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Investor-Management Disagreement and Strategic Information Disclosure *

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Abstract

We examine how investor-management disagreement affects firms' strategic information disclosure, measured by the year-over-year modification of the Management's Discussion and Analysis (MD&A) section of the 10-K form. Controlling for confounding factors, we document that firms with higher levels of investor-management disagreement modify their MD&A section more relative to the previous year. We find a consistent result using flow-induced mutual fund fire sales as a shock to the level of firms' investor-management disagreement. Additional tests show that capital market reaction to MD&A modifications depends on the pre-existing disagreement level. Furthermore, our cross-sectional tests indicate that firms with a high level of investor-management disagreement disclose more due to management's concerns about firm undervaluation, access to external capital, and job security and shareholders' demand for information.

***Keywords*:** Investor-Management Disagreement, Corporate Disclosure, Management's Discussion and Analysis (MD&A)

***JEL classification*:** G23, M41

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I. Introduction

This study investigates whether investor-management disagreement resulting from heterogeneous prior beliefs influences firms' strategic disclosures. As per the extant literature (Grossman and Hart, 1980; Grossman, 1981; Milgrom, 1981; Milgrom and Roberts, 1986), *common prior assumption* is one of the conditions that must be satisfied in order for firms to disclose all private information. In the realm of corporate disclosure, this assumption says that economic agents (which include investors and managers) have identical prior beliefs regarding the firm's future actions and that any differences in opinions or beliefs between investors and managers are entirely due to an exposure to different information. However, because rational investors often agree to disagree in public, the common prior assumption would "fail to explain important features of the world" (Morris, 1995). In the presence of heterogeneous prior beliefs, economic agents could formulate different opinions even when exposed to the same information (Varian, 1989; Harris and Raviv, 1993; Kandel and Pearson, 1995), thereby leading to disagreements. Such disagreements are rooted in the theory of heterogeneous priors as rational beliefs (Kurz, 1994) and are due neither to goal incongruence or conflict of interest nor to information asymmetry between investors and managers. Thus, under a heterogeneous prior assumption, managers may disclose strategic information that they believe will maximise firm value, but investors may interpret it unfavourably. For instance, disclosure of a firm's order backlog could be received unfavourably by investors who believe such backlogs reflect problems with production facilities or the management's lack of control over operations, even though order backlogs could be due to higher demand for products (Dutta and Trueman, 2002). Therefore, how investors interpret a disclosure is influenced by their prior beliefs. As such, strategic information disclosures carry costs of generating potential disagreement between investors and management. Such disagreements are costly to a firm since dissenting investors assign a lower value to the firm when trading its shares (Dittmar and Thakor, 2007), causing a downward price pressure which constrains management's ability to finance desired projects and even jeopardises managers' job security (Huang *et al.*, 2020).

Strategic information disclosures carry benefits as well. Since strategic information disclosures could be about a new strategy and/or extensive details on an existing strategy, such disclosures can guide investors' attention toward information of the managers' choosing (D'Souza *et al.*, 2010) so that managers can provide their perspective of the firm to investors (Brown and Tucker, 2011) and ultimately influence investors' perception (Bowen *et al.*, 2005). Because firms make strategic disclosure decisions by weighing the costs and benefits, we hypothesise that one of the weighing factors is the *ex ante* level of disagreement between investors and management. However, how such disagreement affects a firm's strategic information disclosure decisions is an empirical question, for the reasons outlined below.

On the one hand, when faced with a higher level of investor-management disagreement

and the accompanying downward price pressure and career concerns (Dittmar and Thakor, 2007; Huang *et al.*, 2020), managers might be incentivised to make more strategic disclosures in an attempt to alleviate the disagreement. Shareholders in such situations may also demand more disclosure to weigh in on important issues pertaining to the company and to gain an insight into the firm's business model (Gassen and Schwedler, 2010; Chen *et al.*, 2018). Meanwhile, the incremental benefit of strategic information disclosure to firms with a lower level of investor-management disagreement may not be large enough to justify the resources (such as time) spent on making strategic policies public. This is because investors in such firms already have a high degree of confidence in the management's decisions, as reflected in the lower level of disagreement, and they are more likely to endorse the management's choice of projects. Thus, managers of firms with a low level of investor-management disagreement may not have an incentive to divert resources into the disclosure process, which translates into a lower degree of disclosure by such firms.

On the other hand, higher levels of strategic disclosure against the backdrop of a higher level of investor-management disagreement might backfire and exacerbate the disagreement instead. This is because investors in such situations are more likely to disagree with the management on whether a particular choice of action will enhance or destroy firm value. This potential concern may discourage managers from disclosing strategic information in the face of a higher level of disagreement. Meanwhile, such concerns are largely unfounded in firms with a lower level of investor-management disagreement since investors in such firms are less likely to disagree with the management's strategic vision. Thus, the managers of such firms may have less incentive to withhold information. Due to these opposing predictions, the directional impact of investor-management disagreement on firms' strategic information disclosure decisions is ultimately an empirical question.

Because we are interested in corporate disclosures that are subject to interpretations, we focus on narrative strategic information disclosures. Following Santema *et al.* (2005), we define strategic information disclosure as the revelation of information a firm decides to share with its shareholders on the strategy it is pursuing and/or going to pursue in the future. The Management's Discussion and Analysis (MD&A) section of the 10-K form fits our bill as it is primarily intended to enable "investors and other users to assess the financial condition and results of operations of the registrant, with particular emphasis on the registrant's prospects for the future" (SEC, 1989). The U.S. Securities and Exchange Commission (SEC) requires companies to disclose forward-looking information on any trends, events, or uncertainties that are "reasonably likely to have a material effect on financial condition or results of operations" in the MD&A section.[3] Thus, the MD&A section reflects the management's unique insight on the firm's performance and prospects, and a firm is required to include in this section a discussion of its material forward-looking information about trends, events, and uncertainties

[3] https://www.sec.gov/rules/interp/33-6835.htm.

(Cole and Jones, 2005).[4] Disclosures in this section have received unprecedented scrutiny from the SEC in the aftermath of the Enron, Global Crossing, and Worldcom scandals. While Item 303 of Regulation S-K mandates firms to include the MD&A section in their 10-K report, it contents are not audited. As such, managers have flexibility and discretion over what and how much to disclose in it. This provides variation in the content of MD&A information across firms and over time. Therefore, we use the year-over-year modification of the MD&A section to investigate our research question on whether and how *ex ante* investor-management disagreement affects firms' strategic information disclosure.

We follow Brown and Tucker (2011) and use the "document length adjusted" year-over-year MD&A modification as the proxy for the degree of strategic information disclosure. Minor modification of the MD&A section relative to the previous year implies that little information is being conveyed to investors on top of what they already know. Meanwhile, a greater degree of MD&A modification from the prior year indicates more information being conveyed. Using two measures of investor-management disagreement related to director elections used in the prior literature, we find a positive association between investor-management disagreement and year-over-year MD&A modification. The impact we document is both statistically and economically significant. Depending on the disagreement measures used, a one standard deviation increase in investor-management disagreement is associated with a 13–15% increase in yearly MD&A modification. Thus, our finding suggests that firms with a high level of investor-management disagreement disclose more information.

To mitigate the concern that both disagreement and disclosure levels are endogenous and to bolster our findings, we exploit a shock to the composition of the firm's investor base, and thus to the investor-management disagreement, caused by distressed mutual fund fire sales. When distressed mutual funds experience extreme capital outflows, they are forced to sell their holdings in portfolio firms at a significant discount to liquidity providers (Coval and Stafford, 2007). Existing shareholders of the portfolio firms, who are not distressed, are unlikely to absorb all these shares within a short period because of risk aversion, wealth endowment constraints, or both. Therefore, in equilibrium, the new marginal investors in the stock under fire sales are other liquidity providers who have a lower level of agreement with the management than the existing shareholders. This is because they would have otherwise purchased the stock at a higher price prior to the fire sale.[5] The resulting decline in investor-management agreement in the portfolio firms is a shock because fund fire sales are not driven by a change in the underlying fundamentals of the affected firms. Thus, this setting allows us to deal with the omitted variable issue and also to mitigate the concern that the effect of

[4] Most 10-K reports explicitly mention that *many* of the forward-looking statements (including statements that do not directly relate to any historical or current facts) are located in Item 7 of the 10-K form under the heading "Management's Discussion and Analysis".

[5] One may argue that the disagreement may decrease if new investors with views that are more aligned with the management start buying the stock later. However, Coval and Stafford (2007) show that such purchases do not occur in a short period of time.

investor-management disagreement results from other confounding factors. Using instrumental variable two-stage regressions with this shock as the instrumental variable, we find that distressed mutual fund fire sales, and the resulting increase in disagreement, lead to a larger degree of MD&A modification, which corroborates our baseline findings.

We also perform a set of cross-sectional tests to identify the conditions under which the effect of disagreement on disclosure is stronger. As stated above, narrative strategic disclosures come with a trade-off between potentially generating disagreement and convincing investors that the management's choice of projects is good. We argue that investor-management disagreement is a threat to the management because it can induce investors to second guess managers' decisions, view the management's choice of projects as value destroying, and assign a lower value to the firm by raising the cost of capital for financing such projects. Such downward price pressure is arguably more costly for financially sound firms that have relatively easier access to external capital and for overvalued firms that have access to external capital at "cheaper than fair" rates. Thus, such firms may have less incentive to disclose extensive strategic information in the MD&A section since narrative disclosures carry a positive probability of igniting disagreement with investors. However, by providing an extensive insiders' view, managers can potentially persuade investors that their choice of strategy is the best for the company. The possibility of (re)building investor trust through additional disclosure and thereby reducing the cost of capital is arguably more attractive to financially constrained and undervalued firms. Consistent with this argument, we find that the effect of disagreement on year-over-year MD&A modification is more salient in firms that are undervalued and financially constrained.

Managerial career concerns could also play a moderating role. Huang *et al.* (2020) show that managers are more likely to be fired when the level of investor-management disagreement is high. Therefore, to the extent a higher level of disagreement heightens managers' career concerns and to the extent disclosure carries the possibility of extenuating such disagreement, managers with career concerns may be willing to disclose more when faced with a higher level of disagreement. But because additional disclosure could also generate potential disagreement with investors, managers with less career concerns may not be incentivised to disclose extensively. We find answers in the affirmative.

Firm's information environment could also play a crucial role. Unlike firms with a transparent information environment, opaque firms have more private information. Thus, when faced with a higher level of investor-management disagreement, opaque firms have more incentive to disclose extensively because they are more likely to be successful in alleviating disagreement through such disclosures. Consistent with this argument, we find that the effect of disagreement on disclosure is stronger for firms with an opaque information environment.

Next, we investigate the cross-sectional consequences of year-over-year MD&A

modification. If firms with a high level of investor-management disagreement modify their MD&A section more because the benefits of disclosure outweigh its costs, we expect a positive market reaction to MD&A modification for such firms. Similarly, if firms with a low level of investor-management disagreement modify their MD&A section less because the costs of disclosure outweigh its benefits, we expect a negative market reaction when such firms modify their MD&A section. We measure market reaction by the cumulative abnormal stock returns and by analysts' forecast revisions around the MD&A (i.e. 10-K) filing date. We find results that are consistent with our conjectures. Furthermore, we find that firms with a larger year-over-year MD&A modification exhibit lower instances of forced CEO turnover and reductions in firm undervaluation.

Lastly, one might be concerned that the impact of investor-management disagreement on disclosure we document is driven by significant changes in the firm's economic conditions. Although we control for various economic change measures in our baseline regressions, we directly address this concern by showing that the documented effect of investor-management disagreement on year-over-year MD&A modification persists in the subsamples of firms that recently witnessed below-the-median changes in operations, liquidity, and risk exposure, respectively. Furthermore, we also deal with the potential concern that the effect of disagreement on disclosure is confounded by other factors. Although the test involving the distressed mutual fund fire sales should mitigate this concern, we nonetheless conduct direct tests by adding proxies of information asymmetry and agency problems as additional controls to our baseline regressions. These tests enable us to directly disentangle the effect of disagreement on a firm's disclosure policy from other confounding factors. Our results are robust to all these tests.

Our paper contributes to the literature in two major ways. First, prior literature cites the homogenous interpretation of the same information as one of the necessary conditions for firms to disclose all their information (Beyer *et al.*, 2010). Such homogenous interpretation necessitates a common prior assumption. However, as pointed out in Morris (1995), the common prior assumption fails to explain important features of the real world because rational individuals often agree to disagree in public. In this paper, we relax the assumption that all investors interpret a firm's disclosure in the same way and examine how heterogeneous opinions between investors and managers affect a firm's disclosure policies. Although there are some theoretical studies (e.g. Thakor, 2015) on this topic, to the best of our knowledge, our paper is the first empirical study to provide large-data evidence on how disclosure is affected when investors interpret information heterogeneously.

