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Do Financial Markets Care about Corporate Social Responsibility Disclosure? Further Evidence from China

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Corporations increasingly define their corporate social responsibility (CSR) activities as a part of their business. However, is this trend beneficial to investors? Based on an event study methodology and a sample of Chinese listed companies, we extend the literature on voluntary disclosure by exploring the role of CSR disclosure in reducing stock market information asymmetry, as proxied by share price volatility and liquidity. Our results show that the share price volatility after CSR disclosure is lower than before CSR disclosure; however, the trend is that it decreases first and then increases for three months following disclosure. Stock liquidity also significantly improves after CSR disclosure; however, it increases first and then decreases. Additionally, by dividing CSR disclosure into economic (hard) disclosure and generic (soft) disclosure, we find that the reduction in information asymmetry is higher for hard disclosure than soft disclosure, suggesting that although CSR disclosure does indeed have an impact on investors' behaviour in China, an economic-based disclosure contributes more substantially. Finally, to better understand the characteristics of the Chinese financial market, we also explore the role of marketisation with results that show that the effect in reducing information asymmetry is greater for companies located in a region with a higher degree of marketisation.

Asymmetric information refers to some agents having more information than others. Corporate insiders are a good example of agents who have more valuable information than outsiders, giving them a greater depth of understanding of their companies (Hutton et al. 2009). This implies a violation of the strong form of market efficiency, and it seems that in a world of asymmetric information, insiders have useful information that is not necessarily reflected in the change of stock prices (Kim and Verrecchia 1997). Investors are always seeking ways to reduce information asymmetry. Information disclosure helps to improve firm-level transparency, which in turn reduces the risk to investors caused by information asymmetry (Clarkson et al. 1994; Healy and Palepu 2001).

However, a long-held tenet of business enterprise in Western capitalist systems has been the primacy of capital providers in spurring investment and growth through profit maximisation, which has led to a limited focus on financial measurements and disclosure as a means to evaluate performance and the effective discharge of managerial accountability (Kim and Verrecchia 1991; Brockman et al. 2008; Rosa and Liberatore 2014). In recent years, the terms 'corporate social responsibility' (CSR) and 'sustainability' have become commonplace. There has been a growing awareness of the impact of corporate behaviour not only on shareholders but also on other stakeholders. Moreover, there has also been an increasing willingness to consider a greater variety of persons and groups to be 'legitimate stakeholders' with interests that deserve consideration, such as employees, customers, suppliers and creditors, as well as local communities, developing nations and the environment. Thus, a desire to encourage companies to act responsibly, to ensure development is sustainable and to allow all stakeholders to make informed assessments of corporate activities and practices necessarily leads to a consideration of disclosing CSR reports (or sustainability reports). Therefore, to ensure organisations' long-term survival there are widespread attempts to incorporate social and environmental information into traditional financial reporting, which gives companies a means to report on how non-financial factors interact with financial ones and ultimately drive a company's value (Mock et al. 2007; Thorne et al. 2014). However, the impact of a firm's information disclosure on information asymmetry between managers and investors can only be effective if the firm's disclosure is credible and relevant.

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Unlike financial disclosure, CSR disclosure is characterised by voluntariness, low standards and selectivity. Additionally, most prior studies view CSR disclosure as an additive process in which more is better (Patten 1991). Despite the growth and development of CSR disclosure by many organisations, it is still relatively unknown as to whether CSR disclosure is credible, how much value-relevant information CSR disclosure contains and whether financial markets care about CSR disclosure, especially in China where the awareness of CSR is still weak and corporations have started to disclose discrete CSR reports relatively late – only since 2008 (Mishra and Suar 2010). To our knowledge, there are few previous studies concerned with the relationship(s) between CSR, CSR reporting and the stock market (Jones et al. 2007; Reverte 2012; Dhaliwal et al. 2011, 2014); however, research in the field is still relatively inconclusive and largely underspecified (Murray et al. 2006), and limited to Western countries the institutional settings of which are quite different from emerging nations, including China (Xu et al. 2012; Islam et al. 2015). Whether voluntary CSR disclosure can play a similar role as financial disclosure in reducing the information asymmetry of the stock market in China and whether investors integrate the information disclosed by CSR reporting into their assessment of a company's value is what we want to explore in this paper. This may provide an explanation for the increasing trend of CSR reporting as well as an examination of the relevance and credibility of Chinese firms' overall CSR disclosure.

Using an event study methodology and a sample of Chinese listed companies from 2009 to 2011, this paper examines whether and how CSR disclosure plays a role in reducing stock market information asymmetry by comparing changes in market reaction, as proxied by share price volatility and liquidity, before and after releasing CSR reports. Additionally, four event windows, including one pre-event window and three post-event windows, are established to calculate the information asymmetry between managers and investors. Our results suggest that the share price volatility after CSR disclosure is lower than before CSR disclosure; however, the trend is that it decreases first and then increases for the three months following CSR disclosure. There is also an obvious increase in stock liquidity after CSR disclosure; however, it increases first and then decreases. Additionally, dividing CSR disclosure into different types of information, we find that the reduction in information asymmetry is higher for economic (hard) disclosure than for generic (soft) disclosure, suggesting that financial markets do care about CSR disclosure in China, but economic-based disclosure still provides a greater contribution. Moreover, dividing the sample by the level of marketisation, our results also demonstrate that the higher the level of marketisation in the region in which the company is located, the higher the quality and reliability of the disclosed information in CSR reports and therefore the more impact CSR disclosure will have on reducing information asymmetry between investors and managers.

We contribute to the literature in several ways. First, using an event study methodology, we compare the changes in share price volatility and liquidity before and after releasing CSR reports to address the question of how much value-relevant information voluntary CSR disclosure contains and how investors interpret CSR disclosure in China. This is distinct from Hermalin and Weisbach (2012) and Bischof and Daske (2013), who study the stock market's reaction to financial disclosure, and it is distinct from Richardson and Welker (2001), Reverte (2012), Bachoo et al. (2013), Clarkson et al. (2013), and Dahliwal et al. (2011, 2014) who use the cost of capital as a proxy for the reaction of the financial market. It is also distinct from Cormier et al. (2009), Clarkson et al. (2013) and Plumlee et al. (2015), who restrict their focus to the social or environmental component of CSR reporting.

Second, this study extends past research efforts and fills a gap in the extant literature by making a quantitative comparison of the difference in the quality and reliability of CSR disclosure among regions, and it explores the moderating effect of marketisation. Although past research has already investigated the market response to CSR disclosure (Murray et al. 2006; Cormier and Magnan 2011), considering the particular institutional background and the difference in the level of marketisation among regions in China, the quality of CSR disclosure may change along with it, leading to diverse responses from the financial market. Taking marketisation into consideration may provide empirical evidence for the establishment of a diversified governance mechanism for punishment and regulation in the regions of China.

Third, by dividing the information disclosed by CSR reporting into economic disclosure and generic disclosure, this paper also provides some practical insights for managers wishing to enhance the efficiency of the message that they convey to the financial market in relation to Chinese listed companies. Prior studies have tended to focus on CSR disclosures generally rather than focusing on disclosures pertaining to the CSR-related governance practices in place. That is, currently, there is substantial emphasis on just increasing the number of disclosed information items without much consideration as to their incremental or substitute effect on investors' decision making. Owing to the cost of CSR disclosure, a more efficient disclosure strategy becomes critical if the company wants the financial market to have an accurate picture of its CSR performance. This paper seeks to explore this disclosure strategy by comparing the difference between economic and generic disclosure in CSR reports.

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Theoretical Background and Hypotheses Development

CSR disclosure in China

As one of the largest developing countries, China has undergone rapid changes since adopting reform and an open door policy in 1978. From 2000 to 2009, the average growth rate in GDP reached 9.7%, making China one of the largest economies in the world. However, along with rapid economic growth, a number of serious social and environmental issues have arisen, including environmental pollution, energy shortages, occupational diseases and death, and an absence of product responsibility (Xu et al. 2015). In particular, in 2008, with the news that milk powder exported from some Chinese companies was declared damaging to human health, at least 25 countries stopped all imports of Chinese dairy products (UNESCAP 2010).

Faced with these social and environmental issues, the Chinese government has made sustainable development a national strategy to ensure continuous economic growth and has made efforts to encourage Chinese companies to become more socially and environmentally responsible to their stakeholders. CSR disclosure, which was formerly considered to be a Western phenomenon, is a relatively new practice for Chinese companies (Noronha et al. 2013). Prior to 2005, very few Chinese companies disclosed social and environmental information in their annual reports or social and environmental reports (including environmental reports, CSR reports, or sustainability reports). In early 2008, China's State-owned Assets Supervision and Administration Commission of the State Council (SASAC) issued recommendations to guide the social responsibility activities of central state-owned enterprises (SOEs) (SASAC 2008). In response to the Chinese government's efforts to highlight sustainable development, both the Shenzhen Stock Exchange (SZSE) and the Shanghai Stock Exchange (SSE) promulgated social responsibility guidelines for listed companies in 2006 and 2008, respectively, to encourage listed companies to publicly disclose social and environmental information in annual CSR reports. Additionally, many industry-specific initiatives have grown as well, such as the China Sustainability Reporting Guidelines for Apparel and Textile Enterprises, Guidelines on Corporate Social Responsibility for Banking Financial Institutions in China, and so on. Consequently, Chinese listed companies increasingly began to publish CSR reports as supplements to their annual reports. According to statistics, approximately 963 Chinese companies listed on the SZSH and SSE published CSR reports in addition to their annual reports in 2012. Given the Chinese communities' concerns about social and environmental issues, an independent rating agency initiated by Southern Weekend (one of China's most popular newspapers), consisting of a group of experts and scholars from the government, industries, universities, and research institutes, has ranked Chinese listed companies in terms of their CSR level in 2008. In general, CSR disclosure is a relatively new but somewhat regulated and rapid developing phenomenon in China.

CSR disclosure and the capital market

Is CSR disclosure relevant to investors?

Investors' behaviour in the stock market is always determined by the information they receive. Due to adverse selection, investors who obtain less information will suffer losses when trading compared with those who obtain more. As a result, they have to trade at a better price to make up for the losses, which results in an increase in transaction costs (Prommin et al. 2014). Botosan (1997) shows that an increase of information disclosure reduces the information asymmetry between shareholders and managers. Lang and Lundholm (1999) report that a higher level of transparency and a higher quality of disclosure are associated with lower information risk and smaller transaction costs. Studying institutional and retail investors' trading behaviours, Chiyachantana et al. (2004) suggest that information disclosure, especially earnings announcements, has been effective in improving liquidity by decreasing the level of information asymmetry. Using the public companies of three regions (Shanghai, Hebei and Tibet) listed on the Shanghai Stock Exchange as a sample, Zheng and Song (2011) show that the market effect, measured by the volatility of stock price, will be influenced by the voluntary disclosure of internal control information. Therefore, a higher quality of disclosure can lead to a reduction in information asymmetry between investors and managers and, ultimately, to a reduced share price volatility and an increased liquidity (Diamond and Verrecchia 1991; Heflin et al. 2005; Tannous et al. 2013).

There is greater attention paid to the CSR activities of organisations as awareness of sustainability grows. A high or low CSR score is not only a determinant of the sustainable development of an organisation but also affects the interests of investors. Heinkel et al. (2001) argue that exclusionary investing by investors with environmental awareness results in a scenario in which the stock of polluting firms is only held by neutral investors. Using institutional investors as the research subjects, Hong and Kacperczyk (2009), Plumlee et al. (2009), and Genster et al. (2011) all find that the majority of institutional investors prefer companies with higher CSR and that compared to arbitrageurs, norm-constrained institutional investors include fewer

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'sin' stocks, that is, publicly listed companies operating in the alcohol, tobacco, and gaming industries, in their portfolios.

