

## CSR Disclosure and AH-Share Premium

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### Abstract

We examine the effect of CSR disclosure on equity prices in A- and H-share markets in China. For Chinese companies which are listed both in Hong Kong as H-shares and at the same time in Shanghai or Shenzhen as A-shares, significant stock price premiums are documented for A-shares. Using a sample of 88 Chinese firms from 2009 to 2015, we find that AH-share premium is significantly lower for firms issuing CSR reports. We also examine the relation between the quality of CSR disclosure and AH-share premium and find that higher CSR disclosure quality is associated with lower AH-share premium. Further investigation suggests that the negative relation between CSR disclosure (quality) and AH-share premium is due to the information asymmetry reduction resulted from (high-quality) CSR disclosure.

**Keywords:** CSR disclosure; Information asymmetry; International asset pricing; Segmentation

**JEL Classifications:** G15, G28, M14, M48

## CSR Disclosure and AH-Share Premium

### 1. Introduction

In this paper, we examine the effect of CSR disclosure on equity prices in the Chinese A- and H-share markets. For Chinese companies which are listed both in Hong Kong as H-shares and at the same time in Shanghai or Shenzhen as A-shares (A+H-share companies, hereafter), significant stock price premiums are documented for A-shares. This AH-share premium is contrast to the traditional valuation theory as the two share classes are identical with respect to shareholder rights, such as voting and cash flow rights. Building on the prior literature which suggests an information-asymmetry explanation for such price differences (Brennan & Cao, 1997; Chan, Menkveld, & Yang, 2008; Choe, Kho, & Stulz, 1999; Hau, 2001) and a negative relation between CSR reporting and information asymmetries (Cho, Lee, & Pfeiffer, 2013; Cui, Jo, & Na, 2016), we argue that CSR reporting leads to decreases in the price discrepancies between A- and H- share markets.

CSR reporting typically conveys nonfinancial information about company's economic, environmental, social and governance performance. CSR disclosures are thus important ways for investors to access potential environmental and social liabilities of the firm. Previous research on CSR provides evidence on the information asymmetry effect of CSR disclosures. Cho et al. (2013) among others, investigate the relation between CSR performance and information asymmetry for U.S. firms and find that both positive and negative CSR performance reduce information asymmetry. As for the Chinese setting, Hung, Shi, and Wang (2013) examine the effect of mandatory CSR disclosure on information asymmetry and document that firms that are mandated to make CSR report experience a decrease in information asymmetry subsequent to the mandate.

As with other emerging markets, foreign investors find it difficult to acquire and access information on Chinese firms primarily due to their information (Chan et al., 2008), linguistic, and cultural disadvantages (Brennan & Cao, 1997; Choe et al., 1999; Hau, 2001). In fact, information asymmetry could be more severe in China as a result of its weak investor protection (Chakravarty, Sarkar, & Wu, 1998). Existing literature suggests that this information asymmetry between local and foreign investors explains a significant portion of the variations in foreign share discounts. For example, using the price measure and the adverse selection component of the bid-ask spread as proxies for information asymmetry, Chan et al. (2008) find that their measures of information asymmetry explains more than 40% of variations in B-share discounts in China. Similar to the B-share discounts, the AH-share premium may also be driven by the information disadvantage of investors in Hong Kong market relative to investors in China mainland (Fernald & Rogers, 2002).

When CSR performance is not publically available and local investors are better informed about the company's CSR activities due to low acquisition costs, there could be high information asymmetry between the A- and H-share markets. Starting from 2009, the Shanghai and Shenzhen stock exchanges in China mandate a subset of their listing companies to issue CSR reports. This mandatory CSR reporting makes it easier for less informed H-share investors to access value-relevant information on the company's CSR activities, thereby reducing their information disadvantage relative to investors in Chinese mainland. Consistent with the notion that CSR disclosure is informative, we expect that CSR disclosure leads to lower AH-share premiums because CSR disclosure reduces information asymmetry.

Using a sample of 88 A+H-share firms in China in the period from 2009 to 2015, we find that CSR reporting affects asset prices in the A- and H-share markets as the AH-share premiums are significantly lower for firms that issue CSR reports. We also investigate the association between

the quality of CSR disclosure and the AH-share premium. Our results reveal a negative effect of CSR reporting quality on the AH-share premium.

To investigate the mechanism through which CSR disclosure (quality) influences asset prices in the A- and H-share markets, we borrow from the literature on market microstructure to construct measures of information asymmetry, and we examine whether the documented association between CSR disclosure (quality) and decreased AH-share premiums is driven by the enhanced corporate transparency around CSR performance. We use : the price impact measure  $PI$  , and the adverse selection component of the bid-ask spread,  $AS$  as proxies for information asymmetry. After controlling for other explanations for foreign share discounts, including trading activity (Z. Chen & Xiong, 2001), differential demand (Stulz & Wasserfallen, 1995), differential risks (Eun, Janakiramanan, & Lee, 2001), and speculative behavior (Mei, Scheinkman, & Xiong, 2004), we find that the positive effect of information asymmetry on AH-share premium loosens with CSR reporting firms.

By showing that CSR disclosure has negative effect on the AH-share premium because CSR disclosure reduces information asymmetry, our paper contributes to the literature by documenting an economical significant effect of CSR disclosure in reducing the misevaluation in international equity markets. While there is much evidence suggesting that CSR disclosure can reduce information asymmetry (Cho et al., 2013; Cui et al., 2016), helping firm reduce their cost of capital (Dhaliwal, Li, Tsang, & Yang, 2011; El Ghouli, Guedhami, Kwok, & Mishra, 2011), and avoid negative stock price (Kim, Li, & Li, 2014), very few studies examine whether CSR disclosure affects equity prices in international equity markets.

Our paper also extends the international equity markets literature. By showing that CSR engagement affects asset prices through reducing information asymmetry, our results indicate that CSR disclosure as a key resource of private information has the potential to play a significant role in international equity markets. Furthermore, our results bare policy implications as the negative AH-share premium effect of CSR disclosure suggests potential benefits to further the mandatory CSR disclosure requirement in China. These findings may also be important to other markets, specifically for those that are characterized by opaque information environments and relatively weak legal protection.

The rest of the paper proceeds as follows. Section 2 reviews the related literature and develops hypotheses. Section 3 describes the sample and research method. Regression results on the effect of CSR reporting and the quality of CSR disclosure are reported in section 4. Section 5 is the analysis for the mechanism under the association between CSR disclosure and AH-share premium. In Section 6, we present additional analysis for possible endogeneity issues. Section 7 concludes.

## **2. Literature Review and Hypotheses Development**

### **2.1 Overview of the Chines Equity Markets and the Foreign Share Discounts**

Many Chinese companies float their shares simultaneously on the Hong Kong market and one of the two mainland Chinese stock exchanges – the Shanghai Exchange (SSE) and the Shenzhen Exchange (SZSE). The shares that were initially listed on the SSE and SZSE were referred to as A-shares; and H-shares refer to the shares traded on the Hong Kong Stock Exchange (HKSE). Price discrepancies between the H-shares and the A-share counterparts of the same company are not uncommon. The A- and H-share markets are segmented as the People's Republic of China

government restricts mainland Chinese people from investing abroad and foreigners from investing in the A-share markets in mainland China. By the end of 2015, there were 88 A+H share companies and the average year-end AH-share price premium is 33.8%.

The phenomenon that A-shares trade at a premium in China is a puzzle. In fact, except for China, local shares exhibit price discounts in all other segmented markets (Bailey, Chung, & Kang, 1999). One common explanation for China's local share premium is that compared with domestic investors, foreign investors have information disadvantage in accessing value-relevant information (Brennan & Cao, 1997; Chan et al., 2008; Choe et al., 1999; Hau, 2001). The information disadvantage is due to language barriers, different accounting standards, and lack of reliable information about the local economy and firms. Consistent with this argument, Chakravarty et al. (1998) formulate a theoretical framework and show that B shares may trade at a discount relative to A shares because of asymmetric information in segmented markets. Chan et al. (2008) formulate a model of information asymmetry for Chinese A- and B-share markets and show that share price is a function of the proportion of informed domestic investors. Using trade data, they find that the price impact measure and adverse selection component of bid-ask spread explain a substantial portion of the variations in B-share discounts.

