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Disclosure quality ratings by the stock exchanges: evidence from China

Shuo Yang
Department of Accounting and Finance, College of Business and Public Management, Kean University, Union, New Jersey, USA, and
Jingran Zhao
Faculty of Business, School of Accounting and Finance, The Hong Kong Polytechnic University, Kowloon, Hong Kong

Abstract

Purpose – The stock exchanges in China assess firms' disclosure quality annually according to a grading sheet. The grading sheet evaluates mandatory and voluntary disclosures, investor relations, and compliance with and violations of securities laws; some items are publicly observable, others are either not publicly observable or require managerial discretionary judgement. This paper examines whether the ratings simply summarize easily observable public signals of disclosure quality or offer information less accessible to investors.

Design/methodology/approach – We regress raw ratings on public signals on the grading sheet and obtain the residuals as excess ratings. We examine the association between excess ratings and market-based and accounting-based information quality measures to verify that excess ratings are not noises. We further examine whether the market response to the announcement of ratings is associated with excess ratings and whether excess ratings are predictive of future outcomes.

Findings – We find that the market response to the announcement of the assessment result is not related to excess ratings. Excess ratings are associated with several market-based and accounting-based information quality measures, suggesting that they are not noises. Excess ratings are predictive of an array of outcomes in the following year, including institutional ownership, analyst coverage, analyst forecast accuracy and dispersion, and securities enforcement.

Originality/value – We carefully examine the items on the grading sheet and obtain excess ratings orthogonal to easily observable public signals. We find that excess ratings contain private information about firms' fundamentals and compliance with securities laws which investors cannot easily observe or access, but investors ignore this information.

Keywords Disclosure quality rating, Stock exchange, China, Enforcement, Private information

Paper type Research paper

1. Introduction

This paper examines firms' disclosure quality ratings by the stock exchanges in China. The stock exchanges in Shenzhen and Shanghai conduct disclosure quality assessments annually and give firms A, B, C, or D ratings signifying outstanding, good, pass, or fail. The ratings are based on a grading sheet that evaluates voluntary and mandatory disclosures, investor relations, and compliance with or violations of security laws. While some items are publicly observable and objective, other items are either not publicly observable or require insider information and managers' discretionary judgement. The extant literature examines disclosure quality ratings that are provided by analysts or third parties (Lang & Lundholm, 1993, 1996; Healy, Hutton, & Palepu, 1999; Hope, 2003) or constructed by researchers (Botosan, 1997; Cheung, Jiang, & Tan, 2010), but disclosure quality ratings by securities regulators receive little attention. Prior studies that utilize the ratings by the stock exchanges in China use them

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directly as a proxy for disclosure quality without examining how the ratings are constructed or verifying whether the ratings reflect disclosure quality (Liu & Sun, 2010; Yang, Ho, Shen, & Shi, 2020; Lin, Lin, & Lei, 2020; Hu, Liu, Sohn, & Yuen, 2021; Li, Song, Wang, & Zheng, 2022; Ye, Zeng, Tao, & Yun, 2023; Chen, Ho, Li, & Yu, 2023). It is unclear whether the ratings simply summarize other public signals of disclosure quality. China's government uses a wide range of rules and regulations to steer the economy (Lennox & Wu, 2022), and disclosure quality ratings by securities regulators might convey significant private information not accessible to investors at low costs but relevant to the market. This paper focuses on excess disclosure quality ratings that are orthogonal to easily observable public signals of disclosure quality and firm characteristics, and investigates whether the market response to the announcement of the assessment result is related to excess ratings, whether excess ratings are associated with contemporaneous market-based and accounting-based information quality measures, and whether excess ratings are predictive of future outcomes.

This paper examines disclosure quality ratings for A share (i.e. RMB-denominated) firms listed in Shenzhen and Shanghai between 2016 and 2022. I regress raw ratings in numerical form (4 for A, 3 for B, 2 for C, and 1 for D) on the most common public signals of disclosure quality and firm characteristics on and off the grading sheet. The result suggests that disciplinary actions from the stock exchanges, enforcement actions from the main securities regulator, the China Securities Regulatory Commission (CSRC), "special treatment" status for financial irregularities, comment letters on annual reports, ad-hoc comment letters on non-periodic filings, qualified audit opinions, annual report amendments, material internal control weaknesses, late provision of annual reports, big earnings shortfalls relative to management forecasts, firm age, leverage, losses, accruals, stock return volatility, the number of stock trading suspensions, and equity issuance are negatively associated with raw ratings. The provision of Environmental, Social and Governance (ESG) or Corporate Social Responsibility (CSR) reports, dividends, firm size, accounting performance, market-to-book ratio, stock returns, bid auditors, board independence, state ownership, cross-listings, institutional ownership, and analyst coverage are positively associated with raw ratings. That is, bigger, better performing, and better monitored firms that are compliant with security laws receive better ratings. The residuals from the regression, or excess disclosure quality ratings, either capture private information possessed by managers or represent noises [1]. There is no association between the market response to the announcement of the assessment result and excess ratings. Investors might not pay sufficient attention to the announcement which is released by the stock exchanges for all firms together instead of by firms individually, or they do not believe that excess ratings contain news.

Next, to examine whether excess ratings capture some dimensions of disclosure quality, I explore their association with market-based information quality measures over the same assessment period, which is May 1 (July 1) of year t to April 30 (June 30) of year t+1 for Shenzhen (Shanghai). Excess ratings are negatively associated with the percentage of zero-return trading days, suggesting that firms with higher excess ratings release a larger amount of price-impactful news to the market and reduce the number of zero-return trading days proportionately. Excess ratings are negatively associated with stock crash risk, suggesting that firms with higher excess ratings are less likely to hoard bad news and cause stock prices to suddenly crash later when bad news can no longer be withheld. Excess ratings are not related to the Amihud (2002)'s illiquidity measure. However, several signals of poor disclosure quality (e.g. disciplinary actions, comment letters, annual report amendments, and material internal control weaknesses) are negatively associated with illiquidity, suggesting that the illiquidity measure might not unambiguously reflect information quality in China.

I also examine the association between excess ratings and contemporaneous accounting-based information quality measures. Although the stock exchanges do not directly evaluate financial statements, excess ratings can still be related to favorable earnings attributes if both capture the same underlying construct for disclosure quality. I find that excess ratings are associated with more persistent earnings and higher accruals quality. Excess ratings are

associated with lower conservatism, consistent with prior findings that Chinese firms do not consider conservative financing reporting a desirable earnings attribute (Ball, Robin, & Wu, 2000; Lu, Shin, & Zhang, 2023). The stock exchanges appear to treat conservatism as a reporting bias of which firms should demonstrate less. Collectively, the findings are inconsistent with the idea that excess ratings are noise.

I further examine whether excess ratings contain useful information that is less accessible to investors by testing their predictive power of various outcomes in the following year. Excess ratings are positively associated with institutional ownership and analyst coverage. Higher excess ratings are associated with more accurate and less dispersed analyst forecasts. Excess ratings are negatively associated with securities enforcement next year, including a lower likelihood of CSRC sanctions or disciplinary actions from the stock exchanges and the receipt of comment letters on annual reports. These results suggest that excess ratings contain information about firms' fundamentals and compliance with security laws. The lack of association between the market response to the assessment result and excess ratings implies that investors fail to react to a major source of private information possessed by managers.

In supplemental tests, we examine whether ratings by the two stock exchanges have differential effects on the outcome variables. We find that the issuance of comment letters on annual reports by the Shanghai Stock Exchange is less dependent on excess ratings, suggesting that the stock exchange is less path-dependent in its review process. Excess ratings affect the other outcomes similarly for the two stock exchanges. Because we cannot possibly include all available public signals, we create another version of excess ratings when firm fixed effects are included as determinants of raw ratings. The results are statistically weaker but qualitatively similar to the main results. We also create a discrete version of excess ratings that are the difference between raw ratings and rounded predicted ratings and take on values of −3, −2, −1, 0, 1, 2 or 3. The results remain qualitatively similar.

This paper sheds light on the implementation of a regulatory tool. How to improve investors' access to firm-specific information at low costs is a key objective for securities regulators (The Shanghai Stock Exchange, 2023), given the opaque information environments in emerging markets (Morck, Yeung, & Yu, 2000; Jin & Myers, 2006). Chinese stock exchanges try to provide investors with costless firm-specific news through comment letters and disclosure quality ratings. While comment letters are detailed and released individually for recipient firms by the stock exchanges (and by recipient firms themselves in Shanghai), disclosure quality ratings are coarse and released on the same day for all firms listed on a stock exchange. While investors react to comment letters according to their severity when their receipt is announced by firms (Yang, 2022; Duan, Li, Rogo, & Zhang, 2024), investors do not react to either raw or excess disclosure quality ratings according to their informational content. The policy implication is that regulators may need to release more granular ratings (i.e. detailed scores, preferably for each section on the grading sheet, instead of A, B, C or D) and make firms individually announce the results. This change in design may improve the effectiveness of the disclosure quality assessment and the usefulness of information production by securities regulators.

This paper contributes to the literature on disclosure quality and the information environment. Some researchers construct disclosure quality measures based on earnings properties (Bhattacharya, Daouk, & Welker, 2003; Leuz, Nanda, & Wysocki, 2003), disclosures in annual reports (Botosan, 1997; Cheung *et al.*, 2010), readability (Lehavy, Li, & Merkley, 2011), or nonfinancial disclosures (Dhaliwal, Radhakrishnan, Tsang, & Yang, 2012). Other researchers rely on disclosure ratings provided by analysts or third parties (Lang & Lundholm, 1993, 1996; Healy *et al.*, 1999; Hope, 2003). This paper contributes to this literature by examining disclosure quality ratings by securities regulators in an emerging market that is arguably more unbiased and professional than most (retail) investors but might not view disclosure quality from the perspective of investors.

