

Corporate Disclosure Quality and Institutional Investors' Holdings During Market Downturns*

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Abstract

We examine institutional investors' responses to corporate disclosure quality conditional on market states. Transient institutions react more positively to corporate disclosure quality during market downturns, when uncertainty is high and information is more valuable, than during normal market periods. Dedicated institutions are insensitive to corporate disclosure practices in either periods, as they have access to inside information and rely less on public disclosures. Their reliance on corporate disclosures in market downturns, however, increases significantly after the enforcement of Regulation Fair Disclosure, which removes their information advantage. We further show that corporate disclosure reduces information asymmetry to a greater extent in market downturns than in normal market periods. And that transient ownership in market downturns provides strong price support and stabilizes return volatility, while dedicated ownership does not exhibit such functions.

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1 Introduction

In this paper, we examine institutional investors' response to corporate disclosure practices conditional on market states. Specifically, we examine three interrelated research questions. Our first research question is whether and how market states affect the relation between corporate disclosure quality and institutional ownership. Our second question examines whether the implementation of Regulation Fair Disclosure (Reg FD) changes institutional investors' responses to corporate disclosures, especially during market downturns. The third research question is whether the relation between corporate disclosure quality and information asymmetry is affected by market states. And the fourth research question is how institutional ownership during market downturns affect subsequent stock returns and volatility.

Ample studies have argued that corporate disclosure practices affect institutional interest in stocks for a couple of reasons. First, institutional investors could be attracted to firms with better disclosures as such disclosures reduces information asymmetry between the firm and investors, increase stock liquidity, and thus reduce the price impact of trades (Diamond and Verrecchia 1991; Falkenstein 1996; Gompers and Metrick 1998; Healy, Hutton, and Palepu, 1999). Second, institutional investors prefer stock with more public disclosures as their profit-making ability lies in their superior ability to interpret the implications of public signals (e.g., Kim and Verrecchia 1994). Therefore, greater disclosure could enhance profit opportunities for these investors. Third, institutional investors are sensitive to corporate disclosures for corporate governance activities. Institutional investors have strong incentives to monitor portfolio firms as they usually have large stake in those firms. Better corporate disclosure helps to reduce their monitoring costs, and enable corporate governance mechanisms to work effectively. (e.g. Bushee and Noe 2000; Chuang and Zhang 2011).

Bushee and Noe (2000) and Bushee (2004) further examine the relation between corporate disclosure practices and institutional ownership by types. They partition institutions into "transient" and "dedicated" categories based on their primary investment goals in the empirical

investigation. Transient institutions trade aggressively and focus on short-term trading profits, while dedicated institutions are characterized as taking large stakes in firms and having low portfolio turnover. Bushee and Noe (2000) and Bushee (2004) find that improvements in disclosure are associated with increases in ownership primarily by transient institutions, but have weak impact on ownership of dedicated institutions. They argue that dedicated institutions, which have long-term investment goals and are usually deeply involved in the operations of the firms that they invest, have an advantage in obtaining insider information and thus rely less on public disclosures in obtaining information relative to transient institutions.

Though the aforementioned studies generally suggest that better corporate disclosure quality increases firms' attractiveness to institutional investors, few studies have examined the variation of such relation across market states. We complement studies along this line by taking market conditions into consideration. We expect that the value and importance of corporate disclosure quality, and thus its impact on investor behavior, to be much greater during market downturns than during normal periods. Brunnermeier and Sannikov (2014) show that exogenous uncertainty is amplified in fire sales during market turmoil, because price uncertainty increases natural buyers' balance sheet uncertainty, which in turn feeds back into price uncertainty. Further, during market downturns, asset prices are under great pressures yet valuation becomes more difficult as it is not easy to disentangle pure price pressure from negative fundamental information. As Huang, Ringgenberg, and Zhang (2016) conjecture, the price pressure from fire sales could be partly due to asymmetric information which leads to an adverse selection problem for arbitrageurs, resulting in their reluctance to correct mispricings and provide liquidity. These studies suggest that investors are more sensitive to information in market downturns than during normal market periods, making firms with finer information more attractive. We therefore expect the positive relation between corporate disclosure quality and institutional ownership to be stronger during market downturns.

As Bushee and Noe (2000) and Bushee (2004) suggest that institutional investors respond to corporate disclosures differently, we perform the investigation for different groups of institu-

tional investors separately. Such an investigation betters our understanding of whether and how market states exert different impacts on different categories of institutional investors.

We also examine the relation between corporate disclosure practices and institutional ownership, conditional on market states, before and after the implementation of Regulation Fair Disclosure (Reg FD hereafter). Reg FD is a regulation that was promulgated by the U.S. Securities and Exchange Commission (SEC) in August 2000. It generally prohibits public companies from disclosing previously nonpublic, material information to certain parties (selected disclosure), including institutional investors, unless the information is distributed to the public first or simultaneously. This regulation effectively serves as an exogenous shock to the information advantage previously enjoyed by well-connected institutions, such as the dedicated institutions, and provides a natural experiment in which to test the information channel. We take advantage of this exogenous shock to examine the dedicated and transient institutions' response to corporate disclosures, especially during market downturns. Specifically, we hypothesize that the passage of the regulation should have little impact on the behavior of transient institutions, as their access to private information is limited even in the pre-Reg FD period. However, by reducing the information advantage to well-connected dedicated institutions, the enactment of Reg FD may result in dedicated institutions' increased reliance on corporate disclosures in obtaining information.

We measure corporate disclosure quality using the discretionary disaggregation quality index, or *DQRes*, of Chen, Miao and Shevlin (2015). The *DQRes* measure counts the number of nonmissing Compustat line items, and reflects the extent of details in firms' annual reports. Greater disaggregation leads to more and finer information available to investors. More detailed disclosure reduces information asymmetry and uncertainty, thereby increases the precision of the information in the financial statements and provides investors with more information for valuation (Fairfield, Sweeney, and Yohn 1996; Leuz and Verrecchia 2000; Jegadeesh and Livnat 2006; Ahmed, Taylor, and Hossain 2015). Therefore, more nonmissing Compustat accounting data items, or a higher *DQ*, is expected to be associated with better disclosure quality. Insti-

tutional trading data is obtained from Thomson Financials' CDA/Spectrum database, which contains institutional investors' quarterly shareholding data based on their 13-F filings to the U.S. Securities and Exchange Commission. After combining these two data sets with stock price data from CRSP, our final sample includes 373,399 firm-quarter observations of U.S. non-financial, non-utility public firms between 1981 and 2015.

During the investigation, we define market downturns as periods during which the value-weighted quarterly return of all stocks in NYSE, AMEX and NASDAQ is less than -0.1 (mild downturns) or -0.13 (deep downturns), corresponding to approximately the bottom 10 percentile or 5 percentile of the market returns in our sample. Other periods are viewed as normal periods. And we distinguish between transient and dedicated institutional investors following Bushee (1998, 2001).

Our empirical results confirm that firms with better corporate disclosure quality, as indicated by a higher *DQRes*, are associated with higher institutional ownership, but only for transient institutions. The relation between corporate disclosure quality and ownership of dedicated institutions is indistinguishable from zero. The evidence is consistent with Bushee and Noe (2000). More importantly, we find that the positive relation between corporate disclosure quality and transient institutional ownership is much stronger during market downturns. During such periods, the positive impact of disclosure quality on transient institutions' holdings is three times of the impact during normal times. The evidence confirms that firms could attract more transient institutional investors during market turmoil by improving information transparency. The influence of market condition on the relation between corporate disclosure quality and institutional ownership, however, is again insignificant for dedicated investors.