An alternative explanation for the A-share premium is the illiquidity driven by inactive trading in the foreign share market. This trading activity hypothesis states that the less actively traded B-shares should have a higher expected return and be priced lower to compensate foreign investors for higher trading costs. Consistent with this, G.-M. Chen, Lee, and Rui (2001) show that B-share discount is significantly negatively associated with the relative trading volume of B-shares to A-shares. Z. Chen and Xiong (2001) find that compared with unrestricted institutional shares, restricted institutional shares have an average discount of 78% to 86%.

A second alternative explanation is the speculative hypothesis, which argues that A-share premiums are a result of the speculative bubbles in the A-share market (Mei et al., 2004). According to Scheinkman and Xiong (2003), speculative bubbles may result in a speculative component in asset prices, which leads to higher volume of speculative trading and higher volatility. Assuming a speculative component in the A-share price, Mei et al. (2004) find that the A-share turnover rate explains 20% of the variations in A-share premiums.

A third alternative explanation is the differential demand hypothesis proposed by Stulz and Wasserfallen (1995), which is based on the difference in demand elasticity of two share classes. Specifically, Stulz and Wasserfallen (1995) argue that the demand functions of local and foreign investors differ because of deadweight costs that vary cross countries, and the demand by local investors is more elastic than that by foreign investors. It follows that it is optimal for domestic firms to restrict the supply of unrestricted foreign shares. The result is that the unrestricted foreign shares trade at a premium relative to the restricted local shares. Sun and Tong (2000) argue that the demand elasticity is actually higher for B-share investors because of the existence of good substitutes (H-shares and red-chips) and diversification benefits of oversea investors. Consistently, they find that the B-share discounts become greater when more H-shares and red-chips are listed in Hong Kong. Chan and Kwok (2005) find that the cross-sectional variation in A-share premium is negatively associated with the relative supply of A-shares, and positively related to the relative supply of B- an H-shares.

A fourth alternative explanation is the different investment opportunity sets facing local and foreign investors because only foreign investors can diversify overseas. This differential risk hypothesis asserts that the divergence between benchmark return in the A-share market and world market returns leads to different risk exposures. Consistent with this notion, it is documented by the

literature that B-share discount is positively related to the covariance risk of B-shares with the Morgan Stanley world market index (Eun et al., 2001). Li, Yan, and Greco (2006) find that AH-share premium is negatively associated with the interest rate spread between A- and H-share markets, and the relative market return between A- and H-share markets is positively related to AH-share premium. They then conclude that H-share discounts are at least partly resulted from the relatively lower risk premium required by local A-share investors.

## **2.2. CSR Disclosure and Information Asymmetry**

The important role of CSR disclosure in improving corporate information environment is well documented by the literature. Regarding the information asymmetry effect of CSR activities, Cho et al. (2013) find that both positive and negative CSR performance reduce bid-ask spread and this negative association between CSR performance and information asymmetry is stronger for firms with less institutional holdings. Cui et al. (2016) use dispersion in analyst forecasts and the Amihud (2002) illiquidity ratio as proxies for information asymmetry and find an inverse association between CSR engagement and their information asymmetry measures. Hung et al. (2013) examine the effect of mandatory CSR disclosure on market information asymmetry in China and document that CSR reporting firms experience a decrease in information asymmetry subsequent to the mandate. Consistent with the notion that CSR disclosure is informative about the firms' political and social performance, they find that the negative information asymmetry effect of CSR disclosure is stronger for firms with lower government ownership, weaker political connections, and smaller corporate donation.



Second, prior studies have shown CSR reporting increases financial transparency with regard to the social and environmental impact of companies and their governance structure, thereby reducing informational asymmetry (Diamond & Verrecchia, 1991; Lambert, Leuz, & Verrecchia, 2007) and resulting in lower capital constraints, lower cost of capital, and lower stock crash risk. Kim, Park, and Wier (2012), among others, demonstrate that firms that appear to exhibit corporate social responsibility are less likely to engage in accrual or real earnings management, thereby delivering more transparent and reliable financial information to investors. Cheng, Ioannou, and Serafeim (2014) show that firms with better CSR performance face significantly lower capital constraints, which can be attributed to reduced informational asymmetry due to increased transparency and enhanced stakeholder engagement. The literature also documents reductions in firms' cost of equity capital (Dhaliwal et al., 2011; El Ghouli et al., 2011) and cost of corporate bonds (Ge & Liu, 2015) as potential benefits of CSR disclosure. Kim et al. (2014) find a negative association between CSR activities and stock crash risk, suggesting that socially responsible firms commit to a high standard of transparency and engage in less bad news hoarding. Because information transparency around CSR activities is a subset of the overall information environment and information asymmetry is lower for more transparent firms, we expect that CSR disclosure made by A+H firms will reduce information disadvantage faced by investors in the H-share market.

In sum, previous literature has evidenced that information asymmetry explains a significant portion of variations in A-share premiums. If CSR disclosure are useful for investors to access information about the company's economic, environmental, social, and political prospects, it is expected that the information asymmetry in market will decrease due to CSR disclosures. As a result, we posit a negative association between CSR disclosure and AH-share premium:

**Hypothesis 1: Ceteris paribus, CSR reporting firms have lower AH-share premiums compared with firms do not issue CSR reports.**

The negative relation between disclosure quality and information asymmetry has been documented by prior studies (Healy, Hutton, & Palepu, 1999; Heflin, Shaw, & Wild, 2005; Welker, 1995). Specifically, it is suggested that disclosure quality influences information asymmetry by (1) increasing the trading activity of uninformed investors, as higher disclosure quality increases a firm's visibility and/or reduces the costs of processing public information (Fishman & Hagerty, 1989); and (2) decreasing the incentives to search for private information (Brown & Hillegeist, 2007). For example, Chang, D'Anna, Watson, and Wee (2008) find that firms with higher disclosure quality through their investor-relations activities have lower bid-ask spread, higher analyst following, higher institutional ownership, more active trading, and greater market capitalization.

Regarding CSR disclosure, previous literature suggests that higher CSR disclosure quality is related to lower cost of equity capital, as well as lower analyst forecast errors and dispersion (Casey & Grenier, 2014). The increase in environmental reputation is also significantly higher for firms adopting CSR assurance. Peters and Romi (2013) find that the presence and characteristics of environmental committees on the Board of Directors and a Chief Sustainability Officer (CSO) among the management team increases the incidence of voluntary CSR assurance among US firms. They also find that the value-relevance of CSR assurance is increasing over time. In a related study, Plumlee, Brown, Hayes, and Marshall (2015) use a modified version of the GRI Content Index as an indicator of the quality of firms' voluntary environmental disclosure and find that the quality of environmental disclosure is positively related to firm value.

To the extent that high-quality CSR reports convey more credible value-relevant information, we expect that firms issuing higher quality CSR reports have more transparent information environment and lower information asymmetry between managers and investors. It follows that the information disadvantage of H-share investors is lower for firms issue relatively higher quality CSR reports. Thus, we expect that the AH-share premium is negatively associated with the quality of CSR disclosure:

**Hypothesis 2: For companies that issue CSR report, the higher the quality of the report, the lower the AH-Share premiums.**

### **3. Sample and Research Methodology**

#### **3.1 Data and Variable Definitions**

Our sample consists of 88 A+H listing firms in the period from 2009 to 2015. We obtain financial information and daily stock market prices from WIND and CSMAR, high-frequency trade and quote data used to estimate the adverse selection component of bid-ask spread from GTA, and external rating agency's evaluations for the quality of CSR reports from the Rankins CSR Ratings (RKS)<sup>1</sup>. RKS created a rating system of CSR reports based on the Global Reporting Initiative (3.0) adapted to the Chinese context. All CSR reports were rated based on four dimensions: macrocosm (M, 30%), content (C, 45%), technique (T, 15%), and industry characteristics (I, 10%), and the final score was a weighted average ranging from 0 to 100. RKS CSR ratings have been used in

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<sup>1</sup> <http://www.rksratings.com>.

many studies as measures for the quality of CSR reports (e.g. Hung et al., 2013; Lau, Lu, & Liang, 2016; Luo, Wang, & Zhang, 2014; Marquis & Qian, 2013).

