Institutional Ownership and Market Risk Disclosures

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Abstract

In 1997, the SEC started to require its registrants to disclose their exposures to capital market risks and how they manage these risks, which are found to be informative to the capital market (e.g., Rajgopal and Venkatachalam, 2000; Guo, 2002; Thornton and Welker, 2004). In practice, the degree to which firms disclose their anticipated market risks varies across firms. We investigate the incentives behind the variation of market risk disclosures. In particular, we study the relationship between institutional ownership and the textual content of market risk disclosures. Following Gompers and Metrick (2001) and Ramalingegowda and Yu (2012), we employ the residual ownership to address the concern that firm-specific characteristics may reversely affect institutional ownership. We show that the total institutional ownership is positively associated with the readability and the consistency of capital market risk disclosure. Moreover, we show that firms with higher short-term independent institutional ownership produce more readable market risk disclosures and that firms with higher long-term independent institutional ownership produce more consistent market risk disclosures over time.

Keywords: Institutional ownership; risk disclosures; item 7A

EFM Classification Codes : 150; 530; 710

1. Introduction

In this paper, we use novel data to investigate the relationship between institutional ownership and market risk disclosures. As the most critical market participants, institutional investors dominate the ownership structure of U.S. firms, and a large body of research suggests that they have influence on corporate policies (Derrien, Kecskes, and Thesmar, 2013), corporate governance (Brickley, Lease, and Smith, 1988; Gaspar, Massa, and Matos, 2005; Chen, Harford, and Li, 2007), market timing (Chemmanur, He, and Hu, 2009), and accounting conservatism (Ball, 2001; Watts, 2003; Ramalingegowda and Yu, 2012). Recent studies suggest institutional ownership has a significant influence on the information environment of firms. Boone and White (2015) find evidence that the rise in institutional ownership results in the increases in management disclosure, analyst coverage, and stock liquidity for firms. Bird and Karolyi (2016) show that the exogenous increment in institutional ownership improves both quantity and quality of the 8-K filing. Also, this exogenous increment significantly induces firms' competitors to be more likely and frequently to issue management forecasts (Lin, Mao, and Wang, forthcoming). However, the literature about the impact of institutional ownership on other formats of corporate disclosures is still limited. We aim to extend the knowledge about how institutional ownership affects firms' disclosure practices by conducting textual analyses on firms' market risk disclosures in their annual reports and empirically examining the effect of institutional ownership on the textual content of the disclosure. In particular, we investigate whether institutional investors motivate managers to generate market risk disclosures that are easier to interpret and that reinforce their information over time. Besides, we explore whether different types of institutional investors focus on different disclosure content in terms of 15 most commonly disclosed market risk topics.

We are interested in firm's market risk disclosure because although the SEC requires non-

small reporting firms to disclose their exposures to capital market risks and how they manage these risks, the extent to which firms disclose their anticipated market risks varies across firms.[1] This difference in information content provides an opportunity that institutional investors with specific can intervene firms' market risk disclosure. In practice, most firms disclose their market risks related issues under Item 7A, *Quantitative and Qualitative Disclosures about Market Risk*. Item 7A of the 10-K filings narratively disclose quantitative and qualitative information about firms' capital market risk exposures and how they manage these risk exposures. Market risks refer to risks arising from changes in interest rate, foreign currency exchange rates, commodity prices, equity prices, and other market changes that affect market risk sensitive instruments. [2] See Appendix A for an example of market risks disclosed in Item 7A of the 10-K of United Airline for fiscal year 2016.

Information provided by Item 7A is valuable to investors for several reasons. First, risks disclosed in Item 7A are essential information input in managers' decision making and help account for firms' financing, investing, and operating strategy (e.g., Titman, 1992; Barry et al., 2008; Adler and Dumas, 1983) and variations in expected return on bonds and stocks (Chow, Lee, and Solt, 1997). Second, readers of Item 7A can access managers' risk preference and the effectiveness of risk management as Item 7A discusses the strategy and outcome of risk management. Third, Item 7A create a safe harbor to protect firms from litigation loss by making a forward-looking market risk disclosure. In sum, this item is a channel that allows investors and information intermediaries to assess specific market risks facing firms directly. Consistent with

[1] Smaller reporting companies are not required to disclose market risk exposures. A smaller reporting company is currently defined as a company that has a public float of less than $75 million in common equity as of the last business day of its most recently completed second fiscal quarter, or if a public float of zero, has less than $50 million in annual revenues as of its most recently completed fiscal year end.

[2] Market Risk Disclosure FAQ - Sec.gov. https://www.sec.gov/divisions/corpfin/guidance/derivfaq.htm

these arguments, prior literature suggests that market risk disclosures are informative to the capital market (e.g., Rajgopal and Venkatachalam, 2000; Guo, 2002; Thornton and Welker, 2004).

Although prior research provides extensive evidence elaborating the effect of institutional ownership on firms, we cannot simply consider institutional investors as an indifferent group. In fact, institutional investors exhibit different investment strategies and influences based on their types and preferences (Bushee and Noe, 2000; Gompers and Metrick, 2001). So, we expect the effects of institutional investors on the market risk disclosure are far from homogeneous. The first dimension that we investigate is institutional investors' investment horizons. Derrien, Kecskes, and Thesmar (2013) suggest that institutional investors have different investment horizons because they have different maturities of liabilities (e.g., pension funds vs. actively managed mutual funds) or they have different investment strategies. Also, they find that long-term institutional ownership is associated with more investment and equity financing and fewer payouts, and explain their findings from a catering view. Prior literature also indicates that long-term institutional investors are related to the monitoring role (Gaspar, Massa, and Matos, 2005; Chen, Harford, and Li, 2007; Attig et al., 2013) and, in turn, enhance the value of acquisitions and post-merger performance, and lower the cost of equity. In contrast, short-term institutional investors are undesirable from the perspective of corporate executives because even they temporarily boost the stock price, they can also lead to higher stock price volatility and management myopia that is detrimental to long-term firm value (Bolton, Scheinkman, and Xiong, 2006; Closer et al., 2014; Bushee, 1998). Furthermore, institutional investors exhibit varying preferences for the information environment of firms. Porter (1992) and Bushee and Noe (2000) document that long-term institutional investors less rely on public information because they have better ability to directly interact with their portfolio firms and access to private information. Thus, long-term institutional investors have less incentive to

force management to improve disclosure quality and transparency. Meanwhile, short-term institutions have mixed incentives. They may impede public disclosures to benefit themselves from gathering private information that enables them to gain from trading ahead or short-run stock price fluctuation (Ke, Petroni, and Yu, 2008), and they could also welcome greater disclosures that alleviate the price impact of their transactions (Boone and White, 2015). Accordingly, we can expect the association between short-term investors and stock price volatility will be more pronounced for firms with severe information asymmetry problems. For managers, even they are less likely to respond the demand of short-term investors, they have incentives to disclose more information to lessen unfavorable impacts on stock price volatility or corporate decisions.

We also consider institutional investors' independence. Brickley, Lease, and Smith (1988) suggest that institutional investors having potential business ties with their portfolio firms may not always act for maximizing shareholders' value. Moreover, they document that, different from less independent or say dependent investors (e.g., banks and insurance companies), institutions with greater independence (e.g., mutual funds, foundations, and pension funds, *etc*.) are more likely to monitor the management and oppose management actions if these actions are against their interests. Ferreira and Matos's (2008) international evidence also advocate that dependent institutional investors tend to be pressure-sensitive and support management actions. Further, monitoring costs for independent institutions are less than those for dependent institutions. Chen, Harford, and Li (2007) conclude that it is costly for dependent institutional investors to monitor or change their investee firms because their actions could dampen their ties with firms. Therefore, we argue that the monitoring effect of independent investors is stronger than that of dependent investors. Similar to the mechanism that investment horizon exerts influence on the information environment of firms, dependent institutional investors should be less active than independent investors to improve

corporate disclosures because they have more information sources, such as their business-based relationship with firms.

Next, we consider four categories of institutional investors in light of two dimensions discussed above. Long-term independent institutions have relatively long investment horizon and independence from the management. Short-term independent institutions have relatively short investment horizon and are independent of the management. Long-term dependent institutions' investment horizons are relatively long, and they have potential business ties with firms. Short-term dependent institutions have shorter investment horizon and are, to some extent, related to management. Among these four types of investors, we predict that long-term independent investors have the strongest incentives to be a monitor, whereas short-term dependent investors have the weakest monitoring incentives. We also expect that the presence of short-term independent institutions are positively related to the improvement of corporate disclosures not only because they voice for shareholder value maximization, but also because managers are motivated to disclose more information to lower unfavorable stock price volatility.

Following Li (2008), we use the Fog Index to measure the readability of market risk disclosures – whether the market risk disclosure is easy to interpret. Higher Fog Index indicates lower readability and higher information processing cost. We find that institutional ownership is positively related to the readability of Item 7A. Both short-term institutions and independent institutions make market risk disclosures more understandable. Among four subgroups of institutional ownership, short-term independent institutions have the most pronounced impact on inducing managers to generate more readable disclosures. We argue that these results are associated with monitoring effects of independent investors and managers' response to short-term investors.

We measure the extent to which firms reinforce and confirm prior market disclosures using the Tf-Idf-Cosine similarity score of Item 7A. Higher similarity score suggests that firms mostly confirm their concerns about market risks disclosed in prior years. Our results show that firms with more institutional ownership tend to disclose more consistent information over time. Both long-term institutions and independent institutions are positively related to the consistency of market risk disclosures. Long-term independent institutional investors can significantly improve the consistency of Item 7A. The way we interpret these findings is that the consistency reflects that institutions with strong monitoring incentives exert their monitoring effects on improving corporate governance, inducing managers to produce reliable and persistent disclosures.

We apply machine learning using Latent Dirichlet Allocation (LDA) to extract topics that are most likely to appear in each market risk disclosure. We find that institutional investors with different horizon and dependence have various preferences for disclosed topics. Dependent institutional investors prefer information content that helps raise more capital to finance investments and explains firms' effort to maintain liquidity. However, they dislike information that indicates potential deteriorating income performance and asset valuation. Independent institutions prefer more specific disclosures than dependent institutions. Short-term institutional investors dislike disclosures that hinder their benefits from short-term price fluctuation. Long-term institutions dislike information that impacts short-term stock prices but is not significantly relevant to intrinsic value.