We further investigate institutions' responses to corporate disclosures, conditional on market states, before and after the passage of Reg FD. The empirical results show that there's no significant changes in the influence of market states on transient institutions' reaction to corporate disclosure quality between the pre- and post-Reg FD periods. In either period, transient institutions' ownership increases with corporate disclosures, especially during mild market downturns.

The evidence is as expected as transient institutions, focusing on short-term trading profits and having weak connection with portfolio firms, are less likely to obtain inside information even in the pre-Reg FD period.

For dedicated institutions, however, the relation between corporate disclosure quality and institutional ownership changes significantly after the implementation of Reg FD. In the pre-Reg FD period, the relation between corporate disclosure quality and ownership of dedicated institutions is significantly positive during normal periods. But unlike with transient institutions, such positive relation is significantly reduced during market downturns for dedicated institutions. Bushee and Noe (2000) argue that dedicated institutions with better access to private information may prefer firms with less forthcoming disclosures, as more public disclosures would weaken their information advantage. We show that, before the implementation of Reg FD, such avoidance is more evident during market downturns. After the implementation of Reg FD, dedicated institutions' reliance on corporate disclosures during market downturns increases dramatically. The evidence is consistent with the notion that Reg FD eliminates the information advantage of dedicated institutions, making public disclosures more important for them, especially during market turmoil when uncertainty is high.

After providing evidence on how corporate disclosure quality attracts different institutional investors during normal market periods and market downturns, we also assess the overall impact of disclosure quality on information asymmetry conditional on market states. We follow Chen et al. (2015) to employ the widely accepted measure of information asymmetry, bid-ask spread, and examine its relation between corporate disclosure quality. We find that a higher *DQRes* is associated with significantly lower bid-ask spreads, and that the negative relation is stronger during market downturns. The evidence suggests better corporate disclosure reduces information asymmetry, and that such an effect is especially stronger during market downturns. It is consistent with our conjectures that disclosures are more important and valuable during market turbulence, and shed light on our findings that the relation between corporate disclosures and institutional ownership is strengthened during episodes of market turmoil.

Lastly, we examine the impact of institutional ownership on subsequent stock returns and volatility across market states. In normal market conditions, neither transient nor dedicated institutional ownership is significantly related with subsequent stock returns. During market downturns, however, the ownership of transient institutions demonstrates significantly positive support for stock returns in the following quarter. Though such significant price support disappears after one quarter, there is no reversal in stock returns in the following quarters. During market downturns, compared with the relation during normal market states, dedicated institutional ownership does not exhibit any stronger support for stock returns in the following one or two quarters. The ownership actually turns to be significantly negative related with stock returns when we look into longer following periods. The evidence suggests that it is beneficial for firms to attract transient institutions during market downturns, as their ownership helps to enhance stock prices. Dedicated institutions, however, do not possess such function.

Moreover, while Bushee and Noe (2000) document that transient ownership increases future stock return volatility, we find opposing evidence especially during market downturns. We examine the influence of transient ownership on subsequent return volatility in normal market states and market downturns, and find that transient ownership helps to reduce volatility especially during market turbulence. Such an effect may result from the fact that these investors provide price support in extreme market states, and therefore stabilizes stock returns. For dedicated institutions, however, while their ownership significantly reduces subsequent return volatility when normal market periods are examined, it increases volatility significantly during market turmoil.

We contribute to the literature from three dimensions. First, by investigating how corporate disclosure behavior affects the ownership of institutions conditional on market states and by institution types, we complement studies on the attractiveness of corporate disclosure practices to different institutional investors (e.g. Bushee and Noe 2000; Bushee 2004) by taking market conditions into consideration. We show that transient institutions are attracted by better corporate disclosure practices in normal market states, and react more positively to disclosure quality

during market downturns. Dedicated institutions, however, pay less attention to corporate disclosure either in normal market states or during downturns. Our findings also echo those of Cella, Ellul, and Giannetti (2013), which show that during episodes of market turmoil, institutional investors with short trading horizons sell stockholdings to a larger extent than those with long trading horizons, fearing that selling behind would result in selling at even lower prices.¹ Our results imply that during such periods, firms could increase their attractiveness to institutional investors with short trading horizons by increasing disclosure quality.

Second, we contribute to the literature on the influence that the enforcement of Reg FD brought on the stock markets (e.g. Ke, Petroni, and Yu 2008; Hu, Ke, and Yu 2018). We find that the enforcement of the regulation has little impact on the behavior of transient institutions, but significantly increases dedicated institutions' reliance on corporate disclosures during market downturns. The evidence is as expected, as transient institutions have limited access to insider information even in the pre-Reg period, while dedicated institutions enjoy the benefit of having close relation with the firm and having more inside information before Reg FD was enacted. Therefore, when the information advantage of dedicated institutions is removed in the post-Reg period, their reliance on public disclosures increases significantly, especially during market downturns.

Lastly, we add to studies on how institutional ownership affects subsequent stock returns and volatility. We find that transient institution ownership in market downturns renders significant stronger support to returns over the following quarter. Moreover, transient institution ownership reduces stock return volatility to a greater extent during market downturns, especially when longer periods are examined. Dedicated institution ownership, on the contrary, does not help to enhance subsequent stock returns and even increases stock volatility during market downturns. The findings that transient ownership helps to stabilize subsequent stock prices while dedicated institution ownership adds to future return volatility contradicts with the findings of Bushee and

¹An interesting paper by Cooper, Khorana, Osobov, Patel and Rau (2005) find that following the Internet crash of mid-2000, there is a dramatic reduction in the pace of dot.com additions accompanied by a rapid increase in dot.com name deletion.

Noe (2000). We argue that such difference emerge as our investigation is based on a longer and more recent period and that we perform the tests conditional on market states. Collectively, our findings shed light on the role played by different types of institutional investors during market turmoil, and indicate that firms could attract more transient institution investors during such periods by improving corporate disclosure quality.

The rest of the paper is organized as follows. Section 2 is devoted to the hypothesis development. Section 3 describes the datasets and methodology. Section 4 presents the empirical results. Finally, Section 5 concludes.

2 Hypothesis Development

Many studies have examined the relation between corporate disclosure behavior and institutional ownership. For instance, Healy et al. (1999) report that increases in analysts' assessments of corporate disclosure practices lead to higher levels of institutional ownership. Bushee and Noe (2000) specifically examine corporate disclosure quality and the ownership of institutions by types. They find that firms with higher AIMR disclosure rankings, arguably with higher disclosure quality, are associated with increases in ownership primarily by transient institutions. The relation between disclosure ranking and ownership of dedicated institutions, however, is weak. They argue that the evidence results from the fact that dedicated institutions, relative to transient institutions, have closer relation with their portfolio firms and thus rely less on information disclosures.

