although disagreement does not affect voluntary CEO turnover, disagreement can affect the choice of external replacement. When a CEO leaves voluntarily for reasons other than disagreement, the firm will prefer an external replacement to improve investor-management agreement if agreement with the departing CEO is relatively low, as we explain in Section 2. Nevertheless, in a robustness check, we find that the results (untabulated for brevity but available upon request) remain qualitatively similar if we restrict our analysis to the subsample of forced CEO turnover only.

4.4. Test of Hypothesis 4

We test this hypothesis by examining how investor-management disagreement changes following forced CEO turnover based on the following specification:

$$\text{Change in Disagreement}_{i,t-1 \text{ to } t+1} = \alpha + \beta_1 * \text{Forced turnover}_{i,t} + \beta_2 * \text{Controls} + \mu_{industry} + \eta_t + \varepsilon_{i,t},$$

where *Forced turnover* $_{i,t}$ is an indicator variable that equals one if firm i experiences forced CEO turnover in year t and zero otherwise. We also include other explanatory variables as controls for public information about the firm as of year t, such as *Firm size, Market-to-Book, Stock return, Stock volatility*, and accounting performance *ROA*. Year and industry fixed effects are also included to all regressions. The dependent variable, *Change in Disagreement* $_{i,t-1 \text{ to } t+1}$, measures the change in disagreement from the year prior (year $t-1$) to the year subsequent (year $t+1$) to the turnover. We explain below in more detail how we construct this dependent variable for each of our disagreement proxies.

Proxy proposal first. We note that, conditional on the occurrence of a proxy proposal submission, the average firm receives two proposals in a year. Therefore, a drop of two in the number of proposals received in the average firm implies an aligned view between investors and the new management in the year subsequent to CEO turnover. We thus define the change-in-disagreement variable as a dummy, which equals one if the number of proxy proposals received in year $t+1$ drops by at least two relative to the number of proxy proposals received in year $t-1$, representing a decline in disagreement, and is zero otherwise. Similarly, in the case of *Actual voting*, the change-in-disagreement variable is also defined as an indicator variable that equals one if the fraction of directors receiving less than the yearly-median percentage of yes-votes

Table 5

The effect of disagreement on external CEO hiring.

	Disagreement proxies				
	Earnings disagreement	Earnings disagreement-2	Proxy proposal	Voting recommendation	Actual voting
Disagreement$_{t-1}$	0.007	0.043*	0.017***	0.036*	0.034**
	(0.012)	(0.028)	(0.007)	(0.022)	(0.018)
Forced turnover$_t$	0.162***	0.152***	0.148***	0.140***	0.140***
	(0.010)	(0.011)	(0.011)	(0.019)	(0.019)
Stock return$_{t-1}$	−0.097***	−0.089**	−0.119***	−0.077***	−0.077***
	(0.035)	(0.032)	(0.027)	(0.021)	(0.022)
Firm size$_{t-1}$	−0.016*	−0.027**	−0.018**	−0.013	−0.013
	(0.010)	(0.013)	(0.008)	(0.012)	(0.012)
Institutional blockholding$_{t-1}$	−0.048	−0.050	−0.048**	−0.024	−0.024
	(0.035)	(0.036)	(0.022)	(0.040)	(0.039)
Market-to-Book$_{t-1}$	0.001	−0.003	−0.017**	−0.004	−0.003
	(0.006)	(0.005)	(0.007)	(0.012)	(0.012)
Stock volatility$_{t-1}$	0.114	0.081	0.237***	0.158***	0.157***
	(0.118)	(0.121)	(0.070)	(0.048)	(0.047)
Leverage$_{t-1}$	0.053	0.085	−0.106***	−0.037	−0.031
	(0.074)	(0.067)	(0.042)	(0.031)	(0.031)
Analyst dispersion$_{t-1}$	0.014	0.011			
	(0.015)	(0.014)			
Total analysts$_{t-1}$		0.006***			
		(0.001)			
Total directors$_{t-1}$				−0.000	0.001
				(0.002)	(0.003)
Observations	1356	1356	2289	1846	1846

This table presents results from logit regressions (coefficients of the marginal effect are reported) that examine the impact of investor-management disagreement on the likelihood of external CEO selection, conditional on CEO succession. The dependent variable takes a value of one if the newly appointed CEO has been with the firm for less than a year prior to the appointment and zero otherwise. The investor-management disagreement proxy used in each regression is indicated at the top of the table. *Earnings disagreement* is management's forecast of earnings per share for the fiscal year end minus the mean analyst estimate reported no more than 30 days after the reporting date of management's forecast, scaled by the absolute value of the actual EPS for the fiscal year. *Earnings disagreement-2* is the fraction of analysts (who reported estimates no more than 30 days after the reporting date of management's forecast) with estimates being less than the management's forecast. *Proxy proposal* is the number of proxy proposals a firm receives in a given year. *Voting recommendation* is an indicator of whether a firm's director candidates receive objections from shareholders or unfavorable recommendations from independent proxy advisors before the election. *Actual voting* is defined as the fraction of directors receiving less than the yearly median yes-vote casted in all firms with available actual voting data, among all candidates in the firm who are up for election in a given year. *Forced turnover* is a dummy that equals one if the departing CEO is forced out and zero otherwise. Other explanatory variables are defined in Appendix. Year and industry dummies are included in the regressions. Robust standard errors are clustered by firm and reported in parentheses. *, **, and *** indicate significance at 10%, 5% and 1% respectively.

among all candidates up for election in year $t+1$ is less than that in year $t-1$, and is zero otherwise, i.e., a value of one means a drop in disagreement. In the case of *Voting recommendation*, the change-in-disagreement variable is a dummy that equals one if the fraction of director candidates receiving a "withhold" or "against" recommendation from ISS or/and certain shareholders in a "just vote no" campaign among all candidates in the firm who are up for election in year $t+1$ is less than that in year $t-1$, and zero otherwise. For the other two disagreement proxies associated with earnings forecast, the change in disagreement is the simple difference of the continuous measure from year $t-1$ to year $t+1$.