We contribute to the growing institutional ownership literature and extend the knowledge on risk disclosure. Market risk disclosure under Item 7A is distinct from general risk disclosure under Item 1A because it reveals firms' response to relevant fluctuations in the capital market, which directly influence investors. Our research is one of the few pioneering studies that

specifically focus on market risk disclosure. Our findings suggest that certain types of institutional investors are associated with more readable and more consistent market risk disclosures, and different institutions demand different information content. In other words, firms do respond to *ex-ante* investors' demand for market risk information, and this is in line with findings from studies on general risk disclosures (Hope, Hu, and Lu, 2016; Gaulin, 2017). Consistent with recent studies that empirically examine the effect of institutional ownership on the information environment of firms (Boone and White, 2015; Bird and Karolyi, 2016; Lin et al., forthcoming), our findings support the argument that institutional ownership improves firms' information environment.

The remainder of the paper is organized as follows. Section 2 develops theoretical hypotheses and empirical predictions. Section 3 discusses the construction of our sample. In section 4, we present main empirical results. Section 5 presents additional analyses and robustness tests of the main results. Section 6 concludes the paper.

2. Hypotheses Development

In 1997, the SEC issued FRR No. 48, *Disclosure of Accounting Policies for Derivative Financial Instruments, and Derivative Commodity Instruments and Disclosure of Quantitative and Qualitative Information about Market Risk Inherent in Derivative Financial Instruments, Other Financial Instruments, and Derivative Commodity Instruments,* mandating registrants to disclose quantitative and qualitative information about their market risk exposures and how their risk exposures are managed (SEC 1997). The rule addresses risks arising from fluctuations in interest rates, foreign currency exchange rates, commodity prices, equity prices, and other market changes that affect market risk sensitive instruments.

We examine three different aspects of the information content of Item 7A. The first aspect

is the readability of market risk disclosures. Li (2008) first uses the readability as a dimension of information quality to analyze annual reports. The readability reveals the processing cost of information. In light of this argument, prior literature suggests that less readable annual reports are associated with less earnings persistence, greater analyst dispersion, lower investment efficiency, higher stock price crash risks, higher post-earnings-announcement drift, and greater credit default swap spread (Li, 2008; Lehavy et al., 2011; Biddle et al., 2009; Lee, 2012; Kim et al., 2015). Some studies link the readability to non-professional investors. Miller (2010) document that non-professional investors will lower their trading activities if the report is less readable. Moreover, the readability of disclosures affects non-professional investors' valuation judgment (Rennekamp, 2012; Riley and Taylor, 2014; Asay et al., 2016).

We argue that institutional investors differ from non-professional investors and are more likely to influence the readability of disclosures actively. Institutional investors have incentives to improve information quality of market risk disclosures due to reasons above – monitoring incentives and information needs. This leads to our first hypothesis:

H1a. *Institutional ownership is positively associated with the readability of market risk disclosures.*

As institutional investors have different horizon and independence, we test whether different types of institutions account for different readability of market risk disclosures. We expect that the monitoring effect of long-term institutions may improve the readability, but the nature of long-term institutions that they less depend on public information may discourage these investors to intervene disclosures. For managers who face more short-term ownership, they have incentives to improve the readability to lower stock price volatility and short-term pressure by investors, regardless of short-term institutional investors' preference. Therefore, we form the

following hypothesis:

H1b. *Short-term institutional ownership is more influential than long-term institutional ownership for improving the readability of market risk disclosures.*

Likewise, independent institutions should be more active than dependent institutions to improve the quality of disclosures because firm transparency and public information production by managers reduce the costs of information acquisition, which will benefit their monitoring (D'Souza, Ramesh, and Shen, 2010). We thus hypothesize that:

H1c. *Independent institutional ownership is more influential than dependent institutional ownership for improving the readability of market risk disclosures.*

The second aspect of textual characteristics is the consistency of market risk disclosures. Consistency is defined as the degree to which the current disclosure is textually similar to the preceding one (Bozanic and Thevenot, 2015). The higher consistency of disclosures over time indicates lower uncertainty and decreasing the information-processing cost of investors. Peterson, Schmardebeck, and Wilks (2015) document that accounting consistency, as measured by the consistency of accounting policy footnotes disclosed in 10-K filings, is positively associated with earnings persistence, predictability, and accrual quality and positively associated with lower information asymmetry and lower analysts' uncertainty. In the case of Item 7A, the consistency reflects managerial persistence in market risk management. Bozanic and Thevenot (2015) show that consistent disclosures over time confirm and reinforce themselves rather than providing redundant information. A disclosure consistent to preceding one is a signal that, in other words, managers are diligent and honest in their estimation. Thus, monitors, such as long-term

institutional investors and independent investors, or investors who have the intention to improve the quality of market risk disclosures would prefer consistent disclosures.

H2a. *Institutional ownership is positively related to the consistency of market risk disclosures.*

H2b. *Long-term institutional ownership is positively related to the consistency of market risk disclosures.*

H2c. *Independent institutional ownership is positively related to the consistency of market risk disclosures.*

Our third task is to summarize topics covered by Item 7A. Given the heterogeneity of institutional investors, we believe that different types of institutions show distinct preferences for disclosure topics.

3. Research Design

3.1. Measures of institutional ownership

We calculate institutional ownership using quarterly data from Thomson Reuters' Institutional (13f) Holdings (TRIH) database. We define institutional ownership as, for each publicly traded firm, the ratio of shares held by institutional investors to the number of shares outstanding (Gompers and Metrick, 2001; Asquith et al., 2005), and the annual institutional ownership is the mean of quarterly ownerships. To examine institutional investors' diverse influences, we delineate institutional investors as being of various types based on their horizon and independence. Following Derrien et al. (2013), we measure institutional investors' horizon as their portfolio turnover, and we compute the turnover as follows. First, we compute the fraction of a

stock *i* held by an institutional investor *j* that is sold in three years. We assign 0 to this stock turnover if investor *j* is a net buyer of this stock during the three-year period. Second, we calculate investor *j*'s portfolio turnover at time *t* as the weighted average of all turnovers of stocks in the portfolio. The weight of each stock is the weight at time *t*-3 (i.e., three years ago). As we use quarterly data, the annual institutional investors' horizon is the average quarterly horizons. Corresponding to the time-series means and medians of investor horizons, we consider 25% as the cutoff to classify investors. Institutional investors with a portfolio turnover of 25% or less are considered as long-term investors Harford, Jenter, and Li (2011). Consistent with Derrien et al. (2013), we find the distribution of the cutoff is stable over time, and investor horizons are persistent. Thus, institutional investors are either long-term investors or short-term investors.

We classify institutional investors into independent investors and dependent investors based on their potential business connections with investee firms (Brickley et al., 1988; Ramalingegowda and Yu, 2012; Sakaki et al., 2017). We consider investors with TRIH type code of 3 (investment companies and their managers), 4 (investment advisors), or 5 (pension funds, university endowments, and foundations) as independent investors and investors with TRIH type code of 1 (banks) or 2 (insurance companies) as dependent investors. Further, we re-divide all institutional investors into four subgroups: long-term independent investors, long-term dependent investors, short-term independent investors, and short-term dependent investors.

Prior literature indicates a reversed causality that firm-specific characteristics can attract institutional investors to increase or decrease their ownership. This concern should be minimized before we can confidently address our findings. To mitigate this endogeneity problem, we use residual ownership instead of original ownership in our empirical analysis. Following Gompers and Metrick (2001) and Ramalingegowda and Yu (2012), we define the residual ownership as the

residuals from the following regression:

$$IO_t = \beta_0 + \beta_1 BM_{t-1} + \beta_2 Size_t + \beta_3 Volatility_{t-2,t} + \beta_4 Turnover_{-3} + \beta_5 Price_t + \beta_6 SP500_t + \beta_7 Momentum_{-2,0} + \beta_8 Momentum_{-12,-3} + \beta_9 Age_t + \beta_{10} Yield_{t-1} + \varepsilon_t \quad (1)$$

where IO_t represents institutional ownership at the end of year *t*. BM_{t-1} represents book to market ratio at the end of year *t*-1. $Size_t$ is estimated as the natural logarithm of market value of equity at the end of year *t*. $Volatility_{t-2,\ t}$ represents the standard deviation of monthly returns over the previous two years. $Turnover_{-3}$ represents monthly volume adjusted by the number of shares outstanding, measured for three months prior to the end of year *t*. $Price_t$ is estimated as the natural logarithm of share price measured at the end of year *t*. $SP500_t$ is a dummy variable that is equal to 1 if the firm is included in the S&P 500 index the end of year *t*, and 0 otherwise. $Momentum_{-2,0}$ is firm's three-month gross return prior to the end of year *t*. $Momentum_{-12,3}$ is firm's nine-month gross return ending three months prior to the end of year *t*. Age_t is estimated as the natural logarithm of the number of years a firm is listed on CRSP. $Yield_{t-1}$ is the dividend adjusted by market value at the end of year *t*-1. The firm subscript is omitted for brevity.

We estimate Equation (1) for each type of institutional ownership using the Fama-MacBeth regression. Theoretically, the residual ownership is related to original institutional ownership, but is not related to firm-specific characteristics. Including the residual ownership in our main regressions provides more precise causal effects. Table A1 reports the results of the Fama-MacBeth regression of different types of institutional ownership on ten Gompers-Metrick (2001) determinants. Our results are consistent with prior research. We find that all types of institutional investors tend to invest more in larger, less volatile, and liquid firms, and they are not momentum investors. We also find differences across these institutional investors. For instance, long-term institutions and dependent institutions are more likely to invest in mature firms with the higher

dividend yield, but short-term institutions and independent institutions tend to invest in younger firms with lower dividend yield.