**Dependent Variable** We construct measures for AH-share premium following prior literature (Bailey & Jagtiani, 1994; Z. Chen & Xiong, 2001). Our first measure,  $Premium_{it}^{20}$ , is the average price premium in the [-10, +10] window around the CSR reporting date:

$$Premium_{it}^{20} = \frac{1}{20} \sum_{d=-10}^{d=10} \ln \left( \frac{P_{i,d,t}^A}{P_{i,d,t}^H \cdot Erate_{d,t}} \right), \quad (1)$$

where  $d$  denotes the number of trading dates from the event date and  $P^A$  and  $P^H$  represents the price for A- and H-share, representatively.  $Erate$  is the RMB to Hong Kong dollar exchange rate. The second measure,  $Premium_{it}^{40}$ , is the two-month average price premium calculated as the average AH-share price premium during 40 trading days around the CSR reporting date. Our third measure of AH-share premium is the annual average price discrepancy between A- and H-share markets.

**Independent Variable** Starting from 2009, the Shanghai and Shenzhen stock exchange requires a subset of their listing firms to make CSR reports. While Shanghai Stock Exchange requires all A+H listing companies to disclose CSR activities, Shenzhen Stock Exchange only mandates firms in the Shenzhen 100 Stock Index to issue CSR reports. For our sample of 88 A+H share listing companies, 81 companies start to make CSR disclosure as April 2009. To quantify the effect of CSR disclosure on AH-share premium, we use a dummy variable  $CSR_{i,t}$ , which equals 1 if the firm issues a CSR report and 0 otherwise. For CSR reporting firms, we gauge the quality of their

CSR reports using a quality score provided by the RKS CSR rankings. Our *CSR reporting Quality* measure is then calculated as the logarithm of one plus the RKS CSR score.

**Information Asymmetry Measures** To support our argument that CSR reduces AH-share premium by mitigating information asymmetry between managers and investors, we construct two information asymmetry measures based on market microstructure models. Our first proxy is the price impact measure (*PI*) based on the theoretical models of Glosten (1987), Kyle (1985), and Easley and O'hara (1987). According to Kyle (1985), there exists a linear relation between order flows and price changes and a higher price impact indicates greater information asymmetry. Following Glosten and Harris (1988) and Chan et al. (2008), we estimate *PI* using the following model:

$$\Delta P_t = \gamma Q_t V_t + \varphi(Q_t - Q_{t-1}) + e_t, \quad (2)$$

where  $P$  is the transaction price,  $V$  is the trade size and  $Q$  is trade sign which equals 1 for a buyer-initiated transaction and -1 for a seller-initiated transaction.  $\gamma$  is the price impact coefficient that measures the extent of private information that is available in the market. The higher the  $\gamma$ , the more severe the information asymmetry. Given the small value of  $\gamma$ , we follow prior literature (Chan et al., 2008; Hung et al., 2013) and multiply  $\gamma$  by  $10^7$ . *PI* is then calculated as the logarithm of  $\gamma * 10^7$ .

Our second proxy for information asymmetry is the adverse selection component of the bid-ask spread, *AS component*, which decomposes the gross profit cost ( $\varphi$ ) estimated in Eq. (2) into two components: the order-processing cost and the inventory holding cost. The inventory holding cost arise from the suboptimal inventory position that a risk-averse market maker must hold to supply

immediacy and increases with the level of information asymmetry. Following Easley and O'hara (1987) and Glosten and Harris (1988), we decompose the bid-ask spread to calculate its adverse selection component using the following model:

$$\Delta P_t = c_0(Q_t - Q_{t-1}) + c_1(Q_t V_t - Q_{t-1} V_{t-1}) + z_0 Q_t + z_1 Q_t V_t + e_t, \quad (3)$$

in which variables are defined as the same as Eq. (2). Following Sadka (2006), we use the variable AS component,  $z_1$ , as the measure for the inventory holding cost resulting from risk aversion. The AS component, is then calculated as the logarithm of  $z_1$  multiplied by  $10^8$  (Hung et al., 2013).

**Control Variables** Building on explanations for A-share premiums proposed by previous studies, we construct a few control variables to examine the incremental explanatory power of CSR reporting activities.

The first control variable is the total market capitalization of outstanding A- and H-shares. Market capitalization can be another measure of information asymmetry, as information costs are typically lower for large firms. Bailey and Jagtiani (1994) and Domowitz, Glen, and Madhavan (1997) find that larger companies are preferred by foreign investors in Thailand and Mexico because they display greater financial disclosure and less information asymmetry. To the extent that information asymmetry is negatively correlated with A-share premiums, we expect that the effect of total market capitalization is negatively associated with AH-share premiums.

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<sup>2</sup> We also calculate the variable AS component for median size trade,  $z_0 + z_1 V^*$ , where  $V^*$  is the median trade size. Our results are robust to using  $z_0 + z_1 V^*$  as the measure of information asymmetry.

The second control variable is the relative turnover ratio between A- and H-share Markets, *Diff. Turnover*, calculated as the logarithm of one plus the turnover ratio of A-shares over that of H-shares. Turnover is often used as a proxy for the level of trading activity and transaction costs. Since the required return is higher for less actively traded stocks, the AH-share premium should be higher if the relative turnover ratio of A-share to H-share increases. Turnover ratio may also serve as a proxy for speculative trading. Mei et al. (2004) relate higher turnover of the A-share market to greater speculative bubbles created by domestic investors and find that A-share premium is positively associated with the turnover of the A-shares.

The third control variable is % *H-shares*, which is the percentage of the market capitalization of outstanding H-shares. If AH-share premium arises from the restricted supply of A-shares and the resulted excess demand in the local market, the AH-share premium increases with the relative supply of H-shares. In accordance with this argument, Chan and Kwok (2005) find that the cross-sectional variation in A-share premium positively relates to the relative supply of H-shares.

The remaining three variables control for the differential risk hypothesis. The relative volatility between A- and H-share market (*Diff. Volatility*) is measured as the logarithm of one plus the annual volatility of A-shares over that of the annual volatility of H-shares. If Chinese investors are more risk tolerant than H-share investors, then we should observe that the AH-premium is positively related to relative volatility between A- and H-share markets. *Diff. Risk-free rate* and *Diff. Market return* are the differences in risk free rate and market returns between A- and H-share markets.

Table 1 summarizes descriptive statistics of our variables. Panel A presents summary statistics for all A+H share firms. As is shown, the average AH-premium measured in the 20- or 40-day window

around the CSR reporting date is about 24%, suggesting a significant premium for A-shares. Panel B summarizes Mandatory CSR reporting firms. On average, when comparing with the whole sample, firms mandated to issue CSR reports are not significantly different in their total A+H market capitalization, relative turnover ratio, relative volatility, and the percentage of H-shares. Table 2 presents a Pearson correlation table of variables. See Appendix for variable definitions.

### 3.2 Regression Model

To test our first hypothesis that CSR reporting firms have a lower AH-share premium, we estimate the following panel data regression with year and industry fixed effects between 2009 and 2015 for 88 A+H companies:

$$Premium_{i,t} = \alpha_0 + \alpha_1 CSR_{it} + \sum_j \phi_j Control_{j,it} + \varepsilon_{it} , \quad (4)$$

where the dependent variable is the AH-share premium calculated in the 20- and 40-day window around the CSR reporting date, respectively. *CSR* is a dummy variable that equals 1 if the firm makes CSR disclosure and 0 otherwise. Standard errors are clustered at the firm level to control for possible correlations within the firm.