This paper also contributes to the literature on security enforcement in China. Most studies focus on CSRC enforcement actions (Chen *et al.*, 2005, 2006, 2011, 2013, 2016a, 2016b;

Aggarwal, Hu, & Yang, 2015; Cumming, Leung, & Rui, 2015; Wu, Johan, & Rui, 2016; Wang, Chen, Chin, & Zheng, 2017; Zhang, 2018), disciplinary actions by the stock exchanges (Liebman & Milhaupt, 2008; Cao, McGuinness, & Chao, 2021), and comment letters (Yang, 2022; Lu & Qiu, 2023; Duan *et al.*, 2024). Very few studies consider disclosure quality ratings as a type of security enforcement or evaluate the consequences of receiving poor ratings. Since many markets with low investor protection suffer from poor disclosure quality (Leuz *et al.*, 2003), this paper suggests that securities regulators can provide investors with the overall degree of firms' compliance with disclosure rules on an annual basis.

2. Institutional background and hypotheses

2.1 Institutional background

The stock exchanges in China are regulated by the CSRC, which is further controlled by the state council. The CSRC delegates many responsibilities of a securities regulator to the stock exchanges. Corporate filings are publicized on the stock exchanges' websites, and the stock exchanges can review these filings and issue comment letters comparable to those issued by the U.S. Securities and Exchange Commission (SEC) [2]. The stock exchanges can also take disciplinary actions against firms, shareholders, and executives for violating disclosure and listing rules in the form of condemnation, public criticism, and declaration of the unsuitability of certain individuals to be public firms' directors, executives, or board secretaries. The stock exchanges conduct disclosure quality assessment annually in which they give firms A, B, C, or D ratings signifying outstanding, good, pass, or fail.

The disclosure quality assessment period for year t is from May 1 (July 1) of year t to April 30 (June 30) of year t+1 for the Shenzhen (Shanghai) Stock Exchange. Because all Chinese firms have December 31 as fiscal year end, and the deadline for annual reports is April 30, the assessment period for year t covers annual reports for year t. The assessment results for year t are publicized on the stock exchanges' websites in year t+1, usually in June or July for Shenzhen and in August, September, or October for Shanghai. The Shenzhen Stock Exchange has published its disclosure quality ratings since 2002 (for year 2001), and the Shanghai Stock Exchange has published its disclosure quality ratings since 2017 (for year 2016).

The assessment procedures by the two stock exchanges are largely the same, and I use Shenzhen to demonstrate the details. Firms start with a base mark of 100 and deduct or add points according to a grading sheet with itemized criteria in a self-assessment first. The stock exchange forms a work group to verify and adjust firms' self-reported marks, which are then converted to letter ratings although the cutoffs are not known. Less than 25% of the firms can receive an, and firms that have not been public for twelve months usually do not receive an A. Firms can appeal their ratings within five days of the announcement of the result. The stock exchange notifies the local bureaus of the CSRC of the ratings. When the stock exchange is required by the CSRC to express its opinions on a firm's securities issuance or mergers and acquisitions, it will include the firm's latest disclosure quality rating in its opinions. For firms that receive an A, the stock exchange will provide expedited services on securities issuance, invite board chairmen or board secretaries to be speakers for promoting rule-compliant practices, and recommend board secretaries to be members of the stock exchange's listing and disciplinary committees.

The grading sheet of the Shenzhen Stock Exchange is in Appendix 1. There are seven categories of items, including compliance with disclosure rules, investor relations, ESG or CSR disclosures, cooperation with the stock exchange, material negative events, supervisory measures, and disciplinary actions. Some items are objective and publicly observable, such as disciplinary actions. Some items are objective but not publicly observable, such as supervisory measures (oral warnings, written warnings, regulatory talks etc.). Some items reveal managers' private information, such as material negative events that managers know they fail to disclose, and some require managers' subjective judgement or soft information, such as "disclosures are investor-oriented and help investors evaluate the firm and make investment

decisions." Moreover, firms that have one of the following conditions cannot receive an A: (1) qualified audit opinions; (2) earnings that decrease 50% from last year or loss in the first year of listing; (3) earnings below 80% of earnings forecast by management; (4) firms that receive written warnings or regulatory talks; (5) firms under investigation for violations of securities laws; (6) board secretary being absent for more than three months cumulatively; (7) directors, managers, controlling shareholders, or ultimate owner that receive CSRC enforcement actions, condemnations, public criticisms, or written warnings more than twice; (8) directors, managers, controlling shareholders, or ultimate owner under investigation for violations of securities laws; (9) lack of internal control reports, or internal control reports that receive qualified audit opinions; (10) other situations considered by the stock exchange.

The assessment procedure by the Shanghai Stock Exchange differs in a few aspects. The base mark is 80, and point additions or deductions are different for some items. For example, five points will be deducted if a firm receives a supervisory measure that is not an oral warning, written warning, or regulatory talk in Shanghai, but three, four, or six points will be deducted depending on the specific supervisory measure that is not an oral warning, written warning, or regulatory talk in Shenzhen. In Shanghai, marks are converted to letter ratings according to known cutoffs: A for 90 (inclusive) or above, B for between 80 (inclusive) and 90, C for between 60 (inclusive) and 80, and D for below 60.

2.2 Hypotheses

While the stock exchanges elsewhere also have self-disciplinary measures to ensure firms' compliance with listing rules (e.g. condemnations and public criticisms in China are borrowed from the London Stock Exchange indirectly via the Hong Kong Stock Exchange), the disclosure quality assessment appears to be a Chinese feature. The government is ubiquitous in the capital market in China, and this approach is predicated on the idea that China's underdeveloped stock market and unsophisticated retail investors require government protection (Lennox & Wu, 2022). As can be seen from the grading sheet, the stock exchanges evaluate mandatory and voluntary disclosures broadly and emphasize compliance with securities laws and disclosure rules, and the most impactful items are securities violations. Some items are related to firm fundamentals (e.g. cash dividends), not publicly observable (e.g. supervisory measures), or reveal managers' private information (e.g. material negative events). The authority of the stock exchanges as delegated security regulators ensures truth-telling from managers. The stock exchanges use disclosure quality ratings to communicate with investors about firms' regulatory risk, and the ratings offer a unique, credible, and costless source of information to the market [3].

On the other hand, investors do not have access to the more granular marks and can only observe the coarse letter ratings. It is probably not difficult for investors to classify disclosure quality into four tiers based on publicly available signals (e.g. "special treatment" status, audit opinions, material internal control weaknesses, securities enforcement etc.) and firms' financial characteristics. The stock exchanges do not incorporate a variety of factors that are related to disclosure quality in the assessment, such as stock performance, corporate governance, or auditor size. The market might already impound disclosure quality as assessed by sophisticated investors, analysts, or the media into stock prices such that the stock exchanges' assessment is redundant. The stock exchanges, as an extension of the government in the capital market, might not be motivated to engage in superior information gathering from which the staff do not personally benefit (Stigler, 1971). Given the emphasis on rule compliance, it appears that the stock exchanges are strongly motivated to avoid scandals and desire the certainty of rigid rules (Ball, 2009). The misaligned incentives between the stock exchanges and investors might imply that the disclosure quality assessment can be a bureaucratic process that is not useful to investors. Interestingly, the stock exchanges explicitly state that "the assessment result is not a judgement of firm valuation and should not be construed as investment advice."

This paper focuses on excess disclosure quality ratings that are orthogonal to easily accessible public signals of disclosure quality and firm characteristics. Excess disclosure quality ratings can be either private information possessed by managers (information only known to managers or public information that requires high processing costs) or noise. I examine the association between excess disclosure quality ratings and contemporaneous market-based and accounting-based information quality measures to verify whether excess ratings capture some dimensions of disclosure quality. The collective knowledge of the market can incorporate disclosure quality in stock prices. Although the stock exchanges do not assess financial statements directly, the items on the grading sheet and earnings attributes might be driven by the same underlying construct shaping disclosure quality. I state the first hypothesis in the null form:

H1. Excess disclosure quality ratings are not related to market-based or accounting-based information quality measures.

Because some items assessed by the stock exchanges are about firm fundamentals and compliance with disclosure rules, lower excess ratings can reflect poorer firm prospects, uncertainty about managers' accounting and disclosure choices, and higher costs of processing and interpreting firm disclosures. Lang and Lundholm (1996) find that better disclosure ratings by analysts are associated with more accurate and less dispersed analyst forecasts. Healy *et al.* (1999) find that increases in analyst disclosure ratings are associated with increases in institutional ownership and analyst following. Hope (2003) uses the disclosure score by the Center for International Financial Analysis and Research (CIFAR) and finds that the score is associated with analyst forecast accuracy in an international setting. The disclosure quality assessment can be utilized by security regulators, including the CSRC and the stock exchanges themselves, to allocate monitoring resources. That is probably why the stock exchanges notify the local bureaus of the CSRC of the assessment results. Firms with lower ratings can be subjected to a higher level of scrutiny and are more likely to receive securities enforcement. To summarize, if excess disclosure quality ratings are informative, they should be able to predict an array of future outcomes including interest from intermediaries, analyst forecast properties, and securities enforcement. I state the second hypothesis in the null form:

H2. Excess disclosure quality ratings are not related to future outcomes.

3. Sample selection and models

3.1 Sample selection

The sample includes A share (i.e. RMB-denominated) firms listed in Shenzhen and Shanghai between 2016 and 2022. The sample period starts in 2016 because the Shanghai Stock Exchange has only started publicizing disclosure quality ratings since 2017 (for fiscal year 2016). Disclosure quality ratings and comment letters are collected from the websites of the stock exchanges. Financial and stock data are retrieved from CSMAR. Annual report amendments, ESG or CSR reports, and investor briefings are collected from cninfo (http://www.cninfo.com.cn/new/index). Continuous variables are winsorized at the 1% and 99% tails.