<Insert Table A1 here>

3.2. Information content of disclosures

We use readability, consistency, and topics coverage of Item 7A to capture textual characteristics of market risk disclosures. The first dimension of textual characteristics is the readability of Item 7A, which is measured by the Fog Index (Li, 2008). Fog Index captures two aspects of readability: average sentence length and the fraction of complex words. Based on the notion that managers can obfuscate information by making it harder for investors to interpret, prior studies document that more readable information is associated with better information environment (e.g., Li 2008; Biddle et al., 2009; Lehavy et al., 2011; Bozanic and Thevenot, 2015).

The second dimension is the consistency between market risk disclosures in current year and previous year (SimScore). First, we calculate the frequency a word occurs in a document and normalize the frequency based on the document size because the frequency of a word is likely to be larger in a large document. In this first step, all words are considered equally important. Second, we weight down (up) the effects of more (less) frequently occurring terms and calculate the inverse document frequency. Third, we take the product of normalized word frequency and the inverse document frequency calculated in the first and second steps. Lastly, we derive a vector for each document using the numbers from the third step. The cosine of the vectors of a pair of documents is the similarity score (SimScore) for a pair of documents. SimScore is between 0 and 1, and 1 indicates two identical disclosures.

The third dimension is topics disclosed in Item 7A. Latent Dirichlet Allocation (LDA) is a three-level hierarchical Bayesian model which considers text documents as mixtures of topics

composed of individual words with certain probabilities (Blei, Ng, and Jordan, 2003). This methodology has recently been used in several accounting studies, such as Brown et al. (2016) and Dyer et al. (2017). First, we program in Python to read all Item 7A disclosures in our sample and analyze word frequency from the pool of all Item 7A disclosures. Second, we use LDA to analyze the words from the pooled text to identify 15 topics that the words fit in. Third, the LDA model analyzes each Item 7A disclosure and predict whether each topic appears in a specific disclosure based on the words mixture of this disclosure.

3.3. Empirical Model

We investigate the effect of institutional ownership on the readability and the consistency of Item 7A and conduct additional analyses to see whether different types of institutions prefer different topics of information content. We measure the disclosure quality variables in year *t* and regress them on residual ownership in year *t*-1 along with firm-specific control variables. Our basic regression model is in the following general form:

$$Disclosure_{i,t} = \beta_0 + \beta_1 \widehat{IO}_{i,t-1} + \beta_2 X + \beta_3 Year_t + \beta_4 Industry_i + \varepsilon_{i,t} \quad (2)$$

In this model, $Disclosure_{i,t}$ is the textual characteristics of Item 7A (i.e., readability and consistency). $\widehat{IO}_{i,t\text{-}1}$ represents different types of residual ownership. *X* stands for a set of control variables, which is listed in Appendix C. All control variables except *Age*, *ASC718*, and *E-Index* are lagged by one year. This practice aims to minimize the endogeneity concern of the joint determination of disclosures and institutional ownership. Year fixed effects are controlled, and industry fixed effects are controlled at Fama-French 48 industry categories. Standard errors clustered at the firm level. We winsorize all continuous variables at 1% and 99% of their distribution to minimize the effects of outliers.

4. Sample Selection and Empirical Results

4.1. Sample Selection and Descriptive Statistics

Our initial sample is based on the available 10-K filings of non-small reporting firms from the SEC's Edgar filings database for fiscal years from 2003 to 2016 and contains 43,416 firm-year observations from non-financial service and non-utility industry. We limit the sample period to post-Sarbanes-Oxley Act period to avoid the influence from the dotcom bubble and eliminate observations of small reporting firms because they are not mandated to disclose market risks and may have different incentives when they voluntarily disclose market risks. We exclude observations in utility and financial service industry (SIC of 4800-4999 and 6000-6999) as these industries are regulated, which may affect firms' financial reporting incentives. We then eliminate 2,376 firm-years whose Item 7A disclosures are less than 100 words because their market risks are either not material or disclosed under other sections of 10-K, such as Item 7 and footnotes. We require firms in our sample to have at least two-year consecutive Item 7A disclosures to calculate the similarity score of textual content over time and this step further reduce our sample by 862 Our control variables are calculated using the financial statement data from Compustat. We collect institutional ownership data from Thomason Reuters' Institutional Holdings database. After removing observations that have missing data for control variables and institutional ownership variables, our final sample consists of 17,726 firm-year observations.

Table 1 presents the descriptive statistics of variables used in our analyses. The average *FogIndex* and average *SimScore* for our sample are 9.632 and 0.8163, respectively. *FogIndex* of Item 7A is much lower than that of full 10-K filings reported in prior research (e.g., Lehavy et al., 2011), suggesting that Item 7A is more readable than full 10-K filings. The average total, long-term, short-term, independent, and dependent residual ownership estimated based on Equation (1)

are 14.59%, 6.52%, 6.09%, 17.14%, and -2.46%, respectively. The average long-term independent, short-term independent, long-term dependent, and short-term dependent residual ownership are 7.55%, 8.1%, -0.99%, and -1.94%, respectively.

<Insert Table 1 here>

Table 2 reports the Pearson Correlation between variables. All types of institutional ownership are negatively associated with *FogIndex*. Firms with higher total, short-term, independent, short-term independent ownership reinforce prior market risk disclosures to a greater extent. Firms with higher long-term, dependent, long-term independent, long-term dependent, and short-term dependent institutional ownership are more likely to change market risk disclosures over time. However, correlations reported in Table 2 should be interpreted with caution because they could be driven by the positive correlations between different types of institutional institutions.

<Insert Table 2 here>

4.2. Institutional ownership and the readability

We first examine the impact of institutional ownership on the readability of Item 7A by estimating Eq. 2 using Fog Index as the dependent variable. Table 3 shows our results for the regressions.

<Insert Table 3 here>

Column 1 in Table 3 shows that total institutional ownership is negatively related to the Fog Index. The coefficient on *rTOTAL* is -0.4790 and is statistically significant at the 5% level. Because the higher Fog Index indicates that the disclosure is less readable, this result suggests that the existence of institutional investors improves the readability of a firm's market risk disclosure, and supports H1a that institutional ownership is positively related to the readability of disclosures. In line with the findings of Boone and White (2015) and Bird and Karolyi (2016), institutional

investor presence mitigates information asymmetry. Increases in the readability of market risk disclosures can benefit institutional investors through governance mechanisms, but this may crowd out the private information advantage of particular institutions. Our results, overall, sustain the former impact and are economically significant.

Column 2 in Table 3 includes the ownership of both long-term institutional investors and short-term institutional investors. We find that only short-term ownership is significantly negative at the 5% level. The estimated coefficient on *rSHORT* is -0.6021, which is on a larger scale than the coefficient on *rTOTAL*. Our results indicate that, given the costs of monitoring, long-term institutions are not sufficiently motivated to intervene risk disclosures because they less depend on public information. For the significant impact of short-term institutions, we interpret this result as managers tend to disclose more to minimize unfavorable stock price volatility caused by short-term transactions. This argument is based on the fact that short-term investors have mixed incentives on risk disclosures and they may not stay long enough with firms to affect disclosure policies through voting or other governance mechanisms. Therefore, our evidence support H1b that short-term institutional ownership is more influential than long-term institutional ownership for improving the readability of market risk disclosures .

In column 3 in Table 3, we include both independent ownership and dependent ownership. Consistent with our prediction in H1c, independent ownership improves the readability of market risk disclosures, whereas dependent ownership has no significant impact on the readability. As outside monitors, independent institutions are more efficient than dependent institutions because they do not have business relationships with investee firms.

Not surprisingly, short-term independent institutions have the most significant impact on the readability across four subgroups of investors. In terms of economic magnitude, column 4

shows that the effect of short-term independent ownership is more significant than that of any other types of ownership. We also find that larger or older firms that have higher book-to-market ratios, higher litigation risks, or pay dividends tend to provide less clear market risk disclosures, reflecting their higher bargaining power with investors. The estimated coefficients on *ASC718* across all models are negative and statistically significant at the 5% level, indicating that firms respond changes in regulation regarding derivatives by providing more readable disclosures.

4.3. Institutional ownership and the consistency

Table 4 reports the results from exploring the impact of institutional ownership on the consistency of market risk disclosures. We estimate Equation (2) using the similarity score as the dependent variable. We predict that if the higher consistency of Item 7A indicates that managers are well-disciplined and reinforce themselves over time, institutional ownership should exhibit a positive relationship with this feature.

<Insert Table 4 here>

Our hypothesis (H2a) is supported by the results in column 1 of Table 4. The coefficient on total institutional ownership is 0.0258 and statistically significant at the 5% level. Consistent with Bozanic and Thevenot (2015), our results suggest that, from the viewpoint of institutional investors, a risk disclosure consistent to preceding disclosure does not mean that managers perfunctorily repeat the content or provide redundant information.

In column 2, short-term institutions do not have any significant influence on the consistency. The estimated coefficient on long-term institutional ownership is in the right direction as we expected, but it is not statistically significant. Risk factors confronted by firms may be influenced by unobservable exogenous factors that simultaneously affect other firms. Further, when managers disclose their market risk factors, they may learn from their peers and strategically

organize their information content. Thus, cross-sectional residuals could be potentially correlated across firms and, in turn, lead to the insignificant impact of long-term institutions. We revisit this issue later in Section 5.

Through monitoring mechanism, independent institutional ownership is positively associated with the consistency and statistically significant at the 5% level. This result is consistent with our expectation in H2c that is also confirmed by the insignificant impact of dependent investors. When we compare the estimated coefficients in column 4 with those in other columns, we find that the economic effect of long-term independent ownership is approximately 1.5 times as high as that of total, long-term, and independent ownership, respectively. The coefficient on *rLONGIND* is 0.0399 and statistically significant at the 10%, while other types of institutions do not have a significant impact. In addition, we find that younger firms, firms with higher book-to-market ratios, higher litigation risks, or more foreign segments tend to release consistent market risk disclosures. New accounting rules and regulations after 2006 improve the corporate governance reflected in the consistency.

4.4. Institutional investors' preferences for disclosure content

We first utilize the LDA model to extract 15 most commonly disclosed topics in Item 7A and the corresponding keywords for each topic. Keywords for each extracted topic are reported in Appendix B. Although firms are required to disclose their market risk exposures and how they manage these risks, the extent to which they disclose this information varies across firms. To identify which topic is preferred by different types of institutional investors, we conduct t-tests to compare the average institutional ownership between firms that disclose a specific topic and firms that do not. Table 5 reports the results.