When the change-in-disagreement is defined as a continuous variable, as is the case for *Earnings disagreement* and *Earnings disagreement-2*, we employ an OLS regression in estimating the effect of forced turnover, and we expect a significantly negative impact in these cases. For the other three indicator change-in-disagreement variables, we apply a logistic model in estimating the effect of forced turnover (and coefficients of the marginal effect are reported), and we expect a significantly positive impact in these cases. Year and industry dummies are included and robust standard errors are clustered at the firm level in all regressions. The results presented in Table 6 are consistent with *Hypothesis 4*. The coefficients of *Forced turnover* have the expected signs for all five change-in-disagreement proxies and are statistically significant. It suggests that disagreement declines following forced CEO turnover.

In results presented in Table O-6 of the online Appendix, we extend the examination window of the change in disagreement to three years subsequent to CEO turnover. We find the decline in disagreement persists over the longer time period. We also find that the decline in

disagreement is greater following forced CEO turnover if a replacement CEO is hired externally. This is consistent with *Hypothesis 3* that firms tend to employ an external successor when the level of disagreement is high, because an internal successor is more likely to share similar views and beliefs with the departing CEO than would an external successor.

5. Additional tests and robustness checks

In this section, we discuss two main issues: (i) The stock market's reaction to disagreement-induced CEO turnover, and (ii) endogeneity concerns.

5.1. Market response to announcements of forced CEO turnover

To what extent will the market react to the decline in disagreement that is anticipated following CEO dismissal? The answer suggested by the disagreement hypothesis is that the market will react positively.

To confront this reasoning with the data, we examine the five-day $(-2, +2)$ cumulative abnormal returns (CARs) around the forced turnover announcements. We estimate CARs using the market model and the CRSP equal-weighted stock return as the market return. Specifically, we take the sample of forced CEO turnover that corresponds to the *Proxy proposal* measure of disagreement due to its most complete coverage of sample firms.[33] We divide the sample into two

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[33] Our findings are similar for samples of forced turnover corresponding to other disagreement proxies.

Table 6
The effect of forced CEO turnover on agreement.

	Proxies for change in agreement				
	Earnings disagreement	Earnings disagreement-2	Proxy proposal	Voting recommendation	Actual voting
Forced turnover$_t$	−0.627***	−0.124***	0.018***	0.052***	0.039*
	(0.129)	(0.038)	(0.005)	(0.015)	(0.023)
Stock return$_t$	−0.129**	−0.003	0.004	0.021***	−0.067***
	(0.060)	(0.013)	(0.003)	(0.007)	(0.010)
Stock volatility$_t$	0.043	0.024	0.013	0.025*	0.145***
	(0.138)	(0.038)	(0.011)	(0.015)	(0.024)
ROA$_t$	0.303	0.431***	−0.062**	−0.040	−0.137***
	(0.281)	(0.079)	(0.026)	(0.032)	(0.042)
Market-to-Book$_t$	−0.037*	−0.007	−0.004	0.001	−0.010***
	(0.022)	(0.004)	(0.002)	(0.003)	(0.004)
Firm size$_t$	0.002	0.001	0.021***	−0.008***	0.007***
	(0.008)	(0.003)	(0.001)	(0.002)	(0.002)
Observations	9715	9715	23,872	19,094	20,016

This table presents results from OLS regressions (columns (1), and (2)) and logit regressions (columns (3)–(5)) of the change in investor-management agreement from year $t−1$ to year $t+1$ on forced CEO turnover in year t. The dependent variables, defined as follows, are the changes in the five disagreement proxies which are indicated at the top of columns: a simple difference of *Earnings disagreement* from year $t−1$ to year $t+1$, where *Earnings disagreement* is management's forecast of earnings per share for the fiscal year end minus the mean analyst estimate reported no more than 30 days after the reporting date of management's forecast, scaled by the absolute value of the actual EPS for the fiscal year; a simple difference of *Earnings disagreement-2* from year $t−1$ to year $t+1$, where *Earnings disagreement-2* is the fraction of analysts (who reported estimates no more than 30 days after the reporting date of management's forecast) with estimates being less than the management's forecast; a dummy that equals one if the number of proxy proposals received in year $t+1$ drops by at least two relative to the number of proxy proposals received in year $t−1$, and zero otherwise; a dummy that equals one if the fraction of director candidates receiving a "withhold" or "against" recommendation from ISS or/and certain shareholders in a "just vote no" campaign among all candidates in the firm who are up for election in year $t+1$ is less than that in year $t−1$, and zero otherwise; and a dummy that equals one if the fraction of directors receiving less than the yearly-median percentage of yes-votes among all candidates up for election in year $t+1$ is less than that in year $t−1$, and zero otherwise. *Forced turnover* is a dummy that equals one if a forced CEO turnover occurs in year t and zero otherwise. Other explanatory variables are defined in Appendix. All regressions include year and Fama–French 48 industry dummy variables. Constants from OLS regressions are not tabulated for brevity. Coefficients of the marginal effect are reported in the logit regressions. Robust standard errors are clustered by firm and reported in parentheses. *, **, and *** indicate significance at 10%, 5%, and 1% levels, respectively.

Table 7
The relation between disagreement and CEO turnover: The case of voluntary turnover.