The above studies all represent the fact that investors who are concerned with long-term profit consider CSR an important decision-making factor in evaluating the value of an enterprise, while CSR disclosure is an effective way for them to obtain CSR information (Cox and Wicks 2011). Due to the difficulty for investors in accessing credible financial disclosure, CSR disclosure is always considered an additional cue in the overall impression of management's honesty, credibility and trustworthiness (Cheng et al. 2013), thereby influencing investors' appreciation of a company's underlying risk (Richardson and Welker 2001; Reverte 2012; Clarkson et al. 2013) and the price they are willing to pay for a firm's stock (Cormier and Magnan 2011; Wang and Tuttle 2014). Using a broad cross-section of Canadian companies, Richardson and Welker (2001) argue that CSR disclosure can have a direct influence on the cost of equity capital either through investor preference for socially responsible and ethical investing or through reduced information asymmetry or estimation risk. Similarly, using a sample of 31 countries, Dhaliwal et al. (2011, 2014) propose that the issuance of stand-alone CSR reports is a necessary complement to financial disclosure and could affect investors' behaviour by investigating the relationship between CSR disclosure and the cost of equity capital. Schadewitz and Niskala (2010) propose that the information disclosed by CSR reports often completes financial reports with forward-looking information that can enhance the report users' understanding of such key value drivers as human capital formation, corporate governance, the management of environmental risks and abilities, and the capacity for innovation, all of which are of interest to the financial market. Cohen et al. (2011) examine the impact of CSR disclosure on investors' behaviour. By dividing investors into institutional investors and retail investors, they find that CSR disclosure has a greater impact on institutional investors than retail investors in terms of their investment decisions. Reverte (2012) implies that CSR reporting is a part of a company's communication toolkit to decrease information asymmetry between managers and investors.

Based on these arguments, we acknowledge that financial markets do care about CSR disclosure and the behaviour of investors will be influenced by CSR information not only due to its financial impact but also because of their greater concern over CSR activities. All findings suggest that CSR activities help build up capital for organisations and minimise negative market implications, thereby reducing information asymmetry between the company and investors through their interaction with CSR disclosure. Hence, we propose our first hypothesis as follows:

H1a: CSR disclosure is beneficial to investors by reducing information asymmetry between investors and managers

H1b: The better the CSR disclosure, the greater the reduction in information asymmetry after disclosure

Hard disclosure, soft disclosure and capital markets

Ernst and Ernst (1997) note that disclosures containing quantitative and monetary information have been regarded as being of higher quality than non-quantitative disclosures. Most prior studies of the environmental performance/environmental disclosure relation have attempted to capture this by weighting quantitative or monetary disclosures more highly. They suggest quantitative disclosures are more objective and informative to stakeholders than qualitative information (Wong and Millington 2014). This dichotomous split of disclosure types resembles the distinction made by Clarkson et al. (2008) and Aerts and Cormier (2009) between soft and hard disclosures in which hard disclosures reflect factual, objective information that cannot easily be mimicked by poor environmental performers. They show that soft environmental disclosures are less incentive-consistent than hard (economic-based) disclosure. Economic-based types of disclosures focus on the financial, legal and operational consequences of corporate environmental activities. To investigate whether different information disclosures have different impact on information asymmetry, we divide CSR disclosures into hard (economic-based) disclosure and soft (generic) disclosures as suggested by Clarkson et al. (2008). Hence, we propose,

H2: The reduction in information asymmetry is higher for hard CSR disclosure than for soft CSR disclosure

Marketisation, CSR disclosure and the capital market

The impact of a firm's CSR disclosure on information asymmetry between managers and investors can only be effective if the information disclosed is reliable (Cormier and Magnan 2011). However, among those companies showcasing their CSR activities, the average quality and reliability of the disclosed information is questionable and is useless for meaningful analyses and comparisons (Kamal and Deegan 2013; Weber 2014), especially in China where the CSR guidelines generated by SZSE and SSE are mainly voluntary and lack any legal enforceability (Chen et al. 2011; Noronha et al. 2013). Although companies release CSR information mainly for the purposes of reducing the cost of equity capital (Dhaliwal et al. 2011, 2014), promoting their competitive edge (Kempar et al., 2013), and exhibiting good development prospects to investors (Cox and Wicks 2011; Ghoul et al.

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2011), voluntary CSR disclosure is not independent of its institutional environment but deeply affected by it, which results in the quality and reliability of CSR reports changing frequently according to the institutional environment in which the company is located. Considering the differences in regional policy, geographical position, traffic conditions, and other factors, the difference in the degree of marketisation or institutional environment for the different regions of China is apparent (Xia and Chen 2007). For example, the level of marketisation for the coastal regions of East China is much higher than other regions in which non-market factors play a dominant role in the financial market (Fan et al. 2011). According to the previous studies, the level of marketisation can affect the quality of CSR disclosures in several ways.

First, corporate governance changes based on the level of marketisation, thereby affecting the quality of CSR disclosure. Healy and Palepu (2001) and Cui (2004) propose that the reliability and quality of voluntary information disclosure relies mainly on the effectiveness of corporate governance mechanisms, especially the mechanism for punishment and regulation. However, unlike the developed capital market, which shows a high level of marketisation, the ownership structure of Chinese companies is highly or relatively concentrated, resulting in the limited supervisory role of the board and significant power in the hands of the controlling shareholder (Liu and Tian 2012). Additionally, due to strong government intervention, violations of minority shareholders' rights are much more serious, and the effectiveness of the regulatory system is lower for companies located in regions with a lower degree of marketisation (Kang and Kim 2012), thereby influencing the reliability of voluntary information disclosure.

Second, considering the interaction between internal and external governance mechanisms, which includes legal protection of investors, the takeover market, intermediary markets, product markets, government regulations, and so on, the differences in regions leads to differences in external corporate governance mechanisms, thereby bringing about a difference in internal governance mechanisms (LLSV 1998; Gillan 2006; Fan et al. 2007; Huyghebaert and Wang 2012). Firth et al. (2006) propose that the process of marketisation enhances the pay-for-performance sensitivity of SOEs' CEOs, thus leading to the reduction in perquisite compensation. Wang and Xiao (2011) find that the higher the level of marketisation for the region in which the company is located, the lower the probability that the tunnelling behaviour occurs. Peng et al. (2011) and Rupley et al. (2012) both show that a well-established legal system, especially the effective function of law enforcment, can effectively prevent controlling shareholders from tunnelling and protect the interests of minority shareholders. Zeng et al. (2012) propose that the quality of an information disclosure depends on the institution, that is to say, the quality of the information is ensured only if the company is located in a region with a high degree of marketisation and in which regulatory and legal systems are well-established. All of these findings suggest that regions with higher levels of marketisation in China have better external governance, restricting the capacity of controlling shareholders to mislead the financial market through the spread of misinformation, thus contributing to improvements in the quality of voluntary information disclosure, including voluntary CSR disclosure.

Third, the motivation for CSR disclosure varies with the level of marketisation, which leads to the difference in the quality of voluntary disclosures. As a *guanxi* economy dominates the financial market for regions with low marketisation, the company that established a deeper connection with the government can obtain more social capital and have more financial channels for financing, thereby weakening the economic motive to promote corporate reputation and public relations through CSR disclosure (Lin et al. 1998; Chen et al. 2011). With respect to regions with a high degree of marketisation, Chen et al. (2011) and Xu et al. (2015) propose that there is less government interference and the contracted economy plays a much greater role than the *guanxi* economy. As a result, CEOs of companies located in the regions with a higher level of marketisation have a stronger motivation to capture the attention of investors by releasing CSR information rather than working to establish political connections, which also results in improvements in the quality and reliability of CSR disclosures.

According to the above discussion, we believe that the quality of voluntary information disclosure, including CSR disclosure, varies with the degree of marketisation due to the difference in internal as well as external governance mechanisms. Specifically, the higher the level of marketisation, the better the reliability of CSR disclosure and the stronger the response to CSR reports. Additionally, investors pay more attention to local listed companies and are more familiar with them. Considering those in more market-oriented areas tend to be more aware of CSR (Xu et al. 2015), the attention given to CSR information released by companies located in these regions will be greater than that released by other companies located in regions with a lower degree of marketisation, causing the financial market response to be much stronger as well. Hence, we propose,

H3: The reduction in information asymmetry is higher for companies located in more market-oriented regions than for companies located in regions with a lower degree of marketisation

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Sample and Methodology

Sample description

Considering that the SSE has guided listed companies in releasing CSR reports only since 2008, we select a sample of Chinese A-share listed companies for the period 2009–2011. To examine whether CSR disclosure can play a similar role to financial disclosure in reducing information asymmetry in the Chinese stock market and how investors integrate the information disclosed by CSR reporting into their assessment of a company's value, we begin by merging the following three data sources: financial data and industry affiliation data provided by the China Stock Market & Accounting Research Database (CSMAR) and CSR disclosure data taken from CSR reports released by listed companies. Moreover, we draw on the China Core Newspapers Full-text Database (CCND) for data on media exposure that could play a core role in CSR disclosure (Zyglidopoulos et al. 2012). A search was carried out for each company through the CCND using the name of the company as a keyword. The search results were examined to exclude articles that did not relate specifically to social responsibility issues.

We exclude companies that have missing data as well as those that have special treatment, which have shown deficits for two or three years running and could be delisted, including ST, * ST, S*ST, SST, and S companies. In addition, we eliminate financial companies because they operate under different regulations and their CSR disclosure is significantly different from industrial firms. To control for the effect of outliers, we winsorise all of the continuous variables at the top and bottom 1%. This procedure yields a final sample of 1554 observations (518 each year).

Table 1 shows the sample composition by industry groups (defined by the National Bureau of Statistics of China),[1] size (defined by the Regulation for the Division of Small and Medium Sized Enterprises, large-scale group include those whose total assets are greater than 400 million, medium-scale group include those whose total assets are between 40 million and 400 million, and small-scale group include those whose total assets are less than 40 million), and profitability (measured as the rate of return on equity (ROE) with high ROE groups including those with an average ROE over the three years higher than the mean ROE, and others classified into the low ROE group). To better understand the composition of the sample, we also show the distribution of the sample by CSR disclosure ratings and the level of marketisation in which the high CSR disclosure (marketisation) group includes those with average CSR disclosure ratings (marketisation) over the three years higher than the mean of all sample companies and the low CSR disclosure (marketisation) group includes all others. The manufacturing, transportation, and real estate sectors dominate the sample, and large-scale, low profitability, low CSR disclosure ratings and high marketisation companies represent a strong majority. Furthermore, we also find most of the companies with higher CSR disclosure are those operating in environmentally sensitive industries, including mining, chemicals, manufacturing and so on.

Methodology

We use event study, which is widely used in the finance domain (Kothari and Warner 2006; Jacobs et al. 2010; Xu et al. 2012). Disclosure practices have also followed this method with social and environmental information typically being combined, often through a CSR report. Therefore, we take the releasing of CSR reports by the companies as our events. Boehmer et al. (2005) proposes that the investors' behaviour would not be greatly affected before the information disclosure, as they need a much longer time to adapt to the changes after the event happens. As a result, we set four event windows (one pre-event window and three post-event windows) to compare the differences in the market's response between pre-event and post-event windows. T(–1) is the event window in which information asymmetry is calculated over a period of 30 days prior to CSR disclosure. T(1) measures the market's reaction in a moderate event window over a period of 30 days starting from the 1st day after the event up to the 30th day after the event. T(2) is the event window over the period of 30 days from the 31st day to the 60th day after the event. Finally, T(3) is the event window over the period from the 61st day to the 90th day after the event.

Empirical models and variable definitions

To examine whether CSR disclosure can play as significant a role as financial disclosure in reducing information asymmetry between investors and managers as in H1a and, if so, how CSR disclosure ratings affect the changes in market reactions before and after the disclosure as in H1b, we set two independent variables. These include an indicator variable (*DISD*), which equals 1 after the disclosure and 0 before the CSR disclosure, and a CSR disclosure ratings variable (*CSRD*) and then build model (1) and model (2) as follows:

$$\begin{aligned} VL_{i,t} = {} & \alpha_0 + \alpha_1 DISD_{i,t} \\ & + \alpha_2 LN(Volume)_{i,t} + \alpha_3 LN(Price)_{i,t} \\ & + \alpha_4 LN(Value)_{i,t} + \alpha_5 BETA_{i,t} \\ & + \alpha_6 DM_{i,t} + \varepsilon_{i,t} \end{aligned} \quad (1)$$

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Table 1 Sample breakdown by industry, size and profitability

Industry	N	High CSR disclosure	Low CSR disclosure	High Marketisation	Low Marketisation
Agriculture, forestry, fishery, and animal husbandry	7	1	6	3	4
Mining	24	12	12	10	14
Food products	7	4	3	4	3
Beverage	9	3	6	5	4
Textiles	12	7	5	7	5
Pulp and paper	7	5	2	4	3
Printing and publishing	6	4	2	3	3
Chemicals	26	15	11	14	12
Rubber and plastic products	6	3	3	2	4
Electronic equipment	19	10	9	11	8
Non-metallic mining	9	4	5	4	5
Ferrous metals mining	14	8	6	7	7
Non-ferrous metals mining	23	12	11	11	12
General equipment	13	6	7	6	7
Special equipment	19	9	10	10	9
Transportation equipment	29	14	15	16	13
Electronic equipment	26	12	14	14	12
Pharmaceutical	34	18	16	22	12
Other manufacture	4	2	2	2	2
Electricity, heating, and gas	37	10	27	20	17
Construction	16	7	9	8	8
Transportation	49	16	33	23	26
Warehousing	3	0	3	2	1
Communication	14	5	9	8	6
Computer	12	3	9	8	4
Wholesale	2	0	2	1	1
Retail	12	1	11	6	6
Business services	12	1	11	6	6
Real estate	38	10	28	22	16
Communal facilities	6	1	5	4	2
Tourism	5	0	5	3	2
Others	18	2	16	4	14
Total	518	205	313	270	248
Size	N	High CSR disclosure	Low CSR disclosure	High Marketisation	Low Marketisation
Large-scale	393	136	257	213	180
Medium-scale	102	54	48	49	53
Small-scale	23	15	8	8	15
Total	518	205	313	270	248
Profitability	N	High CSR disclosure	Low CSR disclosure	High Marketisation	Low Marketisation
High ROE	228	124	104	119	109
Low ROE	290	61	229	151	139
Total	518	205	313	270	248

$$\begin{aligned}\Delta VL_{i,t} = {} & \alpha_0 + \alpha_1 CSRD_{i,t} \\ & + \alpha_2 \Delta LN(Volume)_{i,t} + \alpha_3 \Delta LN(Price)_{i,t} \\ & + \alpha_4 \Delta LN(Value)_{i,t} + \alpha_5 \Delta BETA_{i,t} \\ & + \alpha_6 DM_{i,t} + \varepsilon_{i,t} \qquad (2)\end{aligned}$$

in which the variables are defined as follows.