Based on the keywords in Appendix B, we summarize each topic as follows: Topic 1

discloses the degree to which a firm's income performance and asset value are sensitive to hypothetical fluctuation in interest rates and foreign currency exchange rates. Greater information uncertainty results in stock price drift Zhang (2006). The disclosure of Topic 1 provides information that can help financial report users to understand better the consequences stemmed from the uncertainty in income performance and asset value. Topic 2 discloses the impact of interest rate risk and the composition of fixed-term and variable-term debt. This type of information is also disclosed in other sections of the annual report. Topic 3 reveals the effects of a firm's exposure to foreign currency exchange risk and interest risk and on the value of cash holding. This information can help investors to understand the value of the firm's cash holding better. Topic 4 reports the impact of foreign currency exchange rate on the fair value translation fluctuation of foreign currency and the corresponding unrealized gains or losses. Topic 4 reduces the information asymmetry between market participants and firms but meanwhile may also negatively impact investor's expectation for stock value. Topic 5 illustrates impacts of interest fluctuation on a firms' debt financing cost, income from debt investments, and the fair value of debt. Topic 5 reduces investors' uncertainty about whether a firm can raise enough capital from debt holders to finance its future investment. Thus, the disclosure of Topic 5 can lead to lower cost of capital and more efficient investment. Topic 6 discusses whether credit risk is material or not and how management addresses this issue and disclose derivatives in the annual report. This type of information directly helps financial statement users to locate relevant information in the annual report and is less likely to be disclosed if a firm intends to hoard information. Topic 7 discloses how management use investment activities to preserve foreign capital without significantly impact liquidity. Firms with lower financial constrain are less likely to bypass profitable investment Myers and Majluf (1984). Topic 3, 5, and 7 alleviate financial statement users' concern about a firm's financial constraints

and can further help investors develop a clearer prospect regarding a firm's investment outcome. Topic 8 explains how or whether managers utilize derivative contracts to address commodity risks associated with oil price. Topic 9 reports potential impacts of the fair value of common stock and notes and interest rate of notes on the value of a firm's investment. Topic 10 discloses commodity risks associated with the cost and price of raw materials are subject to the supply of materials. This information is pretty firm-specific. Topic 11 addresses how managers use financial instruments to manage the exposure to risks and speculation associated with interest rate and foreign currency. This information may cause a negative revision in stock price while increase short-term stock price volatility. Topic 12 discloses how the exchange rate of functional/local currency to US dollars impacts net sales in denominated currency. Topic 13 suggests that a firm enters interest swap agreements that allow them to pay a fixed rate to manage the notional value of debt. Topic 14 discloses a firm's investment portfolio including the following components: cash equivalents, debt, or other marketable instruments. Topic 14 also discloses these investments are subject to credit and interest risks, which can lead to short-term fluctuation in stock price. Topic 15 reveals that a firm enters forward contract to hedge the exposure to foreign currency exchange risks.

<Insert Table 5 here>

Independent institutional shareholders have less access to private information and prefer firms to disclose more public information. Specific risk disclosures create better information environment Hope, Hu, and Lu (2016). Firms with higher independent institutional ownership tend to prefer specific rather than general information. Topic 13 and Topic 15 link specific market risk to specific risk management strategy and are therefore more in favor of independent institutional shareholders. Dependent institutional shareholders have access to private information. In order to maximize their investment outcome, they have fewer incentives to monitor disclosures or to help

external investors to predict firms' future performance. As a result, they are less likely to appreciate information of potential decreased income performance and asset valuation, which may reduce the stock value, such as Topic 1, Topic 4, and Topic 15. They are more likely to disclose information that helps firms raise more capital to finance investment and how firms maintain liquidity, such as Topic 2, Topic 5 and Topic 7.

Long-term independent institutional investors, on the one hand, have incentives to reduce information asymmetry among market participants, on the other hand also benefit from the private information and avoid short-term stock price volatilities. They avoid firms that disclose information that impacts short-term stock price but not necessarily relevant to firms' intrinsic value, such as Topic 7, Topic 11, and Topic 14. Short-term institutional shareholders dislike information that may reduce their benefits from short-term stock price fluctuation Ke, Petroni, and Yu (2008), such as Topic1. They prefer firms to disclose information that can potentially improve income performance, such as Topic 5.

5. Additional Analyses

5.1. The Fama-MacBeth regression

Petersen (2009) suggests that the Fama-MacBeth approach, comparing with OLS method, produces unbiased standard errors and correctly sized confidence intervals when the residuals of a given year are potentially correlated across firms. In our case, the information content of a firm's Item 7A may be affected by some unobserved factors that also affect other firms' disclosure. For example, the change in macroeconomic conditions or industry factors is likely to influence the risk factors that are confronted by all firms. Therefore, our empirical results may be biased when we estimate OLS regressions. To solve this potential problem, we retain the regression specifications in Eq. 2 and use the Fama-MacBeth regression to re-estimate the impact of institutional ownership

on the readability and the consistency.

The impact of institutional ownership on the readability of market risk disclosures is consistent with the results of fixed-effect regressions. The results from the Fama-MacBeth regressions are reported in Table 6. The estimated coefficients on total institutional ownership, short-term institutional ownership, independent institutional ownership, and short-term independent institutional ownership are still negative and more statistically significant. Further, the economic effects of these variables are more significant than those in OLS regressions. We find the coefficient on long-term independent ownership is still negative but becomes statistically significant at the 5% level. This finding might be due to the substantial effect of independent ownership on improving the readability of disclosures. Our hypotheses 1a, 1b, and 1c are robust.

<Insert Table 6 here>

Table 7 reports the results from the Fama-MacBeth regressions using the consistency as the dependent variable. Total institutional ownership and independent institutional ownership still significantly induce the consistency of Item 7A. Long-term independent institutions are still positively related to the consistency, but its estimated coefficient is statistically significant at the 1% level. Similar to the Fama-MacBeth results for the readability, we find that the economic effects of these three types of institutional ownership are more significant than those in OLS regressions. We predict that the coefficient on long-term institutional ownership is significantly positive, but the OLS results do not support this prediction. Nevertheless, the estimated coefficient from the Fama-MacBeth regression is 0.062 and statistically significant at the 1% level. Therefore, our new findings support that long-term institutions exert their monitoring effects on improving corporate governance, inducing managers to generate reliable and persistent disclosures.

<Insert Table 7 here>

5.2. The impact of firms' overall information environment

Since Item 7A is a section of the 10-K, the informativeness of market risk disclosures *per se* could be associated with the change in firms' overall information environment. To address this issue, we control for the overall information quality in our regressions. Our proxy for the overall information quality is the accrual quality developed by Dechow and Dichev (2002) and modified by Mcnichols (2002). Unlike the modified Jones Model (1991), this measure focuses on short-term working accruals and captures the extent to which accruals map into cash flows. We estimate a cross-sectional regression as demonstrated by Equation (3) by year for each industry to obtain residuals, which represent accrual estimation errors. We then calculate the standard deviation of residuals over the previous four years. Lower standard deviation represents higher accruals quality.

$$WC\_Change_{i,t} = \beta_0 + \beta_1 CFO_{i,t-1} + \beta_2 CFO_{i,t} + \beta_3 CFO_{i,t+1} + \beta_4 \text{Delta\_Sales}_{i,t} + \beta_5 PPE_{i,t} + \varepsilon_{i,t} \quad (3)$$

Variables in Equation (3) are defined as follows. $WC\_Change_{i,t}$ represents the change in working capital, including the sum of the increase in accounts receivable, the increase in the inventory, the decrease in accounts payable, the decrease in accrued tax, the increase in other assets, and the decrease in other liabilities, all scaled by average total assets. $CFO_{i,t-1}$, $CFO_{i,t}$ and $CFO_{i,t+1}$ stand for cash flow from operating activities in year *t-1*, *t* and *t+1*, respectively. $Delta\_Sales_{i,t}$ is the change in sales, scaled by total assets at the beginning of fiscal year *t*. $PPE_{i,t}$ represents gross value of property, plants, and equipment, scaled by total assets at the beginning of fiscal year *t*.

<Insert Table 8 here>

Table 8 presents the regression estimates. After controlling for accrual quality, the impact of institutional ownership on market risk disclosures still holds and is consistent with the results of the Fama-MacBeth regression.

6. Conclusion

This paper investigates the relationship between institutional ownership and market risk disclosures exploiting textual analysis data. Following Gompers and Metrick (2001) and Ramalingegowda and Yu (2012), we employ the residual ownership to address the concern that firm-specific characteristics may reversely affect institutional ownership. We show that higher total institutional ownership is positively associated with the readability and the consistency of market risk disclosure under Item 7A. In addition, we document that there exists a positive relationship between the readability and short-term independent institutional ownership and that higher long-term independent institutional ownership firms produce consistent market risk disclosures over time. Our findings suggest that the monitoring effect and short-term pressure jointly determine managers' choice on the information content of market risk disclosures. Collectively, institutional ownership improves the information environment of firms.

This paper provides several contributions to institutional ownership literature and risk disclosure literature. Our research is one of the few pioneering studies that explicitly focus on market risk disclosed under Item 7A rather than that under Item 1A. This part of market risk disclosure reveals firms' response to relevant fluctuations in the capital market, which directly influences investors. Further, we bring empirical evidence to support that certain types of institutional investors demand more readable and more consistent market risk disclosures, and institutions have different preferences for information content.

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Appendix A. Market risk disclosure of United Airline for fiscal year 2016

Interest Rates. Our net income (loss) is affected by fluctuations in interest rates (e.g. interest expense on variable rate debt and interest income earned on short-term investments). The Company's policy is to manage interest rate risk through a combination of fixed and variable rate debt. The following table summarizes information related to the Company's interest rate market risk at December 31 (in millions):

	2016	2015
Variable rate debt		
Carrying value of variable rate debt at December 31	$ 2,582	$ 2,345
Impact of 100 basis point increase on projected interest expense for the following year	25	23
Fixed rate debt		
Carrying value of fixed rate debt at December 31	8,185	8,552
Fair value of fixed rate debt at December 31	8,469	9,022
Impact of 100 basis point increase in market rates on fair value	(340)	(369)

A change in market interest rates would also impact interest income earned on our cash, cash equivalents and short-term investments. Assuming our cash, cash equivalents and short-term investments remain at their average 2016 levels, a 100 basis point increase in interest rates would result in a corresponding increase in the Company's interest income of approximately $47 million during 2017.