	Disagreement proxies				
	EPS disagreement	EPS disagreement-2	Proxy proposal	Voting recommendation	Actual voting
Panel A: The effect of disagreement on voluntary CEO turnover					
Disagreement$_{t−1}$	−0.071***	−0.046	−0.081**	−0.066	−0.006
	(0.023)	(0.109)	(0.032)	(0.067)	(0.090)
Stock return$_{t−1}$	−0.361***	−0.368***	−0.438***	−0.437***	−0.438***
	(0.065)	(0.068)	(0.079)	(0.086)	(0.086)
EW Industry stock return$_{t−1}$	−0.692***	−0.692***	−0.235	−0.467**	−0.468**
	(0.215)	(0.226)	(0.186)	(0.210)	(0.211)
CEO blockholding$_{t−1}$	−0.620***	−0.619***	−0.799***	−0.867***	−0.873***
	(0.189)	(0.188)	(0.112)	(0.160)	(0.161)
Age$_t$	0.092	0.093	0.193***	0.094	0.096
	(0.066)	(0.066)	(0.064)	(0.066)	(0.066)
Age squared$_t$	−0.000	−0.000	−0.001*	−0.000	−0.000
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
CEO-Chair duality$_t$	−0.290***	−0.292***	−0.320***	−0.225***	−0.225***
	(0.085)	(0.085)	(0.066)	(0.071)	(0.071)
Firm size$_{t−1}$	0.064**	0.060**	0.103***	0.067***	0.068***
	(0.029)	(0.031)	(0.024)	(0.023)	(0.024)
Institutional blockholding$_{t−1}$	0.000	0.003	−0.077	−0.020	−0.018
	(0.090)	(0.089)	(0.079)	(0.081)	(0.080)
Market-to-Book$_{t−1}$	0.049	0.050	0.016	−0.006	−0.006
	(0.032)	(0.034)	(0.028)	(0.032)	(0.032)
Stock volatility$_{t−1}$	0.568*	0.556*	0.583**	0.399	0.396
	(0.320)	(0.303)	(0.228)	(0.251)	(0.245)
Leverage$_{t−1}$	−0.196	−0.169	−0.260	−0.202	−0.203
	(0.277)	(0.268)	(0.177)	(0.183)	(0.183)
Analyst dispersion$_{t−1}$	0.046	0.057			
	(0.052)	(0.052)			

Table 7 (*continued*)

	Disagreement proxies				
	EPS disagreement	EPS disagreement-2	Proxy proposal	Voting recommendation	Actual voting
Total analysts$_{t-1}$		0.001			
		(0.007)			
Total directors$_{t-1}$				−0.001	−0.002
				(0.009)	(0.009)
Observations	14,019	14,019	23,978	20,098	20,098

	Proxies for change in agreement				
	Earnings disagreement	Earnings disagreement-2	Proxy proposal	Voting recommendation	Actual voting
Panel B: The effect of voluntary CEO turnover on agreement					
Voluntary turnover$_t$	0.055	0.006	−0.002	−0.005	0.035***
	(0.050)	(0.022)	(0.005)	(0.011)	(0.012)
Stock return$_t$	−0.121*	−0.001	0.003	0.018**	−0.067***
	(0.060)	(0.015)	(0.003)	(0.007)	(0.009)
Stock volatility$_t$	−0.006	0.015	0.014	0.028*	0.145***
	(0.139)	(0.030)	(0.011)	(0.016)	(0.031)
ROA$_t$	0.395	0.448***	−0.064**	−0.046	−0.139***
	(0.284)	(0.072)	(0.026)	(0.032)	(0.050)
Market-to-Book$_t$	−0.036	−0.007	−0.004	0.000	−0.010**
	(0.022)	(0.005)	(0.003)	(0.003)	(0.004)
Firm size$_t$	0.001	0.000	0.021***	−0.008***	0.006**
	(0.008)	(0.003)	(0.002)	(0.002)	(0.003)
Observations	9715	9715	23,872	19,094	20,016

Panel A presents coefficient estimates from Cox proportional hazard regressions that examine the likelihood of voluntary CEO turnovers. The investor-management disagreement proxy used in each regression is indicated at the top of the table. *Earnings disagreement* is management's forecast of earnings per share for the fiscal year end minus the mean analyst estimate reported no more than 30 days after the reporting date of management's forecast, scaled by the absolute value of the actual EPS for the fiscal year. *Earnings disagreement-2* is the fraction of analysts (who reported estimates no more than 30 days after the reporting date of management's forecast) with estimates being less than the management's forecast. *Proxy proposal* is the number of proxy proposals a firm receives in a given year. *Voting recommendation* is an indicator of whether a firm's director candidates receive objections from shareholders or unfavorable recommendations from independent proxy advisors before the election. *Actual voting* is defined as the fraction of directors receiving less than the yearly median yes-vote casted in all firms with available actual voting data, among all candidates in the firm who are up for election in a given year. All other explanatory variables are defined in Appendix. Year fixed effects are included in all regressions. Different industries (as defined using Fama–French 48 industries) are allowed to have different baseline hazards. Robust standard errors are clustered by firm and reported in parentheses. *, **, and *** indicate significance at 10%, 5%, and 1%, respectively.

Panel B presents results from OLS regressions (columns (1), and (2)) and logit regressions (columns (3)–(5)) of the change in investor-management agreement from year *t*− 1 to year *t* + 1 on voluntary CEO turnover in year *t*. The dependent variables, defined as follows, are the changes in the five disagreement proxies which are indicated at the top of columns: a simple difference of *Earnings disagreement* from year *t*− 1 to year *t* + 1, where *Earnings disagreement* is management's forecast of earnings per share for the fiscal year end minus the mean analyst estimate reported no more than 30 days after the reporting date of management's forecast, scaled by the absolute value of the actual EPS for the fiscal year; a simple difference of *Earnings disagreement*-2 from year *t*− 1 to year *t* + 1, where *Earnings disagreement-2* is the fraction of analysts (who reported estimates no more than 30 days after the reporting date of management's forecast) with estimates being less than the management's forecast; a dummy that equals one if the number of proxy proposals received in year *t* + 1 drops by at least two relative to the number of proxy proposals received in year *t*− 1, and zero otherwise; a dummy that equals one if the fraction of director candidates receiving a "withhold" or "against" recommendation from ISS or/and certain shareholders in a "just vote no" campaign among all candidates in the firm who are up for election in year *t* + 1 is less than that in year *t*− 1, and zero otherwise; and a dummy that equals one if the fraction of directors receiving less than the yearly-median percentage of yes-votes among all candidates up for election in year *t* + 1 is less than that in year *t*− 1, and zero otherwise. *Voluntary turnover* is a dummy that equals one if a voluntary CEO turnover occurs in year t and zero otherwise. Other explanatory variables are defined in Appendix. All regressions include year and Fama–French 48 industry dummy variables. Coefficients of the marginal effect are reported in the logit regressions. Robust standard errors are clustered by firm and reported in parentheses. *, **, and *** indicate significance at 10%, 5%, and 1% levels, respectively.

subsamples – a "high disagreement" subsample in which a firm receives at least one proxy proposal and a "low disagreement" subsample in which a firm does not receive any proxy proposals in the year prior to turnover. We then compare the CARs between the two subsamples to contrast the market's response to forced CEO turnover due to disagreement with its response to other types of forced turnover. Our finding confirms the prediction of our disagreement hypothesis. The average five-day CARs are 1.91% and significant for the "high disagreement" subsample, while the average CARs are −2.19% and significant for the "low disagreement" subsample.[34]

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[34] In untabulated regression results, we find that the CARs for the "high disagreement" subsamples are significantly higher than the CARs for the "low disagreement" even after controlling for various firm and CEO characteristics.