Information asymmetry ($VL_{i,t}$): several approaches to assess a company's information asymmetry coexist. Francis et al. (2005), Gajewski and Quere (2013) and Shroff et al. (2013) show that the extent of information asymmetry proxied by bid-ask spread, share price volatility or stock liquidity is negatively associated with disclosure. In this paper, we will use share price volatility ($VOL_{i,t}$), measured as the average daily standard deviation of rate of return in period *t*, as well as stock liquidity ($LIQ_{i,t}$), measured as the average daily relative bid-ask spread that is higher when liquidity is lower, as the proxy variables for information asymmetry ($VL_{i,t}$). The difference in $VL_{i,t}$ between the pre-event window (T(–1)) and the post-event window, T(1), T(2), and T(3) is $\Delta VL_{i,t}$.

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CSR disclosure ratings (*CSRD*): we measure the ratings by a coding instrument similar to Aerts and Cormier (2009) and Cheung et al. (2012) as follows. First, we construct a set of index systems that include two broad categories of social and environmental related items, to measure CSR disclosure quality. The grid comprises 20 items measuring environmental disclosure quality in which the items are grouped into four categories and 20 items measuring social disclosure quality in which the items are grouped into three categories. Appendix A shows the final index of CSR disclosure.[2] Second, we provide a valuation of the CSR disclosure index for each company. Three points are awarded for an item described in quantitative or monetary terms in the CSR reports, two are awarded when an item is described as by detailed evaluation criteria, one is awarded for an item only showing a brief textual description, and zero when the company discloses nothing regarding the item. Third, we determine the weight of each evaluation index by the analytical hierarchy process (AHP) method. Fourth, we estimate the CSR disclosure ratings (*CSRD*) by the weighted average method.

Determinants of information asymmetry: prior studies on the determinants of information asymmetry between managers and investors suggest numerous determinants other than voluntary disclosure (Barclay and Smith 1988). Based on those literatures, we use the following variables as the determinants of information asymmetry: trading volume ($LN(Volume)_{i,t}$), measured as the natural logarithm of the average daily trading volume in millions in the period *t*; transaction price ($LN(Price)_{i,t}$), measured as the natural logarithm of the average daily closed price in the period *t*; circulation market value ($LN(Value)_{i,t}$), computed as the natural logarithm of the average daily circulation market value in million in the period *t*; systematic risk ($BETA_{i,t}$), estimated from a market model using daily stock returns data. $\Delta LN(Volume)_{i,t}$, $\Delta LN(Price)_{i,t}$, $\Delta LN(Value)_{i,t}$, and $\Delta BETA_{i,t}$ are the differences in $LN(Volume)_{i,t}$, $LN(Price)_{i,t}$, $LN(Value)_{i,t}$, and $BETA_{i,t}$between the pre-event window (T(–1)) and the post-event window, respectively. Additionally, we also add the month of the CSR disclosure ($DM_{i,t}$) as the control variable for different companies that released their CSR reports in different months.

Marketisation (*Market*): as a very important institutional characteristic of China's capital market, political interference is closely related to enterprise operation (Li and Zhang 2010). The higher the level of political interference in the region, the lower the degree of marketisation. Thus, to examine the effect of marketisation proposed by H3, we also use the political interference index for the region in which the firm is located from Fan et al. (2011) as the proxy of marketisation, which is lower with greater political interference but a lower degree of marketisation.

Empirical Results

Descriptive statistics and sample correlations

Table 2 provides some descriptive statistics about sample companies' share price volatility (*VOL*), liquidity (*LIQ*) and their determinants (Panel A) and the Pearson correlation coefficients between these variables (Panel B). To better understand the distribution of the CSR disclosure ratings for the sample companies, we also represent the frequency distribution of *CSRD* for each year (Panel C). We find that all of the explanatory variables are significantly correlated with our information asymmetry proxies (*VOL* and *LIQ*). *VOL* is negatively correlated with circulation market value ($LN(Value)$) and positively correlated with trading volume ($LN(Volume)$), transaction price ($LN(Price)$), and systematic risk (*BETA*); however, *LIQ* is positively correlated with $LN(Price)$ but negatively correlated with other explanatory variables. Additionally, we do not find high correlations between the explanatory variables, suggesting that multicollinearity is not a serious concern in our regressions.

Comparison tests for marketisation

To compare the difference in variables between the companies located in the regions with high and low levels of marketisation, we first divide the sample into two groups by the mean of marketisation and analyse the data using mean comparison tests and nonparametric tests. Table 3 shows the results of the comparison tests. All variables are higher for the companies located in the region with higher degree of marketisation than those with a lower degree. However, only the difference of *CSRD* is significant at the 1% level, which confirms our proposition that the quality and reliability of the disclosed information is better for the companies located in regions with a higher degree of marketisation, whereas other variables are significant at the 10% level or even insignificant.

Whether CSR disclosure affects information asymmetry

Our first hypothesis predicts that CSR disclosure is beneficial to investors by reducing the information asymmetry between investors and managers. To test this hypothesis, we first compare the difference in stock share volatility and liquidity between the pre-event window and post-event windows by mean comparison tests and nonparametric tests. Table 4 shows the results of comparison tests before and after CSR reports were released. We find *VOL* before releasing CSR reports (T(–1)) is significantly higher than after (T(1), T(2), and T(3), respectively), and it is down by 17.391%, 11.111%,

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Table 2 Descriptive statistics and sample correlations about information asymmetry and the determinants of them

Panel A: Descriptive statistics

		BETA			*LN(Volume)*			*LN(Value)*		
		2009	2010	2011	2009	2010	2011	2009	2010	2011
T(–1)	Mean	0.936	0.964	0.992	2.094	2.226	1.998	2.004	2.150	1.938
	Median	0.933	0.955	1.010	2.094	2.249	2.066	1.936	2.039	1.821
	Max	2.381	2.465	2.453	4.849	5.194	5.225	7.107	7.539	7.413
	Min	0.160	0.016	0.172	−0.660	−1.450	−1.160	−0.800	−0.900	−1.080
	St.dev.	0.244	0.266	0.278	1.014	1.182	1.096	1.208	1.287	1.289
T(1)	Mean	0.945	0.961	0.989	2.237	2.176	1.979	2.096	2.248	1.944
	Median	0.947	0.960	1.003	2.241	2.233	2.001	1.970	2.104	1.833
	Max	2.386	2.464	2.405	4.882	5.276	5.214	7.413	7.561	7.367
	Min	0.157	0.046	0.175	−0.520	−1.940	−1.190	−0.920	−1.250	−1.190
	St.dev.	0.259	0.273	0.275	1.001	1.194	1.096	1.300	1.376	1.298
T(2)	Mean	0.933	0.956	0.981	2.174	2.107	2.003	2.075	2.271	1.989
	Median	0.933	0.972	0.998	2.084	2.019	1.973	1.922	2.066	1.848
	Max	2.100	2.459	2.404	5.084	5.534	4.731	7.367	7.477	7.311
	Min	0.146	0.054	0.172	−0.190	−0.920	−1.030	−0.640	−0.630	−0.910
	St.dev.	0.264	0.281	0.280	0.895	0.972	0.921	1.278	1.322	1.237
T(3)	Mean	0.949	0.977	0.991	2.199	2.027	1.670	2.040	2.250	1.911
	Median	0.946	0.982	1.005	2.210	2.019	1.605	1.867	2.052	1.751
	Max	2.402	2.466	2.419	4.736	5.278	4.193	7.311	7.460	7.277
	Min	0.145	0.057	0.209	−1.230	−0.920	−1.770	−0.780	−0.510	−0.990
	St.dev.	0.271	0.284	0.295	0.956	1.024	0.992	1.282	1.317	1.243

		LN(Price)			*LIQ*			*VOL*		
		2009	2010	2011	2009	2010	2011	2009	2010	2011
T(–1)	Mean	2.667	2.647	2.289	0.057	0.058	0.071	0.023	0.018	0.018
	Median	2.576	2.649	2.270	0.056	0.058	0.070	0.022	0.018	0.018
	Max	4.340	4.493	5.044	0.079	0.069	0.092	0.025	0.020	0.020
	Min	1.421	0.976	0.617	0.045	0.048	0.055	0.019	0.016	0.015
	St.dev.	0.580	0.701	0.664	0.006	0.005	0.006	0.001	0.001	0.001
T(1)	Mean	2.487	2.537	2.266	0.047	0.048	0.057	0.019	0.017	0.017
	Median	2.452	2.511	2.255	0.046	0.048	0.056	0.019	0.017	0.017
	Max	4.429	4.408	5.086	0.057	0.056	0.070	0.021	0.019	0.021
	Min	0.896	0.956	0.571	0.037	0.042	0.050	0.017	0.016	0.014
	St.dev.	0.643	0.699	0.661	0.005	0.004	0.005	0.001	0.000	0.001
T(2)	Mean	2.376	2.416	2.182	0.037	0.040	0.049	0.017	0.015	0.015
	Median	2.343	2.408	2.151	0.037	0.039	0.048	0.017	0.015	0.015
	Max	4.438	4.278	4.949	0.042	0.056	0.065	0.020	0.016	0.016
	Min	0.847	0.892	0.505	0.031	0.034	0.040	0.015	0.014	0.014
	St.dev.	0.627	0.659	0.660	0.003	0.005	0.005	0.001	0.001	0.001
T(3)	Mean	2.353	2.397	2.134	0.045	0.042	0.052	0.019	0.016	0.016
	Median	2.308	2.410	2.101	0.044	0.043	0.052	0.020	0.016	0.016
	Max	4.499	4.709	4.928	0.056	0.046	0.066	0.022	0.019	0.018
	Min	0.761	0.877	0.260	0.037	0.035	0.040	0.017	0.014	0.014
	St.dev.	0.642	0.690	0.666	0.006	0.003	0.007	0.001	0.001	0.001

Variable	Year	Mean	Median	Max	Min	St.dev.
CSRD	Total year	30.775	28.215	78.440	11.690	9.570
	2009	30.433	28.151	78.440	11.711	9.383
	2010	30.351	28.122	77.573	11.690	9.713
	2011	31.741	28.793	78.301	11.872	9.032

Panel B: Correlations of variables

	LIQ	*VOL*	*LN(Volume)*	*LN(Price)*	*LN(Value)*
VOL	0.113**				
LN(Volume)	−0.561***	0.024*			
LN(Price)	0.262***	0.283***	−0.317*		
LN(Value)	−0.415***	−0.304***	0.305*	0.063*	
BETA	−0.016**	0.246***	−0.013	−0.050	−0.243*

(Continued)

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Table 2 Continued

Panel C: Frequency distribution of $CSRD$

	2009		2010		2011	
Range	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage
$10 \leq CSRD < 20$	91	0.176	99	0.191	85	0.164
$20 \leq CSRD < 30$	178	0.343	185	0.357	177	0.342
$30 \leq CSRD < 40$	88	0.170	84	0.162	95	0.183
$40 \leq CSRD < 50$	56	0.108	53	0.102	61	0.118
$50 \leq CSRD < 60$	44	0.085	41	0.080	39	0.075
$60 \leq CSRD < 70$	32	0.062	28	0.054	31	0.060
$70 \leq CSRD < 80$	29	0.056	28	0.054	30	0.058