Commodity Price Risk (Aircraft Fuel). The price level of aircraft fuel can significantly affect the Company's operations, results of operations, financial position and liquidity. Since 2014, the price of jet fuel has declined but remains volatile.

Our operational and financial results can be significantly impacted by changes in the price and availability of aircraft fuel. To provide adequate supplies of fuel, the Company routinely enters into purchase contracts that are customarily indexed to market prices for aircraft fuel, and the Company generally has some ability to cover short-term fuel supply

and infrastructure disruptions at some major demand locations. The price of aircraft fuel has fluctuated substantially in the past several years and in order to lower its exposure to unpredictable increases in the market prices of aircraft fuel, the Company has historically hedged a portion of its planned fuel requirements. As of December 31, 2016, the Company did not have any outstanding fuel hedging contracts. The Company's current strategy is to not enter into transactions to hedge its fuel consumption, although the Company regularly reviews its policy based on market conditions and other factors. The Company's 2017 forecasted fuel consumption is presently approximately four billion gallons, and based on this forecast, a one dollar change in the price of a barrel of crude oil would change the Company's annual fuel expense by approximately $95 million.

Foreign Currency. The Company generates revenues and incurs expenses in numerous foreign currencies. Changes in foreign currency exchange rates impact the Company's results of operations through changes in the dollar value of foreign currency-denominated operating revenues and expenses. Some of the Company's more significant foreign currency exposures include the Canadian dollar, Chinese renminbi, European euro, British pound and Japanese yen. The Company's current strategy is to not enter into transactions to hedge its foreign currency sales, although the Company regularly reviews its policy based on market conditions and other factors. As of December 31, 2016, the Company did not have any foreign currency derivative contracts outstanding. The last of the Company's foreign currency derivatives expired in December 2016.

The result of a uniform 10 percent strengthening in the value of the U.S. dollar from December 31, 2016 levels relative to each of the currencies in which the Company has foreign currency exposure would result in a decrease in pre-tax income of approximately $239 million for the year ending December 31, 2017. This sensitivity analysis was prepared based upon projected 2017 foreign currency-denominated revenues and expenses as of December 31, 2016.

Appendix B. Keywords of topics covered in Item 7A

No.	Keywords
1	fair, value, interest, rates, hypothetical, market, changes, sensitivity, foreign, currency, exchange, analysis
2	interest, rate, credit, debt, outstanding, variable, fixed, term, revolving, based, risk
3	interest, rates, foreign, currency, exchange, change, market, risk, exposed, results, financial, exposure, fluctuations, cash
4	unrealized losses, gains, value, fair, recorded, comprehensive, net, income, foreign, currency, contracts
5	interest, rates, fair, value, market, change, debt, expenses, approximately, decrease, increase, income, impact
6	credit, risk, results, material, accounting, information, consolidated, financial, statements, reporting, management, future, counterparties, derivative
7	investment, activities, principal, primary, preserve, foreign, capital, objective, operations, without, significantly, cash, increasing, liquidity, maximizing
8	gas, natural, contracts, prices, oil, commodity, market, derivative, risk, approximately, fuel, production, purchase
9	fair, value, securities, market, investments, price, common, stock, equity, interest, rate, notes, approximately
10	price, raw, products, market, cost, materials, commodity, material, increase, changes, subject, purchase, supply
11	use, enter, financial, derivative, instruments, interest, rate, trading, risk, manage, exposure, speculative, market, foreign, currency
12	foreign, currency, exchange, dollar, denominated, sales, operations, net, rate, approximately, functional, local
13	rate, interest, swap, fixed, debt, notional, amount, entered, agreements, fair, value, variable, hedge, cash
14	cash, equivalents, securities, investment, portfolio, rate, interest, credit, debt, market, risk, marketable, instruments
15	foreign, currency, contracts, exchange, forward, denominated, hedge, exposure, risk, rate, transactions, cash, hedging, enter

Appendix C. Control variable description

Variable name	Description
Size	The natural logarithm of market value of equity in year *t*-1.
BM	Book to market ratio of the firm in year *t*-1.
Lev	Leverage ratio calculated as book value of debt to book value of assets in year *t*-1.
ForeignSale	The number of foreign sales adjusted by total sales in year *t*-1.
ForeignSeg	The number of foreign segments in year *t*-1.
BusSeg	The number of business segments in year *t*-1.
Coverage	The number of unique analysts providing annual forecasts in year *t*-1.
StdRet	The standard deviation of daily stock returns of the firm over year *t*-1.
LitRisk	A dummy variable that equals to one if the firm is in SIC industries 2833-3836, 3507-3577, 3600-3674, 5200-5961, or 7370-7374, which are industries with high litigation risk, and zero otherwise.
Div	A dummy variable that equals to one if the firm pays dividends in year *t*-1, and zero otherwise.
HasD	A dummy variable that equals to one if the firm uses derivative instruments in year *t*-1, and zero otherwise.
TobinQ	Market value of assets (book value of assets plus market value of common stock less book value of common stock and balance sheet deferred taxes) divided by book value of assets.
Age	The natural logarithm of the number of years a firm is listed on CRSP, measured in year *t*.
ASC718	A dummy variable measured in year *t*. that equals to one if the firm-year is between 2006 and 2016, and zero otherwise.
E-Index	The entrenchment index from Bebchuk, Cohen, and Ferrell (2009), measured in year *t*.

This table provides definitions of the independent variables controlled in the empirical analysis.

Table A1. Annual Fama-MacBeth regressions of institutional ownership on Gompers-Metrick (2001) determinants

		Horizon		*Independence*		*Horizon× Independence*			
	$TOTAL_t$	$LONG_t$	$SHORT_t$	IND_t	DEP_t	$LONGIND_t$	$SHORTIND_t$	$LONGDEP_t$	$SHORTDEP_t$
BM_{t-1}	0.0011	0.0034***	-0.0022*	0.0004	0.0006	0.0031***	-0.0022*	0.0006***	-0.0001
	(0.850)	(4.014)	(-1.860)	(0.284)	(1.459)	(3.588)	(-1.793)	(4.534)	(-0.166)
$Size_t$	0.0682***	0.0293***	0.0395***	0.0498***	0.0165***	0.0181***	0.0309***	0.0092***	0.0058***
	(24.102)	(15.743)	(22.375)	(13.591)	(20.703)	(8.614)	(14.367)	(25.151)	(5.990)
$Volatility_{t-2,t}$	-0.2828***	-0.1393***	-0.1630***	-0.2159***	-0.0778***	-0.1158***	-0.1161***	-0.0325***	-0.0568***
	(-7.432)	(-7.642)	(-4.957)	(-7.679)	(-4.868)	(-7.079)	(-5.868)	(-8.101)	(-3.479)
$Turnover_{-3}$	0.0020***	0.0005***	0.0016***	0.0020***	0.0000	0.0005***	0.0016***	-0.0000	-0.0000
	(7.551)	(5.849)	(7.143)	(8.384)	(0.163)	(6.697)	(7.950)	(-0.325)	(-0.008)
$Price_t$	0.0463***	0.0229***	0.0269***	0.0431***	0.0057***	0.0208***	0.0256***	0.0038***	0.0039***
	(15.711)	(14.187)	(17.770)	(18.057)	(9.359)	(17.305)	(20.950)	(10.780)	(6.421)
$SP500_t$	-0.0792***	-0.0275***	-0.0516***	-0.0989***	0.0210***	-0.0420***	-0.0570***	0.0169***	0.0077***
	(-4.119)	(-2.927)	(-4.438)	(-5.886)	(7.272)	(-5.346)	(-5.695)	(8.789)	(3.493)
$Momentum_{-2,0}$	-0.0547***	-0.0286***	-0.0288***	-0.0449***	-0.0107***	-0.0218***	-0.0249***	-0.0069***	-0.0041***
	(-8.882)	(-8.596)	(-8.693)	(-8.060)	(-9.927)	(-7.298)	(-8.122)	(-10.482)	(-4.384)
$Momentum_{-12,-3}$	-0.0344***	-0.0210***	-0.0150***	-0.0278***	-0.0065***	-0.0171***	-0.0123***	-0.0043***	-0.0025***
	(-9.202)	(-8.505)	(-8.109)	(-7.659)	(-10.248)	(-7.421)	(-7.423)	(-12.509)	(-3.500)
Age_t	0.0002	0.0168***	-0.0156***	-0.0067***	0.0065***	0.0099***	-0.0162***	0.0066***	0.0004
	(0.081)	(14.929)	(-6.606)	(-2.995)	(7.261)	(12.003)	(-7.004)	(13.026)	(0.789)
$Yield_{t-1}$	-0.1168**	0.0500*	-0.1694***	-0.2096***	0.0855***	-0.0144	-0.2046***	0.0607***	0.0291**
	(-2.175)	(1.800)	(-4.505)	(-4.381)	(3.266)	(-0.805)	(-5.375)	(3.342)	(2.164)
Constant	-0.0286***	-0.0303***	0.0076	0.0104	-0.0319***	0.0040	0.0178***	-0.0251***	0.0018
	(-3.142)	(-6.481)	(1.149)	(1.210)	(-9.030)	(0.827)	(2.850)	(-12.554)	(0.888)
N	110,758	104,274	108,199	108,141	106,613	99,617	106,180	99,747	93,235
Adj. R^2	0.571	0.472	0.469	0.482	0.463	0.329	0.412	0.428	0.18

This table reports the results of the Fama-MacBeth regression of different types of institutional ownership on ten Gompers-Metrick (2001) determinants. Following Ramalingegowda and Yu (2012), we mitigate the endogeneity concern use residuals of these regressions to construct the measure of residual ownership and omit firm subscripts *i* for brevity. $TOTAL_t$ is the total institutional ownership at the end of year *t*. $LONG_t$ and $SHORT_t$ represent the ownership by long-term and short-term institutional investors, respectively, at the end of year *t*. IND_t and DEP_t represent the ownership by independent and dependent institutional investors, respectively, at the end of year *t*. $LONGIND_t$, $SHORTIND_t$, $LONGDEP_t$, $SHORTDEP_t$ represent the ownership by long-term independent institutional investors, short-term independent institutional investors, long-term dependent institutional investors, and short-term dependent institutional investors at the end of year *t*, respectively. BM_{t-1} is book to market ratio at the end of year *t*-1. $Size_t$ is the natural logarithm of market value of equity at the end of year *t*. $Volatility_{t-2,t}$ is the standard deviation of monthly returns over the previous two years. $Turnover_{-3}$ is monthly volume adjusted by the number of shares outstanding, measured for three months prior to the end of year *t*. $Price_t$ is the natural logarithm of share price measured at the end of year *t*. $SP500_t$ is a dummy variable that is equal to 1 if the firm is included in the S&P 500 index the end of year *t*, and 0 otherwise. $Momentum_{-2,0}$ is firm's three-month gross return prior to the end of year *t*. $Momentum_{-12,3}$ is firm's nine-month gross return ending three months prior to the end of year *t*. Age_t is the natural logarithm of the number of years a firm is listed on CRSP. $Yield_{t-1}$ is the dividend adjusted by market value at the end of year *t*-1. We report *t*-statistic in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% level, respectively.