Second, our paper extends the stream of literature on investor-management disagreement to accounting studies. A large body of studies (e.g. Allen and Gale, 1999; Garmaise, 2001; Boot *et al.*, 2006; Dittmar and Thakor, 2007; Bayar *et al.*, 2011; Boot and Thakor, 2011) has examined the financing choices of firms when investors and management have heterogeneous

prior beliefs about the profitability of a firm's future investment opportunities. These choices essentially concern the undervaluation of firms' stock when investors disagree with the management's project investment and how the control rights will be divided between managers and investors. Specifically, investors are unlikely to advocate the management's project selections when they disagree with the management, and they may undervalue the firm if the management undertakes those projects. To this end, prior studies have shown that firms with a high level of investor-management disagreement are more likely to issue debts instead of equity (Dittmar and Thakor, 2007), buy back stocks (Huang and Thakor, 2013), underinvest (Thakor and Whited, 2010; Garlappi *et al.*, 2017), and fire their CEOs (Huang *et al.*, 2020). In this paper, we examine whether and how a firm's corporate disclosure policy is affected by such disagreement. We document a positive effect of disagreement on strategic information disclosure.

The rest of the paper is organised as follows. Section II develops the testable hypotheses. Section III describes the data, variables, and empirical design. The main empirical analysis appears in Section IV. Section V reports the results of cross-sectional tests, while Section VI reports the results of the robustness tests. Section VII concludes the paper.

II. Hypotheses Development

Prior literature (e.g. Grossman and Hart, 1980; Grossman, 1981; Milgrom, 1981; Milgrom and Roberts, 1986) has identified six conditions under which firms voluntarily disclose all their private information: (1) disclosure is costless; (2) investors know that firms have private information; (3) all investors respond to firms' disclosure in the same way and firms know how investors will interpret that disclosure; (4) managers maximise firms' share prices; (5) firms can credibly disclose their private information; and (6) firms cannot commit to a specific disclosure policy *ex ante* (Suijs, 2007; Beyer *et al.*, 2010). However, empirical evidence points to a partial disclosure equilibrium.

To better understand why firms do not always commit to a full disclosure, at least one of the abovementioned conditions has to be relaxed. There is a large body of empirical studies that examines these conditions and how they affect the disclosure policies of firms. For example, Botosan and Stanford (2005), Li (2010), and Park *et al.* (2019) document that there are proprietary costs associated with disclosure, suggesting that disclosure is not always costless. Kothari *et al.* (2009) and Baginski *et al.* (2018) report that managers often manage to delay disclosing bad news, which is in contrast to the notion that investors know firms have private information. Condition (4) does not always hold either. For instance, Aboody and Kasznik (2000) find that managers take deliberate actions to suppress stock prices around the time stock options are awarded. The possibility of earnings management (e.g. Burgstahler and Eames, 2006) and fraud (e.g. Hoberg and Lewis, 2017) suggests that firms cannot always credibly disclose private information.

However, to our knowledge, there is no empirical evidence on the relaxation of condition (3). Three theoretical papers explore this territory. Dutta and Trueman (2002) allow investors to possess private information (prior beliefs) about the firm's product demand and conclude that managers disclose information when the demand is either sufficiently high or sufficiently low because they are uncertain what private information investors possess. Suijs' (2007) model shows that managers' uncertainty about how investors will respond to disclosure is sufficient to break the full-disclosure equilibrium. Meanwhile, Thakor's (2015) model relaxes the common prior assumption and examines how heterogeneous prior beliefs among economic agents translate into a firm's strategic information disclosure decisions. In our paper, we try to fill the empirical gap by analysing the effect of investor-management disagreement resulting from such heterogeneous prior beliefs on the strategic information disclosure decisions of firms.

Our paper relies on the intuition that investors may disagree with the management when they disclose strategic information due to heterogeneous, albeit rational, prior beliefs (Kurz 1994), even though both parties intend to maximise firm value. In other words, strategy disclosure comes at the cost of potentially generating disagreement between investors and management. Such disagreement could lead to stock sales by dissenting investors, which would result in downward price pressure on the firm's equity (Dittmar and Thakor, 2007) as well as a change in control rights over productive activities, such as forced CEO turnover (Huang *et al.* 2020). However, strategy disclosure need not always backfire, even when there exist heterogeneous prior beliefs among economic agents. Instead, disclosure could provide a platform for managers to communicate their plans to their target users (Sedor, 2002). Such disclosure facilitates investors to envision how and why managers' plans will improve future firm performance and, therefore, to react positively to such information (Sedor, 2002). Therefore, strategy disclosure carries both costs and benefits. Managers will weigh the associated costs and benefits to make disclosure decisions. We hypothesise that one of the weighing factors is the pre-existing level of disagreement between investors and the management.

Managers, who are the suppliers of disclosures, have incentives to reduce the disagreement with investors when a high level of *ex ante* investor-management disagreement exists in order to reduce the likelihood of firm undervaluation and the risk of losing their jobs (Huang *et al.*, 2020). Since investors in such firms already disagree with the management, the costs of potentially generating additional disagreement are arguably marginal for such firms, whereas by disclosing more, the managers of such firms may clear the doubts of investors and eventually bring them on board.

Investors, who get their information predominantly from public disclosures, could also demand additional disclosure from managers with whom they disagree in order to empower themselves with decision-relevant information (Gassen and Schwedler, 2010; Chen *et al.*,

2018). There is ample anecdotal evidence on this. For instance, on 28 February 2019, the Wall Street Journal reported that dissenting investors of Starbucks Corporation requested the company to disclose its efforts toward environmental sustainability in detail.[6] Chen *et al.* (2002) find that managers provide more information in response to investors' demand for additional information when current earnings are less informative and/or future earnings are more uncertain. Furthermore, prior studies (e.g. Boone and White, 2015; Bird and Karolyi, 2016) show that investors' demands influence firms' disclosure decisions. Thus, while the managers in firms with a high level of investor-management disagreement have motivations to supply more disclosures to win investors' support, investors could also demand more disclosures due to their own concerns about the management's strategies. However, since investors and managers already share aligned opinions to a large degree in firms with a low level of *ex ante* investor-management disagreement, and disclosure always carries a positive probability of investors denying project funding (Thakor, 2015), the managers of such firms have incentives to disclose less in order to avoid generating disagreements. Thus, our main hypothesis can be stated as follows:

H1a: *Ex ante* investor-management disagreement is positively associated with disclosure level.

However, it is also plausible that the managers of firms with a high level of *ex ante* investor-management disagreement regard the costs of generating additional disagreement to be too high due to the financial constraints and career concerns associated with a high level of disagreement. Prior literature (e.g. Kothari *et al.*, 2009) has documented that managers tend to withhold information in anticipation of a negative market reaction, especially because of their career concerns (Baginski *et al.*, 2018). As such, the fear of intense objections from dissenting investors *ex post* disclosure might prevent the managers of such firms from disclosing information in the first place. Meanwhile, the managers of firms with a low level of *ex ante* investor-management disagreement are more likely to be backed by their investors. Thus, they may not be too worried about the potential marginal increase in disagreement associated with additional disclosure. On the contrary, the managers of such firms may have incentives to disclose more because their investors are less likely to doubt their decisions, as highlighted by the low prevalence of investor-management disagreement, and disclosure always carries the possibility of further persuading investors. This chain of reasoning leads to our competing hypothesis:

H1b: *Ex ante* investor-management disagreement is negatively associated with disclosure level.

[6] https://www.wsj.com/articles/show-us-your-climate-risks-investors-tell-companies-11551349800.

III. Data, Variables, and Empirical Model

3.1 Data

We obtain firm-level accounting data from Compustat, auditor data from Audit Analytics, stock price and return data from CRSP, institutional ownership data from CDA/Spectrum, board and director characteristics data from RiskMetrics and Boardex, and voting data from Voting Analytics (a product of Institutional Shareholder Services, ISS). Since "just vote no" campaigns are relatively rare, the vast majority of the voting recommendation data comes from ISS.[7] Nonetheless, we supplement this data by searching through LexisNexis and Factiva to collect data on shareholders' "just vote no" campaigns (similar to Del Guercio *et al.*, 2008). We exclude all financial and utility firms, as is the standard in the literature. We also eliminate observations with missing data on control variables as well as observations with missing or negative total assets. Our baseline sample spans 2004 through to 2014 because the comprehensive coverage of director voting data in ISS is available from 2004 onwards.

3.2 Main Variables

We use two proxies of investor-management disagreement as our testing variables based on Huang and Thakor (2013) and Huang *et al.* (2020). Investors can express their disagreement with the management during director (re)elections by withholding votes for or voting against director candidates. This can happen in two ways: "just vote no" campaigns organised by investors and/or unfavourable recommendations from third-party proxy advisors such as ISS. "Just vote no" campaigns aim to encourage fellow shareholders to withhold votes for director candidate(s) via letters, press releases, or Internet communications. More recently, ISS started issuing vote recommendations for director candidates who are up for (re)election each year. We define *Voting Recommendation* as the proportion of director candidates, among all candidates in a firm who are up for (re)election in a given year, receiving a "withhold" or "against" recommendation from ISS and/or an objection from certain shareholders in a "just vote no" campaign. It captures the disagreement with investors' voting behaviour on important corporate decisions. A higher value of this measure indicates a higher level of disagreement.

Our second measure of investor-management disagreement is based on the actual voting by shareholders during the (re)election of directors. Shareholders may voice their disagreement by withholding votes for or voting against certain candidates in director (re)elections. Cai *et al.* (2009) find that an average director across all firms receives just over 94% of the "for" votes during an election. Therefore, given that a director candidate is normally elected with a high percentage of "for" votes, even a slightly lower vote may indicate shareholders' disagreement. As such, we define our second proxy (*Actual Voting*) as an

[7] Del Guercio *et al.* (2008) report 112 "just vote no" campaigns from 1990 to 2003, and we find 222 such campaigns from 2004 to 2014.

indicator variable that equals one if at least one director candidate receives a below-yearly-average percentage of "for" votes in a given firm-year, where the yearly average is the mean proportion of "for" votes received by director candidates in the universe of firms with actual voting data available in that year.

Our main dependent variable is the document length adjusted year-over-year MD&A modification (*MD&A Score*). We follow Brown and Tucker (2011) to construct *MD&A Score*. Specifically, we extract the MD&A section of 10-K forms for each firm with a fiscal year end from 2003 to 2014 and use the vector space model (VSM) described in Salton *et al.* (1975) to calculate the difference score (*Rawscore*) between a firm's current year MD&A and the previous year's MD&A.[8] The VSM is largely used by Internet search engines such as Google to organise documents into similar groups and compare search queries to documents in the search engine's database in order to find similar documents. In the VSM, a document is represented using a vector in an *n*-dimensional Euclidean space, where *n* represents the number of unique words in all documents in the sample and the value of each vector element is the frequency of a particular word in that document. The angle between two vectors of any two documents stands for the similarity of these two documents. The smaller the angle, the more similar two documents are. However, not all frequencies of words should be counted the same. To downplay the weight of the frequency of common words, we multiply "term frequency" (TF) for each word by its "inverse document frequency" (IDF). TF refers to the word counts, and IDF is a weighting factor calculated as the logarithm of the number of all documents in the sample divided by the number of documents in which that particular word appears. The more common a word is, the smaller the value IDF has. *Rawscore,* therefore, captures the difference between a firm's current year MD&A and previous year's MD&A. However, *Rawscore* is inherently related with document length. In order to remove this mechanical relationship, we first estimate the functional form of the relation between *Rawscore* and document length using a Taylor expansion at 0 so that we can calculate the expected raw score given the document length. *MD&A Score* is *Rawscore* minus this expected score.

3.3 Empirical Model

To test our hypothesis, we run ordinary least squares (OLS) regressions based on the following baseline model:

$$MD\&A\ Score_{i,t} = \alpha + \beta_1 * Disagreement_{i,t} + \beta_2 * Controls_{i,t} + \eta_i + \theta_t + \mathcal{E}_{i,t}$$

The dependent variable $MD\&A\ Score_{i,t}$ is defined in section 3.2, and it captures the magnitude of MD&A modification in year *t* relative to the prior year *t-1*.[9] The independent

[8] We extract MD&A data starting from 2003 because our MD&A modification measure is calculated as year-over-year change. For example, the MD&A modification measure for the fiscal year 2004 needs MD&A information in both 2003 and 2004.

[9] We use $MD\&A\ Score_{i,t}$ instead of $MD\&A\ Score_{i,t+1}$ as the dependent variable because the 10-K reports for

variables include a proxy for investor-management disagreement for firm *i* in year *t*, as well as a set of control variables for firm *i* in year *t*. Our primary interest is in examining whether the estimated coefficients on our disagreement parameters are statistically significant and economically meaningful.

Brown and Tucker (2011) show that economic changes and other firm characteristics influence a firm's yearly MD&A modification decision. Thus, we control for these variables in our baseline regression. More specifically, we control for the operational changes with *Change(EPS)*; liquidity changes with *Change(Current)* and *Change(Leverage)*; sources of cash for capital needs with *Change(FCF)*; and the firm's risk exposure with *Change(Volatility)*. These variables are defined in detail in the Appendix.