In estimating the relation between CSR disclosure and AH-share premium, we control for variables that are shown by prior studies to affect A-share premiums. The total market capitalization of outstanding A- and H-shares are used for an addition proxy for information asymmetry, as information costs are typically lower for large firms. We include the relative turnover ratio between A- and H-share markets (*Diff. Turnover*) to control for the trading activity hypothesis and the speculative trading hypothesis. We also include percentage of H-shares in Eq. (4) to control for



relative supply of H-share market, as is suggested by the differential demand hypothesis. Finally, we control for the relative volatility, risk-free rate and market return between A- and H-share market, respectively, which are used as proxies for the differential risk hypothesis.

For firms that issue CSR reports, we also investigate whether the quality of CSR disclosure is related to lower AH-share premiums. The regression used is as follows:

$$Premium_{i,t} = \alpha_0 + \alpha_1 CSR\ Reporting\ Quality_{it} + \sum_j \phi_j Control_{j,it} + \varepsilon_{it} , \quad (5)$$

where *CSR Reporting Quality* is based on a quality score provided by RKS ratings, which is a professional third-party CSR rating agency in China. RKS CSR ratings measure the quality of CSR reports along the dimensions of macrocosm, content, technique and industry and are widely used in the literature. Since our measure of CSR reporting quality – the RKS CSR score – is only available in annual data, we use the annual average AH-share premium as the dependent variable. Control variables are the same as those in Eq. (4). We include year and industry dummies and calculate the standard errors clustered in the firm level.

## 4. Results

### 4.1 CSR disclosure and AH-share premium

Results from estimating the regression specification in Eq. (4) are reported in Table 3. The first two columns present the results of AH-share premium calculated in the 20-day window around CSR reporting date. We first run a baseline regression to demonstrate the incremental effect of CSR disclosure on AH-share premium, of which the result is reported in column (1). Consistent with previous literature, we find that the coefficient on total market capitalization is negative and

significant, as expected if large firms have lower information asymmetry and thereby smaller AH-share premiums. The trading activity explanation and the speculative trading hypothesis predict a positive sign of the coefficient on *Diff. Turnover*. We find that coefficient on *Diff. Turnover* is positive but insignificant, suggesting that differences in trading activity and speculative trading are not likely able to explain the AH-share premium. The coefficient on *Diff. Volatility* is positive and significant, consistent with the differential risk hypothesis that A-share investors are more risk tolerant than H-share investors. We also find that the coefficient on *Diff. Market Return* is positive, as predicted by differential risk hypothesis. However, it is not of statistical significance.

Next, given a baseline for comparison, we estimate Eq. (4) using the 20-day AH-share premium. Column (2) in Table 3 represents the result. The coefficient on *CSR* is positive and highly significant (-0.0800 with  $t = -3.64$ ), confirming our H1 that firms issue CSR reports have lower AH-share premiums. The coefficient estimation of control variables are similar to the baseline analysis.

Columns (3) and (4) present the results of AH-share premium calculated in the 40-day window around CSR reporting date. Similar to column (1), the baseline regression confirms the stylized facts of the information asymmetry hypothesis literature that large firms experience lower AH-share premiums. The coefficient on *Diff. Turnover* has the expected sign but is not significant, so is the coefficient of *Diff. Volatility*. Column (4) reports the result of Eq. (4). Consistent with our prediction, we find that CSR disclosure significantly reduces the AH-share premium even after controlling for alternative explanations.

## 4.2 CSR disclosure quality and AH-share premium

For firms that issue CSR reports, we further investigate whether the quality of CSR disclosure is positively related to the AH-share premium. Table 4 reports the results of our investigation. We first conduct a baseline regression and report the result in the first column. Similar to Table 3, we continue to find that the total market capitalization in A- and H-share markets negatively influences AH-share premium, which is consistent with the information asymmetry hypothesis. The coefficient on *Diff Turnover* is positive and significant, which confirms the trade activity hypothesis and the speculative trading hypothesis. The coefficient on *Diff Volatility* is positive and significant, as expected if A-share investors are more risk tolerant than H-share investors.

The next column presents the result of estimating Eq. (5). The negative and significant coefficient on *CSR Reporting Quality* confirms our H2 that ceteris paribus, firms that issue higher quality CSR reports have significantly lower AH-share premiums. This negative effect of the CSR reporting quality on misevaluation in the A- and H-share markets is not likely driven by differences in trading activities, volatility, risk-free rate and market return between the two markets.

## 5. The Mechanism

In this section, we investigate the mechanism under the negative association between CSR reporting activities and AH-share premiums. Building on the information asymmetry hypothesis that A-share premiums result from the information disadvantage of H-share investors, we posit that CSR disclosure decreases AH-share premium because it reduces information asymmetry.

To test whether the documented negative association between CSR disclosure and AH-share premium is driven by the reduced information asymmetry, we analyze the relation between information asymmetry, CSR disclosure and AH-share premium using the following regression:

$$Premium_{i,t} = \alpha_0 + \beta Info\_Asy_{it} + \gamma Info\_Asy_{it} * CSR_{it} + \alpha_1 CSR_{it} + \sum_j \phi_j Control_{j,it} + \varepsilon_{it} , \quad (6)$$

where *Info\_Asy* are our proxies for information asymmetry, including the price impact measure *PI* and the adverse-selection component of bid-ask spread *AS component*. As in Eq. (4), we control for other explanations for the A-share premium, include year and industry fixed effects, and calculate robust standard errors clustered in the firm level. If CSR disclosure reduces AH-share premiums by mitigating information asymmetry, the coefficient estimate on  $\gamma$  should be significantly negative.

Results from estimating Eq. (6) using the 20-day average AH-premium,  $Premium^{20}$ , are reported in the Panel A of Table 5. As in Table 3, we first run a set of baseline regressions by adding each of our information asymmetry measures to Eq. (4), respectively. Results of these baseline regressions are presented in Column (1) and Column (3). Consistent with the information asymmetry hypothesis which posits that firms with more severe information asymmetry experience higher misevaluation in the international equity markets, we find that the coefficient on price impact (*PI*) and on adverse selection component (*AS component*) are both positive and significant even after controlling for alternative explanations. This finding is consistent with Chan et al. (2008), who show a strong positive link between B-share discounts and information asymmetry in Chinese markets.

Column (2) and column (4) presents regression results of Eq. (6) using *PI* and *AS component* as the proxy for information asymmetry, respectively. The coefficients on the interaction term

between *Info\_Asy* and *CSR* are negative and statistically significant for both *PI* and *AS component*, suggesting that the positive effect of information asymmetry on AH-premium loosens when the firm disclose CSR activities. Among the control variables, we continue to find that information asymmetry has a positive and significant implication on the AH-share premium. Market capitalization as an additional control for information asymmetry negatively influences AH-share premium, as expected if large firms have lower information asymmetry.

Panel B of Table 5 presents results using the 40-day AH-share premium. The first two columns demonstrate that the price impact measure of information asymmetry has a significant and positive effect on AH-share premiums and CSR disclosure significantly decreases this effect. In the next two columns, we use *AS component* as the proxy for information asymmetry and continue to find a positive and significant coefficient on *Info\_Asy* and a significantly negative coefficient on *Info\_Asy\* CSR*. This finding is consistent with our argument that CSR disclosure decreases AH-share premiums because it mitigates the information asymmetry. In this regard we relate our research to Hung et al. (2013), who show that mandatory CSR disclosure China reduces information asymmetry by enhancing transparency around CSR activities.