3.2 Models

The determinants of raw disclosure quality ratings are estimated via the OLS model in Model (1):

$$RATING_t = \alpha + \beta_1 EXCH_t + \beta_2 CSRC_t + \beta_3 ST_t + \beta_4 ANNLETT_t + \beta_5 OTHLETTS_t + \beta_6 MALETTS_t + \beta_7 QUALIFIED_t + \beta_8 AMEND_t + \beta_9 ICWEAK_t + \beta_{10} LATE_t + \beta_{11} SHORTFALL_t + \beta_{12} ESGREPORT_t + \beta_{13} DIVS_t + \beta_{14} BRIEFINGS_t + \beta_{15} AGE_t + \beta_{16} SH_t + \beta_{17} LN\_AT_t + \beta_{18} LEV_t + \beta_{19} ROA_t + \beta_{20} LOSS_t + \beta_{21} ACCRUALS_t + \beta_{22} MB_t + \beta_{23} RET_t + \beta_{24} VOL_t + \beta_{25} NUMSUSP_t + \beta_{26} ISSUE_t + \beta_{27} RESTRUCT_t + \beta_{28} BIGAUD_t + \beta_{29} DUALITY_t + \beta_{30} BDSIZE_t + \beta_{31} BDINDIE_t + \beta_{32} SOE_t + \beta_{33} CROSS_t + \beta_{34} INST_t + \beta_{35} ANA_t + Industry\,fixed\,effects + Year\,fixed\,effects + \varepsilon_t \quad (1)$$

The dependent variable *RATING* equals 4, 3, 2, or 1, corresponding to an A, B, C, or D rating for year t.

The model includes easily accessible public signals of disclosure quality both on and off the grading sheet. *EXCH* indicates the receipt of a disciplinary action from the stock exchange during the assessment period. *CSRC* indicates the receipt of an enforcement action from the CSRC during the assessment [4]. *ST* indicates "special treatment" status for financial irregularities including losses for two consecutive years, shareholders' equity being below paid-in capital, and adverse audit opinion or disclaimer of opinion. *ANNLETT* indicates the receipt of a comment letter on an annual report from the stock exchange during the assessment period. *OTHLETTS* is the number of ad-hoc comment letters on non-periodic filings. *MALETTS* is the number of comment letters on merger and acquisition filings. *QUALIFIED* indicates a qualified (i.e. non-standard) audit opinion for year t. *AMEND* equals 1 if a firm amends any annual report during the assessment period [5]. *ICWEAK* indicates material internal control weaknesses for year t. *LATE* indicates the failure to provide the annual report on time during the assessment period. *SHORTFALL* indicates that a firm's realized earnings are below 80% of its forecast earnings by management. *ESGREPORT* indicates the provision of an ESG or a CSR report during the assessment period. *DIVS* denotes the number of times a firm pays cash dividends during the assessment period. *BRIEFINGS* is the number of times a firm holds investor briefings during the assessment period.

I also include firm characteristics that are related to disclosure quality. *AGE* is the number of months from the listing date to the end of the assessment period. The two stock exchanges have slightly different grading schemes, so I include *SH* that indicates firms in Shanghai. *LN_AT* is the natural log of total assets. *LEV* is leverage calculated as the total liabilities to total assets. *ROA* is return on assets calculated as earnings to total assets. *LOSS* indicates negative earnings. *ACCRUALS* is total accruals (i.e. earnings minus operating cash flow) to total assets. *MB* is the-to-book ratio calculated as the market value of equity to book value of equity. *RET* is market-adjusted buy-and-hold returns during the assessment period. *VOL* is the standard deviation of daily returns during the assessment period. *NUMSUSP* is the number of times a firm suspends its stock trading (possibly to prevent investors from reacting to news) during the assessment period. *ISSUE* indicates equity issuance during the assessment period. *RESTRUCT* indicates an attempted major restructuring during the assessment period. A major restructuring can be abused by a firm to expropriate minority shareholders and is subject to extra scrutiny from securities regulators in China. *BIGAUD* indicates a big auditor. Big auditors are defined as the top five accounting firms that audit the most public firms in a year. *DUALITY* equals 1 if a firm's CEO and board chairman are the same person. *BDSIZE* is the number of directors on a board. *BDINDIE* is the percentage of independent directors. *SOE* indicates a state-owned enterprise. *CROSS* equals 1 if a firm is cross-listed outside Mainland China. *INST* is institutional ownership for year t. *ANA* is the number of analysts that cover a firm for year t. All the models include industry fixed effects based on the CSRC's 2012 industry classification and year fixed effects. Standard errors are clustered at the firm level.

The residuals from Model (1) represent excess disclosure quality ratings, or *INFO*.

To examine whether investors react to excess disclosure quality ratings on the announcement date of the assessment result, I estimate the OLS model in Model (2):

$$CAR_t = \alpha + \beta_1 INFO_t + Controls + \varepsilon \tag{2}$$

CAR is the three-day cumulative market-adjusted returns centered on the announcement date. *Controls* are the same control variables in Model (1) from *EXCH* through the fixed effects. If investors consider excess disclosure quality ratings as good news, β_1 should be positive. If investors consider excess ratings as noise or do not react to the assessment result at all, β_1 should be zero.

To examine the association between excess disclosure quality ratings and market-based information quality measures, I estimate the OLS model in Model (3):

$$QUALITY\_MKT_t = \alpha + \beta_1 INFO_t + Controls + \varepsilon \quad (3)$$

QUALITY_MKT can be *ZERORET* (percentage of zero-return days), *ILLIQ* (illiquidity), or *NCSKEW* (stock crash risk).

ZERORET is the number of zero-return days to the number of trading days during the assessment period (Bekaert, Harvey, & Lundblad, 2007; Lang, Lins, & Maffett, 2012). If firms provide more information to which investors react, there should be fewer days with zero return proportionally.

ILLIQ is an illiquidity measure calculated as the average price impact during the assessment period, price impact being the absolute value of daily returns divided by the daily value traded (Amihud, 2002). Better information quality should decrease *ILLIQ*.

NCSKEW measures crash risk following Kim, Li, and Zhang (2011a, b). The expanded market model $r_{i,d} = \alpha_i + \beta_{1,i} r_{m,d-2} + \beta_{2,i} r_{m,d-1} + \beta_{3,i} r_{m,d} + \beta_{4,i} r_{m,d+1} + \beta_{5,i} r_{m,d+2} + \varepsilon_{i,d}$ during the assessment period is first estimated, where $r_{i,d}$ is firm i's return on day d and $r_{m,d-2}$, $r_{m,d-1}$, $r_{m,d}$, $r_{m,d+1}$, and $r_{m,d+2}$ are market return on day d−2, d−1, d, d+1, and d+2, respectively. Firm-specific returns $W_{i,d}$ are calculated as the natural log of one plus the residual from the market model, or $W_{i,d} = \ln(1 + \varepsilon_{i,d})$. *NCSKEW* is the negative coefficient of skewness of $W_{i,d}$, measured as $-\frac{n(n-1)^{3/2}\sum W_{i,d}^3}{(n-1)(n-2)(\sum W_{i,d}^2)^{3/2}}$. If firms have better disclosure quality, they are less likely to hoard a large amount of bad news that will cause stock prices to crash once the bad news becomes public all at once.

INFO should be negatively related to *ZERORET*, *ILLIQ*, and *NCSKEW*.

To examine the association between excess disclosure quality ratings and accounting-based information quality measures, I estimate the OLS model in Model (4):

$$QUALITY\_ACC_t = \alpha + \beta_1 INFO_t + Controls + \varepsilon \quad (4)$$

QUALITY_ACC can be *CONSERV* (conservatism), *PERSIST* (persistence) or *DD* (accruals quality) following Francis, LaFond, Olsson, and Schipper (2004). All the measures are estimated from firm-level regressions over rolling ten-year windows.

CONSERV is derived from the regression of earnings on returns $EARN_{i,t} = \alpha_{0,i} + \alpha_{1,i} NEG_{i,t} + \beta_{1,i} RET_{i,t} + \beta_{2,i} NEG_{i,t} \times RET_{i,t} + \varepsilon_{i,t}$, where $EARN_{i,t}$ is firm i's earnings for year t scaled by market value at the end of year t−1, $RET_{i,t}$ is firm i's 16-month return ending four months after the end of fiscal year t, and $NEG_{i,t}$ that indicates negative $RET_{i,t}$. *CONSERV* is measured as $\frac{(\beta_{1,i}+\beta_{2,i})}{\beta_{1,i}}$, and a higher value indicates more timely recognition of losses and more conservative earnings. Although conservatism is generally considered a favorable earnings attribute, it can also be viewed as a reporting bias. Chinese firms do not have a bias towards conservative financial reporting (Ball *et al.*, 2000; Lu *et al.*, 2023). It is unclear whether Chinese security regulators prefer more conservative or less conservative earnings.

PERSIST is derived from the autoregressive model of earnings per share $X_{i,t} = \beta_{0,i} + \beta_{1,i} X_{i,t-1} + \varepsilon_{i,t}$, where $X_{i,t}$ and $X_{i,t-1}$ are earnings per share in year t and t−1. *PERSIST* is $\beta_{1,i}$. A higher value of *PERSIST* indicates more persistent earnings.

DD is derived from the regression in Dechow and Dichev (2002), $\frac{TCA_{i,t}}{Assets_{i,t}} = \beta_{0,i} + \beta_{1,i}\frac{CFO_{i,t-1}}{Assets_{i,t}} + \beta_{2,i}\frac{CFO_{i,t}}{Assets_{i,t}} + \beta_{3,i}\frac{CFO_{i,t+1}}{Assets_{i,t}} + \varepsilon_{i,t}$, where $TCA_{i,t}$ is total current accruals (i.e. earnings minus operating cash flow plus depreciation and amortization expense) in year t, $Assets_{i,t}$ is total assets in year t, and $CFO_{i,t-1}$, $CFO_{i,t}$, and $CFO_{i,t+1}$ are operating cash flow in year t−1, t, and t+1. *DD* is the standard deviation of firm i's residuals, or $\sigma(\widehat{\varepsilon_{i,t}})$, and a higher value indicates worse accruals quality.

INFO should be positively related to *PERSIST* and negatively related to *DD*. The relationship between *INFO* and *CONSERV* depends on whether security regulators in China see conservatism as a reporting bias or not.