Other economic changes that could affect a firm's decision to modify its MD&A could be acquisition (*Acquire*) and downsizing (*Downsize*). Furthermore, firm characteristics could also affect disclosure decisions. Firm size (*Ln(AT)*) could affect disclosure because the MD&A of large firms has a higher likelihood of getting scrutinised and the cost of changing MD&A content each year is relatively small for large firms. Big 4 auditors may recommend their clients to disclose more. Institutional investors and analysts are sophisticated users of firms' public disclosures and as such often demand more corporate disclosure to assist them in stock valuation and firm monitoring (Bushee and Noe, 2000). Thus, we also control for these variables. Prior studies (e.g. Botosan and Stanford, 2005; Li, 2010) find that competition affects firms' disclosure level. Thus, we control for competition using the Herfindahl index. Prior studies (e.g. Skinner, 1994) document that litigation concern is an important determinant of disclosure. We control and define *Litigious* as a dummy variable equal to one if a firm is in an industry that is exposed to high litigation risk and zero otherwise (Francis *et al.*, 1994). To reduce the impact of outliers, we winsorise all continuous variables at the 1st and 99th percentiles.

Apart from using firm-clustered, heteroscedasticity-robust standard errors, we also include year and industry (classified by two-digit SIC) fixed effects in all of our regressions.[10] This is because *MD&A Score* varies across time and industry, as highlighted in Figure 1. Figure 1 Panel A shows that *MD&A Score* is substantially higher during economic downturns. Meanwhile, in Panel B, we plot *MD&A Score* over time for three different industries: one with the highest, one with the lowest, and one with the median *MD&A Score* in our sample. As is obvious, there are persistent variations in *MD&A Score* across industries.

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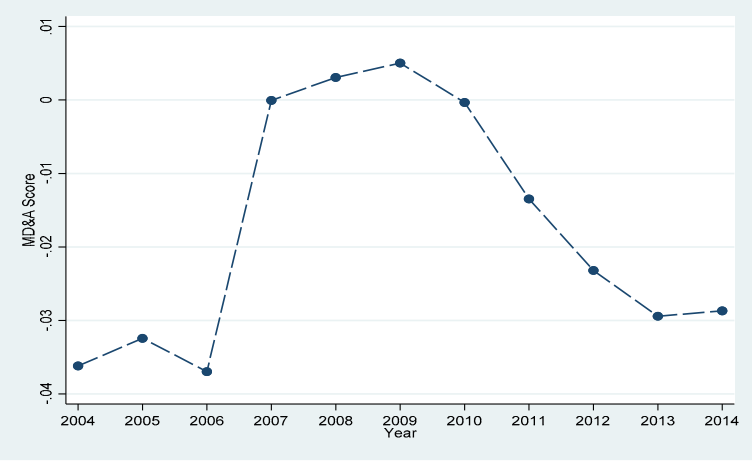
year *t* usually become available to the public a few months after the fiscal year end. This means that it comes after the information content of independent variables measured for year *t*.

[10] Our analyses are robust to the inclusion of firm-fixed effects (results are available upon request). However, we do not include firm-fixed effects in our main analysis because such regressions would examine within-firm variations (that is, the impact of variables that vary over time), while several relevant explanatory variables (such as *Big 4, Large Holder, Litigious*, and total analyst coverage) tend to be sticky over time. Furthermore, our analyses are also robust to the inclusion of within-industry-year fixed effects (results are available upon request).

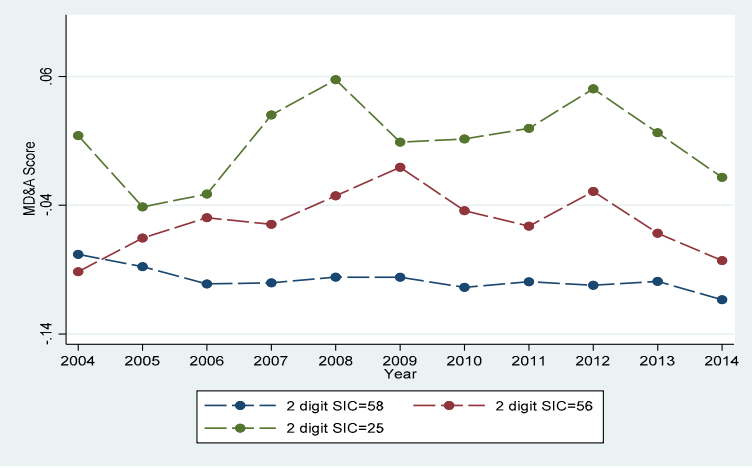
Figure 1 MD&A Modification Over Time and Across Industries

This figure shows the graphs of MD&A modification over time and across industries. MD&A modification is computed using *MD&A Score,* calculated as in Brown and Tucker (2011). It captures the magnitude of change in MD&A content year over year. Panel A depicts the average *MD&A Score* change over time. Panel B plots the yearly average *MD&A Score* for three industries: industries with the highest, lowest, and median *MD&A Score* in the sample.

Panel A: MD&A modification over time



Panel B: MD&A modification across industries



3.4 Summary Statistics

Table 1 presents the descriptive statistics of the key variables used in our analyses. Our final sample size is 13,724 firm-year observations with 1,811 unique firms. The mean (median) *MD&A Score* is -0.019 (-0.052). These values are comparable to the summary statistics in Brown and Tucker (2011). The yearly average (median) *MD&A Score* from 2004 to 2006 in their paper ranges from -0.032 (-0.059) to -0.019 (-0.043). On average, among all the candidates in a firm-year who are up for (re)election, 9% of director candidates receive either a “withhold” or “against” recommendation from ISS or an objection from certain shareholders

in a "just vote no" campaign before the director (re)election. This value is consistent with Huang and Thakor (2013). In about 57.6% of firm-year observations in our sample, at least one director candidate receives a below-yearly-average percentage of "for" votes, which is comparable to Huang and Thakor's (2013) documented value of 66%.

Table 1 Summary Statistics

This table presents the descriptive statistics of our sample. *Actual Voting* is defined as an indicator variable that equals one if at least one director candidate receives a below-yearly-average percentage of "for" votes in a given firm-year, where the yearly-average is the average proportion of "for" votes received by director candidates in the universe of firms with actual voting data available in that year. We define *Voting Recommendation* as the proportion of director candidates, among all candidates in the firm who are up for (re)election in a given year, receiving a "withhold" or "against" recommendation from ISS and/or an objection from certain shareholders in a "just vote no" campaign. *MD&A Score* is computed as in Brown and Tucker (2011) and captures the magnitude of change in MD&A content from year to year. Other variable definitions are presented in the Appendix. All continuous variables are winsorised at the 1% and 99% levels.

Variable	N	Mean	SD	Median
Main variables				
MD&A Score	13724	-0.019	0.117	-0.052
Actual Voting	13724	0.576	0.494	1.000
Voting Recommendation	13724	0.090	0.223	0.000
Abs(ΔEPS)	13724	0.091	0.433	0.017
Abs(ΔCurrent)	13724	0.507	1.014	0.200
Abs(ΔLeverage)	13724	0.038	0.07	0.013
Abs(ΔFCF)	13724	0.038	0.073	0.019
Abs(ΔVolatility)	13724	0.012	0.018	0.007
Acquire	13724	0.095	0.293	0.000
Downsize	13724	0.011	0.103	0.000
Big 4	13724	0.912	0.283	1.000
Ln(AT)	13724	7.637	1.612	7.540
Ln(Herfindahl index)	13724	0.818	1.421	0.083
Litigious	13724	0.285	0.451	0.000
Ln(1+Total analysts)	13724	2.486	0.665	2.565
Large Holder	13724	0.884	0.320	1.000
Total Directors	13724	6.075	3.610	5.000
Supplemental variables				
Adjusted Market-to-Book	12195	0.266	0.751	0.204
Capex	13724	0.052	0.057	0.034
CAR	12430	0.002	0.053	0.000
CAR_Earnings	13262	0.007	0.077	0.004
Constraint	13724	0.503	0.500	1.000
Filelate	13724	0.004	0.059	0.000
CEO age	13288	55.021	7.159	55.000
Dispersion	12720	0.015	0.046	0.004
E-index	9546	3.566	1.316	4.000
Entrenched	13478	0.417	0.493	0.000
Excessive CEO Compensation	13307	0.433	0.496	0.000
Free Cash Flow	13724	0.079	0.103	0.079
Founder	13288	0.071	0.257	0.000
High accruals	11704	0.501	0.500	1.000

High career concerns	13008	0.603	0.489	1.000
ICW	13724	0.041	0.197	0.000
Insider ownership	13288	0.035	0.059	0.014
Leverage	13724	0.183	0.182	0.153
Long term growth forecast	13724	14.537	9.673	15.000
NewItems	13724	587.500	31.900	582.000
R&D expenditures	13724	0.029	0.051	0.000
R&D	13724	0.074	0.458	0.000
Revision	9688	-0.001	0.023	-0.000
Revision_same	8818	-0.001	0.024	-0.000
ROA	13724	0.140	0.118	0.132
Shock	13724	0.142	0.349	0.000
Spread	13401	0.002	0.002	0.001
Stock holding	13288	0.021	0.043	0.006
Stock return	13724	0.140	0.487	0.092
Stock volatility	13724	0.111	0.061	0.097
Ln(1+Tenure)	13288	1.900	0.820	1.946

IV. Empirical Results

4.1 Baseline Results

We test our hypothesis using the multivariate regression model described above. Our key independent variable is investor-management disagreement, measured by the two disagreement proxies. A positive coefficient on the disagreement measures implies a positive impact of disagreement on the firm's level of disclosure (MD&A modification from the previous year). Table 2 reports the baseline results. We find the coefficient estimates of both disagreement measures to be positive and statistically significant. This indicates that firms disclose more when investors disagree with the management. Put differently, firms with a lower level of *ex ante* investor-management disagreement modify their MD&A section to a lesser extent. These results are consistent with our prediction that the benefits of reducing disagreement by disclosing more outweigh its costs for firms with a high level of *ex ante* disagreement and that the costs of inviting potential disagreement by disclosing more outweigh the benefits for firms with a low level of *ex ante* disagreement. The effects are economically meaningful as well. For instance, a one standard-deviation increase in investor-management disagreement increases *MD&A Score* by 13 to 15 per cent depending on the disagreement proxy used. From the coefficient estimates of the other control variables, we find that firms that experience significant changes in operation, liquidity, and risk exposure (relative to the previous year's level) disclose more. In addition, those firms going through acquisition or downsizing disclose more. Also, firms that operate in an industry that is exposed to high litigation risk and firms that are relatively large disclose more. These results are consistent with the findings in Brown and Tucker (2011).

Table 2 MD&A Modification and Investor-Management Disagreement

This table presents the coefficient estimates from the OLS regressions that relate MD&A modification to investor-management disagreement. The dependent variable is *MD&A Score,* which is computed as in Brown and Tucker (2011) and captures the magnitude of change in MD&A content from year to year. The investor-management disagreement proxy used in each regression is indicated at the top of the table. *Actual Voting* is defined as an indicator variable that equals one if at least one director candidate receives a below-yearly-average percentage of "for" votes in a given firm-year, where the yearly average is the average proportion of "for" votes received by director candidates in the universe of firms with actual voting data available in that year. We define *Voting Recommendation* as the proportion of director candidates, among all candidates in the firm who are up for (re)election in a given year, receiving a "withhold" or "against" recommendation from ISS and/or an objection from certain shareholders in a "just vote no" campaign. All other variables are defined in the Appendix. Year and industry fixed effects are included in all regressions. Robust standard errors are clustered by firm and are reported in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

Dependent Variable	MD&A Score	
Disagreement measures	Actual Voting	Voting Recommendation
	(1)	(2)
Disagreement	0.005***	0.013***
	(0.002)	(0.005)
Change (EPS)	0.012***	0.012***
	(0.002)	(0.002)
Change (Current)	0.004**	0.004**
	(0.002)	(0.002)
Change (Leverage)	0.010***	0.010***
	(0.002)	(0.002)
Change (FCF)	-0.002	-0.002
	(0.002)	(0.002)
Change (Volatility)	0.003*	0.003*
	(0.002)	(0.002)
Ln(Herfindahl index)	-0.001	-0.001
	(0.002)	(0.002)
Acquire	0.029***	0.029***
	(0.004)	(0.004)
Downsize	0.059***	0.059***
	(0.012)	(0.012)
Big 4	0.002	0.002
	(0.005)	(0.005)
Ln(AT)	0.005***	0.005***
	(0.002)	(0.002)
Ln(1+Total analysts)	-0.003	-0.003
	(0.003)	(0.003)
Litigious	0.023**	0.023**
	(0.010)	(0.010)
Large Holder	0.003	0.003
	(0.004)	(0.004)
Total Directors	0.000	0.001
	(0.000)	(0.000)
Constant	-0.098***	-0.101***
	(0.012)	(0.012)
Observations	13724	13724
Adjusted R^2	0.086	0.086
F.E.	Year & Ind.	Year & Ind.

4.2 The Shock to Disagreement

Thus far, we have documented a positive association between investor-management disagreement and year-over-year MD&A modification. However, it is plausible that our results are driven by some unobservable firm characteristics that are related to both disagreement and disclosure measures. In order to establish a causal effect of disagreement on disclosure, we follow Huang *et al.* (2020) and exploit a shock to disagreement through a change in the firm's investor base that is uncorrelated to firm characteristics. Flow-induced mutual fund fire sales offer one such ideal setting (Coval and Stafford, 2007).