We extend the literature by taking market conditions into consideration in examining the relation between corporate disclosures and institutional ownership. Brunnermeier and Sannikov (2014) argues that exogenous uncertainty is amplified during episodes of market turbulence. Huang, Ringgenberg and Zhang (2016) suggest that asymmetric information plays a key role in explaining why asset prices remain depressed for prolonged periods of time following fire sales, which usually take places during market downturns, and adds to institutional investors'

reluctance to hold stock and provide liquidity. Given that information uncertainty is higher during market downturns than during normal market periods, we argue that public disclosures are more valuable to institutional investors and the relation between corporate disclosure behavior and institutional ownership is stronger in such periods.²

Following Bushee and Noe (2000), we also consider institutional investor types in conducting the investigation. Given that dedicated institutions have better access to insider information, market conditions may have little impact on their responses to public disclosures. For transient institutions, which rely heavily on public information, their reaction to corporate disclosure quality is expected to be enhanced during market downturns. These consideration lead to our first hypothesis:

Hypothesis H1: *Corporate disclosure quality has a stronger positive impact on institutional ownership during market downturns than during normal market periods, especially for transient institutions.*

We next examine whether the implementation of Reg FD changes institutional investors' responses to corporate disclosures during market downturns. Reg FD prohibits firms' selective disclosures of previously nonpublic and material information to certain parties, including institutional investors. We expect the passage of the regulation to have little impact on transient institutions' sensitivities to corporate disclosure quality during market downturns as these investors, focusing on short-term trading profits, are loosely related with portfolio firms and have no information advantage even in the pre-Reg FD period. The enactment of the regulation, however, is expected to have substantial impact on the behavior of dedicated institutions. Having better access to inside information in the pre-Reg FD period, such investors are insensitive or even avoid firms with better disclosure quality when information is especially valuable, such

²Wang, Zhang, and Zhang (2017) show close relationship between liquidity provision and fire sales in corporate bonds markets.

as during market downturns, as more public disclosures refrain them from taking advantage of inside information. In the post-Reg FD period when their the access to insider information is eliminated, dedicated institutions are expected to rely more on corporate disclosures, especially during market downturns when uncertainty is high. We therefore propose the second research hypothesis as follows:

Hypothesis H2: *Transient institutions' reaction to corporate disclosure quality during market downturns is unaffected by the enforcement of Reg FD, while dedicated institutions' reaction to corporate disclosure quality during market downturns is significantly increased after the enforcement of Reg FD.*

We then investigate the influence of corporate disclosure quality on information asymmetry conditional on market states. Following Chen et al. (2015), we adopt the widely accepted measure of information asymmetry: bid-ask spreads. If better corporate disclosure practices help to reduce information asymmetry, it should be associated with lower bid-ask spreads. If such an effect is stronger during market downturns, when uncertainty is higher and information is more valuable, the negative relation between corporate disclosure quality and bid-ask spreads should be stronger. A stronger negative relation during periods of market turmoil could further justify the stronger relation between corporate disclosure quality and institutional ownership in such periods. This leads to our third hypothesis as follows:

Hypothesis H3: *Corporate disclosure quality is negatively associated with information asymmetry, especially during market downturns.*

Lastly, we examine the influence of institutional ownership during market downturns on portfolio firms' subsequent returns and volatility. As greater institutional ownership contributes to better liquidity, which is especially precious and scarce during market downturns when liq-

uidity dry-ups often take place, institutional ownership may exhibit greater positive impact on subsequent stock returns in such periods. Further, by providing price support to stocks, institutional ownership is expected to be followed by reduced volatility. In addition, since transient institutions are more responsive to stock liquidity, the helping impact should be stronger for them. Our last hypothesis is as follows:

Hypothesis H4: *Institutional ownership, especially transient institutions' ownership, during market downturns renders support to subsequent stock returns and helps to reduce volatility.*

3 Data and Methodology

3.1 Institutional ownership and episodes of market downturns

We obtain institutional ownership data from Thomson Financial's CDA/Spectrum database, which contains institutions' quarterly shareholding data based on their 13-F filings to the U.S. Securities and Exchange Commission. We obtain the classification of institutions from Bushee's Institutional Investor Classification Data.³ Our sample includes all non-financial, non-utility U.S. public companies with institutional ownership data from CDA/Spectrum, quarterly accounting data from Compustat, stock price data from CRSP.

Our sample period is set to be from 1981 to 2015, which is determined by the availability of the CDA/Spectrum data and Bushee's Institutional Investor Classification Data. The CDA/Spectrum dataset contains 688,616 firm-quarter observations, and we combine them with Bushee's dataset to identify transient and dedicated institutions. We obtain 373,399 firm-quarter observations for non-financial, non-utility U.S. public companies with nonmissing main variables. And we denote ownership of transient and dedicated institutions as *TRA* and *DED*,

³See <http://acct.wharton.upenn.edu/faculty/bushee/IIclass.html>

respectively.

We define episodes of market downturns based on quarterly market return measured by the value-weighted return of all stocks in NYSE, AMEX and NASDAQ. We set a downturn indicator $Down(MktRet < -0.1)$ to be equal to one if quarter t 's market return is less than -0.1, which corresponds to the 10 percentile (mild downturns) of the quarterly market returns in the sample, and zero otherwise. We also set a dummy for deep downturns, or $Down(MktRet < -0.13)$, which equals one if quarter t 's market return is less than -0.13, or the 5 percentile of the quarterly market returns in the sample, and zero otherwise.

3.2 Disclosure quality

We capture disclosure quality following Chen et al. (2015). We count the number of nonmissing financial items reported in firms' annual reports, including items both in the financial statements and in the footnotes captured by Compustat, and denote it as DQ . A higher DQ suggests higher disclosure quality. Therefore, this measure captures the level of disaggregation of accounting data and the extent of details in firms' annual reports.⁴

Unlike existing measures, which are usually applicable for a subset of firms or are based on a subset of information items, the DQ measure can be generated for the universe of Compustat industrial firms. Moreover, Chen et al. (2015) conduct three sets of validation tests by examining DQ 's association with variables suggested by prior literature to be indicators of information quality. They find that DQ is negatively (positively) associated with analyst forecast dispersion (accuracy) and negatively associated with bid-ask spreads and cost of equity. These associations continue to hold after they control for firm fundamentals.

As noticed by Chen et al. (2015), firm fundamentals can systematically affect DQ . Our research focuses on the discretionary component of DQ , that is, the component driven by managerial incentives. Thus, we follow Chen et al. (2015) and employ six variables to capture firm

⁴In the process of constructing this DQ measure, we have purged cases where an item irrelevant to a firm's operations is coded as missing by Compustat, e.g., inventory to an Internet company, following Chen et al. (2015).

fundamentals that might affect DQ . These variables include Restructure and M&A indicator variables for asset restructuring and merger and acquisition activities, the magnitude of special items scale by total assets, the volatility of operations captured by the standard deviation of monthly returns in the fiscal year, firm size measured by the natural log of total assets, and operational complexity proxied by the logarithm of business segment numbers. We then estimate the following regression based on the sample of firm-year observations to get the discretionary component of DQ :

$$DQ_{i,s,y} = \alpha_1 + \alpha_2 X_{i,s,y} + \lambda_y + \lambda_s + e_{i,s,y}, \quad (1)$$

where i, s, t represents firm i in industry s and year y , X are the six variables to capture firm fundamentals, λ_y are year fixed effects, and λ_s are 2-digit SIC industry fixed effects. We keep the residuals from these regressions as the measure of discretionary disclosure quality, or $DQRes$.