5.2. Endogeneity of disagreement and turnover

One might be concerned that both disagreement and forced turnover may be related to an unobserved omitted variable, and therefore the relation between them might be spurious. One such variable is the uncertainty that a firm faces in its growth opportunities or its technological development. For instance, such uncertainty is prevalent in high-tech industries with abundant investment opportunities. Uncertainty increases the likelihood that agents will arrive at different interpretations of the same information set, and thus may contribute to disagreement. Meanwhile, higher uncertainty may also make incentive contracting less efficient (e.g., Holmstrom, 1979), leading to lower effort supply by the CEO and hence worse firm performance and higher CEO turnover.

If the omitted variable is time-invariant within the firm, we have tackled this issue in Section 4 where we ran a firm-fixed-effects estimation of disagreement on forced CEO turnover, using a linear

probability model. If the omitted variable is time varying, then a firm fixed effects estimation will not be effective in addressing the omitted-variable-bias concern. We deal with this possibility in two different ways: (i) by running a falsification test, and (ii) by examining the impact of a shock to agreement. Each of these tests is discussed below.

5.2.1. A falsification test

Under our disagreement explanation, a CEO always believes she is maximizing firm value, so she has no reason to depart voluntarily when disagreement is high. Therefore, disagreement is unlikely to affect the likelihood of voluntary CEO turnover in a systematic way. By contrast, under the uncertainty (the omitted variable discussed above) view, if the difficulty in coping with uncertainty increases the likelihood of forced management turnover, we expect to see a similar effect of uncertainty on voluntary turnover. This is because managers are more likely to jump ship to other firms for better perceived opportunities in industries with greater uncertainty, as highlighted by the recent controversy about information technology firms colluding in their hiring practices to limit poaching talent from each other.[35] That might explain the prevalence of talent retention measures in those firms such as non-compete agreements (Garmaise, 2011) and long-duration pay (Gopalan et al., 2016). Thus, the contrasting prediction regarding voluntary CEO turnover under the uncertainty view provides an opportunity to conduct a falsification test of our disagreement hypothesis.

In the falsification test, we repeat the baseline analysis about the effect of disagreement in Table 3 with a replacement of the dependent variable by the hazard rate of voluntary CEO turnover. In doing this, we focus on incidents of voluntary turnover that are not due to mandatory or planned retirements, although our results are not sensitive to this exclusion. The results, presented in Panel A of Table 7, do not support the uncertainty view. Unlike the case of forced turnover, the estimated coefficients are negative for four of the disagreement proxies.[36] This shows that disagreement is not relevant to voluntary CEO turnover, consistent with our disagreement hypothesis.

Next, we also examine the impact of voluntary turnover on the subsequent change in agreement as we did for forced turnover in Table 6. The results are presented in Panel B of Table 7. Unlike the case of forced CEO turnover, there is no significant change in agreement following voluntary CEO turnover.[37] It further confirms the irrelevance of disagreement to voluntary CEO turnover as suggested by our disagreement hypothesis.

5.2.2. Impact of an exogenous shock to investor-management agreement

We also identify a shock to agreement (through a change in the firm's investor base) that is unlikely to be related to the omitted variable or other firm characteristics and then examine how it affects forced CEO turnover. Flow-induced mutual fund fire sales (Coval and Stafford, 2007) constitute an ideal setting for this purpose.

Distressed funds that have experienced extreme capital outflows are forced to sell their holdings with significant discounts. Existing investors who are not distressed are unlikely to absorb, within a short time period, all these shares due to risk aversion, wealth endowment constraints, or both. It follows that, in equilibrium, the new *marginal* investors in the stocks under fire sales are other liquidity providers. They have a lower level of agreement than the existing shareholders but trade to earn a liquidity premium. If these investors did not have a lower level of agreement, they would have purchased the stock prior to

the fire sales. The change in the investor base results in a decline in the level of agreement between investors and management.[38] This decline in agreement, arising from distressed funds' liquidity demand, is unlikely related to changes in firm fundamentals for the affected stocks, and therefore whatever effect on forced CEO turnover we measure in response to this event cannot be due to anything linked to firm fundamentals, including performance. Coval and Stafford (2007) show that fire-sale-affected stocks experience a temporary price drop over the period when they are being sold, which is then reversed in a year or so. It is unlikely, however, that rational shareholders with full knowledge of the uninformed forced sales would force the CEO out simply because of the temporary stock performance decline. A more plausible interpretation is that the firing is due to the (performance-unrelated) lower level of agreement. We expect that the negative shock to agreement would lead to an increased probability of forced CEO turnover, according to our disagreement hypothesis.

We first test whether the level of agreement declines following mutual fund fire sales. Specifically, we use the specification in Table 6 and regress the change in the disagreement measures on *Shock to agreement* and other control variables included in Table 6. *Shock to agreement* is defined as a dummy that equals one if the stock is in the bottom decile of trading *Pressure* and the middle three deciles of trading *UPressure* during any of the four previous quarters and zero otherwise, i.e., a value of one means a decline in agreement. The variables *Pressure* and *UPressure* are defined following the mutual fund fire sales literature (e.g., Coval and Stafford, 2007; Khan et al., 2012) and more details on their construction are in Appendix A.2. The results, presented in Panel A of Table 8, confirm that the change in agreement is negatively related to *Shock to agreement*. The estimated coefficients on the change in disagreement measures all have the predicted signs and are all statistically significant except in the case of the disagreement measure *Actual voting*.