***, **, * are statistically significant at 1%, 5%, and 10% level, respectively.

Table 3 Comparison tests between high and low level of marketisation groups

	Independent samples *T*-Test High degree of marketisation/Low degree of marketisation		Mann-Whitney U Test High degree of marketisation/Low degree of marketisation	
	T-Stat	Sig.	Z-Stat	Sig.
$CSRD$	4.003	0.000	3.972	0.000
LIQ	1.708	0.092	1.325	0.406
VOL	1.777	0.088	1.603	0.090
$LN(Volume)$	2.011	0.045	0.731	0.465
$LN(Price)$	0.375	0.708	0.643	0.520
$LN(Value)$	0.504	0.614	0.964	0.335
$BETA$	1.423	0.156	0.909	0.363

Table 4 Comparison tests before and after CSR disclosure

		LIQ			VOL			
		2009	2010	2011	2009	2010	2011	Remarks
T(–1)	Mean	0.057	0.058	0.071	0.023	0.018	0.018	
T(1)	Mean	0.047	0.048	0.057	0.019	0.017	0.017	
	T-Stat	−1.859*	−1.823*	−2.624***	−9.218***	−3.349***	−4.337***	T(1) – T(−1)
	Z-Stat	−5.357***	−4.024***	−3.499***	−9.321***	−3.696***	−4.893***	T(1) – T(–1)
T(2)	Mean	0.037	0.040	0.049	0.017	0.015	0.015	
	T-Stat	−5.080***	−3.759***	−4.324***	−17.452***	−9.767***	−11.496***	T(2) – T(−1)
	Z-Stat	−6.469***	−6.367***	−6.669***	−16.077***	−9.657***	−11.421***	T(2) – T(−1)
T(3)	Mean	0.045	0.042	0.052	0.019	0.016	0.016	
	T-Stat	−2.815***	−3.470***	−2.944***	−9.475***	−6.050***	−4.905***	T(3) – T(−1)
	Z-Stat	−4.434***	−2.494**	−6.480***	−9.209***	−5.526***	−5.591***	T(3) – T(−1)

***, **, * are statistically significant at 1%, 5%, and 10% level, respectively.

and 11.111% in 2009, 2010, and 2011, respectively. Moreover, *LIQ* in the pre-event window (T(–1)) is also significantly higher than post-event windows (T(1), T(2), and T(3)), and is down by 21.053%, 27.586%, and 26.761% in the three years, respectively. The findings show a significant downward trend of share price volatility and an upward trend of liquidity after releasing CSR reports, suggesting that the information asymmetry between investors and managers is indeed reduced after CSR disclosure.

In addition, the overall trend of volatility (or liquidity) is downward (or upward); however, it fluctuates after CSR disclosure. Compared to T(–1), *VOL* and *LIQ* decreases in T(1) and drops further in T(2); however, it increases slightly in T(3), suggesting that the stock price volatility decreases first and then increases, but liquidity increases first and then decreases after CSR disclosure. The results show that the changes in investors' behaviour are complex after CSR disclosure, which may be caused by the following.

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1. As a type of more professional but additional information disclosure, not all investors in the stock market are sensitive to or care about the firms' CSR activities. There may be only some exclusionary investors with CSR consciousness, such as environmentalists, who will pay attention to CSR reports right after they are released (Heinkel et al. 2001; Cox and Wicks 2011). As time goes by, more and more investors notice the CSR disclosure and then the changes to the market are more significant.
2. Due to their voluntary nature, low standards and selectivity of CSR information disclosure, the reliability of this type of information needs to be further confirmed (Jones et al. 2007). Thus, investors need time to check and respond to the information disclosed in CSR reports. Therefore, the strongest response to CSR disclosure takes place in T(2) and not T(1). The transactions will be stable as the investors' behaviours tend to be rational, or they might believe that the information is already outdated. The share price volatility and liquidity fluctuate with the adjustment in investors' behaviour.

Although there has been a significant change in share price volatility and liquidity between pre-event and post-event windows, several factors, such as trading volume, circulation market value and transaction price may also have an impact on volatility and liquidity. Therefore, we estimate the regression model (1) for further analysis, with the results shown in Table 5. The coefficients of the dummy variable *DISD* are negative (–0.016, −0.019, and –0.012 for *LIQ*, and –0.002, –0.003, and –0.001 for *VOL*), and all are statistically significant at the 1% level, suggesting that considering a number of control variables, CSR disclosure will still have a negative influence on *LIQ* and *VOL*, thereby providing further confirmation of H1a. Additionally, the coefficient of *DISD* is the highest when comparing T(2) and T(–1) and the lowest when comparing T(3) and T(–1), indicating that the financial market's response to CSR disclosure is stronger during the next second month after releasing CSR reports, which is consistent with our finding in Table 4 that the liquidity increases and volatility decreases significantly after disclosure, but the investors' behaviours tend to be rational at the third month. The results confirm the increasing awareness of CSR among the public and the reliability of CSR disclosure to some extent in China, which results in the effect of CSR disclosure on reducing information asymmetry between investors and managers. This may provide an explanation for the increasing trend of CSR reports in China (as well as worldwide) by suggesting that CSR disclosure can be considered a means to lower the cost of equity capital by increasing corporate transparency and reducing risk to the long-run earnings stream (Bachoo et al. 2013; Xu et al. 2015).

How CSR disclosure affects the information asymmetry

To test H1b and H2, we further analyse how CSR disclosure affects the information asymmetry between investors and managers by both univariate analysis and multivariate regression analysis by dividing the information disclosed by CSR reports into different types.

Our univariate analysis compares the mean and the median $\Delta VL_{i,t}$ (between the pre-event window T(–1) and the post-event window, T(1), T(2), and T(3)) of firms with high and low CSR disclosure ratings (*CSRD*). Table 6 shows the results of this analysis. The absolute value of mean (median) ΔLIQ of firms with high CSR disclosure ratings is higher than firms with low CSR disclosure ratings regardless of comparing the difference between T(–1) and T(1), T(2), or T(3). In addition, the differences between high and low CSR disclosure ratings groups are significant at the 5% or 1% level but are most significant when comparing T(2) and T(–1). We find similar evidence when we examine the difference in means and medians of ΔVOL. These findings suggest that firms with higher CSR disclosure ratings have a more significant reduction in volatility and increase in liquidity, especially during the event window of T(2).

To better understand how CSR disclosure plays a role in investors' behaviour, we further estimate our model (2) distinguishing among total, hard, and soft CSR disclosures by employing a multiple regression analysis. Economic-based disclosures, so-called hard disclosures, are mainly comprised within the following components of our content grid of social disclosure items: compensation of workers as per legally mandated minimum wage and insurance, makes timely payment of taxes, gifts and sponsorships, setting up of charity foundation, and investment in product innovation. Investments in expenditures, operation costs, risk litigation, and provision for future expenditures of environmental disclosure items represent soft information relating to the other generic grid captions.

Table 7 presents results by comparing the differences of *VOL* and *LIQ* between T(–1) and T(1), T(2), and T(3). We find that *CSRD* loads negative whatever the dependent variable, and the absolute value of the coefficient of *CSRD* is less for soft disclosures than for hard disclosures. In addition, the coefficient of *CSRD* is statistically significant at the 5% level or better for total disclosure and hard disclosure; however, for soft disclosure, it is only statistically significant at the 10% lever or even insignificant. The results suggest that the higher the *CSRD*, the greater the reduction in *VOL* and *LIQ*. In other words, CSR disclosure not only has an influence on reducing information asymmetry, but that effect is also determined by the quality of the CSR reports in which the higher

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Table 5 OLS estimation of the market reaction

	LIQ			VOL		
	T(1) and T(−1)	T(2) and T(−1)	T(3) and T(−1)	T(1) and T(−1)	T(2) and T(−1)	T(3) and T(−1)
$DISD$	−0.016***	−0.019***	−0.012***	−0.002***	−0.003***	−0.001***
	(−7.752)	(−8.864)	(−4.291)	(−10.366)	(−21.344)	(−6.815)
$LN(Volume)$	−0.042***	−0.031***	−0.033***	0.003***	0.003***	0.003***
	(−22.873)	(−20.321)	(−18.006)	(26.631)	(23.632)	(24.368)
$LN(Price)$	0.011***	0.018***	0.018***	0.005***	0.004***	0.003***
	(4.943)	(9.673)	(8.161)	(29.597)	(28.588)	(27.378)
$LN(Value)$	−0.009***	−0.016***	−0.013***	−0.003***	−0.003***	−0.003***
	(−6.267)	(−13.458)	(−8.832)	(−31.313)	(−29.369)	(−30.248)
$BETA$	−0.012**	−0.017***	−0.010*	0.003***	0.003***	0.003***
	(−2.348)	(−3.980)	(−1.915)	(9.470)	(11.234)	(9.425)
DM	0.011	0.006	0.005	0.000	−0.001	−0.001
	(0.950)	(0.864)	(0.724)	(0.127)	(−0.179)	(−0.197)
Industry	Yes	Yes	Yes	Yes	Yes	Yes
Year	Yes	Yes	Yes	Yes	Yes	Yes
Adj-R^2	0.415	0.432	0.346	0.413	0.472	0.419
F value	277.140	297.350	206.560	274.734	348.165	281.994
No. of obs.	3108	3108	3108	3108	3108	3108

***, **, * are statistically significant at 1%, 5%, and 10% level, respectively.

Table 6 Univariate tests

			ΔLIQ			ΔVOL		
		N	T(1) and T(−1)	T(2) and T(−1)	T(3) and T(−1)	T(1) and T(−1)	T(2) and T(−1)	T(3) and T(−1)
Panel A: Means								
$CSRD \geq mean$	(1)	614	−0.015	−0.023	−0.017	−0.006	−0.008	−0.006
$CSRD < mean$	(2)	940	−0.011	−0.017	−0.015	−0.003	−0.005	−0.004
Difference	(1)–(2)		−0.004	−0.006	−0.002	−0.003	−0.003	−0.002
t-statistic			−2.533**	−2.919***	−2.290**	−2.019**	−2.227**	−1.899*
Panel B: Median								
$CSRD \geq median$	(1)	777	−0.016	−0.024	−0.018	−0.007	−0.010	−0.008
$CSRD < median$	(2)	777	−0.012	−0.017	−0.015	−0.004	−0.006	−0.005
Difference	(1)–(2)		−0.004	−0.007	−0.003	−0.003	−0.004	−0.003
Z-statistic			−2.411**	−3.128***	−2.189**	−2.175**	−2.517**	−2.011**

***, **, * are statistically significant at 1%, 5%, and 10% level, respectively.

the CSR disclosure rating, the more share price volatility will decrease and liquidity will increase after CSR disclosure, confirming what we found in the univariate analysis that is represented in Table 6. Cormier and Magnan (2011) propose that the impact of a firm's CSR disclosure on information asymmetry between managers and investors can only be effective if the information disclosed is reliable, suggesting that the higher the level of CSR disclosure ratings, the more reliable the information disclosed, and therefore the more significant role it may play in reducing information asymmetry. This further confirms the proposal by Bachoo et al. (2013) that investors will ascribe higher transparency and lower risk to the long-run earnings stream of high-quality reporters.

In addition, the results presented in Table 7 also show that the reducion in information asymmetry between managers and investors is much higher and more significant for hard disclosure than soft disclosure, which is consistent with our H2 and further supports the economics-based voluntary disclosure theory (Clarkson et al. 2008). Our results strongly indicate that investors assess the nature of the information being provided and pay closer attention to more substantive disclosures. To capture investors' focus and present the company's image regarding CSR activities to the public, disclosures need to have more substantive and quantified CSR information and not only words. Moreover, compared to T(1), the coefficient of *CSRD* is higher for T(2) and lower for T(3) than we found previously.