In a flow-induced fire sale, distressed mutual funds that experience extreme capital outflows are forced to sell their holdings. However, because of risk aversion and/or wealth endowment constraints, the existing investors (who are not distressed) are unlikely to absorb all these shares. Thus, distressed mutual funds are forced to sell at a significant discount. The new marginal investors that provide stock liquidity under fire sales are likely to have a lower level of agreement with management than the existing shareholders; otherwise they would have purchased the stock prior to the fire sales. In other words, this change in the investors' base is likely to increase the investor-management disagreement level in the affected portfolio firms. The increase in disagreement arising from mutual funds' own distressed situation is a shock to the affected portfolio firms that is unrelated to portfolio firms' characteristics. This means that the shock is unlikely to be related to the firm's information asymmetry because it is unlikely to change the firm's information environment. Thus, if we find that firms' disclosure increases after the shock, the result is unlikely to be caused by information asymmetry. This will help to exclude the possibility of the information asymmetry argument and will attribute the change in disclosure to the change in the disagreement level.

To identify fire sale affected firms, we modify Coval and Stafford's (2007) definition for affected firms on the basis of Khan *et al.* (2012). We first identify distressed mutual funds using fund flows, calculated as[11]

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

for fund *j* during month *s*, where $TNA_{j,s}$ is total net assets for fund *j* at the end of the month *s* and $R_{j,s}$ is the monthly return for fund *j* at the month *s*. We use monthly data on funds' total net assets and returns from the CRSP Mutual Fund Monthly Net Returns database. As the fund holding data that will be used later are available quarterly from Thomson Financial, we follow Coval and Stafford (2007) and sum the monthly flows over each quarter to obtain quarterly fund flows ($FLOW_{j,t}$) for quarter *t* so that we can match it with quarterly fund holdings data. We define funds with severe outflows (inflows) as those below (above) the 10^{th} (90^{th}) percentile of $FLOW_{j,t}$.

Then, for each stock, we calculate flow-induced trading pressure (*Pressure*) as the sum

[11] As in Coval and Stafford (2007) and Khan *et al.* (2012), we focus on open-end US equity funds only.

of the difference between stock purchases by funds with severe inflows and stock sales by funds with severe outflows in a given quarter *t*, scaled by the company's shares outstanding in the prior quarter *t-1*, as shown in the following equation:

$$\text{Pressure}_{i,t} = \left[\sum_{j}\left(\max\left(0,\ \Delta\text{Holdings}_{j,i,t}\right)|\text{FLOW}_{j,t} > \text{Percentile(90th)}\right) - \sum_{j}\left(\max\left(0,\ -\Delta\text{Holdings}_{j,i,t}\right)|\text{FLOW}_{j,t} < \text{Percentile(10th)}\right)\right] / \text{SharesOutstanding}_{i,t-1}$$

Following Coval and Stafford (2007), we define stocks in the bottom decile of *Pressure* as those experiencing excess selling demand from mutual funds with large capital outflows.

We further define fire sale affected firms because firms experiencing excess selling demand from mutual funds with large capital outflows could be the result of information-driven trading (Khan *et al.* 2012). Specifically, we follow Khan *et al.* (2012) and measure unforced trading pressure for stock *i* in quarter *t* as

$$\text{UPressure}_{i,t} = \left[\sum_{j}\Delta\text{Holdings}_{j,i,t}|\text{Percentile(10th)} \le \text{FLOW}_{j,t} \le \text{Percentile(90th)}\right] / \text{SharesOutstanding}_{i,t-1}$$

This measure captures widespread net trading activity by mutual funds with moderate capital flows (the middle eight deciles of $FLOW_{j,t}$). Stocks in the top and bottom deciles of *UPressure* are expected to be experiencing information-driven purchases and sales, while stocks in the middle three deciles (deciles four, five, and six) are unlikely to be experiencing information-driven purchases and sales. Thus, to identify a shock to disagreement unrelated to firms' observables, we define fire sale affected firms in a given quarter as those firms in both the bottom decile of *Pressure* and the middle three deciles of *UPressure* (deciles four, five, and six). The bottom decile of *Pressure* captures a firm's trading pressure induced by mutual funds with severe flows, and the middle three deciles of *UPressure* ensure that the trading pressure that those firms are experiencing is not information driven. Because *Pressure* and *UPressure* are measured quarterly and our sample is yearly, we define fire sales affected firms in a given year (*Shock*) as a dummy variable that is equal to one if the stock is in the bottom decile of *Pressure* and in the middle three deciles of *UPressure* during any of the four previous quarters and zero otherwise.

In our setting, a valid instrument should correlate with our proxies of investor-management disagreement. We find evidence that our instrument satisfies this requirement. In columns (1) and (3) of Table 3, we use *Actual Voting* and *Voting Recommendation* as dependent variables, respectively. The independent variables include *Shock* and all of the

control variables specified in the baseline model. To further mitigate the concern that distressed funds may strategically choose to offload stocks of poorly performing firms or of firms that are expected to perform poorly, we include past year *ROA* and anticipated future performance based on analysts' consensus long-term earnings growth forecasts (from I/B/E/S) as additional control variables. The coefficient on *Shock* is positive and statistically significant. Moreover, the Angrist-Pischke (2009) F-stat for weak instruments is significant at the 1% level, suggesting that the instrument is not weak.

Table 3 Shock to Disagreement

This table presents the coefficient estimates from the two-stage instrumental variables regression. In the first-stage regression, *Shock* is defined as an indicator variable that equals one if the stock is under flow-induced mutual fund fire sales that are not information driven, and zero otherwise. The dependent variable in the second-stage regression is *MD&A Score. MD&A Score* is computed as in Brown and Tucker (2011) and captures the magnitude of change in MD&A content from year to year. All other variables are defined in the Appendix. Year and industry fixed effects are included in all regressions. Robust standard errors are clustered by firm and are reported in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

	First stage	Second stage	First stage	Second stage
Dependent Variable	Actual Voting	MD&A Score	Voting Recommendation	MD&A Score
	(1)	(2)	(3)	(4)
Shock	0.039***		0.011*	
	(0.012)		(0.006)	
Predicted disagreement		0.249**		0.881*
		(0.109)		(0.540)
ROA	-0.173***	-0.030	-0.052**	-0.028
	(0.052)	(0.026)	(0.025)	(0.037)
Long term growth forecast	-0.000	-0.000	0.001**	-0.001*
	(0.001)	(0.000)	(0.000)	(0.000)
Change (EPS)	0.027***	0.002	0.002	0.008*
	(0.010)	(0.005)	(0.004)	(0.005)
Change (Current)	-0.011	0.007**	0.001	0.004
	(0.010)	(0.003)	(0.005)	(0.005)
Change (Leverage)	0.005	0.009***	0.001	0.010**
	(0.009)	(0.003)	(0.005)	(0.005)
Change (FCF)	0.014	-0.004	0.010**	-0.010
	(0.009)	(0.003)	(0.004)	(0.007)
Change (Volatility)	0.002	0.001	0.005	-0.002
	(0.009)	(0.003)	(0.004)	(0.005)
Ln(Herfindahl index)	0.004	-0.002	-0.001	0.000
	(0.007)	(0.003)	(0.004)	(0.004)
Acquire	-0.008	0.036***	0.004	0.031***
	(0.015)	(0.006)	(0.008)	(0.008)
Downsize	0.010	0.047***	0.015	0.036
	(0.040)	(0.016)	(0.021)	(0.025)
Big 4	-0.057***	0.015	-0.031**	0.029
	(0.020)	(0.010)	(0.012)	(0.020)
Ln(AT)	0.003	0.004	0.001	0.004
	(0.007)	(0.002)	(0.001)	(0.004)

Ln(1+Total analysts)	0.013	-0.004	-0.018***	0.015
	(0.012)	(0.004)	(0.007)	(0.012)
Litigious	0.032	0.012	0.012	0.010
	(0.025)	(0.010)	(0.012)	(0.015)
Large Holder	0.010	0.001	-0.022***	0.023*
	(0.015)	(0.005)	(0.008)	(0.014)
Total Directors	0.018***	-0.004*	-0.002**	0.002*
	(0.002)	(0.002)	(0.001)	(0.001)
Constant	-0.276**	-0.033	0.221**	-0.288**
	(0.117)	(0.039)	(0.094)	(0.122)
Observations	13724		13724	
F-stat	43.25		24.26	
F.E.	Year & Ind.		Year & Ind.	

Columns (2) and (4) of Table 3 report the second-stage regression results. We continue to use the baseline models for these regressions, except that we replace the two proxies of disagreement with the *Fitted Disagreement* measure, which is the fitted value from the first-stage regression. As stated above, we also include *ROA* and *Long term growth forecast* as additional controls. Across the models, the coefficient on *Fitted Disagreement* remains positive and statistically significant. This provides robust evidence that investor-management disagreement has a causal effect on yearly MD&A modification.

V. Cross-Sectional Tests

5.1 Effects from Supply and Demand Sides

We conjecture that the increase in disclosure in response to a high level of investor-management disagreement could come from the supply incentives of management and/or the demand by shareholders. In this section, we empirically test these two channels.

Managers are incentivised to disclose more due to their concerns about firm undervaluation and project financing. When a firm's stock is overvalued (undervalued), investors overreact (underreact) to the firm's performance and thus it is relatively easy (more difficult) to raise funds from investors (Graham and Harvey, 2001; Kim and Weisbach, 2008; Hertzel and Li, 2010). In the latter case, lowering the disagreement between investors and management becomes more advantageous. Thus, we expect the effect of investor-management disagreement on disclosure to be more pronounced for undervalued firms. We measure firm undervaluation using market-to-book ratios. However, the raw market-to-book ratios are likely to be confounded by many other factors besides equity misvaluation. To exclude those factors from our misvaluation measure, we follow Blanchard *et al.* (1993) and Kim and Weisbach (2008) and use the residual from the following model:

$$LN\left(\frac{ME_i}{BE_i}\right) = \alpha + \sum_{t=-3}^{-1}\beta_t\left(\frac{sales_{it}}{asset_{it}}\right) + \sum_{t=-3}^{-1}\gamma_t\left(\frac{sales_{it}}{sales_{i(t-1)}}\right) + \sum_{t=-3}^{-1}\delta_t\left(\frac{op.income_{it}}{asset_{it}}\right) + \sum_{t=-3}^{-1}\emptyset_t\left(\frac{dividend_{it}}{sales_{it}}\right) + \sum_{t=-3}^{-1}\vartheta_t\left(\frac{R\&D_{it}}{asset_{it}}\right) + \varepsilon_i.$$

Undervalue takes the value of one for a firm with a residual below the sample median and zero otherwise. The results from the subsample tests based on whether *Undervalue* is one or zero are reported in Table 4 Panel A. We find that the effect of disagreement on disclosure is significant only for the subsample of relatively undervalued firms. In addition, the two-tailed p-value of the coefficient difference in *Disagreement* between the two subsamples is statistically significant. This indicates that our baseline finding is driven by firms whose stocks are likely undervalued. This is consistent with the notion that managers in firms with a high level of investor-management disagreement disclose relatively more due to their concern about firm undervaluation.

Table 4 Cross-Sectional Tests of Investor-Management Disagreement and MD&A Modification

This table presents the coefficient estimates from the OLS regressions that relate *MD&A Score* to investor-management disagreement in the subsamples of firms. The dependent variable is *MD&A Score*, which is computed as in Brown and Tucker (2011) and captures the magnitude of change in MD&A content from year to year. The criteria for subgroup separation are presented on the top of each column. Control variables are defined in the Appendix. Year and industry fixed effects are included in all regressions. Robust standard errors are clustered by firm and are reported in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

Panel A				
Dependent Variable	MD&A Score			
Disagreement measures	Actual Voting		Voting Recommendation	
	(1)	(2)	(3)	(4)
	Undervalue=0	Undervalue=1	Undervalue=0	Undervalue=1
Disagreement	-0.002	0.010***	-0.002	0.017***
	(0.003)	(0.002)	(0.009)	(0.006)
Change (EPS)	0.012***	0.007*	0.012***	0.007**
	(0.004)	(0.004)	(0.004)	(0.004)
Change (Current)	0.004	0.004	0.004	0.004
	(0.003)	(0.003)	(0.003)	(0.003)
Change (Leverage)	0.011***	0.009***	0.011***	0.009***
	(0.002)	(0.003)	(0.002)	(0.003)
Change (FCF)	-0.002	-0.001	-0.002	-0.001
	(0.002)	(0.004)	(0.002)	(0.004)
Change (Volatility)	0.002	0.002	0.002	0.002
	(0.003)	(0.003)	(0.003)	(0.003)
Ln(Herfindahl index)	-0.005	0.003	-0.005	0.003
	(0.003)	(0.003)	(0.003)	(0.003)
Acquire	0.018***	0.040***	0.018***	0.041***
	(0.005)	(0.006)	(0.005)	(0.006)