We then repeat our analysis on the quality of CSR reports. Specifically, we estimate the following regression specification with year and industry fixed effect:

$$\begin{aligned}
 Premium_{i,t} = & \alpha_0 + \beta Info\_Asy_{it} + \gamma Info\_Asy_{it} * CSR\ Reporting\ Quality_{it} \\
 & + \alpha_1 CSR\ Reporting\ Quality_{it} + \sum_j \phi_j Control_{j,it} + \varepsilon_{it} \quad , \quad (7)
 \end{aligned}$$

where we control for alternative explanations and cluster standard errors at the firm level.

Table 6 summarizes regression results of Eq. (7). Column (1) shows that for CSR reporting firms, AH-share premium is higher among firms with more severe information asymmetry. The coefficient estimate also demonstrates a significantly negative link between *CSR Reporting Quality* and AH-share premium, confirming our H2 that AH-share premium is lower for firms issuing high-quality CSR reports. This finding persists even after controlling for the price impact measure of information asymmetry. Result presented in Column (2) reveals that *ceteris paribus*, the positive AH-share premium impact of *PI* is less for firms issuing high-quality CSR reports.

Columns (3) and (4) present results using *AS component* as the information asymmetry measure and document a positive and significant effect of the adverse-selection component on AH-share premium. The coefficient on *AS component\*CSR Reporting Quality* is negative and highly significant, suggesting that the positive effect of *AS component* on misevaluation reduces more if the quality of CSR disclosure is higher. In sum, our results are consistent with our information-asymmetry argument that the higher the quality of CSR reports, the lower the information asymmetry. It follows that firms making high-quality CSR reports have significantly lower AH-share premiums.

## **6. Endogeneity Analysis**

In the main test, we link CSR reporting quality to AH-share premium and document a significant negative association. However, the decision of the quality of CSR disclosure can be endogenous – firms with more severe information asymmetry may choose to increase the quality of their CSR disclosure, as CSR disclosure is an effective tool to legitimize the company's activities among the wide range of its stakeholders (Bonsón & Bednárová, 2015). This endogenous concern is less

important for the relation between CSR disclosure and AH-share premium as the action to issue CSR reports is mandated by the government.

To address this possible endogenous problem, we retest the effect of CSR reporting quality using a two-stage least square regression. The instrument for the quality of CSR disclosure is the industry average CSR reporting quality. *Ceteris paribus*, a firm operating in industries with higher mean CSR reporting quality makes better CSR disclosures because of the competitive pressure from its peers. This peer-effect argument thus suggests a positive relation between mean industry CSR reporting quality and AH-share premium. Meanwhile, it is not likely that the average industry CSR reporting quality influences asset price discrepancies between the A- and H-share markets.

Table 7 presents the results of the two-stage least squares regression. In stage one, we regress the quality of CSR reports on our measures of information asymmetry, the interaction term between information asymmetry measure and CSR reporting quality and other control variables in Eq. (7). Regression results of the first stage using *PI* and *AS component* are presented in column (1) and column (3), respectively. Consistent with our prediction, the coefficient on the average industry CSR reporting quality is positive and of statistical significance. The test of endogeneity rejects the null hypothesis that CSR reporting quality is exogenous at the 5% significant level. The tests of weak instrument suggest that average industry CSR reporting quality is a viable instrument, as the F-statistic is 7.14.

In stage two, we regress AH-share premium on the predicted quality of CSR reports and other variables in Eq. (7). Results are summarized in column (2) and column (4) of Table 7. The coefficients on the interaction term are negative and significant for *PI* and *AS component*,

suggesting that the positive effect of information asymmetry on AH-share premium decreases with the quality of CSR reports.

## **7. Conclusion**

In this paper, we document a significant negative effect of CSR disclosure on AH-share premiums in China. Building on the common information-asymmetry explanation for the A-share premium puzzle that H-shares trade at discounts because of the information disadvantage of H-share investors, we argue that CSR disclosure is negatively related to AH-share premium because CSR disclosure is a way of information asymmetry reduction (Choe et al., 1999; Cui et al., 2016; Huang & Watson, 2015). Based on a sample of 88 Chinese A+H share firms from 2009 to 2015, we find that firms mandated to disclose CSR activities have significantly lower AH-share premiums. For CSR reporting firms, we also investigate the association between the quality of CSR reports and AH-share premiums. Our results show that AH-share premiums decrease with the quality of CSR disclosure. These findings are robust to controlling for variables that are shown by prior literature to influence A-share premiums.

To examine the mechanism under the link between CSR disclosure and AH-share premium, we then construct two measures of information asymmetry based on market microstructure models – the price impact coefficient, and the adverse selection component of the bid-ask spread. We find that *PI* and *AS component* are significantly related to higher AH-share premium and this positive kink between information asymmetry measures and AH-share premium loosens if the firm makes CSR disclosure. Our examination on the quality of CSR reports delivers similar results: again, we



find a positive effect of information asymmetry on AH-share premium; and this positive impact decreases with the quality of CSR reports.

Our paper extends the CSR research by suggesting an important role of CSR disclosure in mitigating the misevaluation in international equity markets. Given the relatively few studies on the quality of CSR reports, we also contribute to the literature by providing evidence that CSR reporting quality is positively related to information asymmetry reduction. In addition, we find that CSR disclosure helps reduce the positive link between AH-share premium and information asymmetry, which contributes to the literature by indicating that non-financial information disclosure is useful in reducing misevaluation in international equity markets.

## Appendix Variable Definition

Variable	Definition
Premium	<p>AH-share premium, calculated as the average price premium in the 20-day window around the CSR reporting date:</p> $Premium_{it}^{20} = \frac{1}{20} \sum_{d=-10}^{d=10} \ln \left( \frac{P_{i,d,t}^A}{P_{i,d,t}^H \cdot Erate_{d,t}} \right)$ <p>where <math>d</math> denotes the number of trading dates from the event, <math>P^A</math> and <math>P^H</math> represents the price for A- and H-share, representatively. <math>Erate</math> is the RMB to Hong Kong dollar exchange rate. The second measure is the two-month average price premium calculated as the average AH-share price premium in 40 trading days around the CSR reporting date. Our third measure of AH-share premium is the annual average price discrepancy between A- and H-share markets.</p>
CSR	1 if the company issues a CSR report and 0 otherwise.
CSR Reporting Quality	The logarithm of one plus the CSR quality score provided by RKS CSR ratings.
PI	<p>The price impact measure of information asymmetry, which is estimated using high-frequency trade and quote data. Following Glosten and Harris (1988) and Chan et al. (2008), we estimate PI using the following model:</p> $\Delta P_t = \gamma Q_t V_t + \varphi(Q_t - Q_{t-1}) + e_t$ <p>where <math>P</math> is the transaction price, <math>V</math> is the trade size and <math>Q</math> is trade sign which equals 1 for a buyer-initiated transaction and -1 for a seller-initiated transaction. <math>\gamma</math> is the price impact coefficient that measures the extent of private information that is available in the market. Given the small value of <math>\gamma</math>, we follow prior literature and calculate <math>PI</math> as the logarithm of <math>\gamma</math> multiplied by <math>10^7</math>.</p>
AS Component	<p>The adverse selection component of the bid-ask spread estimated using high frequency trading data. Following Easley and O'Hara (1987), and Glosten and Harris (1988), we decompose the bid-ask spread to calculate its adverse selection component using the following structural model:</p> $\Delta P_t = c_0(Q_t - Q_{t-1}) + c_1(Q_t V_t - Q_{t-1} V_{t-1}) + z_0 Q_t + z_1 Q_t V_t + e_t$ <p>in which <math>P</math> is transaction price, <math>V</math> is observed number of shares traded on transaction <math>t</math>, and <math>Q</math> is trade sign which equals 1 for a buyer-initiated transaction and -1 for a seller-initiated transaction. We follow Sadka (2006) and use the variable AS component, <math>z_I</math>, as the measure for the inventory holding cost resulting from risk aversion. The AS component, is then calculated as the logarithm of <math>z_I</math> multiplied by <math>10^8</math>.</p>

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Market Cap. A+H share	The total market capitalization in the A- and H-share markets
Diff. Turnover	The relative turnover ratio between A- and H-share markets, calculated as the logarithm of 1 plus the turnover ratio of A-shares over that of H-shares.
% H-shares	The percentage of the market capitalization of outstanding H-shares.
Diff. Volatility	The relative volatility between A- and H-shares, calculated as the logarithm of 1 plus the volatility of A-shares over that of H-shares.
Diff. Risk-free rate	The relative risk-free rate between A-and H-share markets, calculated as the logarithm of 1 plus the risk-free rate in the A-share market over that in the H-share market.
Diff. Market return	The relative market return between A-and H-share markets, calculated as the logarithm of 1 plus the CSI 300 index over the logarithm of 1 plus the Hang Seng Index.