Additionally, given that the quality and reliability of CSR reports are different among the companies located in regions with different levels of marketisation as Table 3 shows, we also extend our analysis to examine whether the stock market's response to CSR disclosure changes with the level of marketisation in China by dividing

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Table 7 **CSR disclosure ratings and the changes of liquidity and volatility**

Panel A: ΔLIQ

	T(1) and T(−1)			T(2) and T(−1)			T(3) and T(−1)		
	Total	Hard	Soft	Total	Hard	Soft	Total	Hard	Soft
$CSRD$	−0.013**	−0.016***	−0.012*	−0.014**	−0.017***	−0.013*	−0.010**	−0.013**	−0.008
	(−2.377)	(−3.767)	(−1.790)	(−2.212)	(−4.202)	(−1.877)	(−2.249)	(−2.493)	(−1.560)
$\Delta LN(Volume)$	−0.011***	−0.027***	−0.008**	−0.020***	−0.022***	−0.019***	−0.008**	−0.010***	−0.007**
	(−3.012)	(−4.529)	(−2.123)	(−7.950)	(−7.155)	(−7.711)	(−2.365)	(−2.661)	(−2.255)
$\Delta LN(Price)$	0.156***	0.112***	0.163***	0.062***	0.058***	0.064***	0.044***	0.032***	0.047***
	(9.951)	(5.775)	(10.459)	(9.080)	(7.459)	(9.398)	(4.623)	(2.791)	(4.969)
$\Delta LN(Value)$	−0.023*	−0.008	−0.026**	−0.037***	−0.033***	−0.038***	−0.044***	−0.045***	−0.043***
	(−1.788)	(−1.500)	(−2.076)	(−5.267)	(−4.480)	(−5.455)	(−4.960)	(−4.905)	(−4.928)
$\Delta BETA$	−0.003	−0.002	−0.005*	−0.056***	−0.076***	−0.049***	−0.093***	−0.103***	−0.090***
	(−1.131)	(−0.732)	(−1.909)	(−3.518)	(−3.892)	(−3.116)	(−4.382)	(−4.618)	(−4.260)
DM	0.006	−0.003	0.008*	−0.011	−0.000	−0.010	−0.009	−0.013	−0.008
	(1.056)	(−0.732)	(1.969)	(−1.444)	(−1.048)	(−1.148)	(−1.388)	(−1.498)	(−1.420)
Industry	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adj. R^2	0.145	0.113	0.158	0.151	0.191	0.159	0.156	0.164	0.158
F value	21.393	13.887	22.396	22.213	34.189	23.819	23.130	31.629	23.272
No. of obs.	1554	1554	1554	1554	1554	1554	1554	1554	1554

Panel B: ΔVOL

	T(1) and T(−1)			T(2) and T(−1)			T(3) and T(−1)		
	Total	Hard	Soft	Total	Hard	Soft	Total	Hard	Soft
$CSRD$	−0.003**	−0.004***	−0.001*	−0.004**	−0.006***	−0.000	−0.001**	−0.001**	−0.000
	(−2.153)	(−4.337)	(−1.865)	(−2.490)	(−4.491)	(−1.153)	(−2.269)	(−2.087)	(−0.202)
$\Delta LN(Volume)$	0.004***	0.003***	0.004***	0.002***	0.001***	0.002***	0.003***	0.003***	0.003***
	(12.576)	(9.192)	(12.671)	(9.025)	(6.543)	(9.209)	(15.949)	(14.478)	(16.123)
$\Delta LN(Price)$	0.016***	0.014***	0.015***	0.004***	0.003***	0.004***	0.002***	0.002**	0.002***
	(13.446)	(13.988)	(13.169)	(6.771)	(5.641)	(6.837)	(3.853)	(2.549)	(3.922)
$\Delta LN(Value)$	−0.005***	−0.004***	−0.005***	−0.003***	−0.002***	−0.003***	−0.003***	−0.003***	−0.003***
	(−4.927)	(−4.905)	(−4.910)	(−4.545)	(−4.261)	(−4.536)	(−6.052)	(−6.596)	(−6.031)
$\Delta BETA$	−0.000	0.003**	0.000	0.014***	0.011***	0.014***	0.003**	0.003**	0.003**
	(−1.275)	(2.283)	(1.248)	(10.492)	(8.106)	(10.569)	(2.251)	(2.093)	(2.246)
DM	0.002	0.002	0.002	0.000	−0.000	0.000	0.000	0.000	0.000
	(0.895)	(0.858)	(1.172)	(1.101)	(−0.137)	(1.344)	(0.024)	(1.190)	(0.116)
Industry	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adj. R^2	0.311	0.593	0.277	0.173	0.335	0.155	0.170	0.283	0.164
F value	80.312	137.366	76.420	37.436	47.746	36.545	35.548	46.302	39.283
No. of obs.	1554	1554	1554	1554	1554	1554	1554	1554	1554

***, **, * are statistically significant at 1%, 5%, and 10% level, respectively.

the sample into a high marketisation group and a low marketisation group, which is above or below the mean. Table 8 reports the results of this analysis. The results show that the coefficient of *CSRD* is negative for companies located in both the regions with high and low levels of marketisation, but the coefficient is lower in the low marketisation group than in the high marketisation group whether testing ΔVOL and ΔLIQ. Additionally, it is statistically significant at the 5% level or better for the high marketisation group but only significant at the 10% level or even insignificant for the low group, suggesting that financial markets do care about the organisations' social and environmental information, regardless of where the company is located; however, the financial market's response to CSR disclosure is much stronger for the companies located in regions with higher marketisation. Consistent with H3, the results display strong evidence for the different response to CSR disclosure between the companies located in the regions with high and low levels of marketisation. We believe that this result will mean stronger awareness of CSR for the public in the more market-oriented areas as well as higher quality CSR disclosure for the companies located in the regions with higher marketisation, which is confirmed in the comparison tests shown in Table 3. Finally, as we found before, the coefficient of *CSRD* is highest when comparing T(2) and T(–1) and the lowest for T(3) regardless of the level of marketisation.

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Table 8 Marketisation, CSR disclosure ratings and the changes of liquidity and volatility

Panel A:ΔLIQ

	T(1) and T(−1)		T(2) and T(−1)		T(3) and T(−1)	
	High Market	Low Market	High Market	Low Market	High Market	Low Market
$CSRD$	−0.015***	−0.011*	−0.016***	−0.012*	−0.013**	−0.009
	(−2.702)	(−1.883)	(−2.803)	(−1.974)	(−2.228)	(−1.639)
$\Delta LN(Volume)$	−0.012***	−0.011**	−0.021***	−0.020***	−0.011***	−0.007**
	(−3.223)	(−2.205)	(−7.829)	(−7.532)	(−2.627)	(−2.319)
$\Delta LN(Price)$	0.155***	0.160***	0.057***	0.066***	0.028**	0.040***
	(8.905)	(9.837)	(7.891)	(9.547)	(2.718)	(3.892)
$\Delta LN(Value)$	−0.026**	−0.021**	−0.026**	−0.033***	−0.050***	−0.042***
	(−2.201)	(−2.119)	(−2.392)	(−3.029)	(−5.002)	(−4.652)
$\Delta BETA$	−0.002	−0.006**	−0.042**	−0.044**	−0.112***	−0.091***
	(−1.326)	(−2.109)	(−2.339)	(−2.351)	(−4.929)	(−4.308)
DM	0.009*	0.005	−0.013*	−0.010	−0.016*	−0.015*
	(1.727)	(1.639)	(−1.737)	(−1.205)	(−1.953)	(−1.804)
Industry	Yes	Yes	Yes	Yes	Yes	Yes
Year	Yes	Yes	Yes	Yes	Yes	Yes
Adj. R^2	0.225	0.178	0.220	0.170	0.213	0.202
F value	44.567	30.726	40.028	28.390	38.028	36.389
No. of obs.	812	742	812	742	812	742

Panel B: ΔVOL

	T(1) and T(−1)		T(2) and T(−1)		T(3) and T(−1)	
	High Market	Low Market	High Market	Low Market	High Market	Low Market
$CSRD$	−0.005***	−0.002*	−0.007***	−0.003*	−0.002**	−0.001
	(−3.598)	(−1.898)	(−4.628)	(−1.889)	(−2.232)	(−1.303)
$\Delta LN(Volume)$	0.004***	0.004***	0.002***	0.003***	0.004***	0.002***
	(8.827)	(9.028)	(5.382)	(6.216)	(9.024)	(5.223)
$\Delta LN(Price)$	0.014***	0.016***	0.002***	0.004***	0.002**	0.002**
	(8.827)	(10.829)	(5.346)	(6.829)	(2.333)	(2.209)
$\Delta LN(Value)$	−0.003**	−0.005***	−0.002**	−0.003***	−0.004***	−0.002**
	(−2.728)	(−3.001)	(−2.398)	(−2.920)	(−3.029)	(−2.331)
$\Delta BETA$	0.002*	0.000	0.015***	0.011***	0.002*	0.002*
	(1.903)	(1.313)	(6.493)	(4.938)	(1.817)	(1.899)
DM	0.004*	0.001	0.001	0.002	0.002*	0.000
	(1.725)	(1.008)	(1.201)	(1.538)	(1.659)	(1.026)
Industry	Yes	Yes	Yes	Yes	Yes	Yes
Year	Yes	Yes	Yes	Yes	Yes	Yes
Adj. R^2	0.428	0.201	0.405	0.220	0.337	0.189
F value	86.028	40.112	78.827	45.920	53.820	36.745
No. of obs.	812	742	812	742	812	742

***, **, * are statistically significant at 1%, 5%, and 10% level, respectively.

Robustness Tests

Alternative model variable

Above, we have developed a measure of companies' CSR disclosure; however, the measurement process or the index of CSR disclosure may be insufficiently objective. Therefore, we also examine the robustness of our results by using Rankins (RKS)[3] CSR disclosure. RKS is an independent third-party organisation providing research and consulting services to investors interested in integrating social responsibility features into their investment decisions. The CSR disclosure index of RKS is formulated according to the standard of GRI guidelines (GRI 2002) and SA 8000 (SAI 2001). Although RKS is not an authoritative organisation, the scores and rankings of CSR disclosure provided by this company are still accepted by many people in China. Considering the limitation of the sample size of RKS, the sample of this process comprises 573 companies listed in China over the period 2009–2011 (191 each year). Because RKS only scores the total ranking of CSR disclosures, it cannot separate the qualities of hard disclosure and soft disclosure; therefore, we only examine the robustness of the results shown in Table 8. Table 9 reports the results of a multivariate regression after replacing the independent variable *CSRD* with the sub *CSRD*, which is a proxy for the CSR disclosure scores provided by RKS. We find the

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Table 9 **Robustness to estimate alternative CSR disclosure**

Panel A: ΔLIQ

	T(1) and T(−1)			T(2) and T(−1)			T(3) and T(−1)		
	Total	High Market	Low Market	Total	High Market	Low Market	Total	High Market	Low Market
Sub $CSRD$	−0.232**	−0.266***	−0.222*	−0.240**	−0.281***	−0.225*	−0.225**	−0.236**	−0.201
	(−2.201)	(−2.933)	(−1.901)	(−2.327)	(−3.920)	(−1.993)	(−2.203)	(−2.423)	(−1.525)
$\Delta LN(Volume)$	−0.020***	−0.028***	−0.017**	−0.042***	−0.050***	−0.032***	−0.022***	−0.025***	−0.018**
	(−3.117)	(−4.008)	(−2.447)	(−6.009)	(−8.019)	(−5.974)	(−3.328)	(−3.029)	(−2.408)
$\Delta LN(Price)$	0.163***	0.149***	0.164***	0.055***	0.050***	0.059***	0.038***	0.024**	0.038***
	(8.738)	(7.625)	(9.632)	(9.205)	(6.911)	(8.732)	(3.928)	(2.331)	(3.832)
$\Delta LN(Value)$	−0.025	−0.026*	−0.022	−0.032***	−0.028***	−0.033***	−0.036***	−0.046***	−0.033***
	(−1.582)	(−1.903)	(−1.556)	(−3.928)	(−2.892)	(−4.009)	(−4.039)	(−5.218)	(−3.982)
$\Delta BETA$	−0.004	−0.002	−0.007**	−0.043**	−0.037**	−0.045**	−0.083***	−0.099***	−0.080***
	(−1.221)	(−1.116)	(−2.203)	(−2.632)	(−2.333)	(−2.653)	(−4.029)	(−5.201)	(−3.920)
DM	0.006	0.012*	0.004	−0.010*	−0.015*	−0.009	−0.008	−0.016*	−0.008
	(1.115)	(1.939)	(1.320)	(−1.902)	(−1.999)	(−1.304)	(−1.557)	(−1.945)	(−1.536)
Industry	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adj. R^2	0.133	0.180	0.182	0.202	0.216	0.190	0.191	0.225	0.205
F value	20.378	32.891	33.808	36.823	40.009	35.639	235.898	48.367	37.336
No. of obs.	573	316	257	573	316	257	573	316	257