Downsize	0.068***	0.050***	0.068***	0.050***
	(0.020)	(0.016)	(0.020)	(0.016)
Big 4	0.009	-0.000	0.009	-0.000
	(0.006)	(0.007)	(0.006)	(0.007)
Ln(AT)	0.006**	0.005	0.006**	0.005
	(0.002)	(0.003)	(0.002)	(0.003)
Ln(1+Total analysts)	-0.003	0.000	-0.003	0.001
	(0.004)	(0.005)	(0.004)	(0.005)
Litigious	0.026***	0.023*	0.026***	0.023*
	(0.009)	(0.013)	(0.009)	(0.013)
Large Holder	0.009	-0.007	0.009	-0.007
	(0.006)	(0.005)	(0.006)	(0.005)
Total Directors	0.000	0.001	0.000	0.001*
	(0.001)	(0.001)	(0.001)	(0.001)
Constant	-0.107***	-0.090***	-0.106***	-0.094***
	(0.013)	(0.014)	(0.014)	(0.014)
Observations	6116	6079	6116	6079
Adjusted R^2	0.084	0.098	0.084	0.098
F.E.	Year & Ind.	Year & Ind.	Year & Ind.	Year & Ind.
Coefficient difference in *Disagreement* measure between two subsamples				
	-0.012***		-0.019**	
[Two-tailed p-value]	[0.000]		[0.050]	

Panel B

Dependent Variable	MD&A Score			
Disagreement measures	Actual Voting		Voting Recommendation	
	(1)	(2)	(3)	(4)
	Constraint=1	Constraint=0	Constraint=1	Constraint=0
Disagreement	0.013***	-0.002	0.018***	0.007
	(0.003)	(0.003)	(0.007)	(0.008)
Change (EPS)	0.011***	0.014***	0.011***	0.013***
	(0.003)	(0.003)	(0.003)	(0.003)
Change (Current)	0.002	0.006*	0.002	0.006*
	(0.003)	(0.003)	(0.003)	(0.003)
Change (Leverage)	0.009***	0.013***	0.009***	0.013***
	(0.003)	(0.003)	(0.003)	(0.003)
Change (FCF)	-0.001	-0.003	-0.001	-0.003
	(0.003)	(0.003)	(0.003)	(0.003)
Change (Volatility)	0.002	0.003	0.002	0.003
	(0.002)	(0.003)	(0.002)	(0.003)
Ln(Herfindahl index)	0.002	-0.003	0.002	-0.003
	(0.003)	(0.003)	(0.003)	(0.003)
Acquire	0.034***	0.026***	0.034***	0.026***
	(0.006)	(0.005)	(0.006)	(0.005)
Downsize	0.062***	0.057***	0.062***	0.057***
	(0.016)	(0.019)	(0.016)	(0.019)
Big 4	-0.006	0.008	-0.007	0.008
	(0.007)	(0.006)	(0.007)	(0.006)

Ln(AT)	0.003	0.008***	0.003	0.008***
	(0.002)	(0.002)	(0.002)	(0.002)
Ln(1+Total analysts)	-0.001	-0.008	-0.000	-0.008
	(0.003)	(0.005)	(0.003)	(0.005)
Litigious	0.020**	0.032***	0.020**	0.032***
	(0.010)	(0.010)	(0.010)	(0.010)
Large Holder	0.002	0.003	0.002	0.003
	(0.005)	(0.006)	(0.005)	(0.006)
Total Directors	0.001	-0.000	0.001*	-0.000
	(0.001)	(0.001)	(0.001)	(0.001)
Constant	-0.081***	-0.111***	-0.086***	-0.113***
	(0.016)	(0.012)	(0.016)	(0.012)
Observations	6906	6818	6906	6818
Adjusted R^2	0.082	0.104	0.081	0.104
F.E.	Year & Ind.	Year & Ind.	Year & Ind.	Year & Ind.
Coefficient difference in *Disagreement* measure between two subsamples				
		0.015***		0.011
[Two-tailed p-value]		[0.000]		[0.321]

Panel C

Dependent Variable	MD&A Score			
Disagreement measures	Actual Voting		Voting Recommendation	
	(1)	(2)	(3)	(4)
	High career concern=0	High career concern=1	High career concern=0	High career concern=1
Disagreement	0.002	0.009***	0.002	0.033***
	(0.003)	(0.003)	(0.008)	(0.009)
Change (EPS)	0.007*	0.014***	0.007*	0.014***
	(0.004)	(0.003)	(0.004)	(0.003)
Change (Current)	-0.000	0.007***	-0.000	0.007***
	(0.003)	(0.003)	(0.003)	(0.003)
Change (Leverage)	0.006*	0.013***	0.006*	0.013***
	(0.003)	(0.003)	(0.003)	(0.003)
Change (FCF)	-0.004	-0.001	-0.004	-0.001
	(0.003)	(0.003)	(0.003)	(0.003)
Change (Volatility)	0.002	0.003	0.002	0.003
	(0.003)	(0.003)	(0.003)	(0.003)
Ln(Herfindahl index)	-0.002	0.002	-0.002	0.002
	(0.002)	(0.002)	(0.002)	(0.002)
Acquire	0.026***	0.030***	0.025***	0.030***
	(0.007)	(0.006)	(0.007)	(0.006)
Downsize	0.011	0.075***	0.011	0.075***
	(0.017)	(0.016)	(0.017)	(0.016)
Big 4	-0.002	-0.000	-0.002	0.000
	(0.008)	(0.007)	(0.008)	(0.007)
Ln(AT)	0.003	0.006***	0.003	0.006***
	(0.002)	(0.002)	(0.002)	(0.002)
Ln(1+Total analysts)	-0.003	-0.004	-0.003	-0.004
	(0.004)	(0.004)	(0.004)	(0.004)

Litigious	0.016*	0.026***	0.016*	0.026***
	(0.009)	(0.008)	(0.009)	(0.008)
Large Holder	0.007	-0.000	0.007	0.001
	(0.006)	(0.005)	(0.006)	(0.005)
Total Directors	0.001	-0.000	0.001	0.000
	(0.001)	(0.001)	(0.001)	(0.001)
Constant	-0.069***	-0.102***	-0.070***	-0.109***
	(0.017)	(0.014)	(0.017)	(0.014)
Observations	5161	7847	5161	7847
Adjusted R^2	0.080	0.096	0.080	0.098
F.E.	Year & Ind.	Year & Ind.	Year & Ind.	Year & Ind.
Coefficient difference in *Disagreement* measure between two subsamples				
		-0.007		-0.031***
[Two-tailed p-value]		[0.118]		[0.007]

Panel D

Dependent Variable	MD&A Score			
Disagreement measures	Actual Voting		Voting Recommendation	
	(1)	(2)	(3)	(4)
	High accruals=1	High accruals=0	High accruals=1	High accruals=0
Disagreement	0.009***	0.000	0.018**	0.007
	(0.003)	(0.003)	(0.008)	(0.008)
Change (EPS)	0.012***	0.012***	0.012***	0.012***
	(0.004)	(0.003)	(0.004)	(0.003)
Change (Current)	0.007**	0.004	0.007**	0.004
	(0.003)	(0.003)	(0.003)	(0.003)
Change (Leverage)	0.010***	0.012***	0.010***	0.012***
	(0.003)	(0.004)	(0.003)	(0.004)
Change (FCF)	-0.004	0.002	-0.004	0.002
	(0.004)	(0.003)	(0.004)	(0.003)
Change (Volatility)	0.002	0.002	0.002	0.002
	(0.003)	(0.003)	(0.003)	(0.003)
Ln(Herfindahl index)	-0.000	-0.003	-0.000	-0.003
	(0.003)	(0.003)	(0.003)	(0.003)
Acquire	0.031***	0.028***	0.031***	0.028***
	(0.006)	(0.008)	(0.006)	(0.008)
Downsize	0.055***	0.090***	0.055***	0.089***
	(0.014)	(0.028)	(0.014)	(0.029)
Big 4	0.009	-0.004	0.008	-0.003
	(0.007)	(0.006)	(0.007)	(0.006)
Ln(AT)	0.005**	0.007***	0.005**	0.007***
	(0.002)	(0.002)	(0.002)	(0.002)
Ln(1+Total analysts)	-0.007*	-0.003	-0.007*	-0.003
	(0.004)	(0.004)	(0.004)	(0.004)
Litigious	0.021	0.027***	0.021*	0.027***
	(0.013)	(0.006)	(0.013)	(0.006)
Large Holder	0.004	0.009*	0.005	0.009*
	(0.007)	(0.005)	(0.007)	(0.005)
Total Directors	0.001*	0.000	0.001**	0.000
	(0.001)	(0.001)	(0.001)	(0.001)

Constant	-0.093***	-0.111***	-0.097***	-0.113***
	(0.014)	(0.013)	(0.014)	(0.013)
Observations	5861	5840	5861	5840
Adjusted R^2	0.078	0.103	0.078	0.103
F.E.	Year & Ind.	Year & Ind.	Year & Ind.	Year & Ind.
Coefficient difference in *Disagreement* measure between two subsamples				
		0.009***		0.011
[Two-tailed p-value]		[0.006]		[0.342]

Panel E

Dependent Variable	MD&A Score			
Disagreement measures	Actual Voting		Voting Recommendation	
	(1)	(2)	(3)	(4)
	ICW=1	ICW=0	ICW=1	ICW=0
Disagreement	0.042***	0.004*	0.072***	0.011**
	(0.014)	(0.002)	(0.025)	(0.005)
Change (EPS)	-0.024	0.013***	-0.022	0.013***
	(0.017)	(0.002)	(0.016)	(0.002)
Change (Current)	0.008	0.005**	0.005	0.005**
	(0.013)	(0.002)	(0.013)	(0.002)
Change (Leverage)	0.006	0.010***	0.010	0.010***
	(0.010)	(0.002)	(0.009)	(0.002)
Change (FCF)	-0.010	-0.001	-0.012	-0.001
	(0.013)	(0.002)	(0.012)	(0.002)
Change (Volatility)	-0.015	0.003*	-0.014	0.003*
	(0.014)	(0.002)	(0.014)	(0.002)
Ln(Herfindahl index)	0.002	-0.001	0.003	-0.001
	(0.006)	(0.002)	(0.006)	(0.002)
Acquire	0.012	0.030***	0.013	0.030***
	(0.022)	(0.005)	(0.022)	(0.005)
Downsize	0.158*	0.054***	0.169**	0.054***
	(0.079)	(0.011)	(0.081)	(0.011)
Big 4	0.018	0.001	0.024	0.001
	(0.014)	(0.004)	(0.015)	(0.005)
Ln(AT)	0.015*	0.005***	0.013	0.005***
	(0.009)	(0.002)	(0.009)	(0.002)
Ln(1+Total analysts)	-0.024	-0.002	-0.021	-0.002
	(0.016)	(0.003)	(0.017)	(0.003)
Litigious	-0.009	0.023**	-0.003	0.023**
	(0.020)	(0.011)	(0.023)	(0.011)
Large Holder	0.000	0.003	0.002	0.003
	(0.021)	(0.004)	(0.020)	(0.005)
Total Directors	-0.001	0.000	-0.001	0.000
	(0.002)	(0.000)	(0.002)	(0.000)
Constant	-0.062	-0.101***	-0.074	-0.104***
	(0.046)	(0.013)	(0.045)	(0.013)
Observations	558	13166	558	13166
Adjusted R^2	0.117	0.087	0.115	0.087
F.E.	Year & Ind.	Year & Ind.	Year & Ind.	Year & Ind.
Coefficient difference in *Disagreement* measure between two subsamples				
		0.038***		0.061**
[Two-tailed p-value]		[0.004]		[0.013]

Financially constrained firms are also more likely to be concerned about investor-management disagreement. Firms can finance their projects with either internally generated funds or external financing. Because financially constrained firms are more dependent on external finance to fund investments, and because investor-management disagreement weakens firms' ability to obtain external funds, financially constrained firms are more likely to strive to decrease disagreement. We repeat the subsample tests on the basis of whether or not the firm is financially constrained. We measure financial constraint using Kaplan and Zingales' (1997) financial constraint index (*KZ index*). *Constraint* takes the value of one for firms with *KZ index* values above the sample median and zero otherwise. The results are presented in Table 4 Panel B. We find that the coefficient on *Disagreement* is positive and statistically significant only for firms that are more financially constrained. This is consistent with our conjecture that managers in firms with a high level of high investor-management disagreement disclose more due to their concern about firms' financial constraints.

In addition, Huang *et al.* (2020) document that managers are more likely to get fired when the level of investor-management disagreement is high. To the extent that disagreement heightens managers' career concerns and to the extent that disclosure carries the possibility of mitigating such disagreement, the effect of disagreement on disclosure should be more salient in firms with managers who already have greater career concerns. We adopt multiple measures of managers' career concerns. These measures include whether the CEO (1) is young (CEO's age is in the lower quartile of the sample (51 years old or younger)), (2) is in the early stage of their tenure (CEO's tenure at the firm is in the lower quartile of the sample (2.74 years or lower)), (3) does not hold the Chairman position, and (4) is not the founder of the firm. Prior literature (e.g. Holmström, 1999; Gibbons and Murphy 1992) suggests that younger CEOs and CEOs in the early years of their career have greater career concerns because the labour market will still be assessing their managerial ability. Furthermore, CEOs who are also (1) the chairman of the board and/or (2) the founder of their firm are less likely to be terminated and thus are less concerned about their career (Pae *et al.*, 2016). We create an index by adding all four measures of career concerns. We then create the variable *High career concern*, which takes the value of one if this index is greater than or equal to the sample median and zero otherwise. Table 4 Panel C presents the results of the subsample analyses based on whether *High career concern* is one or zero. We find that the coefficients on the disagreement proxies are significant only for the subsample of firms with "high-career-concern" managers. In summary, our results suggest that managers' career concerns are likely an underlying channel through which investor-management disagreement affects disclosure.