The relation between excess disclosure quality ratings and future outcomes is estimated via the OLS model in Model (5):

$$OUTCOME_{t+1} = \alpha + \beta_1 INFO_t + Controls + \varepsilon \quad (5)$$

OUTCOME denotes various outcomes in the year following the release of disclosure quality ratings. The first group is intermediation, *F_INST* (institutional ownership) and *F_ANA* (analyst coverage). If institutional investors and analysts prefer firms with more favorable excess disclosure quality ratings, β_1 should be positive.

The second group is analyst forecast properties, *F_FERRORS* and *F_DISPERSION*, which are analyst forecast errors (absolute value of the difference between actual EPS and the median value of the latest analyst EPS forecasts divided by stock price at the fiscal year end) and analyst forecast dispersion (standard deviation of the latest analyst EPS forecasts divided by stock price at the fiscal year end). If analysts make more accurate forecasts and agree on firm fundamentals to a greater extent when excess disclosure quality ratings are higher, β_1 should be negative.

The third group is securities enforcement, *F_ENFORCE* (indicator of CSRC enforcement actions or disciplinary actions from the stock exchanges) and *F_ANNLETT* (indicator of the receipt of comment letters on annual reports). If lower excess ratings attract stricter scrutiny from security regulators, β_1 should be negative.

4. Results

Table 1 reports the descriptive statistics of the variables in the regressions. The mean and median values of *RATING* suggest that a firm typically receives a B rating. More than 10% of firms receive disciplinary actions from the stock exchanges (*EXCH*), around 7% receive CSRC enforcement actions (*CSRC*), 3.5% have "special treatment" status (*ST*), and 11% receive comment letters on annual reports (*ANNLETT*). The average number of ad-hoc comment letters (*OTHLETTS*) and comment letters on merger and acquisition filings (*MALETTS*) is 0.262 and 0.07, respectively. The percentage of firms that receive qualified audit opinions (*QUALIFIED*), amend their annual reports (*AMEND*), report material internal control weaknesses (*ICWEAK*), fail to provide annual reports on time (*LATE*), report earnings that are below 80% of forecast earnings by management (*SHORTFALL*), and provide ESG or CSR reports (*ESGREPORT*) is 2.7%, 9.5%, 1.5%, 0.6%, 5%, and 26.1%, respectively. On average, firms pay dividends 0.727 times (*DIVS*) and hold investor briefings 0.923 times (*BRIEFINGS*) a year. The mean and median values of the market response to the announcement of the assessment result (*CAR*) are −0.001 and −0.005 [6].

Table 2 reports the determinants of and the market response to disclosure quality ratings. In column (1) with *RATING* as the dependent variable, disciplinary actions from the stock exchanges (*EXCH*), CSRC enforcement actions (*CSRC*), "special treatment" status (*ST*), comment letters on annual reports (*ANNLETT*), ad-hoc comment letters (*OTHLETTS*), qualified audit opinions (*QUALIFIED*), annual report amendments (*AMEND*), material internal control weaknesses (*ICWEAK*), late provision of annual reports (*LATE*), and big earnings shortfalls relative to management forecasts (*SHORTFALL*) are negatively related to raw disclosure quality ratings, and ESG reports (*ESGREPORT*) and dividends (*DIVS*) are positively related to raw disclosure quality ratings. Qualified audit opinions, material internal control weaknesses, and security enforcement have the biggest negative impact on ratings. Among the firm characteristics, older firms (*AGE*), Shanghai listings (*SH*), higher leverage (*LEV*), losses (*LOSS*), larger accruals (*ACCRUALS*), higher stock volatility (*VOL*), a larger number of stock trading suspensions (*NUMSUSP*), and equity issuance (*ISSUE*) are associated

Table 1. Descriptive statistics

Variable	*N*	Min	Q1	Mean	Median	Q3	Max
RATING	23,312	1	3	3	3	3	4
INFO	23,312	−2.557	−0.242	0	−0.03	0.282	1.878
EXCH	23,312	0	0	0.104	0	0	1
CSRC	23,312	0	0	0.071	0	0	1
ST	23,312	0	0	0.035	0	0	1
ANNLETT	23,312	0	0	0.11	0	0	1
OTHLETTS	23,312	0	0	0.262	0	0	15
MALETTS	23,312	0	0	0.07	0	0	5
QUALIFIED	23,312	0	0	0.027	0	0	1
AMEND	23,312	0	0	0.095	0	0	1
ICWEAK	23,312	0	0	0.015	0	0	1
LATE	23,312	0	0	0.006	0	0	1
SHORTFALL	23,312	0	0	0.05	0	0	1
ESGREPORT	23,312	0	0	0.261	0	1	1
DIVS	23,312	0	0	0.727	1	1	3
BRIEFINGS	23,312	0	0	0.923	1	1	9
AGE	23,312	4	56	141	118	232	390
SH	23,312	0	0	0.400	0	1	1
LN_AT	23,312	19.287	21.374	22.371	22.150	23.117	26.748
LEV	23,312	0.05	0.264	0.434	0.418	0.582	1.059
ROA	23,312	−0.387	0.012	0.030	0.036	0.067	0.206
LOSS	23,312	0	0	0.128	0	0	1
ACCRUALS	23,312	−0.416	−0.048	−0.017	−0.011	0.025	0.236
MB	23,312	0.287	2.088	4.867	3.386	5.640	37.725
RET	23,312	−0.763	−0.262	−0.012	−0.083	0.134	1.94
VOL	23,312	0.013	0.022	0.03	0.027	0.033	0.072
NUMSUSP	23,312	0	0	0.290	0	0	10
ISSUE	23,312	0	0	0.043	0	0	1
RESTRUCT	23,312	0	0	0.051	0	0	1
BIGAUD	23,312	0	0	0.434	0	1	1
DUALITY	23,312	0	0	0.303	0	1	1
BDSIZE	23,312	4	9	10	10	12	31
BDINDIE	23,312	0.188	0.333	0.383	0.375	0.429	0.889
SOE	23,312	0	0	0.320	0	1	1
CROSS	23,312	0	0	0.03	0	0	1
INST	23,312	0	0.196	0.412	0.423	0.613	1
ANA	23,312	0	0	6	2	8	75
CAR	21,465	−0.326	−0.023	−0.001	−0.005	0.015	0.595
ZERORET	23,312	0	0.012	0.030	0.021	0.041	0.42
ILLIQ	23,310	0.013	0.112	0.286	0.212	0.365	1.665
NCSKEW	23,294	−2.282	−0.908	−0.561	−0.544	−0.210	1.13
CONSERV	10,764	−246.578	−2.816	0.364	0.361	4.139	227.882
PERSIST	9,818	−0.616	0.062	0.345	0.348	0.61	1.671
DD	10,073	0.002	0.012	0.04	0.021	0.039	0.40
F_INST	19,135	0	0.118	0.364	0.374	0.571	1
F_ANA	19,135	0	0	5	1	6	75
F_FERRORS	13,007	0	0.002	0.021	0.007	0.019	0.283
F_DISPERSION	10,782	0	0.003	0.01	0.006	0.012	0.084
F_ENFORCE	21,782	0	0	0.178	0	0	1
F_ANNLETT	21,782	0	0	0.140	0	0	1

Note(s): Table 1 reports descriptive statistics of the variables used in the regressions. Detailed variable definitions are in Appendix 2. Continuous variables are winsorized at the 1% and 99% tails
Source(s): Table created by authors

Table 2. Determinants of and market response to disclosure quality ratings

Dependent variable	RATING (1)	CAR (2)
INFO		0.0002
		[0.368]
EXCH	−0.3597***	0.0007
	[−26.315]	[0.503]
CSRC	−0.2576***	−0.0020
	[−14.346]	[−1.342]
ST	−0.1469***	0.0035*
	[−5.247]	[1.707]
ANNLETT	−0.2330***	0.0013
	[−17.849]	[1.025]
OTHLETTS	−0.0775***	0.0009
	[−12.815]	[1.559]
MALETTS	−0.0092	−0.0017
	[−0.675]	[−1.147]
QUALIFIED	−0.5534***	0.0027
	[−17.482]	[0.977]
AMEND	−0.0769***	−0.0001
	[−6.299]	[−0.085]
ICWEAK	−0.4020***	0.0022
	[−9.144]	[0.654]
LATE	−0.0883*	0.0094
	[−1.888]	[1.630]
SHORTFALL	−0.0340**	−0.0017
	[−1.999]	[−1.164]
ESGREPORT	0.0710***	0.0014**
	[5.698]	[1.961]
DIVS	0.0748***	0.0015**
	[11.192]	[2.544]
BRIEFINGS	0.0013	0.0008*
	[0.263]	[1.813]
AGE	−0.0005***	−0.0000**
	[−7.941]	[−1.965]
SH	−0.1774***	0.0016**
	[−16.595]	[2.496]
LN_AT	0.0592***	0.0004
	[9.326]	[0.996]
LEV	−0.1907***	−0.0008
	[−6.306]	[−0.381]
ROA	0.3847***	0.0004
	[4.345]	[0.049]
LOSS	−0.1661***	−0.0001
	[−10.366]	[−0.068]
ACCRUALS	−0.2014***	−0.0181***
	[−3.423]	[−3.783]
MB	0.0020**	0.0001
	[2.131]	[1.185]
RET	0.0421***	−0.0000
	[4.932]	[−0.024]
VOL	−3.3125***	−0.1022**
	[−7.989]	[−2.540]
NUMSUSP	−0.0510***	−0.0000
	[−7.934]	[−0.055]
ISSUE	−0.0999***	−0.0003
	[−4.998]	[−0.184]

(*continued*)