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Table 1 Summary Statistics

Variable	N	Mean	Std. Dev.	Min	Max
<b>Panel A: All firms</b>					
Premium <sup>20</sup>	522	0.2421	0.3189	-0.2860	1.0481
Premium <sup>40</sup>	522	0.2401	0.3140	-0.2827	1.0387
CSR	522	0.4119	0.4926	0.0000	1.0000
PI	522	3.3543	2.3200	-2.8691	7.6034
AS component	522	5.9672	1.7429	0.0233	10.1640
Market Cap. A+H share	522	25.4589	1.3001	22.8193	28.5171
Diff. Turnover	522	1.7950	1.9065	0.0525	10.6198
% H-shares	522	0.1198	0.0777	0.0170	0.3127
Diff. Volatility	522	0.9340	0.3786	0.3426	2.1700
Diff. Risk-free rate	522	8.3865	2.4084	5.2344	16.4287
Diff. Market return	522	3.8450	5.9326	-2.1987	22.0134
<b>Panel B: Mandatory CSR reporting firms</b>					
Premium, annual	339	0.3011	0.3583	-0.2413	1.2168
CSR Reporting Quality	339	3.9484	0.3692	3.1826	4.4880
PI	339	3.3965	2.2933	-2.8691	7.6034
AS component	339	6.0014	1.7498	0.0233	10.3437
Market Cap. A+H share	339	25.2161	1.3353	22.4341	28.4218
Diff. Turnover	339	1.8488	1.7473	0.0503	10.7221
% H-shares	339	0.1267	0.0778	0.0199	0.3328
Diff. Volatility	339	0.9637	0.2738	0.4443	1.6724
Diff. Risk-free rate	339	7.3161	1.6134	5.6953	12.5024
Diff. Market return	339	-3.4412	11.4558	-27.7098	3.8967

Panel A, Table 1 presents summary statistics for all A+H companies. *Premium*<sup>20</sup> and *Premium*<sup>40</sup> are the A- to H-share premium calculated in the [-10, +10] and [-20, +20] window around the CSR report date, respectively. *CSR* is a dummy variable that equals 1 if the firm is mandated to issue CSR reports. The price impact measure (*PI*) and the adverse-selection component of bid-ask spread (*AS component*) are our two measures of information asymmetry. We borrow from the literature on market microstructure and use high-frequency trade and quote data to construct these two measures. *Market Cap. A+H share* is the total market value of A- and H-shares. *Diff. Turnover*, *Diff. Volatility*, *Diff. Risk-free rate*, and *Diff. Market return* are the difference between the turnover, volatility, risk-free rate and market return in the A-share market and in the H-share market, respectively. % H-share is the percentage of total tradable shares outstanding in the H-share market to the total tradable shares outstanding in the A- and H-share market. Panel B, Table 1 reports summary statistic for firms mandated to issue CSR reports. *Premium* is the A- to H-share premium calculated in the year in which the firm issues CSR reports. *CSR Reporting Quality* is the logarithm of 1 plus the CSR reporting quality score provide by the Rankins (RKS) Inc., a third-party professional China-specific CSR rating agency established in Beijing. Definitions of all variables are summarized in Appendix.

Table 2 Correlations

**Panel A: All Firms**

	Premium <sup>20</sup>	Premium <sup>40</sup>	CSR	PI	AS component	Market Cap. A+H share	Diff. Turnover	% H-shares	Diff. Volatility	Diff. Risk-free rate	Diff. Market return
Premium <sup>20</sup>	1.0000										
Premium <sup>40</sup>	0.9930*	1.0000									
CSR	-0.2708*	-0.2382*	1.0000								
PI	0.0888*	0.1020*	0.0179	1.0000							
AS component	0.0486	0.0657	0.0232	0.9410*	1.0000						
Market Cap. A+H share	-0.3871*	-0.3860*	0.1607*	-0.2640*	-0.3372*	1.0000					
Diff. Turnover	0.1977*	0.1854*	-0.1505*	0.0673	0.0502	-0.1969*	1.0000				
% H-shares	0.0179	0.0129	-0.0800	-0.7495*	-0.6300*	-0.1378*	-0.1206*	1.0000			
Diff. Volatility	0.1379*	0.1174*	-0.2248*	0.1722*	0.0881*	0.0197	0.3078*	-0.2434*	1.0000		
Diff. Risk-free rate	-0.0086	-0.0109	-0.0226	0.1041*	0.0890*	0.1330*	-0.0223	-0.1835*	0.0055	1.0000	
Diff. Market return	-0.0447	-0.0463	-0.2431*	0.0149	0.0709	-0.0799	-0.0059	0.1203*	-0.0684	-0.1457*	1.0000

**Panel B: Mandatory CSR reporting firms**

	Premium, annual	CSR Reporting Quality	PI	AS component	Market Cap. A+H share	Diff. Turnover	% H-shares	Diff. Volatility	Diff. Risk-free rate	Diff. Market return
Premium, annual	1.0000									
CSR Reporting Quality	-0.3928*	1.0000								
PI	0.1008	-0.2295*	1.0000							
AS component	0.0652	-0.2211*	0.9378*	1.0000						
Market Cap. A+H share	-0.4668*	0.5652*	-0.2907*	-0.3581*	1.0000					
Diff. Turnover	0.2622*	-0.1674*	0.1067	0.0904	-0.2613*	1.0000				
% H-shares	0.0568	-0.0226	-0.7045*	-0.5802*	-0.1699*	-0.1033	1.0000			
Diff. Volatility	0.1238*	0.1719*	-0.0426	-0.1431*	0.1080*	0.2388*	-0.1904*	1.0000		
Diff. Risk-free rate	-0.0725	-0.1153	0.1908*	0.1961*	0.0560	-0.0606	-0.1513*	-0.3339*	1.0000	
Diff. Market return	0.1339*	-0.0647	-0.0452	-0.0845	0.0440	0.0448	-0.0934	0.0212	-0.1326*	1.0000

Table 2 presents Pearson correlations for all A+H firms (Panel A) and firms issuing mandatory CSR reports (Panel B). \* indicates statistical significance at the 5 percent level in a two-tailed test. See Appendix for Variable Definitions.