Table 1. Descriptive statistics

	N	Mean	Std Dev	P25	Median	P75
$FogIndex_t$	17,726	9.6320	1.5817	8.4000	9.6000	10.4000
$SimScore_t$	17,726	0.8163	0.2055	0.7684	0.8909	0.9501
$rTOTAL_{t-1}$	17,726	0.1459	0.2067	0.0039	0.1569	0.2966
$rLONG_{t-1}$	17,726	0.0652	0.1227	-0.0236	0.0537	0.1468
$rSHORT_{t-1}$	17,726	0.0609	0.1370	-0.0386	0.0584	0.1548
$rIND_{t-1}$	17,726	0.1714	0.1877	0.0405	0.1860	0.3104
$rDEP_{t-1}$	17,726	-0.0246	0.0430	-0.0527	-0.0304	-0.0018
$rLONGIND_{t-1}$	17,726	0.0755	0.1100	-0.0055	0.0644	0.1458
$rSHORTIND_{t-1}$	17,726	0.0810	0.1306	-0.0156	0.0801	0.1726
$rLONGDEP_{t-1}$	17,726	-0.0099	0.0275	-0.0282	-0.0141	0.0035
$rSHORTDEP_{t-1}$	17,726	-0.0194	0.0268	-0.0363	-0.0244	-0.0090
$Size_{t-1}$	17,726	6.4312	1.7263	5.2669	6.3713	7.5390
BM_{t-1}	17,726	0.3029	0.5377	0.0885	0.2536	0.4932
Lev_{t-1}	17,726	0.3963	1.1115	0.0020	0.1158	0.3652
$ForeignSale_{t-1}$	17,726	0.0131	0.0504	0.0000	0.0000	0.0169
$ForeignSeg_{t-1}$	17,726	4.8231	6.6551	0.0000	3.0000	7.0000
$BusSeg_{t-1}$	17,726	5.9467	4.7673	3.0000	3.0000	9.0000
$Coverage_{t-1}$	17,726	6.1778	8.8005	0.0000	2.0000	9.0000
$StdRet_{t-1}$	17,726	0.0287	0.0156	0.0181	0.0250	0.0351
$LitRisk_{t-1}$	17,726	0.3961	0.4891	0.0000	0.0000	1.0000
Div_{t-1}	17,726	0.3693	0.4826	0.0000	0.0000	1.0000
$HasD_{t-1}$	17,726	0.3375	0.4729	0.0000	0.0000	1.0000
$TobinQ_{t-1}$	17,726	2.1208	1.6541	1.1798	1.6010	2.4307
Age_t	17,726	5.0604	0.8992	4.5433	5.1475	5.6630
$ASC718_t$	17,726	0.7566	0.4292	1.0000	1.0000	1.0000
$E\text{-}Index_t$	17,726	1.5788	1.9620	0.0000	0.0000	3.0000

This table reports descriptive statistics for the sample. There are 17,726 firm-year observations. Control variable definitions are in Appendix C.

Table 2. Pearson correlations

Panel A: Dependent variables and key explanatory variables

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
$FogIndex_t$ (1)										
$SimScore_t$ (2)	0.0402**									
$rTOTAL_{t-1}$ (3)	-0.0861**	0.0279**								
$rLONG_{t-1}$ (4)	-0.0614**	-0.0319**	0.7586**							
$rSHORT_{t-1}$ (5)	-0.0750**	0.0654**	0.8106**	0.2395**						
$rIND_{t-1}$ (6)	-0.0776**	0.0451**	0.9778**	0.7197**	0.8094**					
$rDEP_{t-1}$ (7)	-0.0671**	-0.0607**	0.4911**	0.4724**	0.3286**	0.3038**				
$rLONGIND_{t-1}$ (8)	-0.0520**	-0.0196**	0.7341**	0.9737**	0.2229**	0.7293**	0.3192**			
$rSHORTIND_{t-1}$ (9)	-0.0677**	0.0762**	0.7799**	0.2081**	0.9785**	0.8116**	0.1815**	0.1983**		
$rLONGDEP_{t-1}$ (10)	-0.0623**	-0.0672**	0.4417**	0.5371**	0.1929**	0.2986**	0.7947**	0.3392**	0.1535**	
$rSHORTDEP_{t-1}$ (11)	-0.0475**	-0.0330**	0.3438**	0.2067**	0.3402**	0.1941**	0.7695**	0.1711**	0.1450**	0.2392**

Panel B: Control variables

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
$Size_{t-1}$	0.0609**	0.0767**	0.0034	-0.0713**	0.0315**	0.0790**	-0.3028**	-0.0229**	0.1067**	-0.2023**	-0.3070**
BM_{t-1}	0.0275**	0.0140	0.0301**	0.0887**	-0.0243**	0.0029	0.1218**	0.0730**	-0.0513**	0.0882**	0.1058**
Lev_{t-1}	0.0001	-0.0225**	0.0722**	0.0762**	0.0452**	0.0528**	0.1018**	0.0664**	0.0259**	0.0706**	0.0966**
$ForeignSale_{t-1}$	0.0170**	0.0292**	-0.0391**	-0.0601**	-0.0150**	-0.0127	-0.1253**	-0.0390**	0.0087	-0.1060**	-0.1090**
$ForeignSeg_{t-1}$	-0.0296**	0.0413**	0.0214**	0.0071	0.0212**	0.0366**	-0.0460**	0.0203**	0.0318**	-0.0412**	-0.0308**
$BusSeg_{t-1}$	0.0636**	0.0093	-0.0071	0.0088	-0.0273**	-0.0033	-0.0201**	0.0152**	-0.0216**	-0.0212**	-0.0272**
$Coverage_{t-1}$	0.0562**	0.0410**	0.0117	-0.0482**	0.0425**	0.0495**	-0.1426**	-0.0271**	0.0855**	-0.0831**	-0.1526**
$StdRet_{t-1}$	-0.0127	-0.1021**	-0.0612**	0.0069	-0.0641**	-0.1188**	0.2361**	-0.0299**	-0.1189**	0.1672**	0.2579**
$LitRisk_{t-1}$	-0.0071	-0.0019	-0.0342**	-0.0533**	0.0056	-0.0345**	0.0028	-0.0569**	0.0058	0.0088	0.0208**
Div_{t-1}	0.0945**	0.0318**	-0.1085**	-0.0479**	-0.1378**	-0.0882**	-0.1379**	-0.0303**	-0.1126**	-0.1006**	-0.1525**
$HasD_{t-1}$	0.0468**	0.0447**	0.0239**	-0.0109	0.0289**	0.0504**	-0.1033**	0.0091	0.0544**	-0.0782**	-0.1027**
$TobinQ_{t-1}$	0.0178**	0.0146	-0.1613**	-0.2026**	-0.0624**	-0.1362**	-0.1648**	-0.1884**	-0.0380**	-0.1316**	-0.1200**
Age_t	0.0718**	0.0503**	-0.0473**	-0.0410**	-0.0478**	-0.0202**	-0.1346**	-0.0118	-0.0247**	-0.1405**	-0.1131**
$ASC718_t$	-0.0017	0.2200**	0.1415**	-0.1039**	0.2888**	0.1924**	-0.1582**	-0.0484**	0.3028**	-0.2624**	0.0209**
$E\text{-}Index_t$	0.0181**	0.0817**	0.1916**	0.1450**	0.1357**	0.2147**	-0.0121	0.1442**	0.1746**	0.0838**	-0.1254**

This table reports the Pearson correlation coefficients of the variables in Eq. 2. *, **, and *** indicate significance at the 10%, 5%, and 1% level, respectively. All control variables are defined in Appendix C.