Table 2. Continued

Dependent variable	RATING (1)	CAR (2)
RESTRUCT	0.0194	0.0003
	[0.979]	[0.162]
BIGAUD	0.0268***	−0.0013**
	[2.939]	[−2.039]
DUALITY	−0.0116	0.0002
	[−1.208]	[0.301]
BDSIZE	−0.0006	−0.0000
	[−0.372]	[−0.273]
BDINDIE	0.1255**	0.0040
	[2.471]	[0.954]
SOE	0.1703***	0.0013*
	[12.473]	[1.659]
CROSS	0.1670***	0.0039***
	[5.043]	[2.996]
INST	0.0793***	−0.0043***
	[3.639]	[−2.827]
ANA	0.0112***	0.0000
	[18.543]	[1.245]
Industry fixed effects	Yes	Yes
Year fixed effects	Yes	Yes
No. of obs	23,312	21,465
Adj. R^2	49.0%	3.3%

Note(s): Table 2 reports the results of the determinants of and the market response to disclosure quality ratings. The models are OLS. In column (1), the dependent variable is *RATING* which equals 4, 3, 2, and 1 when a firm's disclosure quality rating is A, B, C, or D. In column (2), the dependent variable is *CAR* which is the three-day cumulative market-adjusted returns centered on the announcement date of the assessment result, and the test variable is *INFO* which is the residuals from the model in column (1) and measures excess disclosure quality ratings. Detailed variable definitions are in Appendix 2. *t*-statistics underneath the coefficients are based on standard errors clustered at the firm. ***, **, and * denote two-tailed statistical significance at the 1%, 5%, and 10% level, respectively

Source(s): Table created by authors

with worse ratings. Bigger firms (*SIZE*), better accounting performance (*ROA*), higher market-to-book ratio (*MB*), better stock performance (*RET*), big auditors (*BIGAUD*), more independent boards (*BDINDIE*), state ownership (*SOE*), cross-listing (*CROSS*), higher institutional ownership (*INST*), and higher analyst coverage (*ANA*) are associated with better ratings. The results suggest that disclosure quality ratings are associated with most of the public signals on the grading sheet, and firm characteristics that indicate better performance and governance are associated with better ratings.

In column (2) with *CAR* as the dependent variable, the coefficient on *INFO*, excess disclosure quality ratings, is close to zero [7]. There is no evidence that investors react to better excess disclosure quality ratings more favorably. It is worth noting that disclosure quality ratings are not announced by firms individually but are announced by the stock exchanges on the same day for all firms. The Shanghai Stock Exchange has a press release that includes all the ratings. The Shenzhen Stock Exchange does not even have a press release and directly posts the ratings on its website in a section called "disclosure quality assessment." It is possible that investors with limited attention do not consider disclosure quality ratings as firm-specific news and do not react to the batch announcements by the stock exchanges. In a similar vein, Yang (2022) and Duan *et al.* (2024) find that the severity of comment letters is negatively related to the market response to the receipt of a comment letter in Shanghai but not in Shenzhen, presumably because comment letters are individually announced by firms in

Shanghai but are only announced by the stock exchange in Shenzhen. Another possibility is that investors consider the four-level ratings too coarse to be informative. A more granular score or a more detailed assessment report may better attract investors' attention. Whether the lack of response to *INFO* is warranted depends on whether excess disclosure quality ratings reflect firm-specific information or noise.

Table 3 reports the association between excess disclosure quality ratings and contemporaneous market-based and accounting-based information quality measures. The first three columns include market-based information quality measures. In column (1) with *ZERORET* as the dependent variable, the coefficient of *INFO* is negative at the 1% level. Firms with better excess disclosure quality ratings provide more value-relevant news to the market and have a lower percentage of zero-return trading days. *ST*, *ANNLETT*, *QUALIFIED*, and *LOSS* are positively associated with *ZERORET*, and *MALETTS* is negatively associated with *ZERORET* probably because firms that attempt mergers and acquisitions need to provide more disclosures to the market. In column (2) with *ILLIQ* as the dependent variable, the coefficient of *INFO* is not statistically significant. The coefficients of some control variables suggest that *ILLIQ* may not reflect information quality in China as it does in other markets. Many negative signals including *EXCH*, *ANNLETT*, *OTHLETTS*, *AMEND*, and *ICWEAK* decrease *ILLIQ*, and some positive signals including *RET*, *CROSS*, and *INST* increase *ILLIQ*, which are inconsistent with the idea that a higher value of *ILLIQ* captures higher information quality. In column (3), *INFO* is negatively associated with the crash risk measure, *NCSKEW*. Many negative signals, including *CSRC*, *ST*, *ANNLETT*, *OTHLETTS*, *MALETTS*, *QUALIFIED*, *ICWEAK*, and *LOSS*, are positively associated with crash risk. However, *DIVS* and *ROA* are also positively associated with crash risk, implying that extremely well performing firms also have extreme stock volatility. Excess disclosure quality ratings are associated with two of the three market-based information quality measures, and the illiquidity measure does not appear to unambiguously reflect information quality.

The next three columns include accounting-based information quality measures. The number of observations is a lot smaller here due to the use of rolling ten-year windows to calculate the accounting-based measures. In column (4) with *CONSERV* as the dependent variable, the coefficient of *INFO* is negative at the 5% level, suggesting that firms with better excess disclosure quality ratings have less conservative earnings. This result implies that Chinese security regulators prefer earnings to demonstrate less conservatism. It is possible that security regulators are worried that firms speedily recognize bad news to facilitate theft from minority shareholders (Lennox & Wu, 2022). In column (5) with *PERSIST* as the dependent variable, the coefficient of *INFO* is positive at the 1% level, suggesting that firms that have better excess disclosure quality ratings have more persistent earnings. While *CSRC*, *ANNLETT*, *MALETTS*, and *SHORTFALL* are associated with less persistent earnings, *EXCH*, *OTHLETTS*, *QUALIFIED*, and *LATE* are associated with more persistent earnings. That is, not all signals that indicate lower disclosure quality are consistently related to less persistent earnings. In column (6) with *DD* as the dependent variable, the coefficient on *INFO* is negative at the 5% level, so firms with better excess disclosure quality ratings have better accruals quality. *ST*, *ANNLETT*, *MALETTS*, *QUALIFIED*, *ACCRUALS*, *ISSUE*, and *INST* are associated with worse accruals quality, and *LATE*, *DIVS*, and *SOE* are associated with better accruals quality. Excess disclosure quality ratings are associated with less conservatism, higher persistence, and better accruals quality. Overall, Table 3 suggests that excess disclosure quality ratings are not noises but capture some dimensions of information quality embedded in the stock prices and earnings.

Table 4 reports the relationship between excess disclosure quality ratings and future outcomes. The first two columns include interest from intermediaries next year. In column (1) with *F_INST* as the dependent variable, the coefficient of *INFO* is positive at the 1% level, although the economic significance is small as institutional ownership only increases by 0.3% (0.8% of the mean value) when *INFO* changes from Q1 to Q3. *OTHLETTS*, *QUALIFIED*, *ICWEAK*, *LATE*, *DIVS*, and *BRIEFINGS* are associated with lower future institutional ownership. In column (2), *INFO* is positively associated with *F_ANA* at the 1% level, and a firm will be covered by 0.3 more analysts (6% of the mean value) when *INFO* increases from Q1 to

Table 3. Excess disclosure quality ratings and market-based and accounting-based information quality measures

Dependent variable	Market-based information quality measures			Accounting-based information quality measures		
	ZERORET (1)	ILLIQ (2)	NCSKEW (3)	CONSERV (4)	PERSIST (5)	DD (6)
INFO	−0.0022***	0.0015	−0.0482***	−2.1755**	0.0402***	−0.0025**
	[−5.329]	[0.491]	[−6.145]	[−2.301]	[4.351]	[−2.265]
EXCH	0.0006	−0.0090*	−0.0083	1.4916	0.0448***	−0.0011
	[1.037]	[−1.755]	[−0.621]	[0.769]	[3.068]	[−0.543]
CSRC	−0.0007	−0.0058	0.0426***	−1.5215	−0.0341**	0.0022
	[−0.913]	[−0.943]	[2.637]	[−0.698]	[−2.004]	[0.846]
ST	0.0194***	0.2832***	0.2879***	−4.2767	−0.0233	0.0318***
	[11.395]	[14.845]	[13.572]	[−1.558]	[−0.922]	[6.249]
ANNLETT	0.0014**	−0.0111**	0.0567***	−0.4314	−0.0227*	0.0112***
	[2.314]	[−2.026]	[4.182]	[−0.266]	[−1.646]	[4.157]
OTHLETTS	−0.0002	−0.0166***	0.0249***	−0.1664	0.0157**	−0.0006
	[−0.637]	[−6.972]	[4.976]	[−0.164]	[2.351]	[−0.647]
MALETTS	−0.0010*	0.0035	0.0693***	3.5449*	−0.0349*	0.0047*
	[−1.829]	[0.618]	[3.643]	[1.739]	[−1.882]	[1.737]
QUALIFIED	0.0046***	−0.0087	0.0595**	6.3111	0.1109***	0.0121*
	[2.910]	[−0.652]	[2.302]	[1.246]	[2.987]	[1.918]
AMEND	−0.0002	−0.0152***	0.0189	1.5741	0.0067	0.0006
	[−0.333]	[−3.220]	[1.403]	[0.969]	[0.487]	[0.284]
ICWEAK	−0.0017	−0.0336**	0.1106***	6.4693	−0.0549	−0.0000
	[−0.946]	[−2.278]	[3.723]	[1.100]	[−1.270]	[−0.005]
LATE	−0.0007	−0.0299	−0.0822*	6.0027	0.1388**	−0.0115**
	[−0.249]	[−1.609]	[−1.706]	[0.777]	[2.285]	[−2.109]
SHORTFALL	−0.0001	0.0102	−0.0099	−0.9288	−0.0679***	0.0007
	[−0.094]	[1.469]	[−0.546]	[−0.494]	[−3.772]	[0.292]
ESGREPORT	0.0003	−0.0078*	−0.0224**	1.9775*	0.0152	−0.0020
	[0.383]	[−1.758]	[−2.217]	[1.731]	[1.103]	[−1.204]
DIVS	−0.0038***	−0.0138***	0.0141*	0.5776	0.0936***	−0.0128***
	[−10.258]	[−5.192]	[1.904]	[0.633]	[10.270]	[−8.889]
BRIEFINGS	−0.0009***	−0.0049***	0.0119**	−0.4779	0.0044	−0.0005
	[−3.284]	[−2.622]	[2.498]	[−0.906]	[0.760]	[−0.628]
AGE	0.0000***	−0.0001***	−0.0000	−0.0042	−0.0006***	0.0001***
	[8.839]	[−4.926]	[−0.817]	[−0.429]	[−5.578]	[3.651]
SH	0.0008	0.0343***	0.1837***	0.7814	−0.0225	−0.0050**
	[1.493]	[7.807]	[21.182]	[0.673]	[−1.474]	[−2.296]
LN_AT	0.0051***	−0.1201***	−0.0107**	−1.1631	0.0446***	−0.0067***
	[12.207]	[−43.071]	[−1.972]	[−1.530]	[5.709]	[−5.615]
LEV	−0.0016	0.2208***	−0.0359	−1.4643	−0.0692*	0.0082
	[−0.883]	[16.530]	[−1.380]	[−0.381]	[−1.774]	[1.296]
ROA	−0.0325***	−0.0538	0.4774***	−31.1783**	0.4905***	0.0090
	[−8.174]	[−1.402]	[5.835]	[−2.294]	[3.826]	[0.598]
LOSS	0.0019**	0.0221***	0.1014***	−3.2193	0.1020***	−0.0012
	[2.467]	[3.230]	[6.455]	[−1.576]	[5.275]	[−0.532]
ACCRUALS	−0.0003	0.0390	−0.0973*	5.9893	−0.5438***	0.0231**
	[−0.102]	[1.595]	[−1.745]	[0.730]	[−7.442]	[2.265]
MB	−0.0002***	−0.0080***	0.0051***	0.0123	−0.0023**	0.0016***
	[−4.811]	[−12.720]	[5.836]	[0.111]	[−1.968]	[5.880]
RET	0.0031***	0.0782***	−0.1028***	0.3700	−0.0159	−0.0015
	[9.484]	[19.395]	[−11.994]	[0.294]	[−1.439]	[−1.136]
VOL	−0.9703***	−3.8481***	3.0409***	−98.4656	−1.1929	−0.0305
	[−37.819]	[−13.133]	[6.504]	[−1.178]	[−1.594]	[−0.265]