Panel B: ΔVOL

	T(1) and T(−1)			T(2) and T(−1)			T(3) and T(−1)		
	Total	High Market	Low Market	Total	High Market	Low Market	Total	High Market	Low Market
Sub $CSRD$	−0.017***	−0.028***	−0.010	−0.022***	−0.033***	−0.013*	−0.014**	−0.020**	−0.008
	(−2.803)	(−4.039)	(−1.535)	(−2.993)	(−4.690)	(−1.901)	(−2.303)	(−2.401)	(−1.342)
$\Delta LN(Volume)$	0.010***	0.013***	0.010***	0.013***	0.011***	0.014***	0.015***	0.016***	0.012***
	(7.522)	(9.029)	(7.849)	(10.029)	(8.038)	(11.287)	(13.818)	(14.328)	(9.029)
$\Delta LN(Price)$	0.025***	0.025***	0.028***	0.010***	0.007***	0.011***	0.009**	0.009**	0.007**
	(6.782)	(6.891)	(7.887)	(3.829)	(2.838)	(3.903)	(2.633)	(2.545)	(2.305)
$\Delta LN(Value)$	−0.006***	−0.003***	−0.006***	−0.004***	−0.002**	−0.004***	−0.005***	−0.006***	−0.002**
	(−4.030)	(−2.428)	(−4.331)	(−3.782)	(−2.402)	(−3.301)	(−4.119)	(−4.426)	(−2.301)
$\Delta BETA$	−0.000	0.001*	0.000	0.010***	0.014***	0.006***	0.005*	0.04*	0.05*
	(−1.111)	(1.876)	(1.402)	(6.782)	(8.830)	(3.627)	(1.903)	(1.829)	(1.992)
DM	0.003	0.004*	0.000	0.001	0.001	0.003*	0.000	0.002*	0.000
	(1.020)	(1.742)	(0.083)	(1.006)	(1.337)	(1.685)	(1.019)	(1.735)	(0.825)
Industry	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adj. R^2	0.300	0.483	0.200	0.336	0.311	0.330	0.166	0.229	0.190
F value	79.829	69.028	43.827	88.398	85.309	87.099	31.204	48.081	38.792
No. of obs.	573	316	257	573	316	257	573	316	257

***, **, * are statistically significant at 1%, 5%, and 10% level, respectively.

coefficient of sub *CSRD* is negative and statistically significant at the 5% level or better for total disclosure as well as the high marketisation group but only significant at the 10% level or even insignificant for the low marketisation group. In addition, the coefficient is still lower for the low marketisation group than for the high marketisation group. Furthermore, the coefficient of *CSRD* is the highest when comparing T(2) and T(–1), and the lowest when comparing T(3) and T(–1). Our findings reinforce our earlier evidence that CSR disclosure can reduce information asymmetry between investors and managers, and the better the disclosure, the greater the reduction in information asymmetry after its release. Compared to the companies located in regions with lower marketisation, the reduction in information asymmetry is higher for the companies located in regions with a higher degree of marketisation.

Possible error by group comparison

To explore the moderating effect of marketisation, we divided the sample into a high marketisation group and a low marketisation group for comparison. However, considering the difference in sample distribution between the two groups, errors or deviation may occur when comparing the coefficients directly. Thus, we

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Table 10 Robustness to the possible error by group comparison

Panel A: ΔLIQ

	T(1) and T(−1)			T(2) and T(−1)			T(3) and T(−1)		
	Total	Hard	Soft	Total	Hard	Soft	Total	Hard	Soft
$CSRD$	−0.009**	−0.011**	−0.006*	−0.013**	−0.015**	−0.010*	−0.005*	−0.008*	−0.003
	(−2.292)	(−2.672)	(−1.637)	(−2.222)	(−2.773)	(−1.938)	(−1.903)	(−1.891)	(−1.203)
$CSRD \times Markt$	−0.023**	−0.031**	−0.016	−0.025**	−0.037**	−0.020*	−0.017*	−0.022**	−0.014
	(−2.116)	(−2.481)	(−1.535)	(−2.380)	(−2.663)	(−1.878)	(−1.972)	(−2.110)	(−1.454)
$Markt$	−1.208*	−1.331**	−1.220**	−1.337**	−1.276**	−1.117*	−1.325**	−1.209*	−1.111
	(−1.878)	(−2.389)	(−2.229)	(−2.427)	(−2.115)	(−1.802)	(−2.408)	(−1.998)	(−1.533)
$\Delta LN(Volume)$	−0.006**	−0.010***	−0.005*	−0.014***	−0.011***	−0.011***	−0.005**	−0.008**	−0.003*
	(−2.626)	(−3.115)	(−1.838)	(−3.209)	(−3.273)	(−3.009)	(−2.117)	(−2.301)	(−1.873)
$\Delta LN(Price)$	0.112***	0.108***	0.121***	0.033***	0.028***	0.033***	0.020**	0.025**	0.030***
	(6.473)	(3.829)	(6.918)	(4.938)	(3.829)	(3.627)	(2.672)	(2.309)	(3.118)
$\Delta LN(Value)$	−0.025**	−0.011*	−0.022**	−0.031***	−0.028***	−0.031***	−0.035***	−0.033***	−0.037***
	(−2.319)	(−1.779)	(−2.007)	(−4.006)	(−3.878)	(−4.116)	(−4.837)	(−4.291)	(−3.625)
$\Delta BETA$	−0.002	−0.003	−0.006*	−0.041**	−0.055***	−0.038**	−0.088***	−0.092***	−0.082***
	(−1.092)	(−1.038)	(−1.827)	(−2.627)	(−3.129)	(−2.625)	(−4.009)	(−5.019)	(−4.117)
DM	0.008*	−0.002	0.008*	−0.010*	−0.003	−0.013*	−0.008*	−0.014*	−0.005
	(1.667)	(−0.827)	(1.829)	(−1.882)	(−1.309)	(−1.928)	(−1.635)	(−2.001)	(−1.389)
Industry	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adj. R^2	0.150	0.133	0.160	0.162	0.200	0.183	0.177	0.172	0.147
F value	22.038	20.119	24.837	26.202	37.827	32.109	29.364	28.391	21.294
No. of obs.	1554	1554	1554	1554	1554	1554	1554	1554	1554

Panel B: ΔVOL

	T(1) and T(−1)			T(2) and T(−1)			T(3) and T(−1)		
	Total	Hard	Soft	Total	Hard	Soft	Total	Hard	Soft
$CSRD$	−0.004**	−0.005**	−0.001	−0.006**	−0.008**	−0.000	−0.002**	−0.002**	−0.001
	(−2.184)	(−2.397)	(−1.479)	(−2.387)	(−2.572)	(−1.205)	(−2.010)	(−2.111)	(−1.098)
$CSRD \times Markt$	−0.021*	−0.025**	−0.013	−0.025**	−0.028**	−0.016	−0.018*	−0.021*	−0.010
	(−1.927)	(−2.119)	(−1.225)	(−2.100)	(−2.189)	(−1.269)	(−1.992)	(−1.892)	(−1.425)
$Markt$	−1.227*	−1.209	−1.118	−1.223*	−1.246**	−1.309**	−1.217*	−1.204*	−1.230**
	(−1.889)	(−1.524)	(−1.592)	(−1.920)	(−2.338)	(−2.301)	(−1.885)	(−1.30)	(−2.119)
$\Delta LN(Volume)$	0.003**	0.003**	0.004***	0.002**	0.001*	0.002**	0.003***	0.003**	0.004***
	(2.392)	(2.308)	(4.006)	(2.222)	(1.927)	(2.402)	(2.920)	(2.203)	(4.204)
$\Delta LN(Price)$	0.018***	0.015***	0.010**	0.004**	0.004**	0.003**	0.003**	0.004**	0.002**
	(8.294)	(6.303)	(5.339)	(2.391)	(2.402)	(2.223)	(2.192)	(2.603)	(2.110)
$\Delta LN(Value)$	−0.003**	−0.004***	−0.003**	−0.004***	−0.002**	−0.003**	−0.003**	−0.003**	−0.004***
	(−2.384)	(−3.029)	(−2.393)	(−3.202)	(−2.384)	(−2.309)	(−2.333)	(−2.402)	(−3.110)
$\Delta BETA$	−0.000	0.002*	0.000	0.008**	0.007**	0.010***	0.002**	0.003**	0.002**
	(−1.004)	(1.924)	(1.330)	(2.563)	(2.403)	(3.021)	(2.330)	(2.402)	(2.304)
DM	0.006*	0.003	0.002	0.002	−0.000	0.000	0.004*	0.000	0.005*
	(1.803)	(1.203)	(1.115)	(1.303)	(−0.203)	(0.940)	(1.783)	(1.203)	(1.847)
Industry	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adj. R^2	0.200	0.325	0.189	0.237	0.210	0.168	0.268	0.305	0.185
F value	40.293	54.293	36.039	47.342	42.930	34.395	48.396	50.202	34.029
No. of obs.	1554	1554	1554	1554	1554	1554	1554	1554	1554

***, **, * are statistically significant at 1%, 5%, and 10% level, respectively.

build model (3) by adding variable *CSRD* × *Market* into model (2) to examine the moderating effect of marketisation,

$$\Delta VL_{i,t} = \alpha_0 + \alpha_1 CSRD_{i,t} + \alpha_2 CSRD_{i,t} \times Market_{i,t} + \alpha_3 Market_{i,t} + \alpha_4 \Delta LN(Volume)_{i,t} + \alpha_5 \Delta LN(Price)_{i,t} + \alpha_6 \Delta LN(Value)_{i,t} + \alpha_7 \Delta BETA_{i,t} + \alpha_8 DM_{i,t} + \varepsilon_{i,t} \quad (3)$$

The OLS regression of model (3) is estimated and the results are shown in Table 10. The coefficient of *CSRD* loads negative and statistically significant at the 10% level or better for total disclosure as well as hard

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Table 11 Robustness to the possible error by practical significance

Panel A: ΔLIQ

	T(1) and T(−1)		T(2) and T(−1)		T(3) and T(−1)	
	High Disclosure	Low Disclosure	High Disclosure	Low Disclosure	High Disclosure	Low Disclosure
$CSRD$	−0.022***	−0.007*	−0.025***	−0.010*	−0.020**	−0.005
	(−3.689)	(−1.863)	(−3.702)	(−1.885)	(−2.510)	(−1.328)
$\Delta LN(Volume)$	−0.012***	−0.011**	−0.023***	−0.020***	−0.015***	−0.006**
	(−3.118)	(−2.620)	(−8.003)	(−7.625)	(−3.192)	(−2.199)
$\Delta LN(Price)$	0.150***	0.158***	0.051***	0.063***	0.030**	0.051***
	(7.773)	(6.203)	(7.685)	(8.522)	(2.433)	(4.022)
$\Delta LN(Value)$	−0.020**	−0.026**	−0.031**	−0.041***	−0.059***	−0.039***
	(−2.009)	(−2.551)	(−2.251)	(−4.026)	(−6.310)	(−4.133)
$\Delta BETA$	−0.002	−0.004*	−0.051**	−0.060**	−0.112***	−0.088***
	(−1.411)	(−1.982)	(−2.193)	(−2.429)	(−4.827)	(−4.218)
DM	0.009*	0.003	−0.010	−0.013*	−0.011*	−0.015*
	(1.922)	(1.422)	(−1.521)	(−1.921)	(−2.003)	(−1.813)
Industry	Yes	Yes	Yes	Yes	Yes	Yes
Year	Yes	Yes	Yes	Yes	Yes	Yes
Adj. R^2	0.211	0.172	0.209	0.188	0.208	0.173
F value	43.891	29.221	38.552	33.338	38.011	30.104
No. of obs.	513	513	513	513	513	513

Panel B: ΔVOL

	T(1) and T(−1)		T(2) and T(−1)		T(3) and T(−1)	
	High Disclosure	Low Disclosure	High Disclosure	Low Disclosure	High Disclosure	Low Disclosure
$CSRD$	−0.010***	−0.001*	−0.011***	−0.002*	−0.007**	−0.000
	(−5.398)	(−1.885)	(−5.301)	(−1.879)	(−2.437)	(−1.538)
$\Delta LN(Volume)$	0.005***	0.004***	0.002***	0.002***	0.005***	0.002***
	(6.788)	(5.372)	(4.721)	(4.186)	(7.420)	(4.293)
$\Delta LN(Price)$	0.014***	0.017***	0.006***	0.004***	0.004**	0.002**
	(6.738)	(8.839)	(5.309)	(4.317)	(2.521)	(2.108)
$\Delta LN(Value)$	−0.003**	−0.005***	−0.001*	−0.003**	−0.07***	−0.005**
	(−2.425)	(−3.115)	(−1.829)	(−2.561)	(−4.171)	(−3.621)
$\Delta BETA$	0.000	0.004**	0.015***	0.011***	0.003*	0.001
	(1.496)	(2.115)	(3.772)	(3.728)	(1.901)	(1.526)
DM	0.005*	0.001	0.001	0.000	0.000	0.003**
	(1.902)	(1.612)	(1.329)	(1.211)	(1.538)	(2.226)
Industry	Yes	Yes	Yes	Yes	Yes	Yes
Year	Yes	Yes	Yes	Yes	Yes	Yes
Adj. R^2	0.411	0.255	0.418	0.242	0.403	0.223
F value	81.283	50.721	83.092	46.837	76.520	41.028
No. of obs.	513	513	513	513	513	513

***, **, * are statistically significant at 1%, 5%, and 10% level, respectively.

disclosure; however, it is only statistically significant at the 10% level or even insignificant for soft disclosure. Meanwhile, the absolute value of the coefficient of *CSRD* is less for soft disclosure than for hard disclosure, which is consistent with the values reported in Table 7. With respect to *CSRD* × *Market*, the coefficient is negative and the absolute value of this variable is bigger than *CSRD*, suggesting that the moderating effect of marketisation on financial market response to CSR disclosure is positive. In other words, the higher the level of marketisation in the region where the company is located, the greater the reduction in information asymmetry between managers and investors through CSR disclosure, which reinforces what we found in Table 8.