Finally, the increase in disclosure could also be a result of shareholders' demand. When shareholders disagree with the management about a firm's future course of action, they are likely to demand additional disclosure so that they can evaluate the risk and reward of their investment. If this is the case, we expect the increase in disclosure level resulting from

investor-management disagreement to be more pronounced for firms with an opaque information environment. The opacity of firms hinders investors' comprehension and evaluation of firms' performance. Therefore, we conjecture that investors in such firms are more likely to demand strategic information disclosure when they disagree with managers. Following Kim and Zhang (2014), we use discretionary accruals and internal control weakness (ICW) to capture a firm's financial opacity. Discretionary accruals are computed using the absolute value of the modified cross-sectional Jones model (Jones, 1991) as described in Dechow *et al.* (1995). Large discretionary accruals reflect a higher likelihood of firms engaging in opportunistic earnings management, which makes financial reporting opaque (Kim and Zhang, 2014). This is because opportunistic earnings management hinders investors' understanding of firms' financial statements. Therefore, investors may demand disclosure of strategy to help evaluate firms. We divide our sample into two subsamples on the basis of the level of discretionary accruals. *High accruals* is an indicator that equals one if a firm's discretionary accruals are above the sample median and zero otherwise. Table 4 Panel D presents the results. Consistent with our conjecture, the results show that the effect of disagreement is concentrated in the subsample of firms with high accruals. Thus, this provides consistent evidence that increases in disclosure are also due to shareholders' demand.

Table 4 Panel E presents the results using ICW as the opacity proxy. ICW is defined as a dummy variable equal to one if auditor-attested material ICW over financial reporting under the requirements of Section 404 of the Sarbanes-Oxley Act is present in a firm at a given year, and zero otherwise. Internal control systems for financial reporting are designed to provide reasonable assurances of the reliability of financial reporting for external use (Kim and Zhang, 2014). If the internal control systems are not effective, it leads to higher instances of misstatements and low accruals quality (Ashbaugh-Skaife *et al.*, 2008; Doyle *et al.*, 2007). This empirical evidence confirms that ICW proxies for a firm's financial reporting opacity as the financial reporting of firms with weak internal control systems is less likely to be reliable. Thus, investors of firms with ICW may demand more information from other channels. The results in Table 4 Panel E suggest that the effect of disagreement on disclosure is prevalent in both ICW firms and non-ICW firms. However, the effect is more pronounced in the subsample of ICW firms, consistent with our conjecture that investors demand information when the financial reporting environment is opaque.

5.2 Investor-Management Disagreement, MD&A Modification, and Price/Analysts' Response

So far, we have found that firms with a high level of *ex ante* investor-management disagreement disclose more because the benefits of disclosure outweigh the costs, whereas firms with a low level of *ex ante* investor-management disagreement disclose less because the costs outweigh the benefits. Therefore, we expect that the market reaction to a higher level of disclosure also depends on the *ex ante* disagreement level. Specifically, we expect a positive

(negative) market reaction to disclosure for firms with a high (low) *ex ante* disagreement level.

To examine the market reaction to MD&A modification, we run the following OLS regression on subsamples of firms with high and low levels of *ex ante* investor-management disagreement.

$$CAR_{i,t} = \delta_2 + \lambda_{12} * MD\&A\ Score_{i,t} + \lambda_{22} * Controls_{i,t} + \tau_{2i} + \upsilon_{2t} + \mu_{2i,t}$$

CAR is the cumulative abnormal market-adjusted returns over the three days beginning with the 10-K filing date [0, 2]. We estimate *CAR* using the returns in the Standard & Poor's index and the market model, where the parameters for the market model are estimated over the [-120,-30] day interval. To ensure that the investors' reaction is not due to earnings surprises, we only keep those firm-years that announced earnings prior to the 10-K filing date. Furthermore, we remove firm-years for which there are any other firm-specific announcements in the three days beginning with the 10-K filing date. Our selection of the set of control variables is based on Brown and Tucker (2011). Specifically, we control for firm size (*Ln(AT)*), the timeliness of the 10-K filings (*Filelate*), additional financial information (*NewItems*), and cumulative abnormal returns around the earnings announcement date (*CAR_Earnings*). *Filelate* is a dummy variable that equals one if the filing is more than 90 days after the fiscal year end and zero otherwise. *NewItems* is the number of non-missing financial statement items on Compustat. This measure is used to control for other information in the 10-K reports (Brown and Tucker, 2011). *CAR_Earnings* is the three day [-1, 1] cumulative abnormal returns around the earnings announcement date.

The results are presented in columns (1) and (2) of Table 5 panels A and B. Panel A (Panel B) uses *Actual Voting* (*Voting Recommendation*) as the disagreement proxy. The coefficient estimates on *MD&A Score* are negative (positive) and statistically significant for the subsample of firms with a low (high) level of *ex ante* disagreement. The two-tailed p-value of the coefficient difference in *MD&A Score* between the two subsamples is also statistically significant. This suggests that the market, on average, reacts negatively (positively) when firms with a low (high) level of *ex ante* disagreement modify their MD&A section from the prior year. It is consistent with our conjecture that the costs of disclosure outweigh its benefits for firms with a low level of *ex ante* disagreement and the benefits outweigh its costs for firms with a high level of *ex ante* disagreement. In sum, our finding suggests that the market reacts to disclosure differently depending on the *ex ante* level of investor-management disagreement at the firm.

Table 5 Investor-Management Disagreement, MD&A Modification, and Price/Analysts' Response

This table presents the coefficient estimates from the OLS regressions that relate price and analysts' responses to MD&A modifications for subsamples of firms with a high and low level of investor-management disagreement. *CAR* is the cumulative abnormal market-adjusted returns over the three days beginning with the 10-K filing date. *MD&A Score* is computed as in Brown and Tucker (2011) and captures the magnitude of change in MD&A content from year to year. *Filelate* is a dummy variable that equals one if the filing is

more than 90 days after the fiscal year end and zero otherwise. *NewItems* is the number of non-missing items on Compustat. *CAR_Earnings* is the three-day cumulative abnormal returns around the earnings announcement date. *Revision* is the difference between the mean analyst forecasts for the year *t+1* issued in the 90-day window before the 10-K filing and the mean forecasts issued in the 30-day window after the filing, scaled by the stock price at the end of the year *t*. *Revision_same* is defined the same as *Revision* but is calculated using only the analysts who issue forecasts within the 90-day window before the 10-K filing and revise their forecasts within the 30-day window after the filing. All other variables are defined in the Appendix. Robust standard errors are clustered by firm and are reported in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

Panel A: Actual Voting

	(1)	(2)	(3)	(4)	(5)	(6)
	CAR		Revision		Revision_same	
	Low Disagreement	High Disagreement	Low Disagreement	High Disagreement	Low Disagreement	High Disagreement
MD&A Score	-0.015**	0.009*	-0.008***	0.005*	-0.009***	0.008***
	(0.008)	(0.005)	(0.003)	(0.003)	(0.003)	(0.003)
Ln(AT)	-0.001*	-0.001***	-0.000	-0.000**	-0.000	-0.001**
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Filelate	0.009	0.023	0.022*	-0.004	0.026*	-0.005
	(0.020)	(0.020)	(0.012)	(0.004)	(0.015)	(0.004)
NewItems	0.000	0.000***	-0.000**	-0.000	-0.000**	-0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
CAR_Earnings	0.089***	0.075***	-0.015***	-0.024***	-0.006	-0.028***
	(0.016)	(0.015)	(0.006)	(0.006)	(0.006)	(0.007)
Constant	-0.007	-0.043	0.029*	0.009	0.037**	0.007
	(0.028)	(0.027)	(0.017)	(0.012)	(0.016)	(0.012)
Observations	5039	6918	3819	5516	3460	5040
Adjusted R2	0.024	0.028	0.072	0.023	0.073	0.033
F.E.	Year & Ind.	Year & Ind.	Year & Ind.	Year & Ind.	Year & Ind.	Year & Ind.
Coefficient difference in *MD&A Score* between two subsamples						
		-0.024**		-0.013***		-0.017***
[Two-tailed p-value]		[0.011]		[0.003]		[0.000]

Panel B: Voting Recommendation

	(1)	(2)	(3)	(4)	(5)	(6)
	CAR		Revision		Revision_same	
	Low Disagreement	High Disagreement	Low Disagreement	High Disagreement	Low Disagreement	High Disagreement
MD&A Score	-0.007*	0.023***	-0.004*	0.015***	-0.004*	0.021***
	(0.004)	(0.009)	(0.002)	(0.005)	(0.002)	(0.006)
Ln(AT)	-0.001***	-0.001	-0.000	-0.001	-0.000*	-0.001*
	(0.000)	(0.001)	(0.000)	(0.000)	(0.000)	(0.000)
Filelate	0.028*	-0.008	0.014	-0.000	0.020*	-0.006*
	(0.016)	(0.019)	(0.010)	(0.003)	(0.013)	(0.003)
NewItems	0.000*	0.000	-0.000	-0.000	-0.000	-0.000*
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
CAR_Earnings	0.072***	0.069***	-0.016***	-0.033***	-0.013***	-0.044***
	(0.010)	(0.019)	(0.005)	(0.009)	(0.005)	(0.011)
Constant	-0.026	-0.048	0.009	0.051	0.011	0.065*
	(0.019)	(0.040)	(0.008)	(0.040)	(0.010)	(0.036)
Observations	9598	2359	7571	1764	6916	1584
Adjusted R2	0.031	0.026	0.044	0.026	0.050	0.036
F.E.	Year & Ind.	Year & Ind.	Year & Ind.	Year & Ind.	Year & Ind.	Year & Ind.
Coefficient difference in *MD&A Score* between two subsamples						
		-0.030***		-0.019***		-0.025***
[Two-tailed p-value]		[0.004]		[0.001]		[0.000]

Next, we examine whether and how analysts, the sophisticated processors of accounting disclosures, respond to MD&A modification differently for firms with different levels of *ex ante* disagreement. Brown and Tucker (2011) do not find evidence of analysts revising earnings forecasts in response to MD&A modification by the management, and they suggest that analysts do not use MD&A for their year-ahead earnings forecasts. If this is the case, we expect no significant analysts' forecast revision following MD&A modification regardless of the firms' *ex ante* level of disagreement. However, if analysts do revise their forecasts in response to MD&A modification and if they also take the *ex ante* disagreement levels of firms into account, we expect analysts to revise their estimates upward (downward) for firms with a high (low) level of *ex ante* investor-management disagreement.

To test analysts' forecast revision following MD&A modification, we run the following OLS regression for the two subsamples of firms with a high and low level of investor-management disagreement:

$$Revision_{i,t} = \delta_3 + \lambda_{13} * MD\&A\ Score_{i,t} + \lambda_{23} * Controls_{i,t} + \tau_{3i} + \upsilon_{3t} + \mu_{3i,t}.$$

Similar to Brown and Tucker (2011), we define *Revision* as the difference between the mean analyst forecasts for the year $t+1$ issued in the 90-day window before the 10-K filing and the mean forecasts issued in the 30-day window after the filing, scaled by the stock price at the end of the year t. The results are reported in columns (3) and (4) of Table 5 panels A and B. The set of controls we use in this regression is the same as that used in the *CAR* regressions. We find that analysts revise their earnings forecasts downward (upward), on average, in response to MD&A modification by firms with a low (high) level of *ex ante* investor-management disagreement.

Since *Revision* may capture forecasts by different analysts, we repeat the test by replacing *Revision* with a conservative definition of analysts' forecast revisions. Specifically, *Revision_same* is defined in the same way as *Revision*, except that we only include the forecasts and revisions of those analysts who issue forecasts within the 90-day window before the 10-K filing as well as revise their forecasts within the 30-day window after the filing. The results are reported in columns (5) and (6) of Table 5 panels A and B. Although this approach reduces our sample size, we continue to find consistent results. In sum, our results indicate that analysts use MD&A modification to revise their forecasts, and they revise differently on the basis of firms' *ex ante* investor-management disagreement level.

5.3 MD&A Modification, Forced CEO Turnover, and Firm Undervaluation

To the extent managerial career concerns and firm undervaluation resulting from higher disagreement are the driving forces behind a firm's year-over-year MD&A modification decisions and to the extent such disclosures attenuate disagreement, one should expect to see a reduction in the likelihood of forced CEO turnover and firm undervaluation subsequent to large MD&A modifications. We first examine the effect of *MD&A Score* on the likelihood of

forced CEO turnover by employing the linear probability model where the dependent variable is a dummy variable that identifies years when a firm experiences a forced CEO turnover.[12] We follow the standard criteria in Parrino (1997) to classify a turnover as forced.[13] The specific firm characteristics we include are as follows: *Stock return* (firm's annualised stock return), *Ln(AT)*, *Stock volatility* (standard deviation of the firm's stock return over the past two months), *Leverage*, *Market-to-Book*, *Firm age*, and *Large Holder.* The set of CEO characteristics we include are *Tenure* (number of years the CEO has been in office), *Age* (age of the CEO in years)*, Stock holding* (fraction of shares owned by the CEO), and *Founder* (dummy indicating whether or not the CEO is also the founder of the firm). Compensation and CEO specific data are obtained from *ExecuComp*, which covers S&P1500 firms only. Thus, we see a further reduction in our sample size. Nevertheless, using a lead-lag design, we find that the coefficient on *MD&A Score* is negative and statistically significant, which corroborates the above argument (results reported in Panel A of Table 6). The estimates of the other control variables are in line with the findings in the extant literature (e.g. Jenter and Kanaan, 2015).