Table 3 CSR reporting and the AH-share premium

VARIABLES	(1)	(2)	(3)	(4)
	Baseline	<u>Premium<sup>20</sup></u>	Baseline	<u>Premium<sup>40</sup></u>
CSR		-0.0800*** (-3.64)		-0.0611*** (-2.74)
Market Cap. A+H share	-0.0936*** (-4.07)	-0.0891*** (-3.96)	-0.0912*** (-3.95)	-0.0878*** (-3.87)
Diff. Turnover	0.0069 (0.96)	0.0061 (0.87)	0.0057 (0.80)	0.0051 (0.73)
% H-shares	0.4520 (1.46)	0.3543 (1.16)	0.4065 (1.33)	0.3318 (1.09)
Diff. Volatility	0.0530* (1.70)	0.0296 (0.90)	0.0414 (1.34)	0.0235 (0.72)
Diff. Risk-free rate	0.0056 (0.34)	-0.0069 (-0.41)	-0.0035 (-0.20)	-0.0130 (-0.74)
Diff. Market return	-0.0014 (-1.19)	-0.0040** (-2.61)	-0.0020 (-1.63)	-0.0040** (-2.36)
Constant	2.5775*** (3.84)	2.7108*** (4.18)	2.7029*** (3.94)	2.8048*** (4.18)
Year dummies	YES	YES	YES	YES
Industry dummies	YES	YES	YES	YES
Observations	522	522	522	522
adj. R squared	0.511	0.523	0.497	0.504

This table presents the results of the following regression:

$$Premium_{i,t} = \alpha_0 + \alpha_1 CSR_{it} + \sum_j \phi_j Control_{j,it} + \varepsilon_{it},$$

where the dependent variable is the AH-share premium calculated in the 20- and 40-day window around the CSR reporting date, respectively. CSR is a dummy variable that equals 1 if the firm makes CSR disclosure and 0 otherwise. Year and industry fixed effect are included. Standard errors are clustered at firm level. In estimating the relation between CSR disclosure and AH-share premium, we control for variables that are shown by prior studies to affect A-share premium. The total market capitalization of outstanding A- and H-shares, *Market Cap. A+H share*, is used for an addition proxy for information asymmetry, as information costs are typically lower for large firms. We include the relative turnover ratio between A- and H-share markets (*Diff. Turnover*) to difference in trading activity and speculative trading between A- and H-share markets. We also include percentage of H-shares to control for relative size of H-share market. Finally, we control for the relative volatility, risk-free rate and market return between A- and H-share market, which are used as proxies for different risk exposure of A- and H-share investors. t-statistics in parentheses. \*\*\*, \*\*, and \* indicates significance level of 1%, 5% and 10%, respectively.

Table 4 CSR Reporting Quality and the AH-share premium

VARIABLES	(1)	(2)
	Baseline	<u>Premium, annual</u>
CSR Reporting Quality		-0.1621** (-2.12)
Market Cap. A+H share	-0.1358*** (-5.27)	-0.1039*** (-4.94)
Diff. Turnover	0.0156* (1.69)	0.0098 (0.85)
% H-shares	0.9053*** (2.85)	0.6317** (2.05)
Diff. Volatility	0.1696** (2.34)	0.1432* (1.68)
Diff. Risk-free rate	0.0444 (1.01)	0.0896* (1.91)
Diff. Market return	-0.0087 (-1.61)	-0.0060 (-0.97)
Constant	3.0786*** (3.99)	2.0817*** (2.93)
Year dummies	YES	YES
Industry dummies	YES	YES
Observations	339	339
R-squared	0.607	0.476

This table presents the results of the following regression:

$$Premium_{i,t} = \alpha_0 + \alpha_1 CSR\ Reporting\ Quality_{it} + \sum_j \phi_j Control_{j,it} + \varepsilon_{it},$$

where the dependent variable is the annual average AH-share premium. *CSR Reporting Quality* is based on a quality score provided by RKS CSR ratings, which is a professional third-party CSR rating agency in China. RKS CSR ratings measure the quality of CSR reports along four dimensions: macrocosm, content, technique and industry, and are widely used in the literature. We control for variables that are shown by prior studies to affect A-share premium. The total market capitalization of outstanding A- and H-shares, *Market Cap. A+H share*, is used for an addition proxy for information asymmetry, as information costs are typically lower for large firms. We include the relative turnover ratio between A- and H-share markets (*Diff. Turnover*) to difference in trading activity and speculative trading between A- and H-share markets. We also include percentage of H-shares to control for relative size of H-share market. Finally, we control for the relative volatility, risk-free rate and market return between A- and H-share market, which are used as proxies for different risk exposure of A- and H-share investors. t-statistics in parentheses. \*\*\*, \*\*, and \* indicates significance level of 1%, 5% and 10%, respectively.

Table 5 Information Asymmetry, CSR reporting and AH-share premium

<b>Panel A: Premium<sup>20</sup></b>				
VARIABLES	(1)	(2)	(3)	(4)
	Baseline	<u>PI</u>	Baseline	<u>AS component</u>
PI	0.0311*** (3.12)	0.0371** (2.20)		
PI*CSR		-0.0160** (-2.04)		
AS component			0.0231* (1.91)	0.0312** (2.31)
AS component*CSR				-0.0217* (-1.85)
CSR	-0.0985*** (-3.82)	-0.0452 (-1.33)	-0.0999*** (-3.85)	0.0293 (0.39)
Market Cap. A+H share	-0.0792*** (-7.08)	-0.0796*** (-4.35)	-0.0867*** (-7.68)	-0.0872*** (-8.96)
Diff. Turnover	0.0021 (0.32)	0.0015 (0.17)	0.0005 (0.08)	0.0001 (0.01)
% H-shares	1.1676*** (3.85)	1.1380** (2.26)	0.7742*** (2.89)	0.7552*** (2.95)
Diff. Volatility	0.0217 (0.61)	0.0243 (0.62)	0.0299 (0.84)	0.0339 (0.92)
Diff. Risk-free rate	0.0188 (0.75)	0.0150 (0.81)	0.0179 (0.71)	0.0136 (0.68)
Diff. Market return	-0.0033 (-1.25)	-0.0033** (-2.15)	-0.0034 (-1.26)	-0.0034 (-1.31)
Constant	1.6937*** (3.46)	1.7440*** (3.03)	1.9084*** (3.74)	1.9392*** (4.73)
Year dummies	YES	YES	YES	YES
Industry dummies	YES	YES	YES	YES
Observations	522	522	522	522
Adj. R-squared	0.372	0.375	0.364	0.367

<b>Panel B: Premium<sup>40</sup></b>				
VARIABLES	(1)	(2)	(3)	(4)
	Baseline	<u>PI</u>	Baseline	<u>AS component</u>
PI	0.0338*** (3.41)	0.0394** (2.37)		
PI*CSR		-0.0150* (-1.90)		
AS component			0.0275** (2.28)	0.0348* (1.74)
AS component*CSR				-0.0197*

				(-1.82)
CSR	-0.0787***	-0.0288	-0.0801***	0.0374
	(-3.08)	(-0.84)	(-3.11)	(0.57)
Market Cap. A+H share	-0.0771***	-0.0775***	-0.0840***	-0.0845***
	(-6.94)	(-4.22)	(-7.49)	(-4.56)
Diff. Turnover	0.0014	0.0009	-0.0002	-0.0006
	(0.21)	(0.10)	(-0.03)	(-0.07)
% H-shares	1.2168***	1.1891**	0.8312***	0.8139*
	(4.04)	(2.39)	(3.12)	(1.89)
Diff. Volatility	0.0184	0.0208	0.0271	0.0307
	(0.52)	(0.53)	(0.77)	(0.77)
Diff. Risk-free rate	0.0124	0.0088	0.0115	0.0075
	(0.50)	(0.44)	(0.46)	(0.37)
Diff. Market return	-0.0033	-0.0033**	-0.0034	-0.0035**
	(-1.27)	(-2.00)	(-1.29)	(-2.09)
Constant	1.7396***	1.7868***	1.9196***	1.9476***
	(3.58)	(3.01)	(3.78)	(3.05)
Year dummies	YES	YES	YES	YES
Industry dummies	YES	YES	YES	YES
Observations	522	522	522	522
Adj. R-squared	0.358	0.361	0.350	0.352

This table presents the results of the following regression:

$$Premium_{i,t} = \alpha_0 + \beta Info\_Asy_{it} + \gamma Info\_Asy_{it} * CSR_{it} + \alpha_1 CSR_{it} + \sum_j \phi_j Control_{j,it} + \varepsilon_{it},$$

where the dependent variable is the AH-share premium calculated in the 20- (Panel A) and 40-day (Panel B) window around the CSR reporting date, respectively. *Info\_Asy* are our proxies for information asymmetry, including the price impact measure *PI* and the adverse-selection component of bid-ask spread *AS component*. *CSR* is a dummy variable that equals 1 if the firm makes CSR disclosure and 0 otherwise. Year and industry fixed effect are included. Standard errors are clustered at firm level. We control for variables that are shown by prior studies to affect A-share premium. The total market capitalization of outstanding A- and H-shares, *Market Cap. A+H share*, is used for an addition proxy for information asymmetry, as information costs are typically lower for large firms. We include the relative turnover ratio between A- and H-share markets (*Diff. Turnover*) to difference in trading activity and speculative trading between A- and H-share markets. We also include percentage of H-shares to control for relative size of H-share market. Finally, we control for the relative volatility, risk-free rate and market return between A- and H-share market, which are used as proxies for different risk exposure of A- and H-share investors. t-statistics in parentheses. \*\*\*, \*\*, and \* indicates significance level of 1%, 5% and 10%, respectively.