3.3 Control variables

We include a set of control variables in the empirical investigation. *Size* is the market value of equity in millions in quarter $t-1$, *Age* is the number of years that the firm became listed measured at the end of the last fiscal year, *MB* is the market-to-book ratio measured at the end of quarter $t-1$, *Tangibility* is fixed assets scaled by total assets in quarter $t-1$, *Dividend* is dividends paid in the previous fiscal year scaled by total assets, *RetVol* is standard deviation of monthly returns over the previous fiscal year, *Mom* is cumulative stock return from quarter $t-5$ to quarter $t-1$, *Prc* is stock price at the end of quarter $t-1$, *Turnover* is trading volume scaled by shares outstanding in quarter $t-1$, and *S&P500* is a dummy variable that equals one if the firm is included in the S&P 500 index in quarter $t-1$, and 0 otherwise.

4 Empirical results

Table 1 presents the descriptive statistics of major variables used in our empirical investigation. The average ownership of transient and dedicated institutions are 0.102 and 0.062 respectively, suggesting that transient institutions typically take larger positions in portfolio firms than dedicated institutions. The greater ownership of transient institutions, relative to dedicated institutions, also implies that the trading behavior of the former group may exert greater influence over portfolio firms.

The sample average of corporate disclosure quality, or $DQRes$, is 0.003 with a standard deviation of 0.068. The distribution of $DQRes$ indicates that there's a wide variation in corporate disclosure quality among our sample firms. For the control variables, the descriptive statistics suggest that the average market capitalization of our sample firms is 2.4 million, firm age is 14 years on average, and around 11% of sample firms are S&P 500 component firms.

Insert Table 1 here

4.1 Institutional investors' responses to corporate disclosure quality conditional on market states

We first perform tests to examine Hypothesis H1, namely whether institutional investors' responses to corporate disclosure quality is affected by market states. Specifically, we estimate the following equation:

$$y_{ist} = \beta_1 + \beta_2 DQRes_{is,y-1} + \beta_3 DQRes_{is,y-1} * Down_t + \beta_4 X_{is,t-1} + \gamma_{ind} + \gamma_t + \epsilon_t, \quad (2)$$

where y is the percentage ownership by each type of institutional investors, $DQRes$ stands for

the discretionary component of DQ from Equation (1), $Down$ is a dummy variable that equals one if quarter t is defined to be within a market downturn period and zero otherwise, $X_{is,t-1}$ represents the set of control variables, and γ_{Ind} and γ_t are industry and time (year by quarter) fixed effects. To account for the within-industry correlations, we use robust standard errors clustered at the industry level.

In Eq. (2), the major variable of interest is the interaction term $DQRes_{is,y-1} * Down_t$, the coefficient of which captures the incremental effect of market states on the relation between institutional ownership and corporate disclosure quality. A significantly positive coefficient of $DQRes_{is,y-1} * Down_t$ indicates that institutional investors react more positively to better corporate disclosure quality during market downturns than during normal market periods, and vice versa.

To separately investigate the behavior of transient and dedicated institutions, we estimate Eq. (2) for these two types of institutional investors, respectively, using TRA and DED as the dependent variable. We also employ different market downturn indicators in the regressions, $Down(MktRet < -0.1)$ and $Down(MktRet < -0.1)$, representing mild and deep market downturn periods respectively. A set of control variables are added in the regressions to account for other factors that might affect institutional investors' holdings decisions, including firm size, firm age, market-to-book ratio, tangibility, dividend ratio, return volatility, momentum, stock price, share turnover, and S&P membership. In order to mitigate the endogeneity concern, $DQRes$, firm age, dividend yield⁵, and stock return volatility are measured in the previous fiscal year, other variables are measured in the previous fiscal quarter. The results are shown in Table 2.

Insert Table 2 here

⁵Firms usually extend dividends to shareholders annually. Moreover, institution investors pay little attention to varying dividends across quarters.

In Table 2, ownership of transient institutions (*TRA*) is employed as the dependent variable in columns (1) and (3), and ownership of dedicated institutions (*DED*) is examined in columns (2) and (4). Further, we define market downturns using $Down(MktRet < -0.1)$ in the first two columns, and $Down(MktRet < -0.13)$ in the following two columns.

The coefficient on *DQRes* is significantly positive at the 5% level when *TRA* is used as the dependent variable, but turns to be indistinguishable from zero when *DED* is examined. The results suggest that transient institutions react positively to firms with better disclosure quality and are more likely to invest in such firms, while dedicated institutions are insensitive to corporate disclosure practices. The evidence is consistent with the findings of Bushee and Noe (2000) that improvements in disclosure are followed by increases in ownership of transient institutions but have weak influence on dedicated institutions, as the latter group has better access to inside information and rely less on public disclosures.

More importantly, the coefficient of both $DQRes * Down(MktRet < -0.1)$ and $DQRes * Down(MktRet < -0.13)$ are significantly positive in columns (1) and (3), with *t*-values equal to 2.74 and 2.08, respectively. The results suggest that the ownership of transient institutions are more positively affected by corporate disclosure quality during market downturns than during normal periods, and that the stronger reaction is robust to different definitions of market downturn periods. The increased reaction to corporate disclosure quality is consistent with our expectation that the attractiveness of better corporate disclosure practices is significantly increased in episodes of market turbulence, as uncertainty is higher and information is more valuable in such periods than in normal market periods.

When ownership of dedicated institutions is investigated in columns (2) and (4), however, the coefficient on the interaction term between disclosure quality and market states is insignificant. The weak relation may result from the fact that these institutional investors, having close relation with portfolio firms, are able to obtain private information regardless of the market states. Therefore, they do not rely much on public disclosures in making their investment decisions either in normal market periods or during market downturns.

Overall, the results in Table 2 suggest that corporate disclosure quality has stronger positive impact on ownership of transient institutions during market downturns than during normal market periods. Market states, however, have little impact on dedicated institutions' reaction to corporate disclosure practices. Such investors are insensitive to corporate disclosures in normal market periods as well as in episodes of market turmoil. These pieces of evidence render strong support to our Hypothesis H1.

4.2 The impact of the passage of Reg FD

Previous tests show that transient and dedicated institutions' reactions to corporate disclosures, conditional on market states, differ as dedicated institutions have access to inside information while transient investors do not. We therefore further examine the impact of the passage of Reg FD, which was introduced to eliminate the inside information advantage of certain groups.

Specifically, we test our Hypothesis H2 by comparing the influence of market states on institutional investors' responses to corporate disclosure before and after the enforcement of Reg FD using the following equation:

$$y_{ist} = \beta_1 + \beta_2 DQRes_{is,y-1} + \beta_3 DQRes_{is,y-1} * Down_t + \beta_4 DQRes_{is,y-1} * Down_t * PostFD_t + \beta_5 X_{is,t-1} + \gamma_{Ind} + \gamma_t + \varepsilon_t, \quad (3)$$

where $PostFD_t$ is a dummy variable that equals one for the post-Reg FD period (after 2000) and zero for the pre-Reg FD period (year 2000 and earlier). The set of control variables, $X_{is,t-1}$, includes $DQRes * PostFD$ and all other control variables as in Eq. (2). We focus on the coefficient of $DQRes_{is,y-1} * Down_t * PostFD_t$, or β_4 , which captures the effect of the passage of Reg FD. A significantly positive (negative) β_4 indicates that institutional investors' increased sensitivity to corporate disclosure quality during market downturns than during normal market periods is more (less) evident in the post-Reg FD period. The results are shown in Table 3.