We then regress forced CEO turnover on *Shock to agreement, Stock return*, and other control variables using the baseline Cox proportional hazard model as in Table 3. The results, presented in Panel B of Table 8, suggest that the likelihood of forced CEO turnover is significantly greater following a negative shock to agreement. As shown in Column (1), the estimated coefficient on *Shock to agreement* is positive and statistically significant after controlling for past-year stock returns and other firm and CEO characteristics.

One could be concerned that distressed funds may choose to sell stocks of firms that had performed poorly and were expected to continue to perform poorly, and thus *Shock to agreement* might be proxying for poor firm performance. However, we find that the correlation between *Shock to agreement* and past-year operating performance ROA is very low at 0.048. Nevertheless, we control for past-year ROA (in addition to past-year stock returns) and a forward-looking measure of firms' future performance based on analysts' long-term earnings growth forecasts ("*Long term growth forecast*") in the regression. The results in Columns (2) and (3) show that the coefficients on *Shock to agreement* remain positive and significant. In sum, this finding overcomes the omitted variable bias concern. Also, since it does not rely on any empirical measures of disagreement or firm performance, it enables us to circumvent any potentially confounding interpretations of the measures. It thus provides strong support for our disagreement hypothesis.

6. Conclusion

Our paper deviates from the conventional focus on firm performance in the study of involuntary CEO turnover, and examines instead the power of investor-management disagreement as a driver of CEO

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[35] See Wall Street Journal articles titled "Ebay settles recruiting allegations" dated May 1, 2014 and "Tech companies agree to settle wage suit" dated April 24, 2014.

[36] They are even significant in cases of *Earnings disagreement* and *Proxy proposal*.

[37] There is one exception that the estimated coefficient on *Actual voting* is positive and statistically significant.

[38] Although it is possible that agreement may improve if new investors, who have a more aligned view with management, start buying the stock later, Coval and Stafford (2007) find that this does not seem to occur over short time periods.

Table 8

The effect of disagreement on forced CEO turnover: Evidence from a shock to agreement.

	Proxies for change in agreement				
	Earnings disagreement	Earnings disagreement-2	Proxy proposal	Voting recommendation	Actual voting
Panel A: The effect of mutual fund fire sales on agreement					
Shock to agreement$_t$	0.082***	0.044***	−0.010**	−0.027***	−0.008
	(0.034)	(0.013)	(0.005)	(0.008)	(0.010)
Stock return$_t$	−0.087*	0.011	0.002	0.020***	−0.068***
	(0.048)	(0.014)	(0.004)	(0.008)	(0.011)
Stock volatility$_t$	0.014	0.018	0.014	0.020	0.151***
	(0.131)	(0.041)	(0.011)	(0.020)	(0.026)
ROA$_t$	0.411	0.466***	−0.067***	−0.062*	−0.106**
	(0.332)	(0.088)	(0.022)	(0.035)	(0.047)
Market-to-Book$_t$	−0.036*	−0.009*	−0.002	0.000	−0.010***
	(0.019)	(0.005)	(0.002)	(0.003)	(0.004)
Firm size$_t$	0.002	0.001	0.022***	−0.008***	0.008***
	(0.010)	(0.003)	(0.001)	(0.002)	(0.003)
Observations	8468	8468	18,672	16,841	17,550

	(1)		(2)		(3)
Panel B: The effect of a shock to agreement induced by mutual fund fire sales on forced CEO turnover					
Shock to agreement$_{t-1}$	0.247***		0.262***		0.326***
	(0.101)		(0.101)		(0.128)
Stock return$_{t-1}$	−1.151***		−1.112***		−1.125***
	(0.242)		(0.250)		(0.274)
ROA$_{t-1}$			−1.133***		−1.188***
			(0.462)		(0.483)
Long term growth forecast$_{t-1}$					0.002
					(0.005)
EW Industry stock return$_{t-1}$	−0.124		−0.082		−0.109
	(0.304)		(0.311)		(0.309)
CEO blockholding$_{t-1}$	−0.470*		−0.453*		−0.386
	(0.256)		(0.256)		(0.316)
Age$_t$	0.054		0.066		0.029
	(0.091)		(0.094)		(0.097)
Age squared$_t$	−0.000		−0.001		−0.000
	(0.001)		(0.001)		(0.001)
CEO-Chair duality$_t$	−0.738***		−0.726***		−0.795***
	(0.106)		(0.107)		(0.110)
Firm size$_{t-1}$	0.114***		0.120***		0.156***
	(0.041)		(0.040)		(0.037)
Institutional blockholding$_{t-1}$	−0.137		−0.121		−0.059
	(0.108)		(0.107)		(0.114)
Market-to-Book$_{t-1}$	−0.077		−0.050		−0.054
	(0.075)		(0.071)		(0.077)
Stock volatility$_{t-1}$	1.595***		1.408***		1.295***
	(0.276)		(0.306)		(0.359)
Leverage$_{t-1}$	−0.314		−0.385		−0.571
	(0.329)		(0.338)		(0.381)
Observations	18,723		18,722		16,161