(*continued*)

Table 3. Continued

Dependent variable	Market-based information quality measures			Accounting-based information quality measures		
	ZERORET (1)	ILLIQ (2)	NCSKEW (3)	CONSERV (4)	PERSIST (5)	DD (6)
NUMSUSP	0.0005*	−0.0007	0.0647***	−1.0611	0.0091	0.0001
	[1.875]	[−0.254]	[8.784]	[−1.281]	[1.038]	[0.145]
ISSUE	−0.0035***	0.0075	0.0461**	2.9035	−0.0522***	0.0199***
	[−4.033]	[1.026]	[2.540]	[1.347]	[−2.626]	[5.844]
RESTRUCT	0.0007	−0.0007	−0.0366	0.5110	−0.0039	−0.0038
	[0.820]	[−0.085]	[−1.558]	[0.171]	[−0.170]	[−1.289]
BIGAUD	−0.0014***	0.0001	0.0026	0.9718	0.0008	−0.0003
	[−3.055]	[0.032]	[0.327]	[0.895]	[0.064]	[−0.156]
DUALITY	−0.0014***	0.0093**	−0.0016	0.1649	0.0055	0.0004
	[−3.162]	[2.293]	[−0.179]	[0.114]	[0.408]	[0.187]
BDSIZE	0.0001	0.0001	−0.0008	0.1906	−0.0019	0.0002
	[1.195]	[0.194]	[−0.562]	[1.014]	[−1.095]	[0.725]
BDINDIE	−0.0013	0.0320	−0.0383	6.2371	0.1035	−0.0026
	[−0.529]	[1.517]	[−0.723]	[0.946]	[1.460]	[−0.286]
SOE	−0.0026***	−0.0124**	−0.0479***	−0.4586	0.0489***	−0.0114***
	[−3.433]	[−2.279]	[−4.304]	[−0.386]	[3.190]	[−4.826]
CROSS	0.0055*	0.0605***	−0.0807***	1.7498	−0.0249	0.0045
	[1.660]	[6.026]	[−3.010]	[0.458]	[−0.635]	[1.622]
INST	−0.0057***	0.1156***	0.0258	2.6784	0.0250	0.0151***
	[−5.192]	[11.773]	[1.311]	[0.755]	[0.683]	[2.681]
ANA	−0.0008***	−0.0027***	0.0093***	0.1053	0.0045***	−0.0001
	[−25.620]	[−13.510]	[20.303]	[1.640]	[5.966]	[−1.420]
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
No. of obs	23,312	23,310	23,294	10,764	9,818	10,073
Adj. R^2	40.0%	43.7%	11.6%	0.3%	14.7%	26.1%

Note(s): Table 3 reports the relation between excess disclosure quality ratings and market-based and accounting-based information quality measures during the assessment period. The models are OLS. Market-based information quality measures are *ZERORET* (percentage of zero-return trading days), *ILLIQ* (illiquidity), and *NCSKEW* (negative coefficient of skewness) in columns (1) through (3). Accounting-based information quality measures are *CONSERV* (conservatism), *PERSIST* (earnings persistence), and *DD* (accruals quality) in columns (4) through (6). Detailed variable definitions are in Appendix 2. *t*-statistics underneath the coefficients are based on standard errors clustered at the firm. ***, **, and * denote two-tailed statistical significance at the 1%, 5%, and 10% level, respectively
Source(s): Table created by authors

Q3. *OTHLETTS*, *AMEND*, *BRIEFINGS*, *ACCRUALS*, *NUMSUSP*, and *ISSUE* are associated with a lower level of analyst coverage. The results suggest that favorable excess disclosure quality ratings attract intermediaries. The next two columns include analyst forecast properties. In column (3) with *F_FERRORS* as the dependent variable, the coefficient of *INFO* is negative at the 1% level, and analyst forecast errors decrease by 0.003 (16% of the mean value) when *INFO* increases from Q1 to Q3. *ANNLETT* and *QUALIFIED* are associated with less accurate analyst forecasts, and *ESGREPORT* is associated with more accurate analyst forecasts. In column (4) with *F_DISPERSION* as the dependent variable, the coefficient on *INFO* is negative at the 1% level and implies a 0.0007 decrease in analyst forecast dispersion (7% of the mean value) when *INFO* increases from Q1 to Q3. *ST*, *OTHLETTS* and *SHORTFALL* are associated with more dispersed analyst forecasts. Analyst forecasts for state-owned enterprises (*SOE*) are

Table 4. Excess disclosure quality ratings and future outcomes

Dependent variable	Intermediation		Analyst forecast properties		Securities enforcement	
	F_INST (1)	F_ANA (2)	F_FERRORS (3)	F_DISPERSION (4)	F_ENFORCE (5)	F_ANNLETT (6)
INFO	0.0066***	0.5007***	−0.0065***	−0.0014***	−0.0828***	−0.0599***
	[4.055]	[4.594]	[−7.718]	[−4.890]	[−16.467]	[−15.309]
EXCH	−0.0000	−0.0085	0.0020	0.0002	0.0459***	0.0306***
	[−0.017]	[−0.055]	[1.054]	[0.341]	[5.815]	[5.424]
CSRC	−0.0034	−0.0740	0.0015	−0.0003	0.0466***	0.0307***
	[−0.962]	[−0.435]	[0.713]	[−0.391]	[4.806]	[4.319]
ST	0.0002	0.2984	0.0052	0.0035*	−0.0098	0.0029
	[0.032]	[1.482]	[1.156]	[1.737]	[−0.700]	[0.266]
ANNLETT	0.0027	−0.1209	0.0080***	0.0008	0.0444***	0.0838***
	[0.905]	[−0.997]	[3.417]	[1.174]	[5.760]	[14.836]
OTHLETTS	−0.0030*	−0.1116**	0.0011	0.0006*	0.0202***	0.0268***
	[−1.947]	[−2.322]	[0.999]	[1.658]	[6.092]	[9.460]
MALETTS	0.0076**	0.1190	0.0005	−0.0001	0.0091	0.0026
	[1.977]	[0.695]	[0.241]	[−0.107]	[0.951]	[0.358]
QUALIFIED	−0.0305***	0.1457	0.0393***	−0.0032	0.1140***	0.0161
	[−3.529]	[0.701]	[2.856]	[−1.431]	[7.321]	[1.328]
AMEND	−0.0005	−0.2886*	0.0003	0.0004	0.0168**	0.0221***
	[−0.199]	[−1.951]	[0.216]	[0.772]	[2.234]	[3.980]
ICWEAK	−0.0245**	0.2582	0.0022	0.0001	0.0552***	−0.0520***
	[−2.321]	[0.961]	[0.307]	[0.054]	[2.909]	[−3.461]
LATE	−0.0504***	0.0433	0.0111	0.0010	0.0734***	0.0104
	[−3.210]	[0.148]	[0.741]	[0.284]	[2.613]	[0.448]
SHORTFALL	0.0039	−0.1243	−0.0006	0.0017**	0.0025	0.0141*
	[1.080]	[−0.669]	[−0.326]	[2.029]	[0.225]	[1.752]
ESGREPORT	0.0048**	0.2576	−0.0021**	−0.0001	−0.0292***	−0.0126**
	[2.096]	[1.589]	[−2.269]	[−0.371]	[−4.147]	[−2.198]
DIVS	−0.0055***	−0.0526	−0.0010	−0.0003	−0.0113**	−0.0247***
	[−3.677]	[−0.612]	[−1.405]	[−1.002]	[−2.401]	[−6.550]
BRIEFINGS	−0.0125***	−0.3117***	0.0004	0.0002	0.0044	−0.0009
	[−9.007]	[−4.293]	[0.894]	[1.228]	[1.248]	[−0.301]
AGE	−0.0000	−0.0064***	0.0000***	0.0000	0.0001***	0.0001***
	[−1.385]	[−8.700]	[4.560]	[1.290]	[2.958]	[2.883]
SH	0.0059***	0.3691***	−0.0037***	−0.0008**	−0.0189***	−0.0809***
	[3.160]	[2.985]	[−4.661]	[−2.129]	[−3.245]	[−17.387]
LN_AT	0.0011	0.7504***	0.0034***	0.0014***	0.0113***	0.0178***
	[0.857]	[9.794]	[6.250]	[6.114]	[3.151]	[6.503]
LEV	0.0193***	−0.5783**	0.0189***	0.0094***	0.0422**	−0.0027
	[3.040]	[−1.962]	[6.058]	[7.942]	[2.505]	[−0.199]
ROA	0.1054***	12.1481***	−0.0036	0.0362***	−0.3550***	−0.3564***
	[5.038]	[10.114]	[−0.278]	[6.780]	[−6.631]	[−8.170]
LOSS	0.0019	1.2769***	0.0112***	0.0069***	0.0248**	0.0567***
	[0.475]	[7.644]	[3.782]	[6.741]	[2.473]	[7.753]
ACCRUALS	−0.0805***	−8.4635***	0.0204***	−0.0074***	0.1752***	0.1786***
	[−5.991]	[−10.408]	[3.025]	[−2.735]	[4.712]	[5.914]
MB	0.0001	0.0654***	−0.0006***	−0.0004***	0.0005	0.0022***
	[0.324]	[5.514]	[−5.832]	[−7.280]	[0.778]	[5.254]
RET	0.0122***	3.8000***	−0.0117***	−0.0019***	−0.0143**	−0.0332***
	[5.426]	[23.781]	[−13.736]	[−5.774]	[−2.170]	[−5.956]
VOL	−0.7760***	−2.8183	0.1823***	0.0882***	0.0198	−0.5503**
	[−7.717]	[−0.442]	[4.217]	[4.829]	[0.068]	[−2.249]
NUMSUSP	0.0060***	−0.1323*	0.0003	0.0005**	0.0144***	0.0013
	[4.077]	[−1.727]	[0.449]	[2.225]	[3.818]	[0.411]