Insert Table 3 here

Columns (1) and (3) report regression results of Eq. (3) where ownership of transient institutions is used as the dependent variable. The coefficients of both $DQRes_{is,y-1} * Down(MktRet < -0.1)_t * PostFD_t$ and $DQRes_{is,y-1} * Down(MktRet < -0.13)_t * PostFD_t$, where $Down(MktRet < -0.10)_t$ and $Down(MktRet < -0.13)_t$ correspond to mild and deep market downturn periods, are insignificant. The evidence is as expected as transient institutions, which are loosely connected with portfolio firms, have limited access to inside information even before Reg FD was enacted. Therefore, the passage of the regulation has little impact on such investors' behavior.

Columns (2) and (4) perform the tests for dedicated institutional ownership. The coefficients of both $DQRes_{is,y-1} * Down(MktRet < -0.1)_t * PostFD_t$ and $DQRes_{is,y-1} * Down(MktRet < -0.13)_t * PostFD_t$ are significantly positive at the 1% level, with t -values equal to 5.56 and 3.75, respectively. It suggests that dedicated institutions' sensitivity to corporate disclosure during market downturns is significantly increased in the post-Reg FD period. The evidence confirms our conjecture that when the information advantage of dedicated institutions is limited after Reg FD, their reliance on public disclosures increased, especially during market downturns when information is more valuable and important to ease investors' panic.

It is also worth noting that the coefficient of the interaction term between corporate disclosure and the indicator of market downturns is significantly negative for dedicated investors in both columns (2) and (4), suggesting that these investors actually avoid firms with better disclosure practices during market downturns in the pre-Reg FD period. Bushee and Noe (2000) contend that given better corporate disclosure practices could provide a substitute for private information collection, dedicated institutions may avoid such firms as their profit opportunities are eroded when their information advantage is weakened. Our results extend their argument by showing that before Reg FD, when obtaining inside information is feasible for dedicated investors, their avoidance of firms with higher disclosure quality is more evident during market

downturns than during normal market periods, as inside information has greater value during market turbulence.

Overall, the results in Table 3 show that the passage of Reg FD, while having little impact on the behavior of transient institutions, significantly increases dedicated institutional investors' sensitivity to corporate disclosures during market downturns. The results are as expected as Reg FD removes the information advantage of dedicated institutions, and support our Hypothesis H3. Moreover, such results corroborate our previous arguments that the general weak association between corporate disclosure quality and dedicated ownership results from their access to inside information.

4.3 Market states, corporate disclosure, and information asymmetry

We have shown that better corporate disclosure helps to attract institutional investors in general, especially during market downturns. We argue that the stronger response results from the increased uncertainty and greater value of information during market turbulence than during normal market periods. In this section, we directly test whether corporate disclosure quality is negatively associated with information asymmetry, especially during market downturns, as stated in our Hypothesis H3. As past studies have already suggested that institutional investors prefer stocks with lower information asymmetry (e.g., Diamond and Verrecchia 1991; Falkenstein 1996; Gompers and Metrick 1998; Healy, Hutton, and Palepu, 1999), if corporate disclosure quality indeed reduces information asymmetry more effectively during market downturns as we expect, the evidence would reinforce our understanding of the documented increased attractiveness of firms with better disclosure quality to institutional investors during such periods.

We measure information asymmetry using the bid-ask spread, following Chen et al. (2015). Bid-ask spread is commonly used to capture information asymmetry and a wider spread is indicative of greater information asymmetry, as it reflects the pricing of the risk of adverse selection.

We first calculate daily bid-ask spread, which is the average of all bid-ask spreads, calculated as $0.5 * (Ask - Bid) / (Ask + Bid)$, quoted during regular trading hours (9:30-16:00). We then average daily bid-ask spread over quarter t to obtain quarterly bid-ask spread. A higher bid-ask spread indicates greater information asymmetry. Thus, if better corporate disclosure quality reduces information asymmetry, we should observe a negative relation between the two.

We regress quarterly bid-ask spread on corporate disclosure quality $DQRes$ as well as its interaction with market downturn indicator $DQRes * Down$:

$$BidAskSpread_{ist} = \beta_1 + \beta_2 DQRes_{is,y-1} + \beta_3 DQRes_{is,y-1} * Down_t + \beta_4 X_{is,t-1} + \gamma_{Ind} + \gamma_t + \epsilon_t, \quad (4)$$

where the control variables are the same as in Eq. (2), and a significantly negative (positive) β_3 suggests that better corporate disclosure' ability to reduce information asymmetry is more (less) evident during market downturns. The results are shown in Table 4.

Insert Table 4 here

The coefficient of $DQRes$ is significantly negative in both columns (1) and (2), suggesting that better corporate disclosure is followed by a significant reduction in information asymmetry generally. The evidence is consistent with the notion that improved disclosure quality reduces information asymmetry.

Moreover, the coefficient of the interaction term between corporate disclosure quality and market downturn indicator is significantly negative in both columns, where alternative market downturn indicators are employed. It suggests that increased corporate disclosure quality is better able to reduce information asymmetry during market downturns than during normal market periods. Such a piece of evidence may result from the fact the uncertainty is higher and

thus information is more valuable during episodes of market turmoil than during normal periods. The results support Hypothesis H3, and coincide with our previous findings that corporate disclosure quality is especially attractive to institutional investors during market downturns.

4.4 Market states, institutional ownership, and subsequent stock return and volatility

So far, we have shown that better corporate disclosure attracts institutional investors, especially during market downturns, possibly because it reduces information asymmetry to a greater extent in such periods. Though greater institutional ownership is often considered as a desirable feature for firms, some may concern that whether institutional investors would destabilize stock prices in the following periods, especially for those with short trading horizons. In particular, Bushee and Noe (2000) argue that higher transient ownership may increase subsequent stock return volatility as such investors focus on earning short-term trading profits. We therefore proceed to examine the relation between institutional ownership and future stock return and volatility, respectively, conditional on market states.

We first regress future stock returns, measured in quarter $t+1$, $t+2$, $t+3$, or $t+4$ on transient and dedicated ownership, as well as their interaction terms with market downturn indicators, and the set of control variables, as shown in Eq. (5):

$$\begin{aligned}
 Ret_{ist} = & \beta_1 + \beta_2 TRA_{ist} + \beta_3 TRA_{ist} * Downturn_t + \beta_4 DED_{ist} + \beta_5 DED_{ist} * Downturn_t + \beta_6 X_{is,t-1} \\
 & + \gamma_s + \gamma_t + \epsilon_t,
 \end{aligned}
 \tag{5}$$

where Ret_{ist} is quarterly stock return. The coefficients of TRA_{ist} and DED_{ist} measure the influence of transient and dedicated institutional ownership on subsequent stock returns in normal market periods, while the coefficients of $TRA_{ist} * Downturn_t$ and $DED_{ist} * Downturn_t$ capture

such influence during market downturns. The results are shown in Table 5.

Insert Table 5 here

The coefficients of *TRA* or *DED* are largely insignificant (except for *DED* in column (4)), suggesting that institutional ownership has little impact on future stock returns in normal market periods. In column (1) where stock return in quarter $t+1$ is examined, the coefficient of $TRA * Downturn(MktRet < -0.1)_t$ is significantly positive at the 1% level ($t=4.99$). It suggests that higher transient ownership during market downturns is followed by significantly higher stock returns over the next quarter. The coefficient turns to be insignificant across columns (2) to (4), implying that such strong price support disappears in the following two to four quarters. The insignificant coefficient in the following three columns also suggests that there's no price reversal following the strong support that the stock gains in quarter $t+1$.