Panel A presents results from OLS regressions (columns (1), and (2)) and logit regressions (columns (3)–(5)) of the change in investor-management agreement from year $t-1$ to year $t + 1$ on *Shock to agreement* in year t. The dependent variables, defined as follows, are the changes in the five disagreement proxies which are indicated at the top of columns: a simple difference of *Earnings disagreement* from year $t-1$ to year $t + 1$, where *Earnings disagreement* is management's forecast of earnings per share for the fiscal year end minus the mean analyst estimate reported no more than 30 days after the reporting date of management's forecast, scaled by the absolute value of the actual EPS for the fiscal year; a simple difference of *Earnings disagreement*-2 from year $t − 1$ to year $t + 1$, where *Earnings disagreement-2* is the fraction of analysts (who reported estimates no more than 30 days after the reporting date of management's forecast) with estimates being less than the management's forecast; a dummy that equals one if the number of proxy proposals received in year $t + 1$ drops by at least two relative to the number of proxy proposals received in year $t − 1$, and zero otherwise; a dummy that equals one if the fraction of director candidates receiving a "withhold" or "against" recommendation from ISS or/and certain shareholders in a "just vote no" campaign among all candidates in the firm who are up for election in year $t + 1$ is less than that in year $t− 1$, and zero otherwise; and a dummy that equals one if the fraction of directors receiving less than the yearly-median percentage of yes-votes among all candidates up for election in year $t + 1$ is less than that in year $t − 1$, and zero otherwise. *Shock to agreement* is defined as a dummy that equals one if the stock is in the bottom decile of *Pressure* and the middle three deciles of *UPressure* during any of the four previous quarters and zero otherwise. *Pressure* is mutual fund flow-induced trading pressure defined as in Coval and Stafford (2007). *UPressure* is unforced trading pressure, defined as in Khan et al. (2012), by mutual funds that experience mild capital flows (the middle eight deciles of flows). Other explanatory variables are defined in Appendix. All regressions include year and Fama–French 48 industry dummy variables. Constants from OLS regressions are not tabulated for brevity. Coefficients of the marginal effect are reported in the logit regressions. Robust standard errors are clustered by firm and reported in parentheses. *, **, and *** indicate significance at 10%, 5%, and 1% levels, respectively.

Panel B presents coefficient estimates from Cox proportional hazard regressions that examine the likelihood of forced CEO turnover following a shock to agreement. All other explanatory variables are defined in Appendix. Year fixed effects are included in all regressions. Different industries (as defined using Fama–French 48 industries) are allowed to have different baseline hazards. Robust standard errors are clustered by firm and reported in parentheses. *, **, and *** indicate significance at 10%, 5%, and 1%, respectively.

turnover. The reason is that higher disagreement leads to a higher cost of capital for the firm, so a CEO is more likely to be forced out if there is a higher level of investor-management disagreement. And this is more likely to be the case when the CEO is less entrenched. Investor-management disagreement declines after forced CEO turnover, and anticipation of this results in a stock price reaction to the announcement of the firing of a CEO with low agreement with investors that is more positive than the announcement effects associated with other types of forced turnover.

We also examine the impact of investor-management disagreement on the sensitivity of forced CEO turnover to firm performance as well as a firm's choice of an internal versus external CEO. We find that a CEO's dismissal decision is less sensitive to firm performance if she shares a higher level of agreement with investors. The firm is more likely to select an external CEO when the departing CEO has higher

disagreement with investors. Our paper thus highlights the role of a previously-ignored factor – investor-management disagreement – in the CEO turnover decision.

Our paper suggests some fruitful avenues for future research. One is the information-spillover effects of disagreement-induced CEO turnover for the firm's customers. Johnson et al. (2018) find that secondary equity offerings reveal adverse information about the issuer's major customers. Is there a similar effect associated with CEO dismissal and is it stronger or weaker when the dismissal is disagreement-based rather than performance-based? Another is whether common institutional ownership of firms induces correlated disagreement-based CEO dismissals. It is plausible that an institutional blockholder who triggers a disagreement-based CEO dismissal in one firm will likely do so in another firm in which it has block ownership and disagreement is high.[39]

Supplementary material

Supplementary material associated with this article can be found, in the online version, at doi:10.1016/j.jfi.2019.01.006.

Appendix: Variable definitions

A.1. Investor-management disagreement

Like the prior studies (e.g., Dittmar and Thakor, 2007; Thakor and Whited, 2011; Huang and Thakor, 2013), we do not use disagreement proxies based on the firm's stock performance, because disagreement affects firm valuation, both in theory and in the data (Dittmar and Thakor, 2007), and thus it will be hard to disentangle the effect of stock-performance-related disagreement proxies from that of firm performance. Instead, our proxies based on management and analysts' EPS forecast, shareholder proxy proposal, and director elections do not suffer from this problem. In regressions on CEO turnover, we control for various measures of firm performance and also conduct our analysis in the subsample of firms that have performed well. This provides stronger reassurance that our disagreement proxies capture the effect of disagreement that is orthogonal to that of firm performance.

A.1.1. Earnings disagreement

Our first two measures of investor-management disagreement relate to the discrepancy between management and analysts' EPS forecasts. The first, adopted by Thakor and Whited (2011), is management's forecast of earnings per share for the fiscal year end minus the mean analyst estimate reported no more than 30 days after the reporting date of management's forecast, scaled by the absolute value of the actual EPS for the fiscal year. The idea is that, the lower the forecast of analysts falls below that of management, the more likely investors are questioning management decisions. The second is the fraction of analysts (who reported estimates no more than 30 days after the reporting date of management's forecast) with estimates being less than the management's forecast of EPS for the fiscal year end. Thus, a higher value of these proxies implies a higher level of disagreement.

Three issues are potentially associated with these two proxies. First, following Thakor and Whited (2011), we ensure that the forecast discrepancy does not arise from the potential arrival of significant news between the time interval of management's and analysts' forecasts. Specifically, if there exists an abnormal stock return during the time interval for a firm, we set the disagreement measure to be zero for that firm-year. A stock return is classified to be "abnormal" if the excess return with respect to the Fama–French three-factor model is larger than two standard deviations of the firm's predicted expected return.[40] Thakor and Whited (2011) present evidence that this disagreement proxy is unrelated to measures of information asymmetry between management and investors. Second, one might be concerned that, instead of fundamental disagreement, the forecast discrepancy could be due either to management's behavioral bias such as overconfidence or to management's poor forecast ability. Lee et al. (2012) show that lower management forecast accuracy is associated with a higher likelihood of CEO turnover. We thus control for measures of managerial overconfidence and management forecast error in the regressions (see more details in Section 4.1.1). Lastly, firms choose to provide earnings guidance. One might thus be concerned that our results are subject to a selection bias. Note that, however, we condition our analysis on firms that provide guidance and exploit the cross-sectional variations in the forecast discrepancy among these firms. The selection concern is therefore unlikely to affect our results. Our final sample using these two disagreement proxies spans 2142 firms and 14,159 firm-years from 1993 to 2016.