Possible error by practical significance

Although the explanatory power of CSR disclosure on reducing information asymmetry is significant, the regression correlation coefficients of *CSRD* are small. To examine the explanatory power of *CSRD* and its possible error by practical significance, we first estimate our model (2) again by eliminating the variable of *CSRD* and compare the difference of the adjusted coefficient of determination (Adj. R^2) against the regression results before and after eliminating this variable. We may find that the adjusted coefficient of determination is much lower when eliminating *CSRD*, confirming the explanatory power of CSR disclosure ratings on

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Table 12 Robustness to market noise

Panel A: ΔLIQ

	T(1) and T(−1)					T(2) and T(−1)					T(3) and T(−1)				
	Total	Hard	Soft	High Market	Low Market	Total	Hard	Soft	High Market	Low Market	Total	Hard	Soft	High Market	Low Market
$CSRD$	−0.015**	−0.018***	−0.013*	−0.017**	−0.013*	−0.017**	−0.020***	−0.014*	−0.021***	−0.015**	−0.013**	−0.015**	−0.009*	−0.015**	−0.010
	(−2.521)	(−3.022)	(−1.838)	(−2.853)	(−1.933)	(−2.785)	(−3.385)	(−1.922)	(−3.411)	(−2.018)	(−2.255)	(−2.339)	(−2.011)	(−2.384)	(−1.838)
$\Delta LN(Volume)$	−0.010***	−0.018***	−0.007**	−0.012***	−0.009**	−0.019***	−0.021***	−0.019***	−0.020***	−0.018***	−0.009**	−0.011**	−0.007**	−0.011***	−0.008**
	(−4.038)	(−3.221)	(−2.622)	(−3.411)	(−2.133)	(−7.871)	(−7.929)	(−7.625)	(−4.381)	(−3.533)	(−2.533)	(−2.618)	(−2.227)	(−2.739)	(−2.408)
$\Delta LN(Price)$	0.147***	0.125***	0.171***	0.142***	0.163***	0.062***	0.056***	0.065***	0.055***	0.066***	0.045***	0.035***	0.050***	0.029**	0.043***
	(8.451)	(6.014)	(10.237)	(7.115)	(9.270)	(8.723)	(6.379)	(9.011)	(6.354)	(9.301)	(4.718)	(3.627)	(5.681)	(2.828)	(3.891)
$\Delta LN(Value)$	−0.025**	−0.008	−0.028**	−0.027**	−0.022*	−0.044***	−0.036***	−0.048***	−0.035***	−0.046***	−0.040***	−0.041***	−0.038***	−0.043***	−0.037***
	(−2.033)	(−1.601)	(−2.590)	(−2.339)	(−1.916)	(−5.019)	(−4.629)	(−6.018)	(−3.875)	(−4.298)	(−4.011)	(−4.138)	(−3.875)	(−4.496)	(−3.856)
$\Delta BETA$	−0.002	−0.002	−0.004*	−0.002	−0.005**	−0.052**	−0.066**	−0.047**	−0.050**	−0.054**	−0.095***	−0.100***	−0.092***	−0.113***	−0.092***
	(−1.371)	(−1.025)	(−1.878)	(−1.522)	(−2.067)	(−2.533)	(−2.751)	(−2.332)	(−2.198)	(−2.411)	(−4.327)	(−4.428)	(−4.038)	(−4.949)	(−4.319)
DM	0.006	−0.004	0.009**	0.010**	0.004	−0.010	−0.005	−0.011	−0.014	−0.009	−0.009	−0.012	−0.007	−0.016*	−0.008
	(1.337)	(−1.251)	(2.015)	(2.148)	(1.381)	(−1.332)	(−0.985)	(−1.439)	(−1.685)	(−1.226)	(−1.378)	(−1.525)	(−1.432)	(−1.908)	(−1.320)
$\Delta ALIQ$	0.516**	0.621***	0.507**	0.477**	0.579***	0.487**	0.511**	0.480**	0.473**	0.522***	0.532**	0.620***	0.508**	0.478**	0.573***
	(2.817)	(3.428)	(2.726)	(2.525)	(3.115)	(2.563)	(2.655)	(2.385)	(2.298)	(3.010)	(2.763)	(3.209)	(2.650)	(2.502)	(3.098)
Industry	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adj. R^2	0.166	0.126	0.177	0.241	0.225	0.160	0.228	0.172	0.231	0.178	0.172	0.182	0.170	0.220	0.210
F value	33.827	18.729	38.091	49.029	41.838	36.577	43.189	37.338	46.284	38.138	37.122	38.622	36.998	40.725	39.536
No. of obs.	1554	1554	1554	812	742	1554	1554	1554	812	742	1554	1554	1554	812	742

Panel B: ΔVOL

	T(1) and T(−1)					T(2) and T(−1)					T(3) and T(−1)				
	Total	Hard	Soft	High Market	Low Market	Total	Hard	Soft	High Market	Low Market	Total	Hard	Soft	High Market	Low Market
$CSRD$	−0.004**	−0.006***	−0.001*	−0.006***	−0.002**	−0.006***	−0.008***	−0.001*	−0.008***	−0.003*	−0.002**	−0.003**	−0.001	−0.003**	−0.001
	(−2.219)	(−4.117)	(−1.922)	(−3.687)	(−2.213)	(−2.931)	(−3.337)	(−1.878)	(−4.611)	(−1.928)	(−2.316)	(−2.139)	(−0.899)	(−2.320)	(−1.416)l
$\Delta LN(Volume)$	0.005***	0.003***	0.005***	0.005***	0.004***	0.003***	0.001***	0.003***	0.002***	0.003***	0.003***	0.003**	0.003***	0.004***	0.002***
	(12.779)	(10.801)	(12.627)	(11.401)	(11.137)	(9.039)	(7.229)	(9.627)	(6.028)	(6.211)	(14.378)	(12.219)	(14.390)	(9.157)	(5.410)
$\Delta LN(Price)$	0.015***	0.014***	0.015***	0.014***	0.016***	0.003***	0.003***	0.004***	0.002***	0.004***	0.003***	0.002***	0.003***	0.003**	0.003**
	(11.627)	(9.337)	(10.209)	(8.176)	(10.301)	(5.201)	(4.290)	(4.729)	(5.225)	(7.108)	(3.900)	(3.627)	(4.109)	(2.435)	(2.411)
$\Delta LN(Value)$	−0.004***	−004***	−0.004**	−0.004**	−0.005***	−0.003***	−0.003***	−0.002***	−0.002**	−0.003**	−0.003***	−0.003***	−0.002***	−0.004***	−0.002**
	(−3.872)	(−3.568)	(−3.743)	(−2.829)	(−3.180)	(−3.627)	(−3.378)	(−3.109)	(−2.489)	(−2.865)	(−5.418)	(−5.628)	(−5.387)	(−3.239)	(−2.526)
$\Delta BETA$	−0.001*	0.003**	0.000	0.002*	0.001*	0.013***	0.012***	0.013***	0.015***	0.011***	0.003**	0.002**	0.003***	0.003*	0.002*
	(−1.872)	(2.133)	(1.533)	(1.878)	(1.789)	(8.792)	(6.548)	(8.927)	(4.981)	(3.983)	(2.209)	(2.113)	(2.319)	(1.925)	(1.872)
DM	0.003	0.002	0.002	0.005**	0.001	0.000	−0.000	0.001	0.000	0.002*	0.000	0.001	0.000	0.002*	0.001
	(1.039)	(1.202)	(1.198)	(2.110)	(0.890)	(1.213)	(−0.225)	(1.410)	(1.328)	(1.782)	(0.189)	(1.209)	(0.925)	(1.871)	(1.419)
$\Delta AVOL$	1.098**	1.117**	0.978*	1.289***	1.038**	1.319**	1.365***	1.297**	1.162**	1.408***	0.876**	0.928**	0.808*	1.037**	0.782*
	(2.290)	(2.389)	(1.891)	(3.230)	(2.726)	(2.627)	(3.429)	(2.437)	(2.220)	(3.398)	(2.290)	(2.490)	(1.909)	(2.550)	(1.817)
Industry	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adj. R^2	0.318	0.603	0.285	0.447	0.229	0.192	0.352	0.168	0.418	0.231	0.188	0.296	0.175	0.339	0.195
F value	52.728	112.102	47.389	86.301	38.829	35.78	61.393	22.390	76.337	41.209	33.036	50.098	27.938	54.201	37.012
No. of obs.	1554	1554	1554	812	742	1554	1554	1554	812	742	1554	1554	1554	812	742

***, **, * are statistically significant at 1%, 5%, and 10% level, respectively.

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Table 13 **Robustness to alternative methodology**

Panel A: ΔLIQ

	T(1) and T(−1)					T(2) and T(−1)					T(3) and T(−1)				
	Total	Hard	Soft	High Market	Low Market	Total	Hard	Soft	High Market	Low Market	Total	Hard	Soft	High Market	Low Market
$CSRD$	−0.111**	−0.125**	−0.088	−0.146***	−0.110*	−0.120**	−0.136***	−0.123*	−0.164***	−0.113*	−0.102**	−0.119**	−0.066	−0.122**	−0.096
	(−2.338)	(−2.393)	(−1.601)	(−2.938)	(−1.920)	(−2.385)	(−3.485)	(−1.854)	(−3.837)	(−1.792)	(−2.192)	(−2.253)	(−1.202)	(−2.384)	(−1.485)
$\Delta LN(Volume)$	−0.125***	−0.138***	−0.119***	−0.122***	−0.110**	−0.133***	−0.108*	−0.127***	−0.147***	−0.118***	−0.129***	−0.122***	−0.117**	−0.025***	−0.018**
	(−4.038)	(−5.402)	(−3.945)	(−4.294)	(−2.538)	(−5.028)	(−1.829)	(−4.392)	(−6.589)	(−3.746)	(−3.593)	(−2.988)	(−2.627)	(−3.029)	(−2.408)
$\Delta LN(Price)$	0.372***	0.342**	0.402***	0.322**	0.264**	0.374***	0.402***	0.539***	0.382***	0.422***	0.319**	0.323**	0.411***	0.219*	0.231**
	(3.008)	(2.837)	(5.038)	(2.627)	(2.392)	(3.029)	(4.220)	(6.938)	(3.354)	(4.374)	(2.428)	(2.632)	(5.201)	(1.928)	(2.391)
$\Delta LN(Value)$	−1.028*	−1.233**	−1.301**	−1.442**	−1.003	−1.128**	−1.135**	−1.360**	−1.482***	−1.239**	−1.384**	−1.225**	−1.301**	−1.603***	−1.522***
	(−1.849)	(−2.394)	(−2.492)	(−2.603)	(−1.405)	(−2.239)	(−2.301)	(−2.693)	(−2.957)	(−2.472)	(−2.746)	(−2.384)	(−2.422)	(−4.294)	(−3.028)
$\Delta BETA$	−0.203	−0.119	−0.246*	−0.223*	−0.311**	−0.520***	−0.611***	−0.428**	−0.287*	−0.482**	−0.527***	−0.622***	−0.428**	−0.529***	−0.321**
	(−1.294)	(−1.029)	(−1.982)	(−1.837)	(−2.301)	(−2.920)	(−3.402)	(−2.472)	(−1.920)	(−2.501)	(−3.827)	(−4.382)	(−2.469)	(−3.349)	(−2.419)
DM	0.138*	−0.101	0.144**	0.137*	0.092	−0.125*	−0.082	−0.135*	−0.147**	−0.102	−0.118*	−0.142**	−0.116	−0.102	−0.122*
	(1.902)	(−1.412)	(2.301)	(1.982)	(1.428)	(−1.836)	(−0.938)	(−1.839)	(−2.482)	(−1.524)	(−1.792)	(−2.532)	(−1.530)	(−1.320)	(−1.982)
Industry	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adj. R^2	0.208	0.200	0.251	0.281	0.225	0.302	0.300	0.250	0.331	0.302	0.203	0.311	0.265	0.225	0.205
F value	37.928	35.282	45.855	48.937	39.932	55.395	49.038	45.038	60.284	56.938	37.953	55.594	48.533	48.367	37.336
No. of obs.	1554	1554	1554	812	742	1554	1554	1554	812	742	1554	1554	1554	812	742