The coefficient of $DED * Downturn(MktRet < -0.1)_t$ reveals the impact of dedicated ownership on subsequent stock returns during market downturns. The coefficient is insignificant in columns (1) and (2), but turns to be significantly negative in columns (3) and (4), where returns in quarter $t+3$ and $t+4$ are examined. It suggests that when longer periods of time are examined, higher dedicated ownership during market downturns may have adverse impact on subsequent stock returns.

Collectively, the evidence in Table 5 suggests that different institutions have different impacts on future stock returns during market downturns. While transient ownership renders support for stock prices, at least in the short-term, dedicated ownership may negatively affect stock returns in the long run.

We further replace Ret_{ist} in Eq. (5) with quarterly idiosyncratic volatility to examine the impact of institutional ownership on subsequent stock return volatility:

$$\begin{aligned}
IVOL_{ist} = & \beta_1 + \beta_2 TRA_{ist} + \beta_3 TRA_{ist} * Downturn_t + \beta_4 DED_{ist} + \beta_5 DED_{ist} * Downturn_t + \beta_6 X_{is,t-1} \\
& + \gamma_s + \gamma_t + \varepsilon_t,
\end{aligned}
\tag{6}$$

where $IVOL_{ist}$ is the idiosyncratic volatility of stock i estimated from the Fama-French model from WRDS Beta Suite, based on the 70 daily returns before the end of quarter t . The results are shown in Table 6.

Insert Table 6 here

Results in Table 6 show that transient ownership during market downturn has weak influence over stock volatility in quarters $t+1$ and $t+2$, but is significantly negatively related with $IVOL$ in quarters $t+3$ and $t+4$. For dedicated ownership, its relation with subsequent stock volatility during normal market periods, as suggested by the coefficient of DED , is significantly negative across all four columns, confirming that these investors help to stabilize stock returns generally. However, when dedicated ownership during market downturns is examined, its relation with subsequent stock volatility turns to be significantly positive in all four columns, suggesting that higher dedicated ownership in episodes of market turbulence actually adds to future stock volatility.

Overall, results in Tables 6 and 7 show that during market downturns, enlarging transient ownership is beneficial to firms as it provides price support as well as helps to stabilize stock returns, at least in the long-term. The price stabilizing function of transient ownership contradicts with the findings of Bushee and Noe (2000). We argue that the difference could result from the fact that our tests are based on a longer and more recent period, and more importantly, we focus on the consequences of transient ownership during episodes of market turmoil, which may

differ from those in normal market periods. Dedicated ownership during market downturns, however, does not render strong price support or help to stabilize stock prices.

5 Conclusion

In this paper, we examine institutional investors' reaction to corporate disclosure quality conditional on market states. Though many studies have shown that institutional investor prefer stocks with better corporate disclosure practices, few have considered the variation of such preference across market conditions. Our study attempts to fill this void. We argue that taking market states into consideration is important, as uncertainty is higher and investors are more sensitive to information during episodes of market turmoil, making finer information more attractive during such periods than during normal market periods.

We find that for transient institutions, better corporate disclosure is more attractive during market downturns than during normal market periods, as expected. For dedicated institutions, however, they are insensitive to corporate disclosure quality in either periods, which may result from the fact that they have better access to inside information through their close relation with portfolio firms and thus rely less on public disclosures.

We further examine the influence of the enforcement of Reg FD on institutional investors' reaction to corporate disclosures conditional on market states. We find that the regulation has little impact on the behavior of transient institutions, but has substantial impact on that of dedicated institutions. After Reg FD was enacted, when dedicated institutions' information advantage is greatly weakened, their sensitivity to corporate disclosure quality during market downturns increases significantly. The evidence confirms that the different reactions of transient and dedicated institutions to corporate disclosure quality results from their different access to private information.

We also directly examine the relation between corporate disclosure quality and information asymmetry conditional on market states, and find that corporate disclosure reduces information

asymmetry to a greater extent during market downturns than during normal market periods. It is consistent with our argument that uncertainty is higher and thus information is more valuable during market turbulence, and further explains why firms with better disclosure practices are especially attractive to institutional investors during such periods.

Lastly, we examine the influence of institutional ownership during market downturns on subsequent stock return and volatility. We show that transient ownership renders support for stock returns at least in the short-run, and destabilize stock return volatility in the long-run. Dedicated ownership, however, does not exhibit such functions and may even adds to stock volatility. These pieces of evidence further suggest that it is beneficial for firms to attract or maintain transient institutional investors during market downturns, possibly through improve corporate disclosure quality.

References

- [1] Al-Hadi, Ahmed, Grantley Taylor, and Mahmud Hossain. 2015. "Disaggregation, auditor conservatism and implied cost of equity capital: An international evidence from the GCC." *Journal of Multinational Financial Management* 29, 66-98.
- [2] Blackwell, David. 1951. "Comparisons of Experiments." in Proceedings of the Second Berkeley Symposium in Mathematical Statistics and Probability, edited by J. Neyman. Berkeley and Los Angeles: University of California Press, 1951.
- [3] Brunnermeier, Markus, and Yuliy Sannikov. 2014. "A macroeconomic model with a financial sector." *American Economic Review* 104, 379-421.
- [4] Bushee, Brian. 1998. "The influence of institutional investors on myopic R&D investment behavior." *The Accounting Review* 13, 305-333.
- [5] Bushee, Brian. 2001. "Do institutional investors prefers near-term earnings over long-run value?" *Contemporary Accounting Research* 18, 207-246.
- [6] Bushee, Brian. 2004. "Identifying and attracting the right investors: Evidence on the behavior of institutional investors." *Journal of Applied Corporate Finance* 16, 28-35.
- [7] Bushee, Brian, and Christopher Noe. 2000. "Corporate disclosure practices, institutional investors, and stock return volatility." *Journal of Accounting Research* 38, 171-202.
- [8] Bushee, Brian, Dawn Matsumoto, and Greg Miller. 2004. "Managerial and investor responses to disclosure regulation: The case of Reg FD and conference calls." *The Accounting Review* 79, 617-643.
- [9] Bushman, Robert, and Raffi Indjejikian. 1995. "Voluntary disclosures and the trading behavior of corporate insiders." *Journal of Accounting Research* 33, 293-316.