(*continued*)

Table 4. Continued

Dependent variable	Intermediation		Analyst forecast properties		Securities enforcement	
	F_INST (1)	F_ANA (2)	F_FERRORS (3)	F_DISPERSION (4)	F_ENFORCE (5)	F_ANNLETT (6)
ISSUE	−0.0099**	−1.4677***	0.0137***	0.0035***	0.0534***	0.0590***
	[−2.444]	[−6.502]	[4.825]	[3.661]	[5.051]	[7.475]
RESTRUCT	0.0257***	0.0089	0.0003	0.0005	0.0065	0.0369***
	[4.684]	[0.039]	[0.100]	[0.690]	[0.485]	[3.816]
BIGAUD	0.0022	−0.0977	−0.0013	−0.0001	−0.0107**	−0.0067
	[1.311]	[−0.884]	[−1.645]	[−0.321]	[−2.066]	[−1.621]
DUALITY	−0.0040*	0.2695**	0.0000	−0.0004	0.0117**	0.0015
	[−1.956]	[2.120]	[0.036]	[−1.147]	[2.022]	[0.343]
BDSIZE	0.0001	0.0027	−0.0002	−0.0000	0.0019*	0.0010
	[0.352]	[0.138]	[−1.094]	[−0.218]	[1.949]	[1.372]
BDINDIE	0.0144	1.8691***	−0.0063	−0.0013	−0.0184	−0.0316
	[1.282]	[2.687]	[−1.254]	[−0.697]	[−0.545]	[−1.212]
SOE	0.0258***	−0.2140	−0.0067***	−0.0010**	−0.0867***	−0.0651***
	[11.368]	[−1.325]	[−6.192]	[−2.127]	[−11.304]	[−10.740]
CROSS	0.0161***	1.3068***	−0.0013	0.0012	−0.0302	−0.0470***
	[3.227]	[2.849]	[−0.643]	[0.998]	[−1.337]	[−2.641]
INST	0.7820***	1.6351***	−0.0136***	−0.0035***	−0.0471***	−0.0309***
	[163.822]	[5.789]	[−7.647]	[−5.186]	[−3.694]	[−3.131]
ANA	−0.0006***	0.6200***	−0.0002***	−0.0000	−0.0015***	−0.0028***
	[−5.407]	[56.353]	[−3.902]	[−1.013]	[−4.090]	[−9.117]
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
No. of obs	19,135	19,135	13,007	10,782	21,782	21,782
Adj. R^2/ Pseudo R^2	83.2%	59.6%	10.9%	8.9%	17.7%	29.7%

Note(s): Table 4 reports the relation between excess disclosure quality ratings and future outcomes including intermediation, analyst forecast properties, and securities enforcement. Intermediation measures are *F_INST* (institutional ownership) and *F_ANA* (analyst following) in the year following the announcement of the assessment result in columns (1) and (2). Analyst forecast properties are *F_FERRORS* (analyst forecast errors) and *F_DISPERSION* (analyst forecast dispersion) in the year following the announcement of the assessment result in columns (3) and (4). Securities enforcement measures are *F_ENFORCE* (indicator of CSRC enforcement actions or disciplinary actions from the stock exchange) and *F_ANNLETT* (indicator of the receipt of a comment letter on the annual report) in the year following the announcement of the assessment result in columns (5) through (6). The models are OLS in columns (1) through (4) and Probit in columns (5) and (6). Marginal effects at the mean are reported as coefficients for the Probit models. Detailed variable definitions are in Appendix 2. *t*-statistics or *z*-statistics underneath the coefficients are based on standard errors clustered at the firm. ***, **, and * denote two-tailed statistical significance at the 1%, 5%, and 10% level, respectively
Source(s): Table created by authors

both more accurate and less dispersed. Excess disclosure quality ratings are associated with a better information environment in terms of analyst forecast properties. The next two columns include future security enforcement. In column (5) with *F_ENFORCE* as the dependent variable, the marginal effect of *INFO* is negative at the 1% level, and the likelihood of a CSRC enforcement action or a disciplinary action from the stock exchange next year decreases by 2.3% (13% of the mean value) when all the variables are at their mean and *INFO* increases from the mean (i.e. 0) to Q3. In column (6) with *F_ANNLETT* as the dependent variable, the marginal effect of *INFO* is negative at the 1% level and translates to a 1.69% (12% of the mean value) lower likelihood of receiving a comment letter on an annual report when the variables are held at the mean and *INFO* changes from the mean to Q3. *EXCH*, *CSRC*, *ANNLETT*, *OTHLETTS*, and

AMEND are related to a higher likelihood of future securities enforcement. State-owned enterprises (*SOE*) and cross-listed firms (*CROSS*) are less likely to receive future securities enforcement. The results suggest that excess disclosure quality ratings contain information about the level of future scrutiny from securities regulators. In terms of economic significance, *INFO* is particularly predictive of future analyst forecast accuracy and securities enforcement, whereas its impact on future institutional ownership is very small.

In unreported results, I also include the three market-based information quality measures in the models, and excess disclosure quality ratings continue to predict all the outcomes. When I include the three accounting-based information quality measures in the models with a smaller number of observations, excess disclosure quality ratings are no longer predictive of analyst coverage but continue to predict the other outcomes. The results suggest that excess disclosure quality ratings contain unique information not captured by the other measures, but investors do not seem to incorporate excess ratings as firm-level news, probably due to the dissemination method or the coarseness of the ratings.

5. Supplemental tests

5.1 Shanghai versus Shenzhen stock exchanges

The stock exchanges in Shanghai and Shenzhen have slightly different marking schemes in the assessment of disclosure quality, and the model in column (1) of Table 2 shows that firms listed in Shanghai (*SH*) on average receive lower ratings. We examine whether ratings by the two stock exchanges have differential effects on the outcome variables, including the market reaction to the announcement of the assessment result and future outcomes, and Table 5 reports the results. Table 5 indicates that the coefficient of the interaction between *INFO* and *SH* is only significant when the dependent variable is the indicator of the receipt of comment letters on annual reports next year (*F_ANNLETT*). Because comment letters are issued by the stock exchanges, the result suggests that the issuance of comment letters by the Shanghai Stock Exchange is less reliant on past information captured in *INFO* than that by the Shenzhen Stock Exchange. Otherwise, excess disclosure quality ratings by the two stock exchanges have similar effects on the outcome variables.

Table 5. Shanghai versus Shenzhen stock exchanges

Dependent variable	CAR (1)	F_INST (2)	F_ANA (3)	F_FERRORS (4)	F_DISPERSION (5)	F_ENFORCE (6)	F_ANNLETT (7)
INFO × SH	−0.0007	0.0005	−0.0386	0.0007	−0.0002	−0.0126	0.0497***
	[−0.533]	[0.140]	[−0.175]	[0.413]	[−0.437]	[−1.209]	[5.844]
INFO	0.0005	0.0064***	0.5176***	−0.0068***	−0.0013***	−0.0776***	−0.0765***
	[0.553]	[2.908]	[3.549]	[−5.649]	[−3.292]	[−11.931]	[−15.462]
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
No. of obs	21,465	19,135	19,135	13,007	10,782	21,782	21,782
Adj. R^2/Pseudo R^2	3.3%	83.2%	59.6%	10.8%	8.9%	17.7%	29.9%

Note(s): Table 5 reports whether disclosure quality ratings by the Shanghai and Shenzhen stock exchanges have differential effects on the outcome variables. The outcome variables include market reactions to the announcement of disclosure quality ratings (*CAR*), future institutional ownership (*F_INST*), future analyst coverage (*F_ANA*), future analyst forecast errors (*F_FERRORS*), future analyst forecast dispersion (*F_DISPERSION*), future enforcement actions from the CSRC or the stock exchange (*F_ENFORCE*), and future receipt of comment letters on annual reports (*F_ANNLETT*). The test variable is the interaction between excess disclosure quality ratings (*INFO*) and the indicator of Shanghai listings (*SH*). The models are OLS in columns (1) through (5) and Probit in columns (6) and (7). Marginal effects at the mean are reported as coefficients for the Probit models. Detailed variable definitions are in Appendix 2. *t*−statistics or *z*−statistics underneath the coefficients are based on standard errors clustered at the firm. ***, **, and * denote two−tailed statistical significance at the 1%, 5%, and 10% level, respectively