Panel B: ΔVOL

	T(1) and T(−1)					T(2) and T(−1)					T(3) and T(−1)				
	Total	Hard	Soft	High Market	Low Market	Total	Hard	Soft	High Market	Low Market	Total	Hard	Soft	High Market	Low Market
$CSRD$	−0.235***	−0.247***	−0.187*	−0.251***	−0.172	−0.241***	−0.255***	−0.199*	−0.257***	−0.192*	−0.202**	−0.221**	−0.175	−0.213**	−0.163
	(−3.034)	(−3.407)	(−1.922)	(−3.693)	(−1.483)	(−2.990)	(−4.029)	(−1.922)	(−4.325)	(−1.911)	(−2.502)	(−2.409)	(−1.532)	(−2.392)	(−1.426)
$\Delta LN(Volume)$	0.117***	0.122***	0.110**	0.129***	0.112**	0.131***	0.121***	0.119***	0.101*	0.125***	0.112**	0.108**	0.128***	0.108**	0.111**
	(3.038)	(3.201)	(2.536)	(3.401)	(2.637)	(5.039)	(3.029)	(3.131)	(1.928)	(3.203)	(2.625)	(2.230)	(3.402)	(2.159)	(2.529)
$\Delta LN(Price)$	0.310**	0.302**	0.332***	0.276**	0.283**	0.220*	0.337***	0.358***	0.256**	0.341***	0.262**	0.421***	0.287**	0.325**	0.007**
	(2.592)	(2.312)	(3.021)	(2.226)	(2.301)	(1.982)	(3.428)	(3.602)	(2.225)	(3.208)	(2.353)	(4.282)	(2.422)	(2.875)	(2.305)
$\Delta LN(Value)$	−0.983**	−1.023**	−1.115**	−0.884**	−1.329***	−1.024**	−1.117***	−1.105**	−1.258***	−0.928**	−1.111**	−1.116**	−1.127**	−1.133***	−0.926**
	(−2.384)	(−2.598)	(−2.743)	(−2.129)	(−4.287)	(−2.627)	(−2.997)	(−2.726)	(−3.291)	(−2.201)	(−2.535)	(−2.652)	(−2.743)	(−3.201)	(−2.192)
$\Delta BETA$	−0.021*	0.029**	0.033**	0.015*	0.025**	0.038***	0.022**	0.042***	0.048***	0.026**	0.018*	0.025**	0.045***	0.022*	0.025**
	(−1.928)	(2.442)	(2.593)	(1.728)	(2.203)	(3.098)	(2.103)	(3.566)	(3.763)	(2.331)	(1.846)	(2.213)	(3.674)	(1.937)	(2.222)
DM	0.110	0.126*	0.122*	0.130**	0.127*	0.113	0.119	0.133**	0.125*	0.136**	0.104	0.119	0.117	0.135**	0.115
	(1.293)	(1.892)	(1.809)	(2.202)	(1.905)	(1.203)	(1.635)	(2.401)	(1.958)	(2.482)	(1.025)	(1.542)	(1.425)	(2.351)	(1.402)
Industry	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adj. R^2	0.320	0.360	0.400	0.420	0.310	0.315	0.305	0.371	0.311	0.300	0.285	0.266	0.250	0.262	0.248
F value	80.563	92.295	95.606	99.065	75.938	78.496	72.395	86.306	76.309	69.035	58.036	53.028	50.024	50.028	48.938
No. of obs.	1554	1554	1554	812	742	1554	1554	1554	812	742	1554	1554	1554	812	742

***, **, * are statistically significant at 1%, 5%, and 10% level, respectively.

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reducing information asymmetry. Due to the limitations of article length, we do not report the results that exclude *CSRD* here. Furthermore, we also divide all of the 1554 sample companies into three groups according to total CSR disclosure ratings and estimate model (2) by the top and bottom 33% percentile sample companies for comparison. Table 11 shows the results. We find *CSRD* loads negative regardless of the dependent variable, and the absolute value of the correlation coefficient of *CSRD* is much bigger for the high CSR disclosure ratings group than for the low CSR disclosure group. Particularly, the coefficients of *CSRD* are significant at the 5% or 1% level for the high disclosure group but only significant at only the 10% level or even insignificant for the low disclosure group, suggesting that CSR disclosure does have an influence on reducing information asymmetry but that the effect is determined by the quality of the CSR reports. Once investors believe the information disclosed by CSR reports is unreliable, their behaviour will not be significantly affected by this type of information disclosure, reinforcing our earlier finding that the higher the *CSRD*, the greater the reduction in *VOL* and *LIQ*.

Market noise

Although we control for several important factors affecting share price volatility and liquidity, the market response of the share may also be driven by market noise. Thus, we address this concern by controlling for the average market liquidity (*ALIQ*) and volatility (*AVOL*) across stocks in each event window in the market as the proxies of market noise, and Table 12 reports our results. According to Amihud (2002), the average market liquidity is calculated as:

$$ALIQ = 1/N_y \sum_{i=1}^{N_y} LIQ_{iy} \quad (4)$$

where N_y is the number of A shares eliminating the outliers the estimated *LIQ* of which in the event window is at the highest or lowest 1% tail of the distribution. The measure of *AVOL* is the average daily standard deviation of the Shanghai and Shenzhen 300 index in the period *t*, while $\Delta ALIQ$ ($\Delta AVOL$) is the deference in *ALIQ* (*AVOL*) between the pre-event window (T(–1)) and the post-event window, T(1), T(2), and T(3). The results reported in Table 12 are also consistent with our previous findings that better CSR disclosure results in a reduction in information asymmetry, especially for hard disclosures and the firms located in the regions with higher marketisation.

Other test

Additionally, in order to control for serial and cross-sectional dependence, we examine the robustness of our results through an alternative methodology, the Fama-MacBeth methodology. The results reported in Table 13 are consistent with our previous findings.

Conclusion

Corporations increasingly define their CSR activities as part of their business. The emergence of CSR disclosure is a response to the demands of activist investors, ethical and green institutional investors and rating services that evaluate corporations through the lens of CSR, thus going beyond traditional environmental indicators. However, is this trend beneficial to investors, especially in China where awareness of CSR is still weak and institutions are quite different from those in developed countries? The objective of this study is to explore how the financial market responds to voluntary CSR disclosure in China. Using an event study methodology and a sample of Chinese listed companies during 2009–2011, we extend the literature on voluntary disclosure by examining whether and how CSR disclosure can play a role in reducing stock market information asymmetry between managers and investors, as proxied by share price volatility and liquidity. Our results show that share price volatility after CSR disclosure is lower than before CSR disclosure; however, the trend is that it decreases first and then increases for the three months following CSR disclosure. There is also an obvious increase in stock liquidity after CSR disclosure; however, it increases first and then decreases. Additionally, by dividing the information disclosed by CSR reports into different types, we find that the reduction in information asymmetry is higher for economic (hard) disclosures than for generic (soft) disclosures. Finally, our results also show that the higher the level of marketisation of the region in which the company is located, the higher the quality and reliability of the disclosed information of CSR reports, and therefore the stronger the impact of CSR disclosure on reducing information asymmetry between investors and managers. This paper hopes to provide a better understanding of how companies are responsible for their stakeholders, and recommend suggestions for strengthening government regulations in CSR management for emerging economies.

Our findings contribute to the debate on whether and how the trend of CSR disclosure is beneficial to Chinese investors by showing that it can reduce information asymmetry between managers and investors, especially for the companies that are listed in the regions with a higher degree of marketisation. Thus, while prior research emphasises the importance of financial disclosure for capital markets, our research suggests that CSR disclosure is also important to companies and investors, as it has the power to explain investors' behaviour beyond earnings information and other risk factors.

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This study has implications for policy makers pushing for CSR disclosure in emerging markets. First, we provide evidence that CSR disclosure is as beneficial to investors as financial disclosure. Second, we indicate that different rules and regulations for CSR should be made for companies in different industries. Third, whether the impact of a company's CSR disclosure on information asymmetry between managers and investors can be effective depends on the types of information it discloses as well as the degree of marketisation in the regions where the company is located. However, such disclosures are not cost-free for organisations. Thus investors must gauge, assess and retain an increasing flow of information: a more efficient disclosure strategy becomes critical if companies want investors to have an accurate picture of their CSR performance. In that regard, more comprehensive and quantified (hard) CSR information should be contained in CSR reports, especially for companies located in less market-oriented regions.

Several topics are worth pursuing in further research. First, this paper focuses on CSR reports released on websites, which excludes hyper-linked documents in PDF. However, these documents are typically also published in paper form that can be compared for further study. Second, our measure of social and environmental disclosures is based upon a coding instrument that makes some explicit assumptions about the value and relevance of information. However, a more reliable and objective method to measure CSR disclosure needs to be developed. Third, as has been noted by Levine and Zervos (1993), cross-country studies can be very useful and the present study can be extended internationally by using a global sample. Fourth, four event windows, each on a thirty-day basis, were set in this paper, which can be reset to another time period in further research.

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Notes

1 See http://www.stats.gov.cn/tjsj/tjbz/hyflbz/.

2 We ensure the validity and reliability of the CSR disclosure index as follows: first, the index is constructed on the basis of previous studies and relevant standards; second, we have consulted widely with experts on the index; third, the process of constructing the index is objective. Based on related standards and studies, we initially constructed a CSR disclosure index system with 47 items. The 47 items were then given to 60 respondents (including experts working in the area of CSR and the managers of companies), who were asked to judge the importance of the items to assess the CSR of Chinese companies by questionnaire. The response descriptions for each item were given on a five-point scale ranging from 1 'it is not important at all' to 5 'it is very important'. The results of the questionnaire showed that the set of items met the demand of validity; the convergent degree of the index toward two groups was 58.9% and 68.3%, respectively. The results showed the dividing of CSR was reasonable to a certain extent. In addition, the items in which average importance was more than three had a percentage of 85.1%. On the basis of the importance and convergent degrees of items, we excluded the least important seven items after discussions with experts. We then tested the reliability of the questionnaire, showing that the inter-item alpha reliability of all 40 items was high (Cronbach's alpha = 0.856). The final index of CSR contained 40 items as shown in Appendix A.

3 See http://www.rksratings.com/index.php/Index/Product/index.

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Appendix A: Index of CSR Disclosure

Dimension	Description	Items
Social disclosure	Labour practices and decent work	Policies covering health and safety at work
		Policies towards prohibiting forced overtime
		Compensation of workers as per legally mandated minimum wages and insurance
		Provision for formal worker representation in decision making
		A full and varied cultural life
		Policies for the training and development of employees
		Equal recruitment, development and promotion opportunities for minorities, females and disabled people
	Society	Makes timely payment of taxes
		Increase job opportunities, re-employ laid-off workers, provide jobs for the disabled
		Prohibits child labor and violation of human rights
		Gifts and sponsorships
		Set up charity foundation
		Community involvement
		Business ethics/measures anti-corruption
	Consumer and product responsibility	Genuine goods at fair prices
		Consumer health and safety
		Refrain from false advertising
		Policy/management systems for customer satisfaction
		Protect customers' personal information
		Investment in product innovation

(Continued)

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Dimension	Description	Items
Environmental disclosure	Environmental management	Environmental policies for the environment
		Goals and targets
		Department, group engage in environmental activities
		ISO 14000
		Involvement in environmental organisations (industry committees, etc)
	Sustainable development	Natural resource conservation
		Recycling
		Life cycle information
	Pollution abatement	Emission of pollutants
		Installation and process controls
		Compliance status of facilities
		Noise and odours
	Laws and regulations conformity	Litigation, actual and potential
		Fines
		Corrective action
		Incidents
	Expenditures and risks	Investments in expenditures
		Operation costs
		Risk litigation
		Provision for future expenditures

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