- [10] Cella, Cristina, Andrew Ellul, and Mariassunta Giannetti. 2013. "Investor horizons and the amplification of market shocks." *Review of Financial Studies* 26 (7), 1607-1648.
- [11] Chen, Shuping, Bin Miao, and Terry Shevlin. 2015. "A new measure of disclosure quality: the level of disaggregation of accounting data in annual reports." *Journal of Accounting Research* 53(5), 1017-1054.
- [12] Chung, Kee H., and Hao Zhang. 2011. "Corporate governance and institutional ownership." *Journal of Financial and Quantitative Analysis* 46, 247-273.
- [13] Cooper, Michael, Ajay Khorana, Igor Osobov, Ajay Patel, and P. Raghavendra Rau. 2005. "Managerial actions in response to a market downturn: valuation effects of name changes in the dot.com decline." *Journal of Corporate Finance* 11, 319-335.
- [14] Falkenstein, Eric. 1996. "Preferences for stock characteristics as revealed by mutual fund portfolio holdings." *Journal of Finance* 51, 111-135.
- [15] Fairfield, Patricia, Richard Sweeney, and Teri Yohn. 1996. "Accounting classification and the predictive content of earnings." *The Accounting Review* 71(3), 337-355.
- [16] Gompers, Paul, and Andrew Metrick. 1998. "How are large institutions different from other investors? Why do these differences matter" Working paper, Harvard Business School.
- [17] Diamond, Douglas , and Verrecchia Robert. 1991. "Disclosure, liquidity, and the cost of capital." *Journal of Finance* 66, 1325-55.
- [18] Healy, Paul, Amy Hutton, and Krishna Palepu. 1999. "Stock performance and intermediation changes surrounding increases in disclosure." *Contemporary Accounting Research* 1999, 485-520.

- [19] Hu, Gang, Bin Ke, and Yong Yu. 2018. "Can transient institutions correctly interpret small negative earnings surprises in the absence of access to managements private information?" *Journal of Accounting, Auditing and Finance* 33, 3-33.
- [20] Huang, Sheng, Matthew Ringgenberg, Zhe Zhang. 2016. "The information in asset fire sales." Working paper, University of Utah.
- [21] Jegadeesh, Narasimhan, and Joshua Livnat. 2006. "Revenue surprises and stock returns." *Journal of Accounting & Economics* 41, 147-171.
- [22] Ke, Bin, Kathy Petroni, and Yong Yu. 2008. "The effect of Regulation FD on transient institutional investors' trading behavior." *Journal of Accounting Research* 46(4), 853-883.
- [23] Kim, Oliver, and Robert Verrecchia. 1994. "Market liquidity and volume around earnings announcement." *Journal of Accounting and Economics* 17, 41-67.
- [24] Leuz, Christian, and Robert Verrecchia. 2000. "The economic consequences of increased disclosure." *Journal of Accounting Research* 38, 91-124.
- [25] Wang, Z. Jay, Hanjiang Zhang, and Xinde Zhang. 2017. "Fire Sales and Liquidity Provision in the Corporate Bond Market." Working paper, University of Oregon.

Table 1: Descriptive statistics

	Mean	Std. Dev.	Median	P10	P90
<i>TRA</i>	0.102	0.113	0.067	0.000	0.258
<i>DED</i>	0.062	0.091	0.025	0.000	0.179
<i>DQRes</i>	0.003	0.068	0.004	-0.079	0.089
<i>Size</i>	2,440	14,244	171	13	3,282
<i>Age</i>	14.32	12.44	11	2	33
<i>MB</i>	2.107	33.266	1.448	0.886	3.621
<i>Tangibility</i>	0.272	0.223	0.209	0.042	0.625
<i>Dividend</i>	0.000	0.000	0.000	0.000	0.000
<i>RetVol</i>	0.152	0.326	0.125	0.063	0.260
<i>Mom</i>	0.191	1.458	0.046	-0.500	0.869
<i>Prc</i>	18.83	20.42	12.13	1.88	44.59
<i>Turnover</i>	0.378	0.578	0.216	0.045	0.868
<i>S&P500</i>	0.113	0.317	0	0	1

This table reports the descriptive statistics of major variables. *TRA* and *DED* are transient and dedicated ownership, respectively. *DQRes* is discretionary disclosure quality estimated based on Eq. (1) following Chen et al. (2015). *Size* is the market value of equity in millions in quarter $t-1$, *Age* is the number of years that the firm became listed measured at the end of the last fiscal year, *MB* is the market-to-book ratio measured at the end of quarter $t-1$, *Tangibility* is fixed assets scaled by total assets in quarter $t-1$, *Dividend* is dividends paid in the previous fiscal year scaled by total assets, *RetVol* is standard deviation of monthly returns over the previous fiscal year, *Mom* is cumulative stock return from quarter $t-5$ to quarter $t-1$, *Prc* is stock price at the end of quarter $t-1$, *Turnover* is trading volume scaled by shares outstanding in quarter $t-1$, and *S&P500* is a dummy variable that equals one if the firm is included in the S&P 500 index in quarter $t-1$, and 0 otherwise.

Table 2: Institutional ownership and corporate disclosure quality conditional on market states

Dep. var.:	<i>TRA</i>	<i>DED</i>	<i>TRA</i>	<i>DED</i>
Percentage ownership	(1)	(2)	(3)	(4)
<i>DQRes</i>	0.0195** (2.36)	0.0032 (0.39)	0.0219** (2.56)	0.0029 (0.36)
<i>DQRes</i> * <i>Down</i> (<i>MktRet</i> < -0.1)	0.0362*** (2.74)	-0.0067 (-0.88)		
<i>DQRes</i> * <i>Down</i> (<i>MktRet</i> < -0.13)			0.0224** (2.08)	-0.0084 (-0.90)
<i>Log</i> (<i>Size</i>)	0.0261*** (17.85)	0.0124*** (23.02)	0.0261*** (17.86)	0.0124*** (23.02)
<i>Log</i> (<i>Age</i>)	-0.0049*** (-4.47)	0.0046*** (4.99)	-0.0049*** (-4.46)	0.0046*** (4.99)
<i>MB</i>	-0.0000 (-1.62)	-0.0000 (-0.46)	-0.0000 (-1.62)	-0.0000 (-0.46)
<i>Tangibility</i>	-0.0224*** (-4.55)	-0.0099*** (-3.10)	-0.0224*** (-4.55)	-0.0099*** (-3.10)
<i>Dividend</i>	-0.8048*** (-2.81)	-0.2985*** (-3.80)	-0.8036*** (-2.81)	-0.2989*** (-3.80)
<i>RetVol</i>	-0.0105** (-2.17)	0.0004 (0.16)	-0.0105** (-2.17)	0.0004 (0.16)
<i>Mom</i>	0.0034** (2.55)	-0.0014*** (-2.69)	0.0034** (2.54)	-0.0014*** (-2.69)
<i>Prc</i>	0.0002*** (4.48)	0.0000 (0.10)	0.0002*** (4.48)	0.0000 (0.10)
<i>Turnover</i>	0.0349*** (8.73)	-0.0029*** (-3.20)	0.0349*** (8.73)	-0.0029*** (-3.20)
<i>S&P500</i>	-0.0622*** (-12.30)	-0.0233*** (-6.81)	-0.0622*** (-12.30)	-0.0233*** (-6.81)
Industry&Time FEs	Yes	Yes	Yes	Yes
N	373,399	373,399	373,399	373,399
Adj. R-squared	0.405	0.232	0.405	0.232

This table reports the regression results of Eq. (2). *TRA* and *DED* are transient and dedicated ownership, respectively. *DQRes* is discretionary disclosure quality estimated based on Eq. (1) following Chen et al. (2015). *Down*(*MktRet* < -0.1) and *Down*(*MktRet* < -0.13) are indicators of market downturn periods and equal to one if market return is less than -0.1 and -0.13 in quarter *t*, respectively, and zero otherwise. *Size* is the market value of equity in millions in quarter *t*-1, *Age* is the number of years that the firm became listed measured at the end of the last fiscal year, *MB* is the market-to-book ratio measured at the end of quarter *t*-1, *Tangibility* is fixed assets scaled by total assets in quarter *t*-1, *Dividend* is dividends paid in the previous fiscal year scaled by total assets, *RetVol* is standard deviation of monthly returns over the previous fiscal year, *Mom* is cumulative stock return from quarter *t*-5 to quarter *t*-1, *Prc* is stock price at the end of quarter *t*-1, *Turnover* is trading volume scaled by shares outstanding in quarter *t*-1, and *S&P500* is a dummy variable that equals one if the firm is included in the S&P 500 index in quarter *t*-1, and 0 otherwise. Robust standard errors are clustered at the industry level, and *t* statistic are in the brackets. * p<0.10, ** p<0.05, *** p<0.01.