Source(s): Table created by authors

5.2 Excess disclosure quality ratings when firm fixed effects are determinants

Although we strive to include as many common public signals as possible when estimating excess disclosure quality ratings, we may miss some firm characteristics that affect how the stock exchanges rate disclosure quality. We re-estimate the determinant model in column (1) of Table 2 with firm fixed effects and create an alternative version of excess disclosure quality ratings, or *INFO_FE*. In Table 6, we replicate all the results with *INFO_FE*. In Panel A, *INFO_FE* is still unrelated to the market reaction to the announcement of the assessment result. In Panel B, *INFO_FE* is no longer associated with *CONSERV* and *DD*; in Panel C, *INFO_FE* is

Table 6. Firm fixed effects and excess disclosure quality ratings

Panel A: Market reactions to the announcement of disclosure quality ratings

Dependent variable	CAR (1)
INFO_FE	0.0002
	[0.181]
Controls	Yes
No. of obs	21,250
Adj. R^2	3.3%

Panel B: Association with market−based and accounting−based information quality measures

Dependent variable	ZERORET (1)	ILLIQ (2)	NCSKEW (3)	CONSERV (4)	PERSIST (5)	DD (6)
INFO_FE	−0.0006*	0.0015	−0.0331***	−0.9856	0.0214**	−0.0004
	[−1.874]	[0.479]	[−3.417]	[−0.869]	[2.350]	[−0.423]
Controls	Yes	Yes	Yes	Yes	Yes	Yes
No. of obs	22,954	22,953	22,939	10,760	9,817	10,068
Adj. R^2	39.6%	44.1%	11.6%	0.3%	14.5%	26.1%

Panel C: Predictability of future outcomes

Dependent variable	F_INST (1)	F_ANA (2)	F_FERRORS (3)	F_DISPERSION (4)	F_ENFORCE (5)	F_ANNLETT (6)
INFO_FE	0.0040**	−0.1252	−0.0019*	−0.0005	−0.0199***	−0.0164***
	[1.978]	[−0.972]	[−1.733]	[−1.405]	[−3.122]	[−3.261]
Controls	Yes	Yes	Yes	Yes	Yes	Yes
No. of obs	18,991	18,991	12,891	10,690	21,560	21,560
Adj. R^2/ Pseudo R^2	83.5%	59.7%	10.4%	8.7%	15.9%	28.4%

Note(s): Table 6 replicates all the results using an alternative measure of excess disclosure quality ratings when public signals include firm fixed effects. The test variable *INFO_FE* is the residuals from estimating the model in column (1) of Table 2 with firm fixed effects. Panel A reports the relation between *INFO_FE* and market reactions to the announcement of disclosure quality ratings (*CAR*). Panel B reports the association between *INFO_FE* and market-based information quality measures (*ZERORET*, *ILLIQ*, and *NCSKEW*) and accounting-based information quality measures (*CONSERV*, *PERSIST* and *DD*). Panel C reports the relation between *INFO_FE* and future outcomes (*F_INST*, *F_ANA*, *F_FERRORS*, *F_DISPERSION*, *F_ENFORCE* and *F_ANNLETT*). The models in columns (5) and (6) of Panel C are Probit and the other models are OLS. Marginal effects at the mean are reported as coefficients for the Probit models. Detailed variable definitions are in Appendix 2. *t*-statistics or *z*-statistics underneath the coefficients are based on standard errors clustered at the firm. ***, **, and * denote two-tailed statistical significance at the 1%, 5%, and 10% level, respectively

Source(s): Table created by authors

no longer associated with *F_ANA* and *F_DISPERSION*. *INFO_FE* is still associated with the percentage of zero-return days, crash risk, and earnings persistence, and continues to predict future institutional ownership, analyst forecast accuracy, and securities enforcement. Because we do not have long firm-level time series (seven years at most and often fewer) and disclosure quality ratings are sticky, the model with firm fixed effects (equivalent to a within-firm change specification) is arguably not the ideal model for the data.

5.3 Discrete excess disclosure quality ratings

Because disclosure quality ratings are discrete (i.e. 4, 3, 2 or 1 for A, B, C or D), excess disclosure quality ratings should technically also be discrete. For example, investors expect a firm to receive an A (4) based on the easily observable public signals, but the firm receives a B (3), so the excess disclosure quality rating in this case is −1. *INFO*, however, is a continuous variable. We create a discrete version of excess disclosure quality ratings named *INFO_ROUND*. We first estimate the expected ratings based on the model in column (1) of Table 2 and then round the ratings into integers (e.g. 2.7 becomes 3 and 1.3 becomes 1). *INFO_ROUND* equals the raw ratings minus the rounded expected ratings and can take on the value of −3, −2, −1, 0, 1, 2 or 3. Table 7 reports the effect of *INFO_ROUND* on the outcome variables. The results are qualitatively similar to those with the continuous version of excess disclosure quality ratings.

6. Conclusion

This paper examines firms' disclosure quality ratings by the stock exchanges in China. The stock exchanges give firms A, B, C or D ratings annually according to a grading sheet that evaluates mandatory and voluntary disclosures, investor relations, and compliance with or violations of securities laws. We construct excess disclosure quality ratings that are the residuals from the regression of raw ratings on easily observable public signals of disclosure quality and firm characteristics on and off the grading sheet. Market responses to better raw or excess disclosure quality ratings are not more favorable, indicating that investors do not consider the ratings as firm-level news. However, excess ratings are associated with several

Table 7. Discrete excess disclosure quality ratings

Dependent variable	CAR (1)	F_INST (2)	F_ANA (3)	F_FERRORS (4)	F_DISPERSION (5)	F_ENFORCE (6)	F_ANNLETT (7)
INFO_ROUND	0.0007 [1.212]	0.0057*** [3.917]	0.3852*** [3.859]	−0.0048*** [−6.549]	−0.0010*** [−3.795]	−0.0654*** [−14.447]	−0.0516*** [−14.896]
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
No. of obs	21,465	19,135	19,135	13,007	10,782	21,782	21,782
Adj. R^2/ Pseudo R^2	3.3%	83.2%	59.6%	10.7%	8.8%	17.3%	29.6%

Note(s): Table 7 the relation between discrete excess disclosure quality ratings and outcome variables. Discrete excess disclosure quality ratings, *INFO_ROUND*, are calculated as the difference between raw disclosure quality ratings and rounded predicted disclosure quality ratings based on the model in column (1) of Table 2. The possible values of *INFO_ROUND* are −3, −2, −1, 0, 1, 2, and 3. The outcome variables include *CAR*, *F_INST*, *F_ANA*, *F_FERRORS*, *F_DISPERSION*, *F_ENFORCE*, and *F_ANNLETT*. The models are OLS in columns (1) through (5) and Probit in columns (6) and (7). Marginal effects at the mean are reported as coefficients for the Probit models. Detailed variable definitions are in Appendix 2. *t*-statistics or *z*-statistics underneath the coefficients are based on standard errors clustered at the firm. ***, **, and * denote two-tailed statistical significance at the 1%, 5%, and 10% level, respectively

Source(s): Table created by authors

market-based and accounting-based information quality measures, suggesting that they are not noise. Moreover, excess ratings can predict an array of future outcomes, including intermediation, analyst forecast properties, and security enforcement. Overall, the results suggest that disclosure quality ratings by the stock exchanges in China contain information about firm fundamentals and compliance with disclosure rules which investors cannot easily observe, but investors ignore this costless information.

Notes

1. It is worth noting that it is impossible to include *all* public signals, so excess disclosure quality ratings are likely to also contain some public information. However, less accessible public information that requires high processing costs (e.g., awareness costs or acquisition costs) can also be considered private information (Blankespoor, deHaan, & Marinovic, 2020). Because we include the most common, easily accessible public signals, excess disclosure quality ratings capture information only known to managers as well as public information with high processing costs, both of which can be characterized as private information possessed by managers.
2. Comment letters are firm-specific letters that target a specific filing with numbered questions, and the recipient firm is expected to address the questions point by point with detailed responses before a deadline. In China, there are three types of comment letters: comment letters on annual reports, ad-hoc comment letters on non-periodic filings, and comment letters on merger and acquisition filings.
3. The "special treatment" status for financial irregularities is another method used by the stock exchanges to communicate with investors about firms' regulatory risk. "ST" is added in front of a stock's trading symbol to alert investors.
4. CSMAR does not differentiate disciplinary actions from the stock exchanges or enforcement actions from the CSRC that target a firm, its directors or executives, or its shareholders, but point deductions are different for these cases according to the grading sheet. CSMAR also does not differentiate the different types of disciplinary actions from the stock exchanges. The residuals of Model (1) might capture information because easily observable public signals are too coarse.
5. Annual report amendments are equivalent to restatements in prior literature because firms sometimes amend financial statements or footnotes when they amend annual reports. Cao *et al.* (2021) and Huang and Ke (2022) use restatements to describe annual report amendments.
6. The mean values of *CAR* for the four disclosure quality ratings are as follows: 0.001 (*t*-statistic = 0.984) for A, −0.002 (*t*-statistic = −6.026) for B, −0.000 (*t*-statistic = −0.487) for C, and 0.005 (*t*-statistic = 2.037) for D. The mean value of *CAR* is −0.001 (*t*-statistic = −3.25) when *INFO* (excess disclosure quality rating) is positive and −0.001 (*t*-statistic = −2.5) when *INFO* is negative. Based on the descriptive statistics, there is no evidence that the market response is more favorable when the raw or excess rating is better.
7. The coefficient on *RATING* (raw ratings) is also not statistically significant if *RATING* replaces *INFO* in the model.

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Supplementary material
The supplementary material for this article can be found online.

Corresponding author
Shuo Yang can be contacted at: shyang@kean.edu