There are often multiple management forecasts made for the fiscal-year-end EPS.[41] For our main measures described above, we choose the one closest to the actual annual EPS announcement. This is to ensure that information has been incorporated into both management's and analysts' forecasts to the most extent, so that any forecast discrepancy is due less likely to information asymmetry. While the rationale of focusing on the closest forecast is clear, it does not account for the extent of persistence of disagreement over time and thus the potential cumulative pressure on the board to take actions. Therefore, we construct two additional measures of earnings disagreement that derive from and are supplementary to the above two main measures, which are meant to capture the persistence of disagreement.

Specifically, for each management forecast for the fiscal-year-end EPS in a year, we define a dummy that equals one if the corresponding analysts' consensus forecast falls below management's forecast and zero otherwise. We then take the average of the dummies for the multiple management forecasts in a year (labeled as "SED1"). This is the first new measure. Also, for each management forecast, we define a dummy that equals one if more

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[39] Gao et al. (2107) document that common ownership explains correlated returns among otherwise unrelated firms.

[40] Factor loadings are estimated with monthly data over the period from three years to one month before the date of management's forecast.

[41] On average, four forecasts are made in a year for a sample firm.

than half of the analysts covering the firm have their corresponding forecasts below management's forecast and zero otherwise. The average of the dummies for the multiple management forecasts in a year is thus our second new measure (labeled as "SED2"). A higher value of either measure implies more persistent disagreement. As in the construction of the main measures, we require that analysts' forecasts be made no more than 30 days after management's forecast and there not exist an abnormal stock return between the time interval of management's and analysts' forecasts for a firm. To conserve space, we report the results with the two supplementary measures in Table O-1 of the online Appendix.

A.1.2. Submission of proxy proposals in a given year

Our other three disagreement measures are defined following Huang and Thakor (2013). The third proxy for disagreement exploits the idea that investors may submit proxy proposals for a shareholder vote when they disagree and therefore press for changes, but the private communication with management for changes is not effective or fails.[42] Institutional investors, in particular, public and union pension funds, investment firms, and coordinated investors, are found to be the most active sponsors of proxy proposals (e.g., Gillan and Starks, 2000; Thomas and Cotter, 2007; Renneboog and Szilagyi, 2011). To capture our idea of disagreement, we focus on governance-related proposals only.[43] The issues addressed in such proposals include, but are not limited to, shareholder voting, takeovers, selection of directors, executive compensation, and the sale of the company. Despite the nonbinding nature of voting on shareholder proxy proposals, proposal submission sponsored by shareholders is a conspicuous sign of investor-management disagreement. We use the number of shareholder proxy proposals that a firm receives in a given year to measure the level of disagreement. In untabulated results for brevity, we find that our findings are robust if we use an indicator variable of whether or not a firm receives proxy proposal submissions.

Note that our use of proxy proposal as a disagreement measure does not necessarily suggest that investors' beliefs are always aligned with the firm's management if we do not observe the proposal submissions. It is likely that, in some firms, investors may choose not to submit proxy proposals as a means to challenge managerial decisions, because some unobservable factors may prevent them from doing so at any time. Therefore, to examine whether investors are more likely to disagree with management based on proxy proposal submissions, we follow Huang and Thakor (2013) and exclude firms from our analysis that are never observed to have any shareholder proxy proposals in any given year of the sample period 1993–2016. In focusing on firms that have experienced at least one proxy proposal submission over the sample period, we argue that investors are more likely to disagree with management in the years they submit proxy proposals than in the years in which they do not. Our final sample in using shareholder proxy proposal as a disagreement proxy covers 1529 firms and 24,126 firm-years from 1993 to 2016.

A.1.3. Vote recommendations in director election

Investors can signal their disagreement with management in the case of director elections. Our last two proxies for disagreement exploit this idea. It is observed that some investors organize "just vote no" campaigns against one or more director candidates to be elected before a director election. Conducted via letters, press release, or internet communications, such campaigns encourage fellow shareholders to withhold votes for the candidate(s). More recently, third-party proxy advisors like Institutional Shareholder Services (ISS) also start issuing vote recommendations for all director candidates who are up for election every year. Voting Analytics (a product of ISS) provides detailed records of such vote recommendations, either "for" or "withhold" ("against"), issued by ISS starting from 2003 for elections in most of the Russell 1000 firms and many of the Russell 2000 firms.

Therefore, we define our fourth disagreement proxy as an indicator of whether a firm's director candidates receive objections from shareholders or unfavorable recommendations from independent proxy advisors *before* the election. We note that the number of director candidates who are up for election may vary across firms and over time, which affects the extent of potential objections received in different firm-years. To account for this, we define an additional measure as the proportion of director candidates receiving a "withhold" or "against" recommendation from ISS or/and objections from certain shareholders in a "just vote no" campaign, among all candidates in the firm who are up for election in a given year. A greater magnitude of this measure shall indicate a higher level of disagreement. For brevity, we do not report results of this additional measure (available upon request), which are consistent with the results of the main measure. Our final sample in using this disagreement proxy includes 2366 firms and 20,257 firm-years during 2003–2016.

Note that the vast majority of the observations for this measure come from ISS vote recommendations because "just vote no" campaigns are relatively rare. Del Guercio et al. (2008) report 112 "just vote no" campaigns from 1990 to 2003, and we find 279 such campaigns from 2004 to 2017. They show an increase in disciplinary turnover following "just vote no" campaigns.[44] However, no prior studies have examined the effect of ISS vote recommendations on CEO turnover.

A.1.4. Actual voting in director elections

The fifth proxy relates to actual shareholder voting *during* the director election. Shareholders may express their disagreement by withholding votes for or voting against certain candidates in the election of directors. Candidates are normally elected with high "for" votes.[45] Therefore, an even slightly lower vote may indicate shareholders' disagreement. As such, we define this proxy as the proportion of director candidates receiving a below-yearly-median percentage of "for" votes in a given firm-year, where the yearly median is the median percentage of "for" votes of director candidates in the universe of firms with available actual voting data in that year.[46] After merging actual voting data with our sample from ExecuComp, the final sample with this fifth disagreement proxy covers 2366 firms and 20,257 firm-years from 2003 to 2016.[47]

Note that although both *Voting recommendation* and *Actual voting* are constructed based on director elections and thus are correlated, they differ in a meaningful way. The former can be subject to the coverage choice by proxy advisors (they may not allocate their attention and resources to firms

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[42] In more extreme cases, investors may initiate proxy contests. DeAngelo and DeAngelo (1989) and Mulherin and Poulsen (1998) find that many CEOs are replaced following proxy contests. However, proxy contests are quite rare with an average of 56 contests per year during 1994–2012 (see Fos, 2017) and thus focusing exclusively on them does not sufficiently capture the effect of disagreement on corporate decisions.