Table 3: The effect of the enforcement of Reg FD

Dep. var.:	<i>TRA</i>	<i>DED</i>	<i>TRA</i>	<i>DED</i>
Percentage ownership	(1)	(2)	(3)	(4)
<i>DQRes</i>	0.0101 (1.46)	0.0193** (2.01)	0.0112 (1.59)	0.0181* (1.92)
<i>DQRes</i> * <i>Down</i> (<i>MktRet</i> < -0.1)	0.0155* (1.88)	-0.0374*** (-4.55)		
<i>DQRes</i> * <i>Down</i> (<i>MktRet</i> < -0.1) * <i>PostFD</i>	0.0248 (1.46)	0.0651*** (5.56)		
<i>DQRes</i> * <i>Down</i> (<i>MktRet</i> < -0.13)			-0.0055 (-0.34)	-0.0423** (-2.66)
<i>DQRes</i> * <i>Down</i> (<i>MktRet</i> < -0.1e) * <i>PostFD</i>			0.0307 (1.33)	0.0660*** (3.75)
Other controls	Yes	Yes	Yes	Yes
N	373,399	373,399	373,399	373,399
Adj. R-squared	0.405	0.232	0.405	0.232

This table reports the regression results of Eq. (3). *TRA* and *DED* are transient and dedicated ownership, respectively. *DQRes* is discretionary disclosure quality estimated based on Eq. (1) following Chen et al. (2015). *Down*(*MktRet* < -0.1) and *Down*(*MktRet* < -0.13) are indicators of market downturn periods and equal to one if market return is less than -0.1 and -0.13 in quarter *t*, respectively, and zero otherwise. *PostFD* equals one for the post-Reg FD period, and zero otherwise. The control variables include *DQRes* * *PostFD*, the logarithm of firm size, the logarithm of firm age, market-to-book ratio, tangibility, dividend ratio, return volatility, momentum, stock price, turnover, S&P500 dummy, industry and time fixed effects. Robust standard errors are clustered at the industry level, and *t* statistic are in the brackets. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 4: Market states, disclosure quality, and bid-ask spreads

Dep. var.: firm's bid-ask spread	(1)	(2)
DQRes	-0.0088** (-2.49)	-0.0096*** (-2.73)
DQRes*Down(MktRet<-0.1)	-0.0119** (-2.64)	
DQRes*Down(MktRet<-0.13)		-0.0090** (-2.01)
Other controls	Yes	Yes
N	317,881	317,881
Adj. R-squared	0.421	0.421

This table reports the regression results of Eq. (4). *DQRes* is discretionary disclosure quality estimated based on Eq. (1) following Chen et al. (2015). *Down(MktRet < -0.1)* and *Down(MktRet < -0.13)* are indicators of market downturn periods and equal to one if market return is less than -0.1 and -0.13 in quarter t , respectively, and zero otherwise. The control variables include the logarithm of firm size, the logarithm of firm age, market-to-book ratio, tangibility, dividend ratio, return volatility, momentum, stock price, turnover, S&P500 dummy, industry and time fixed effects. Robust standard errors are clustered at the industry level, and t statistic are in the brackets. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 5: Institutions' ownership during downturns and subsequent stock returns

Dep. var.: firm's stock return in quarter	$t + 1$	$t + 2$	$t + 3$	$t + 4$
	(1)	(2)	(3)	(4)
<i>TRA</i>	-0.0050 (-0.53)	0.0058 (0.94)	0.0060 (1.28)	0.0001 (0.01)
<i>TRA</i> * <i>Down</i> (<i>MktRet</i> < -0.1)	0.1071*** (4.99)	0.0094 (0.46)	-0.0251 (-1.12)	-0.0179 (-0.82)
<i>DED</i>	0.0062 (0.78)	0.0043 (0.71)	0.0050 (0.85)	0.0170* (1.85)
<i>DED</i> * <i>Down</i> (<i>MktRet</i> < -0.1)	-0.0281 (-0.70)	-0.0220 (-0.70)	-0.0774** (-2.43)	-0.1015*** (-3.53)
Other controls	Yes	Yes	Yes	Yes
N	370,291	364,042	357,550	351,159
Adj. R-squared	0.119	0.136	0.132	0.113

This table reports the regression results of Eq. (5). The dependent variables are stock returns in quarters $t+1$, $t+2$, $t+3$, and $t+4$, respectively, in columns (1) to (4). *TRA* and *DED* are transient and dedicated ownership, respectively. *Down*(*MktRet* < -0.1) is an indicator of market downturn periods and equals to one if market return is less than -0.1 in quarter t , and zero otherwise. The control variables include the logarithm of firm size, the logarithm of firm age, market-to-book ratio, tangibility, dividend ratio, return volatility, momentum, stock price, turnover, S&P500 dummy, industry and time fixed effects. Robust standard errors are clustered at the industry level, and t statistic are in the brackets. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 6: Institutions' ownership during downturns and subsequent stock idiosyncratic volatility

Dep. var.: firm's idiosyncratic volatility in quarter	$t + 1$	$t + 2$	$t + 3$	$t + 4$
	(1)	(2)	(3)	(4)
TRA ownership	-0.0016 (-1.04)	-0.0021 (-1.29)	-0.0024 (-1.52)	-0.0030** (-2.08)
TRA ownership*Down(MktRet<-0.1)	-0.0019 (-1.16)	-0.0003 (-0.17)	-0.0025* (-1.75)	-0.0022** (-2.10)
DED ownership	-0.0190*** (-14.43)	-0.0190*** (-14.62)	-0.0189*** (-14.42)	-0.0186*** (-15.48)
DED ownership*Down(MktRet<-0.1)	0.0049** (2.05)	0.0053** (2.14)	0.0061** (2.54)	0.0060*** (3.28)
Other controls	Yes	Yes	Yes	Yes
N	368,536	362,570	356,154	349,803
Adj. R-squared	0.384	0.365	0.353	0.343

This table reports the regression results of Eq. (6). The dependent variables are stock idiosyncratic volatility in quarters $t+1$, $t+2$, $t+3$, and $t+4$, respectively, in columns (1) to (4). Idiosyncratic volatility is estimated from the Fama-French model from WRDS Beta Suite, based on the 70 daily returns before the end of the quarter. *TRA* and *DED* are transient and dedicated ownership, respectively. *Down*($MktRet < -0.1$) is an indicator of market downturn periods and equals to one if market return is less than -0.1 in quarter t , and zero otherwise. The control variables include the logarithm of firm size, the logarithm of firm age, market-to-book ratio, tangibility, dividend ratio, return volatility, momentum, stock price, turnover, S&P500 dummy, industry and time fixed effects. Robust standard errors are clustered at the industry level, and t statistic are in the brackets. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.