Table 6 Information Asymmetry, CSR Reporting Quality and A- to H-share Premiums

VARIABLES	(1)	(2)	(3)	(4)
	Baseline	<u>PI</u>	<u>AS component</u>	
	Baseline	Baseline	Baseline	Baseline
PI	0.0405*** (3.21)	0.2943*** (3.25)		
PI*CSR reporting quality		-0.0657*** (-2.95)		
AS component			0.0423*** (2.71)	0.3859*** (3.30)
AS component*CSR reporting quality				-0.0893*** (-2.96)
CSR reporting quality	-0.1431*** (-2.86)	0.2290 (1.27)	-0.1555*** (-3.09)	0.5435 (0.47)
Market Cap. A+H share	-0.0754*** (-4.61)	-0.1246*** (-4.56)	-0.0774*** (-4.60)	-0.1311*** (-4.39)
Diff. Turnover	0.0129 (1.46)	0.0178* (1.98)	0.0120 (1.35)	0.0168* (1.84)
% H-shares	1.6534*** (4.37)	1.6183*** (3.71)	1.3701*** (4.03)	1.3149*** (3.24)
Diff. Volatility	0.1650** (2.07)	0.1716** (2.44)	0.1780** (2.22)	0.1815** (2.51)
Diff. Risk-free rate	0.0739 (1.20)	0.0419 (1.00)	0.0757 (1.23)	0.0389 (0.97)
Diff. Market return	-0.0085 (-0.81)	-0.0097* (-1.84)	-0.0075 (-0.71)	-0.0091* (-1.82)
Constant	1.1767 (1.36)	1.3945** (2.03)	1.1599 (1.30)	0.3417 (0.43)
Year dummies	YES	YES	YES	YES
Industry dummies	YES	YES	YES	YES
Observations	339	339	339	339
Adj. R-squared	0.474	0.648	0.469	0.647

This table presents the results of the following regression:

$$\begin{aligned}
 Premium_{i,t} = & \alpha_0 + \beta Info\_Asy_{it} + \gamma Info\_Asy_{it} * CSR\ Reporting\ Quality_{it} \\
 & + \alpha_1 CSR\ Reporting\ Quality_{it} + \sum_j \phi_j Control_{j,it} + \varepsilon_{it}
 \end{aligned}$$

where the dependent variable is the annual average AH-share premium. *Info\_Asy* are our proxies for information asymmetry, including the price impact measure *PI* and the adverse-selection component of bid-ask spread *AS component*. *CSR Reporting Quality* is based on a quality score provided by RKS CSR ratings, which is a professional third-party CSR rating agency in China. RKS CSR ratings measure the quality of CSR reports along four dimensions: macrocosm, content, technique and industry, and are widely used in the literature. Year and industry fixed effect are included. Standard errors are clustered at firm level. We control for variables that are shown by prior studies to affect A-share premium. The total market capitalization of outstanding A- and H-shares, *Market Cap. A+H share*, is used for an addition proxy for information asymmetry, as information costs are typically lower for large firms. We include the relative turnover ratio between A- and H-share markets (*Diff. Turnover*) to difference in trading activity and speculative trading between A- and H-share markets. We also include percentage of H-shares to control for relative size of H-share market. Finally, we control for the relative volatility, risk-free rate and market return between A- and

H-share market, which are used as proxies for different risk exposure of A- and H-share investors. t-statistics in parentheses. \*\*\*, \*\*, and \* indicates significance level of 1%, 5% and 10%, respectively.



Table 7 Endogeneity Examination for CSR Reporting Quality

VARIABLES	(1)	(2)	(3)	(4)
	<u>PI</u> CSR reporting quality	Premium	<u>AS component</u> CSR reporting quality	Premium
PI	-0.6748*** (-22.11)	1.1371** (2.47)		
PI*CSR reporting quality	0.1666*** (22.40)	-0.2748** (-2.41)		
AS component			-0.2671*** (-11.00)	0.2774* (1.82)
AS component*CSR reporting quality			0.0682*** (14.32)	-0.0638* (-1.65)
Mean industry CSR Reporting Quality	0.3025*** (2.67)		0.3792*** (2.64)	
CSR Reporting Quality		1.4394 (1.52)		0.8801 (0.53)
Market Cap. A+H share	0.0762*** (5.53)	0.2302*** (-3.73)	0.1250*** (7.39)	0.2464*** (-3.19)
Diff. Turnover	-0.0022 (-0.39)	0.0186* (1.88)	-0.0061 (-0.85)	0.0222** (2.17)
% H-shares	-0.0121 (-0.05)	1.5206*** (3.43)	1.0277*** (3.54)	0.3522 (0.48)
Diff. Volatility	0.0913* (1.80)	0.0464 (0.42)	0.1308** (2.03)	0.0682 (0.57)
Diff. Risk-free rate	0.0399 (1.06)	-0.0010 (-0.01)	0.0777 (1.63)	-0.0316 (-0.41)
Diff. Market return	-0.0042 (-0.65)	-0.0042 (-0.36)	-0.0059 (-0.72)	-0.0045 (-0.38)
Constant	0.5143 (0.78)	0.4391 (0.35)	-1.8356** (-2.22)	3.3710*** (4.45)
Year dummies	YES	YES	YES	YES
Industry dummies	YES	YES	YES	YES
Observations	339	339	339	339
Adj. R-squared	0.834	0.371	0.734	0.360
Tests of endogeneity				
Durbin Score, <i>p</i> -value	0.0127		0.0193	
Wu-Hausman, <i>p</i> -value	0.0176		0.0259	
Test of Weak Instrument				
F-stat (Prob >F)	7.1413 (0.0080)		6.9737 (0.0087)	

This table presents the results for the endogeneity examination for *CSR reporting quality* using two-stage least squares regression. *CSR Reporting Quality* is based on a quality score provided by RKS CSR ratings, which is a professional third-party CSR rating agency in China. RKS CSR ratings measure the quality of CSR reports along four dimensions: macrocosm, content, technique and industry, and are widely used in the literature. The instrument for the quality of CSR disclosure is the *mean industry CSR reporting quality*. The null hypothesis that CSR reporting quality is

exogenous is rejected at the 5% level. F-statistics suggest that Mean industry CSR reporting quality is a strong IV for CSR reporting quality.

In stage one, we regress the quality of CSR reports on our measures of information asymmetry, the interaction term between information asymmetry measure and CSR reporting quality and other control variables. In stage two, we regress annual AH-share premium on the predicted quality of CSR reports and other variables. Proxies for information asymmetry include the price impact measure *PI* and the adverse-selection component of bid-ask spread *AS component*. The total market capitalization of outstanding A- and H-shares, *Market Cap. A+H share*, is used for an addition proxy for information asymmetry, as information costs are typically lower for large firms. We include the relative turnover ratio between A- and H-share markets (*Diff. Turnover*) to difference in trading activity and speculative trading between A- and H-share markets. We also include percentage of H-shares to control for relative size of H-share market. Finally, we control for the relative volatility, risk-free rate and market return between A- and H-share market, which are used as proxies for different risk exposure of A- and H-share investors. Year and industry fixed effect are included. Standard errors are clustered at firm level. t-statistics in parentheses. \*\*\*, \*\*, and \* indicates significance level of 1%, 5% and 10%, respectively.