[43] The other type of proposals is social responsibility related and typically submitted by religious/socially responsible investors.

[44] Earlier studies do not find a significant impact of shareholder proposals on firm policy changes in older samples (e.g., Karpoff et al., 1996).

[45] For instance, Cai et al. (2009) find that an average director across all firms receives just over 94% of the "for" votes for the period of 2003–2005.

[46] Both Cai et al. (2009) and Fischer et al. (2009) find that CEO turnover follows less favorable director voting in their sample periods of 2003–2005 and 2000–2004, respectively. They interpret less favorable director voting as an agency issue, while we believe that disagreement is behind the scene at least for many firms (as can be seen from many anecdotes we discuss earlier). Also, our sample covers a much longer period.

[47] The smaller sample size here, compared to that of the vote recommendation sample, is due to the missing information in actual votes for many firm-years.

equally) and the target choice by shareholders due to the imbalance between benefits and costs involved (not shareholders in every firm may find it optimal to launch a campaign). That is, *Voting recommendation* captures disagreement in firms where disagreement is likely more profound. In contrast, shareholder voting does not rely on any third party or involve significant costs like in "Just vote no" campaign, and thus *Actual voting* captures disagreement to a larger extent.

A.2. Flow-induced trading pressure

We follow Coval and Stafford (2007) and Khan et al. (2012) to construct fund-flow-induced trading pressure for each stock held by mutual funds during our sample period.[48] Specifically, we define fund flows as

$$FLOW_{j,s} = [TNA_{j,s} - TNA_{j,s-1} \cdot (1 + R_{j,s})]/TNA_{j,s-1}$$

to fund j during month s, where $TNA_{j,s}$ is total net assets for fund j as of the end of the month s and $R_{j,s}$ is the monthly return for fund j at the month s. The data of funds' total net assets and returns are from CRSP mutual fund monthly net returns database. To match with the quarterly fund holding data from Thomson Financial, we sum the monthly flows over the quarter to obtain quarterly fund flows $FLOW_{j,t}$ for quarter t. We calculate flow-induced trading pressure for stock i in quarter t as

$$Pressure_{i,t} = \left[\sum_j (max(0, \Delta Holdings_{j,i,t}) | flow_{j,t} \rangle Percentile(90th)) - \sum_j (max(0, -\Delta Holdings_{j,i,t}) | flow_{j,t} \right.$$
$$\left. < Percentile(10th)) \right]/SharesOutstnding_{i,t-1}.$$

It is the summation of the difference between flow-induced purchases and flow-induced sales in a given quarter, divided by the stock's shares outstanding in the prior quarter. Flow-induced purchases (sales) are identified as increases (reductions) in *Holdings* by funds experiencing severe inflows (outflows). Severe outflows/inflows are those below/above the 10th/90th percentile of *FLOW* (*Percentile*(10th)/*Percentile*(90th)). As in Coval and Stafford (2007), stocks in the bottom decile of *Pressure* are considered to be experiencing excess selling demand from mutual funds with large capital outflows.

To ensure that the flow-induced selling is not driven by information about potential changes in firm characteristics, we first calculate "unforced trading pressure" for stock i in quarter t following Khan et al. (2012) as

$$UPressure_{i,t} = \left[\sum_j \Delta Holdings_{j,i,t} | Percentile(10th) \leq flow_{j,t} \leq Percentile(90th) \right]/SharesOutstnding_{i,t-1}.$$

This measure captures widespread net trading activity by mutual funds with mild capital flows (the middle eight deciles). Stocks in the top and bottom deciles of *UPressure* are thus expected to be experiencing information-driven purchases and sales, respectively. To identify an exogenous shock to agreement unrelated to firm unobservables, we focus on stocks that are not subject to widespread net trading pressure by other mutual funds than funds with extreme flows, i.e., those in the middle three deciles of *UPressure* (deciles four, five, and six). Among them, we define a stock in the bottom decile of *Pressure* to experience a negative shock to agreement.

A.3. Other variables

Age	Age of the CEO (in years)
Age squared	Square of Age
Analyst dispersion	Standard deviation of raw (i.e. not split-adjusted) analysts' forecasts
CEO-Chair duality	A dummy that takes a value of one if the CEO is also the chairperson of the board, and zero otherwise
CEO blockholding	A dummy that takes a value of one if the fraction of outstanding shares owned by the CEO is greater than 5%, and zero otherwise
EW Industry stock return	Equally-weighted average stock returns for all firms in Compustat-CRSP from the same Fama–French 48 industry as the sample firm. We exclude each sample firm from the construction of its industry benchmark to eliminate any artificial correlation.
Firm size	Natural log of the total assets of the firm
Institutional blockholding	A dummy that takes a value of one if there is at least one institutional investor holding more than 5% of the firm's outstanding shares, and zero otherwise
Leverage	Total book value of debt normalized by the sum of the total book value of debt and market value of equity
Ln(Tenure)	Natural logarithm of one plus the number of years the CEO was in office
Market-to-Book	Sum of the total book value of debt and market value of equity deflated by the firm's total assets
ROA	Net income deflated by one-year lagged total assets
Stock return	Fama–French 48-industry adjusted daily stock return compounded for the previous 12 months
Stock volatility	Volatility in the firm's stock return over the previous 12 months
Total analysts	Total analysts is the natural log of one plus the number of analysts that report estimates no more than 30 days after the reporting date of management's EPS forecast.
Total directors	Total number of directors who are up for (re)election in a given year

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[48] As in the previous studies, we focus on open-end U.S. equity funds only.

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