Table 6 MD&A Modification, Forced CEO Turnover, and Firm Undervaluation

Panel A of this table presents the coefficient estimates from the linear probability model that relates the likelihood of forced CEO turnover to *MD&A Score*. Panel B presents the coefficient estimates from the OLS regressions that relate firm valuation to *MD&A Score*. We follow Blanchard *et al.* (1993) and Kim and Weisbach (2008) and use the residual from the following model as the dependent variable:

$$LN\left(\frac{ME_i}{BE_i}\right) = \alpha + \sum_{t=-3}^{-1}\beta_t\left(\frac{sales_{it}}{asset_{it}}\right) + \sum_{t=-3}^{-1}\gamma_t\left(\frac{sales_{it}}{sales_{i(t-1)}}\right) + \sum_{t=-3}^{-1}\delta_t\left(\frac{op.income_{it}}{asset_{it}}\right) + \sum_{t=-3}^{-1}\emptyset_t\left(\frac{dividend_{it}}{sales_{it}}\right) + \sum_{t=-3}^{-1}\vartheta_t\left(\frac{R\&D_{it}}{asset_{it}}\right) + \varepsilon_i.$$

All variables are defined in the Appendix. Robust standard errors are clustered by firm and are reported in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

Panel A: Forced CEO Turnover	
	(1)
MD&A Score	-0.020**
	(0.010)
Stock return	-0.020***
	(0.004)
Stock holding	-0.089***
	(0.021)
Ln(1+Tenure)	-0.007***
	(0.002)
CEO age	-0.000*
	(0.000)

[12] Our results are robust if we use a Logit model or a hazard model. For brevity, results pertaining to these models are not reported but are available upon request.

[13] There are 361 instances of forced CEO turnover in our sample.

Founder	-0.011***
	(0.004)
Leverage	0.010
	(0.009)
Ln(AT)	-0.001
	(0.001)
Market-to-Book	-0.000
	(0.000)
Stock volatility	0.142***
	(0.033)
Firm age	0.002
	(0.002)
Large Holder	-0.003
	(0.003)
Constant	0.056***
	(0.016)
Observations	13288
Adjusted R^2	0.011
F.E.	Year & Ind.

Panel B: Adjusted Market-to-Book

	(1)
MD&A Score	0.140***
	(0.056)
Lagged Adjusted Market-to-Book	0.870***
	(0.012)
R&D expenditures	0.137
	(0.107)
Capex	-0.313***
	(0.099)
ROA	-0.059
	(0.080)
Ln(AT)	0.014***
	(0.004)
Leverage	0.006
	(0.039)
Firm age	0.012
	(0.022)
Insider ownership	-0.034
	(0.074)
E-index	-0.001
	(0.004)
Constant	-0.072**
	(0.033)
Observations	9156
Adjusted R^2	0.719
F.E.	Year & Ind.

Next, we examine the association between *MD&A Score* and firm undervaluation. The empirical model we implement is

$$Adjusted\ Market\text{-}to\text{-}Book_{i,t+1} = \delta_4 + \lambda_{14} * MD\&A\ Score_{i,t} + \lambda_{24} * Adjusted\ Market\text{-}to\text{-}Book_{i,t} + \lambda_{34} * Controls_{i,t} + \tau_{3i} + \upsilon_{3t} + \mu_{3i,t}.$$

Adjusted Market-to-Book is the residual from the model outlined in section 5.1. We control for a variety of firm attributes that are deemed to influence firm valuation. These include *R&D expenditures* (R&D expenditures scaled by beginning of the year total assets), *Capex* (capital expenditures scaled by beginning of the year total assets), *ROA, Ln(AT)*, *Leverage*, *Firm age*, *Insider ownership* (fraction of shares owned by the C-suite executives), and *E-index* (entrenchment index). Because we require data on executives as well as the *E-index*, the sample size for this test is relatively smaller than that in our baseline case. Nonetheless, the results tabulated in Panel B of Table 6 show that the coefficient on *MD&A Score* is positive and statistically significant at the 1% level, which suggests that larger year-over-year MD&A modification mitigates firm undervaluation. The signs on the coefficients of the control variables are in line with previous studies.

VI. Robustness Tests

6.1 Investor-Management Disagreement, MD&A Modification, and Economic Change

One may argue that managers and investors are most likely to have disagreements when there is an economic change, which is likely to result in more disclosure by the management to explain the situation. Due to this concern, we control for various economic changes in our baseline regression. Our baseline results indicate that *Change(EPS)*, *Change(Current), Change(Leverage)*, and *Change(Volatility)* are significantly and positively associated with MD&A modification (coefficient on *Change(FCF)* is not significant). To further show that the effect of disagreement is independent of firm performance and economic changes, we now focus on the subsamples of firms that witness "below-the-median" recent changes in these four measures. In these firms, the year-over-year MD&A modification decision is less likely to be due to the economic changes, but it can occur because investors and management disagree.

Table 7 presents the results. Columns (1) to (4) report results using *Actual Voting* as the disagreement proxy, and Columns (5) to (8) report the results using *Voting Recommendation* as the disagreement proxy. The effect of disagreement on year-over-year MD&A modification remains, as the coefficient estimates on the disagreement measures are all positive and statistically significant in all eight subsample tests. The magnitudes of the coefficient estimates are similar to those in Table 2 or even larger. Overall, the results help to further mitigate the concern that the impact of disagreement might be due to significant changes in firms' economic conditions.

Table 7 Investor-Management Disagreement, MD&A Modification, and Small Economic Changes

This table presents the coefficient estimates from the OLS regressions that relate *MD&A Score* to investor-management disagreement in the subsamples of firms with below-the-median economic changes. The dependent variable is *MD&A Score*, which is computed as in Brown and Tucker (2011) and captures the magnitude of change in MD&A content from year to year. The criteria for subgroup separation are given on the top of each column. All other variables are defined in the Appendix. Year and industry fixed effects are included in all regressions. Robust standard errors are clustered by firm and are reported in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

Dependent Variable	MD&A Score							
Disagreement measures	Actual Voting				Voting Recommendation			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Change (EPS)=0	Change (Current)=0	Change (Leverage)=0	Change (Volatility)=0	Change (EPS)=0	Change (Current)=0	Change (Leverage)=0	Change (Volatility)=0
Disagreement	0.005*	0.007**	0.005**	0.004*	0.022**	0.012*	0.021***	0.014*
	(0.003)	(0.003)	(0.002)	(0.002)	(0.010)	(0.007)	(0.009)	(0.008)
Change (EPS)		0.013***	0.012***	0.010***		0.013***	0.012***	0.010***
		(0.004)	(0.003)	(0.004)		(0.004)	(0.003)	(0.004)
Change (Current)	0.006**		0.008***	0.010***	0.006**		0.008***	0.010***
	(0.003)		(0.003)	(0.003)	(0.003)		(0.003)	(0.003)
Change (Leverage)	0.010***	0.012***		0.009***	0.010***	0.012***		0.009***
	(0.002)	(0.002)		(0.002)	(0.002)	(0.003)		(0.002)
Change (FCF)	-0.003	-0.001	-0.003	-0.005*	-0.003	-0.001	-0.003	-0.005*
	(0.002)	(0.003)	(0.003)	(0.003)	(0.002)	(0.003)	(0.003)	(0.003)
Change (Volatility)	-0.000	0.009***	0.002		0.000	0.009***	0.002	
	(0.003)	(0.003)	(0.002)		(0.003)	(0.003)	(0.002)	
Ln(Herfindahl index)	-0.003	-0.000	-0.000	-0.002	-0.003	-0.000	-0.000	-0.002
	(0.002)	(0.003)	(0.003)	(0.003)	(0.002)	(0.003)	(0.003)	(0.003)
Acquire	0.031***	0.039***	0.015**	0.037***	0.031***	0.039***	0.014**	0.037***
	(0.006)	(0.008)	(0.006)	(0.007)	(0.006)	(0.008)	(0.006)	(0.007)
Downsize	0.060**	0.043**	0.045***	0.100***	0.059**	0.044**	0.044***	0.101***
	(0.026)	(0.018)	(0.014)	(0.026)	(0.026)	(0.018)	(0.015)	(0.026)
Big 4	0.008	0.002	0.005	0.001	0.008	0.001	0.006	0.001
	(0.006)	(0.006)	(0.006)	(0.007)	(0.006)	(0.006)	(0.006)	(0.007)
Ln(AT)	0.005**	0.005**	0.005**	0.005*	0.005**	0.005**	0.005**	0.005*
	(0.002)	(0.002)	(0.002)	(0.003)	(0.002)	(0.002)	(0.002)	(0.003)
Ln(1+Total analysts)	-0.005	-0.001	-0.001	-0.000	-0.004	-0.001	-0.001	0.000
	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.005)
Litigious	0.021*	0.023***	0.020*	0.021*	0.021*	0.023***	0.019*	0.021*
	(0.012)	(0.007)	(0.011)	(0.011)	(0.012)	(0.007)	(0.011)	(0.011)
Large Holder	0.004	0.004	-0.002	-0.001	0.005	0.004	-0.002	-0.001
	(0.005)	(0.006)	(0.007)	(0.006)	(0.005)	(0.006)	(0.007)	(0.006)
Total Directors	0.000	0.000	0.001	-0.000	0.000	0.000	0.001*	-0.000
	(0.000)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Constant	-0.091***	-0.103***	-0.095***	-0.092***	-0.097***	-0.106***	-0.100***	-0.095***
	(0.015)	(0.018)	(0.014)	(0.020)	(0.016)	(0.018)	(0.014)	(0.019)
Observations	6950	6701	6357	6428	6950	6701	6357	6428
Adjusted R^2	0.085	0.086	0.077	0.088	0.086	0.085	0.078	0.088
F.E.	Year & Ind.	Year & Ind.	Year & Ind.	Year & Ind.	Year & Ind.	Year & Ind.	Year & Ind.	Year & Ind.

6.2 Excluding Confounding Factors

In this section, we report on robustness tests to exclude confounding factors, including information asymmetry and agency conflict. However, it is important to note that information asymmetry arises when management has superior information relative to investors, and it implicitly assumes that there is "uniformity of initial beliefs" among investors (Allen and Gale, 1999). Meanwhile, disagreement between investors and management arises due to heterogeneous prior beliefs and could prevail even when both sides have the same set of information (i.e. in the absence of information asymmetry). We point this out to emphasise that these two concepts are fundamentally different. In addition, mutual fund fire sales should not, in theory, affect information asymmetry. Furthermore, if firms disclose just to reduce information asymmetry, the theory predicts a positive capital market reaction to a greater degree of disclosure. However, if additional disclosure runs the risk of increasing disagreement at firms with a low level of *ex ante* investor-management disagreement, we expect a negative capital market reaction when such firms disclose more. Consistent with the latter view, we find a negative (positive) capital market reaction to disclosure by firms with a low (high) level of *ex ante* disagreement.

Nonetheless, to further make sure that our proxies of investor-management disagreement do not capture information asymmetry and agency problems, we conduct an additional check that addresses this issue more directly. For each of the two measures of disagreement, we estimate an adjusted measure of investor-management disagreement after filtering out the information asymmetry and agency problems component from the original measure and then use the residual to proxy for the "pure" investor-management disagreement. This is done using a two-stage regression approach. Specifically, in the first stage, we regress each of the two disagreement measures on six commonly used proxies of information asymmetry and agency problems.[14] These proxies include *Spread* (Copeland and Galai, 1983; Glosten and Milgrom, 1985; Easley and O'Hara, 1987; Glosten and Harris, 1988, Chung and Zhang, 2014), *Dispersion* (Bryan and Tiras, 2007), and *R&D* (Barth and Kasznik, 1999; Barth *et al.*, 2001), as well as three commonly used proxies of agency problems, namely, *Free Cash Flow* (Jensen, 1986), *Excessive CEO Compensation* (Bebchuk and Fried, 2003), and *Entrenched* (Hermalin and Weisbach, 2003).[15] *Spread* is the yearly average daily bid-ask spread scaled by the stock price. Similar to Chung and Zhang (2014), we exclude observations with greater than 50% of the quote midpoint as an attempt to reduce the effect of data errors and outliers. *Dispersion* is

[14] Note that our baseline regressions already control for firm size (a variable which can also be considered to proxy for information asymmetry (Vermaelen, 1981)) and number of analysts (greater analyst coverage is associated with lower information asymmetry by improving the information environment (Brenan and Subramanyam, 1995).