Table 3. The relationship between institutional ownership and the readability

	Dependent variable: FogIndex			
	(1)	(2)	(3)	(4)
$rTOTAL_{t-1}$	-0.4790**			
	(-2.381)			
$rLONG_{t-1}$		-0.3439		
		(-1.275)		
$rSHORT_{t-1}$		-0.6021**		
		(-2.201)		
$rIND_{t-1}$			-0.5394**	
			(-2.276)	
$rDEP_{t-1}$			-0.0207	
			(-0.023)	
$rLONGIND_{t-1}$				-0.4601
				(-1.440)
$rSHORTIND_{t-1}$				-0.6524**
				(-2.103)
$rLONGDEP_{t-1}$				0.5336
				(0.410)
$rSHORTDEP_{t-1}$				-0.3572
				(-0.306)
$Size_{t-1}$	0.1258***	0.1218***	0.1315***	0.1268***
	(3.114)	(2.995)	(3.260)	(2.989)
BM_{t-1}	0.1493**	0.1477**	0.1578**	0.1406**
	(2.184)	(2.144)	(2.303)	(1.973)
Lev_{t-1}	-0.0388	-0.0426	-0.0383	-0.0550
	(-1.053)	(-1.153)	(-1.041)	(-1.381)
$ForeignSale_{t-1}$	0.4019	0.4302	0.4013	0.4214
	(0.666)	(0.712)	(0.667)	(0.695)
$ForeignSeg_{t-1}$	-0.0056	-0.0056	-0.0057	-0.0056
	(-0.782)	(-0.788)	(-0.789)	(-0.787)
$BusSeg_{t-1}$	0.0196*	0.0196*	0.0194*	0.0186*
	(1.823)	(1.826)	(1.795)	(1.694)
$Coverage_{t-1}$	0.0064	0.0067	0.0061	0.0064
	(1.169)	(1.211)	(1.114)	(1.147)
$StdRet_{t-1}$	4.3841*	4.8175*	4.0705	4.2461
	(1.762)	(1.932)	(1.587)	(1.529)
$LitRisk_{t-1}$	0.3074**	0.3049**	0.3144**	0.3362**
	(2.449)	(2.416)	(2.495)	(2.574)
Div_{t-1}	0.2445***	0.2439***	0.2442***	0.2530***
	(3.251)	(3.218)	(3.243)	(3.243)
$HasD_{t-1}$	0.1191	0.1220	0.1198	0.1253
	(1.554)	(1.589)	(1.558)	(1.616)
$TobinQ_{t-1}$	0.0015	0.0018	0.0011	-0.0099
	(0.059)	(0.072)	(0.042)	(-0.415)
Age_t	0.1709***	0.1715***	0.1698***	0.1727***
	(2.790)	(2.795)	(2.759)	(2.747)
$ASC718_t$	-0.4282**	-0.3933**	-0.4552**	-0.4565**
	(-2.268)	(-2.033)	(-2.422)	(-2.203)
$E\text{-}Index_t$	-0.0346	-0.0353	-0.0358	-0.0378*
	(-1.503)	(-1.532)	(-1.603)	(-1.672)
Constant	7.9585***	7.9385***	7.9921***	8.1446***
	(10.665)	(10.645)	(10.717)	(10.721)
Year FE	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes
N	17,726	17,726	17,726	17,726
Adj. R^2	0.053	0.053	0.053	0.056

This table reports the results of regressions of disclosure features on institutional ownership and other control variables. Year fixed effects and industry fixed effects are included. The sample comprises 17,726 firm-years from 2002 to 2016. The dependent variable is Fog Index. We report t-statistic in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% level, respectively. All control variables are defined in Appendix C.

Table 4. The relationship between institutional ownership and the consistency

	Dependent variable: SimScore			
	(1)	(2)	(3)	(4)
$rTOTAL_{t-1}$	0.0258**			
	(2.329)			
$rLONG_{t-1}$		0.0299		
		(1.642)		
$rSHORT_{t-1}$		0.0211		
		(1.363)		
$rIND_{t-1}$			0.0277**	
			(2.189)	
$rDEP_{t-1}$			-0.0120	
			(-0.225)	
$rLONGIND_{t-1}$				0.0399*
				(1.954)
$rSHORTIND_{t-1}$				0.0148
				(0.891)
$rLONGDEP_{t-1}$				-0.0998
				(-1.134)
$rSHORTDEP_{t-1}$				0.0648
				(0.788)
$Size_{t-1}$	0.0032	0.0031	0.0025	0.0017
	(1.532)	(1.502)	(1.210)	(0.811)
BM_{t-1}	0.0193***	0.0188***	0.0188***	0.0172***
	(4.581)	(4.472)	(4.442)	(4.054)
Lev_{t-1}	0.0012	0.0013	0.0014	0.0004
	(0.667)	(0.747)	(0.792)	(0.242)
$ForeignSale_{t-1}$	-0.0228	-0.0227	-0.0230	-0.0202
	(-0.621)	(-0.620)	(-0.625)	(-0.545)
$ForeignSeg_{t-1}$	0.0008**	0.0008**	0.0008**	0.0007**
	(2.184)	(2.148)	(2.162)	(1.983)
$BusSeg_{t-1}$	0.0001	0.0001	0.0001	0.0001
	(0.138)	(0.117)	(0.152)	(0.313)
$Coverage_{t-1}$	0.0002	0.0002	0.0002	0.0003
	(0.795)	(0.818)	(0.813)	(0.955)
$StdRet_{t-1}$	-0.3012	-0.3215	-0.3419*	-0.3050
	(-1.499)	(-1.599)	(-1.688)	(-1.476)
$LitRisk_{t-1}$	0.0179**	0.0184**	0.0181**	0.0175**
	(2.266)	(2.332)	(2.294)	(2.208)
Div_{t-1}	0.0062	0.0062	0.0063	0.0060
	(1.307)	(1.288)	(1.309)	(1.243)
$HasD_{t-1}$	-0.0039	-0.0038	-0.0036	-0.0036
	(-0.861)	(-0.848)	(-0.809)	(-0.807)
$TobinQ_{t-1}$	-0.0004	-0.0004	-0.0004	-0.0005
	(-0.250)	(-0.249)	(-0.261)	(-0.327)
Age_t	-0.0077**	-0.0077**	-0.0077**	-0.0074**
	(-2.343)	(-2.341)	(-2.348)	(-2.254)
$ASC718_t$	0.2844***	0.2810***	0.2830***	0.3009***
	(12.931)	(12.661)	(12.654)	(12.175)
$E\text{-}Index_t$	0.0019	0.0019	0.0021*	0.0023*
	(1.584)	(1.544)	(1.697)	(1.836)
Constant	0.5180***	0.5232***	0.5213***	0.5064***
	(9.772)	(9.865)	(9.822)	(9.097)
Year FE	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes
N	17,726	17,726	17,726	17,726
Adj. R^2	0.111	0.110	0.111	0.108

This table reports the results of regressions of disclosure features on institutional ownership and other control variables. Year fixed effects and industry fixed effects are included. The sample comprises 17,726 firm-years from 2002 to 2016. The dependent variable is Similarity Score. We report *t*-statistic in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% level, respectively. All control variables are defined in Appendix C.

Table 5. Institutional investors' preference for specific topics disclosed in Item7A

	rLONGIND			*rSHORTIND*			*rLONGDEP*			*rSHORTDEP*		
Topic	Mean(1)	Mean(0)	Diff	Mean(1)	Mean(0)	Diff	Mean(1)	Mean(0)	Diff	Mean(1)	Mean(0)	Diff
1	0.0754	0.0745	-0.0009	0.0789	0.0904	0.0115***	-0.0138	-0.0102	0.0036***	-0.0228	-0.0177	0.0051***
			(-0.4483)			(4.8533)			(7.1827)			(9.9247)
2	0.0779	0.0724	-0.0056***	0.0918	0.0844	-0.0075***	-0.0101	-0.0118	-0.0017***	-0.0174	-0.0201	-0.0027***
			(-3.2326)			(-3.6223)			(-3.9278)			(-6.0051)
3	0.0757	0.0734	-0.0023	0.0870	0.0884	0.0013	-0.0098	-0.0129	-0.0031***	-0.0186	-0.0194	-0.0009*
			(-1.3487)			(0.6527)			(-7.0633)			(-1.9155)
4	0.0748	0.0747	-0.0001	0.0928	0.0859	-0.0069***	-0.0125	-0.0106	0.0019***	-0.0201	-0.0186	0.0015***
			(-0.0312)			(-2.8777)			(3.8063)			(2.9717)
5	0.0737	0.0757	0.0020	0.0906	0.0850	-0.0057***	-0.0104	-0.0116	-0.0012***	-0.0181	-0.0196	-0.0015***
			1.1472			(-2.7704)			(-2.8161)			(-3.4540)
6	0.0714	0.0753	0.0038	0.0849	0.0880	0.0032	-0.0119	-0.0109	0.0010	-0.0207	-0.0186	0.0021***
			(1.5744)			(1.0792)			(1.6036)			(3.3042)
7	0.0667	0.0760	0.0093***	0.0916	0.0870	-0.0047	-0.0100	-0.0112	-0.0013**	-0.0172	-0.0192	-0.0020***
			(3.7408)			(-1.5648)			(-2.0387)			(-3.0947)
8	0.0635	0.0763	0.0129***	0.0771	0.0891	0.0120***	-0.0140	-0.0107	0.0034***	-0.0227	-0.0184	0.0043***
			(4.9556)			(3.8587)			(5.1483)			(6.5007)
9	0.0763	0.0744	-0.0019	0.0898	0.0870	-0.0028	-0.0124	-0.0107	0.0017***	-0.0192	-0.0189	0.0003
			(-0.9088)			(-1.1067)			(3.1378)			(0.5655)
10	0.0741	0.0749	0.0009	0.0846	0.0884	0.0038	-0.0110	-0.0111	-0.0001	-0.0191	-0.0189	0.0002
			0.4100			(1.5165)			(-0.1646)			(0.3534)
11	0.0711	0.0769	0.0058***	0.0869	0.0880	0.0011	-0.0114	-0.0109	0.0005	-0.0197	-0.0185	0.0012***
			(3.3153)			(0.5107)			(1.0656)			(2.5839)
12	0.0753	0.0744	-0.0009	0.0945	0.0828	-0.0116***	-0.0111	-0.0110	0.0001	-0.0188	-0.0190	-0.0002
			(-0.5015)			(-5.6175)			(0.1600)			(-0.3960)
13	0.0797	0.0734	-0.0063***	0.0946	0.0857	-0.0089***	-0.0105	-0.0112	-0.0007	-0.0190	-0.0189	0.0001
			(-2.9845)			(-3.5361)			(-1.2764)			0.2047
14	0.0692	0.0773	0.0081***	0.0883	0.0873	-0.0010	-0.0107	-0.0112	-0.0005	-0.0185	-0.0191	-0.0006
			(4.4663)			(-0.4762)			(-1.0507)			(-1.2653)
15	0.0807	0.0716	-0.0091***	0.0913	0.0857	-0.0056***	-0.0123	-0.0104	0.0019***	-0.0204	-0.0182	0.0022***
			(-5.0699)			(-2.6151)			(4.2553)			(4.7498)

This table presents the results of the t-test on the sample from 2002 to 2016. We utilize the LDA model to extract 15 most commonly disclosed topics in Item 7A and the corresponding keywords for each topic. Keywords for each extracted topic are reported in Appendix B. Mean(1) stands for the average institutional ownership of a firm that discloses certain topics. Mean(0) stands for the average institutional ownership of a firm that does not disclose certain topics. Diff is equal to Mean(0) minus Mean(1). We report t-statistic in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% level, respectively.

Table 6. The Fama-MacBeth regression results for institutional ownership and the readability

	Dependent variable: FogIndex			
	(1)	(2)	(3)	(4)
$rTOTAL_{t-1}$	-0.5675***			
	(-4.499)			
$rLONG_{t-1}$		-0.3651		
		(-1.719)		
$rSHORT_{t-1}$		-0.7360***		
		(-10.237)		
$rIND_{t-1}$			-0.6596***	
			(-5.923)	
$rDEP_{t-1}$			0.4004	
			(0.490)	
$rLONGIND_{t-1}$				-0.5816**
				(-2.913)
$rSHORTIND_{t-1}$				-0.8061***
				(-12.117)
$rLONGDEP_{t-1}$				2.0824*
				(1.786)
$rSHORTDEP_{t-1}$				-1.3447
				(-1.249)
$Size_{t-1}$	0.1472***	0.1427***	0.1541***	0.1467***
	(7.758)	(7.466)	(8.102)	(9.812)
BM_{t-1}	0.2192***	0.2183***	0.2270***	0.2347***
	(4.622)	(4.620)	(4.916)	(3.683)
Lev_{t-1}	-0.0376*	-0.0438**	-0.0360	-0.0427*
	(-1.892)	(-2.167)	(-1.638)	(-1.856)
$ForeignSale_{t-1}$	1.7477	1.7458	1.6942	1.8822
	(1.355)	(1.382)	(1.362)	(1.374)
$ForeignSeg_{t-1}$	-0.0086**	-0.0088**	-0.0088**	-0.0092**
	(-2.634)	(-2.582)	(-2.584)	(-2.196)
$BusSeg_{t-1}$	0.0194***	0.0195***	0.0189***	0.0183***
	(6.679)	(6.626)	(5.901)	(5.350)
$Coverage_{t-1}$	0.0024	0.0026	0.0024	0.0025
	(0.650)	(0.675)	(0.672)	(0.646)
$StdRet_{t-1}$	5.3438**	5.6678**	4.9728**	5.6970**
	(2.533)	(2.668)	(2.312)	(2.291)
$LitRisk_{t-1}$	0.1335***	0.1317***	0.1406***	0.1319***
	(3.195)	(3.303)	(3.379)	(4.352)
Div_{t-1}	0.2678***	0.2659***	0.2663***	0.2688***
	(8.002)	(7.518)	(7.887)	(6.783)
$HasD_{t-1}$	0.2393**	0.2421**	0.2388**	0.2532**
	(2.908)	(2.895)	(2.964)	(2.957)
$TobinQ_{t-1}$	-0.0212	-0.0207	-0.0193	-0.0213
	(-1.600)	(-1.527)	(-1.416)	(-1.522)
Age_t	0.1756***	0.1767***	0.1780***	0.1874***
	(5.862)	(5.800)	(6.257)	(6.279)
$E\text{-}Index_t$	-0.0321**	-0.0333**	-0.0337**	-0.0393**
	(-2.276)	(-2.390)	(-2.404)	(-2.898)
Constant	7.8931***	7.8893***	7.8881***	7.8584***
	(43.461)	(42.186)	(44.516)	(41.127)
N	17,726	17,726	17,726	17,726
Adj. R^2	0.045	0.046	0.047	0.050

This table reports the results of the Fama-MacBeth regressions of disclosure features on institutional ownership and other control variables. The sample comprises 17,726 firm-years from 2002 to 2016. The dependent variable is Fog Index. We report *t*-statistic in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% level, respectively. All control variables are defined in Appendix C.

Table 7. The Fama-MacBeth regression results for institutional ownership and the consistency

	Dependent variable: SimScore			
	(1)	(2)	(3)	(4)
$rTOTAL_{t-1}$	0.0371***			
	(3.669)			
$rLONG_{t-1}$		0.0620***		
		(3.851)		
$rSHORT_{t-1}$		0.0152		
		(1.071)		
$rIND_{t-1}$			0.0328**	
			(2.370)	
$rDEP_{t-1}$			0.0718	
			(0.803)	
$rLONGIND_{t-1}$				0.0717***
				(4.177)
$rSHORTIND_{t-1}$				0.0030
				(0.160)
$rLONGDEP_{t-1}$				-0.0062
				(-0.064)
$rSHORTDEP_{t-1}$				0.2003
				(0.999)
$Size_{t-1}$	-0.0014	-0.0017	-0.0016	-0.0009
	(-0.610)	(-0.588)	(-0.722)	(-0.399)
BM_{t-1}	0.0171***	0.0154**	0.0163**	0.0123*
	(3.548)	(2.942)	(2.786)	(1.952)
Lev_{t-1}	-0.0038**	-0.0040**	-0.0031*	-0.0045**
	(-2.383)	(-2.476)	(-1.989)	(-2.470)
$ForeignSale_{t-1}$	-0.0438	-0.0480	-0.0482	-0.0354
	(-0.830)	(-0.895)	(-0.901)	(-0.644)
$ForeignSeg_{t-1}$	0.0014***	0.0014***	0.0015***	0.0014***
	(4.681)	(4.668)	(4.630)	(4.697)
$BusSeg_{t-1}$	0.0006	0.0007	0.0007	0.0006*
	(1.491)	(1.344)	(1.478)	(1.787)
$Coverage_{t-1}$	0.0001	0.0001	0.0001	0.0002
	(0.268)	(0.589)	(0.445)	(0.836)
$StdRet_{t-1}$	-0.7696***	-0.7754***	-0.8100***	-0.7219***
	(-4.007)	(-4.039)	(-4.059)	(-3.101)
$LitRisk_{t-1}$	0.0112**	0.0105**	0.0116***	0.0084*
	(2.967)	(2.781)	(3.103)	(2.000)
Div_{t-1}	0.0054	0.0042	0.0049	0.0054
	(1.682)	(1.376)	(1.727)	(1.650)
$HasD_{t-1}$	-0.0015	-0.0013	-0.0020	-0.0026
	(-0.419)	(-0.353)	(-0.544)	(-0.680)
$TobinQ_{t-1}$	0.0022	0.0022	0.0023	0.0019
	(1.510)	(1.545)	(1.480)	(1.459)
Age_t	-0.0106	-0.0102	-0.0100	-0.0112
	(-1.408)	(-1.404)	(-1.447)	(-1.328)
$E\text{-}Index_t$	0.0046	0.0044	0.0046	0.0045
	(1.305)	(1.243)	(1.358)	(1.355)
Constant	0.8387***	0.8395***	0.8386***	0.8440***
	(30.335)	(29.502)	(33.361)	(29.677)
N	17,726	17,726	17,726	17,726
Adj. R^2	0.024	0.025	0.026	0.029

This table reports the results of the Fama-MacBeth regressions of disclosure features on institutional ownership and other control variables. The sample comprises 17,726 firm-years from 2002 to 2016. The dependent variable is Similarity Score. We report t-statistic in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% level, respectively. All control variables are defined in Appendix C.

Table 8. The impact of firms' overall information environment on market risk disclosures

	(1)	(2)	(3)	(4)
	Panel A: Dependent variable is FogIndex			
$rTOTAL_{t-1}$	-0.5199***			
	(-4.102)			
$rLONG_{t-1}$		-0.2893		
		(-1.504)		
$rSHORT_{t-1}$		-0.3799**		
		(-2.138)		
$rIND_{t-1}$			-0.4482***	
			(-3.137)	
$rDEP_{t-1}$			-0.9177	
			(-1.590)	
$rLONGIND_{t-1}$				-0.3764*
				(-1.747)
$rSHORTIND_{t-1}$				-0.4924***
				(-2.579)
$rLONGDEP_{t-1}$				-0.9658
				(-1.154)
$rSHORTDEP_{t-1}$				-0.6108
				(-0.689)
$WCAccrual_{t-1}$	0.4580**	0.4854**	0.4760**	0.5123**
	(2.332)	(2.282)	(2.422)	(2.465)
Year fixed effect	Yes	Yes	Yes	Yes
Industry fixed effect	Yes	Yes	Yes	Yes
Other controls	Yes	Yes	Yes	Yes
N	17,128	17,128	17,128	17,128
Adj. R^2	0.052	0.047	0.050	0.056
	Panel B: Dependent variable is SimScore			
$rTOTAL_{t-1}$	0.0256**			
	(2.298)			
$rLONG_{t-1}$		0.0292		
		(1.604)		
$rSHORT_{t-1}$		0.0205		
		(1.324)		
$rIND_{t-1}$			0.0263**	
			(2.097)	
$rDEP_{t-1}$			-0.0043	
			(-0.082)	
$rLONGIND_{t-1}$				0.0378*
				(1.866)
$rSHORTIND_{t-1}$				0.0130
				(0.790)
$rLONGDEP_{t-1}$				-0.0859
				(-0.994)
$rSHORTDEP_{t-1}$				0.0699
				(0.887)
$WCAccrual_{t-1}$	-0.0496**	-0.0487**	-0.0522**	-0.0465**
	(-2.321)	(-2.275)	(-2.428)	(-2.186)
Year fixed effect	Yes	Yes	Yes	Yes
Industry fixed effect	Yes	Yes	Yes	Yes
Other controls	Yes	Yes	Yes	Yes
N	17,128	17,128	17,128	17,128
Adj. R^2	0.111	0.110	0.111	0.108

This table reports the results of the fixed effects regressions of disclosure features on institutional ownership with considering the impact of firms' overall information environment. The sample comprises 17,128 firm-years from 2002 to 2016. The dependent variable is Fog Index and Similarity Score, respectively. We report t-statistic in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% level, respectively. Other control variables are defined in Appendix C.