[15] The highest correlation between the three information asymmetry proxies is 0.107 (between *Spread* and *Dispersion*), whereas the highest correlation between the three agency problem measures is 0.094 (between *Excess CEO Compensation* and *Free Cash Flow*). This highlights that all of the proxies capture different aspects of information asymmetry and agency problems, respectively.

the standard deviation of analysts' forecasts scaled by the stock price. *R&D* is the ratio of research and development expenses to sales.[16] *Free Cash Flow* is the operating income before depreciation deducted by the sum of interest expenses, total income tax, preferred dividends, and common dividends, denominated by lagged total assets. *Excessive CEO Compensation* is a dummy variable that takes the value of one if the total compensation of the CEO is greater than 120% of the median CEO compensation of a peer firm group, which consists of all firms in the same industry in the same year with total assets ranging within 50 to 150 per cent of the total assets of the firm, and zero otherwise. *Entrenched* is a dummy that takes the value of one if the fraction of outsiders on the board is below the sample median, and zero otherwise. [17] In the second stage, we repeat our baseline analysis with each disagreement proxy being replaced by the estimated residual from the first stage that is orthogonal to the proxies of information asymmetry and agency problems. We find that our main results, presented in Table 8, continue to hold. In Panel A for the first-stage analysis, we indeed do not find evidence that our disagreement proxies are correlated with either information asymmetry or agency problems in a consistent way. Furthermore, in Panel B for the second-stage analysis, we find that the estimated coefficients are consistent with the ones reported in our baseline case. This provides direct empirical evidence that disagreement is different from information asymmetry and agency problems and has an effect beyond these factors.

Table 8 Additional Control Variables

Panel A of this table presents the coefficient estimates from the OLS regressions of the disagreement measures on proxies of information asymmetry and agency problems. Panel B presents the coefficient estimates using the baseline model with disagreement proxies replaced by estimated residuals obtained in the first-stage regressions of Panel A. *Spread* is the yearly average daily bid-ask spread scaled by the stock price. Similar to Chung and Zhang (2014), we exclude observations with greater than 50% of the quote midpoint as an attempt to reduce the effect of data errors and outliers. *Dispersion* is the standard deviation of analysts' forecasts scaled by the stock price. *R&D* is the ratio of research and development expenses to sales. *Free Cash Flow* is the operating income before depreciation deducted by the sum of interest expenses, total income tax, preferred dividends, and common dividends, denominated by lagged total assets. *Excessive CEO Compensation* is a dummy variable that takes the value of one if the total compensation of the CEO is greater than 120% of the median CEO compensation of a peer firm group. *Entrenched* is a dummy that takes the value of one if the fraction of outsiders on the board is below the sample median, and zero otherwise. All other variables are defined in the Appendix. Year and industry fixed effects are included in all regressions. Robust standard errors are clustered by firm and are reported in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

[16] The pairwise correlation between *Voting Recommendation* (*Actual Voting*) and *Spread* is 0.105* (-0.009). Similarly, the pairwise correlation between *Voting Recommendation* (*Actual Voting*) and *Dispersion* is 0.039* (0.042*), whereas the pairwise correlation between *Voting Recommendation* (*Actual Voting*) and *R&D* is 0.023* (0.029*). Meanwhile, the highest correlation between *MD&A Score* and the three information asymmetry proxies is 0.045* (for *R&D*). * represents statistical significance at the 10% level.

[17] The pairwise correlation between *Voting Recommendation* (*Actual Voting*) and *Free cash flow* is -0.033* (-0.025*). The pairwise correlation between *Voting Recommendation* (*Actual Voting*) and *Excessive CEO compensation* is -0.021* (-0.019*). Finally, the pairwise correlation between *Voting Recommendation* (*Actual Voting*) and *Entrenched* is 0.021* (0.120*). * represents statistical significance at the 10% level. Meanwhile, the highest correlation between *MD&A Score* and the three agency problem proxies is -0.068* (for *Free cash flow*). * represents statistical significance at the 10% level.

Panel A: First-stage regression		
Dependent Variable	Actual Voting	Voting Recommendation
	(1)	(2)
Spread	-15.356***	7.894***
	(2.196)	(0.985)
Dispersion	0.487***	0.104**
	(0.109)	(0.049)
R&D	0.017	0.008
	(0.013)	(0.006)
Free Cash Flow	-0.153***	-0.028
	(0.049)	(0.022)
Excessive CEO Compensation	0.027***	0.001
	(0.009)	(0.004)
Entrenched	0.035***	0.047***
	(0.010)	(0.004)
Constant	0.586***	0.056***
	(0.009)	(0.004)
Observations	11169	11169
Adjusted R^2	0.008	0.019
Panel B: Second-stage regression		
Dependent Variable	MD&A Score	
Disagreement measures	Actual Voting	Voting Recommendation
	(1)	(2)
Disagreement	0.005*	0.012*
	(0.003)	(0.007)
Change (EPS)	0.012***	0.012***
	(0.003)	(0.003)
Change (Current)	0.005**	0.005**
	(0.002)	(0.002)
Change (Leverage)	0.009***	0.009***
	(0.003)	(0.003)
Change (FCF)	-0.003	-0.003
	(0.002)	(0.002)
Change (Volatility)	0.003	0.003
	(0.002)	(0.002)
Ln(Herfindahl index)	-0.001	-0.001
	(0.002)	(0.002)
Acquire	0.030***	0.030***
	(0.005)	(0.005)
Downsize	0.057***	0.056***
	(0.015)	(0.015)
Big 4	0.003	0.003
	(0.006)	(0.006)
Ln(AT)	0.006***	0.005***
	(0.002)	(0.002)
Ln(1+Total analysts)	-0.002	-0.002
	(0.003)	(0.003)
Litigious	0.021***	0.021***
	(0.007)	(0.007)
Large Holder	0.005	0.005
	(0.005)	(0.005)
Total Directors	0.000	0.001
	(0.001)	(0.001)
Constant	-0.091***	-0.093***
	(0.014)	(0.014)
Observations	11169	11169
Adjusted R^2	0.085	0.085
F.E.	Year & Ind.	Year & Ind.

VII. Conclusion

In this paper, we examine how *ex ante* investor-management disagreement affects strategic information disclosure, measured by year-over-year modification of the MD&A section of the 10-K form. We provide a robust link between a firm's disagreement level and its disclosure decision. When the disagreement level is high, firms disclose more to reduce disagreement; when the disagreement level is low, firms disclose less to avoid giving rise to any unnecessary disagreement. Consistent with this, users of MD&A disclosure, both investors and analysts, react positively (negatively) to disclosures by firms with a high (low) *ex ante* disagreement level. We also find evidence that the increase in disclosure in response to a high level of *ex ante* investor-management disagreement is driven in part by management's incentives to reduce disagreement and investors' demand for more information.

In this paper, we relax one of the full-disclosure conditions, that is, all investors uniformly interpret firms' disclosures (Beyer *et al.*, 2010). Because investors may interpret firms' strategic information disclosures differently, disclosure comes with the cost of generating potential disagreement. Empirically, we find that firms with a pre-existing low level of disagreement between investors and managers are more concerned with this cost and therefore disclose less. Strategic information disclosure also comes with the benefit of reducing disagreement. Prior literature has documented that firms take steps to strategically reduce investors' disagreement with management by repurchasing stocks (Huang and Thakor, 2013) and firing CEOs (Huang *et al.*, 2020). In this paper, we show that firms disclose strategically to influence the disagreement level.

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Appendix Variable Definitions

Variable Name	Definition
Main Variables	
Change(EPS)	A dummy variable that takes the value of one if *Abs(ΔEPS)* is greater than the sample median, and zero otherwise. *Abs(ΔEPS)* is the absolute value of change in a firm's diluted EPS from the previous year, scaled by the fiscal-year-end stock price.
Change(Current)	A dummy variable that takes the value of one if *Abs(ΔCurrent)* is greater than the sample median, and zero otherwise. *Abs(ΔCurrent)* is the absolute value of change in a firm's current ratio.
Change(Leverage)	A dummy variable that takes the value of one if *Abs(ΔLeverage)* is greater than the sample median, and zero otherwise. *Abs(ΔLeverage)* is the absolute value of change in total liability scaled by total assets.
Change(FCF)	A dummy variable that takes the value of one if *Abs(ΔFCF)* is greater than the sample median, and zero otherwise. *Abs(ΔFCF)* is the absolute value of change in free cash flows scaled by total assets.
Change(Volatility)	A dummy variable that takes the value of one if *Abs(ΔVolatility)* is greater than the sample median, and zero otherwise. *Abs(ΔVolatility)* is the absolute value of change in a firm's return volatility.
Acquire	A binary variable that takes the value of one if the total assets increase by at least one third from the previous year, and zero otherwise.
Downsize	A binary variable that takes the value of one if the total assets decrease by at least one third from the previous year, and zero otherwise.
Big 4	A binary variable that takes the value of one if the firm is audited by a Big 4 accounting firm, and zero otherwise.
Large Holder	A dummy variable that takes the value of one if there is at least one institutional investor holding more than 5% of the firm's outstanding shares, and zero otherwise.
Ln(AT)	The natural logarithm of total assets.
Ln(Herfindahl index)	The natural logarithm of the Herfindahl index computed using the 100 firms (or fewer if the number of firms is less than 100) with the highest sales in the industry.
Litigious	A dummy variable equal to one if a firm is in an industry that is exposed to high litigation risk and zero otherwise (Francis *et al.*, 1994).
Ln(1+Total analysts)	The natural logarithm of one plus the number of analysts whose earnings estimates for the subsequent year are included in the most recent I/B/E/S consensus before the 10-K filing.
Total Directors	Total number of directors who are up for (re)election in a given year.
Supplemental Variables	
Adjusted Market-to-Book	The residual from the following model as the dependent variable:

$$LN\left(\frac{ME_i}{BE_i}\right) = \alpha + \sum_{t=-3}^{-1} \beta_t\left(\frac{sales_{it}}{asset_{it}}\right) + \sum_{t=-3}^{-1} \gamma_t\left(\frac{sales_{it}}{sales_{i(t-1)}}\right) + \sum_{t=-3}^{-1} \delta_t\left(\frac{op.income_{it}}{asset_{it}}\right) + \sum_{t=-3}^{-1} \emptyset_t\left(\frac{dividend_{it}}{sales_{it}}\right) + \sum_{t=-3}^{-1} \vartheta_t\left(\frac{R\&D_{it}}{asset_{it}}\right) + \varepsilon_i.$$

Capex	Capital expenditures scaled by beginning of the year total assets.
CAR	The cumulative abnormal market-adjusted returns over the three days beginning with the 10-K filing date.
CAR_Earnings	The three-day cumulative abnormal returns around the earnings announcement date.
Constraint	A dummy variable that takes the value of one for firms with *KZ index* values above the sample median and zero otherwise.
CEO age	Age of the CEO in years.
Dispersion	The standard deviation of analysts' forecasts scaled by the stock price.
E-index	Bebchuk, Cohen, and Ferrell's (2009) entrenchment index
Entrenched	A dummy that takes the value of one if the fraction of outsiders on the board is below the sample median, and zero otherwise.
Excessive CEO Compensation	A dummy variable that takes the value of one if the total compensation of the CEO is greater than 120% of the median CEO compensation of a peer firm group, which consists of all firms in the same industry in the same year with total assets ranging within 50 to 150 per cent of the total assets of the firm, and zero otherwise.
Filelate	A dummy variable that equals one if the filing is more than 90 days after the fiscal year end and zero otherwise.
Free Cash Flow	The operating income before depreciation deducted by the sum of interest expenses, total income tax, preferred dividends, and common dividends, denominated by lagged total assets.
Founder	Dummy indicating whether or not the CEO is also the founder of the firm.
High accruals	An indicator equal to one if a firm's discretionary accruals are above the sample median and zero otherwise.
High career concerns	A dummy variable that takes the value of one if the *Career concern index* is greater than or equal to the sample median, and zero otherwise. *Career concern index* is the sum of the following four binary variables: (1) CEO is young (CEO's age is in the lower quartile of the sample (51 year old or younger)), (2) CEO is in the early stage of their tenure (CEO's tenure at the firm is in the lower quartile of the sample (2.74 years or lower)), (3) CEO does not hold the Chairman position, and (4) CEO is not the founder of the firm.

ICW	A dummy variable equal to one if auditor-attested material ICW over financial reporting under the requirements of Section 404 of the Sarbanes-Oxley Act presents in a firm at a given year, and zero otherwise.
Insider ownership	Fraction of shares owned by the C-suite executives
Leverage	The ratio of total debt to total assets.
Long term growth forecast	Anticipated future performance based on analysts' consensus long-term earnings growth forecasts.
NewItems	The number of non-missing items on Compustat.
R&D expenditures	R&D expenses scaled by beginning of the year total assets.
R&D	The ratio of R&D expenses to sales.
Revision	The difference between the mean analyst forecasts for the year *t+1* issued in the 90-day window before the 10-K filing and the mean forecasts issued in the 30-day window after the filing, scaled by the stock price at the end of the year *t*.
Revision_same	Defined the same as *Revision* but calculated using only the analysts who issue forecasts within the 90-day window before the 10-K filing and revise their forecasts within the 30-day window after the filing.
ROA	The ratio of net income and total assets.
Spread	The yearly average daily bid-ask spread scaled by the stock price. Similar to Chung and Zhang (2014), we exclude observations with greater than 50% of the quote midpoint as an attempt to reduce the effect of data errors and outliers.
Stock holding	Fraction of shares owned by the CEO.
Stock return	Firm's annualised stock return.
Stock volatility	Standard deviation of the firm's stock return over the past two months.
Tenure	Number of years the CEO has been in office.
Undervalue	A dummy variable that takes the value of one for a firm with an *Adjusted Market-to-Book* below the sample median and zero otherwise.