Short Selling and Financial Reporting Quality: Evidence from Chinese AH shares

Abstract

This paper investigates whether short sale's monitoring on firms' financial reporting quality is conditional on the regulatory quality of the markets and the strength of internal control at firm level. Using data of Chinese cross-listing AH-shares over the period of 2010 to 2015, we find that short sale plays a monitoring role in restricting accrual earnings management in A-share markets but not in the H-share market. This difference is explained by the inferiority of the regulatory quality of A-share markets compared to that of the H-share market, and is accentuated when the cross-listing AH-share firms have weak internal control. Taken together, the results indicate that short sellers impose strong monitoring on reporting quality when they perceive a great likelihood of managerial expropriation in a weak legal environment, or in firms with weak internal control.

Keywords:

1. Introduction

Market participants' influence on managerial decisions is an important issue attracting increasing research attention. An emerging stream of research finds that short selling interest on stock markets constricts firms' accrual earnings management (Fang, 2016; Massa, Zhang, and Zhang, 2015), uncovers misconduct of firms (Hirshleifer, Teoh, and Yu, 2011; Karpoff and Lou, 2010), and contains firms' real earnings management activities (Jiang, Qin and Bai, 2017). We extend this stream of research by investigating whether short sale's monitoring function on financial reporting quality, as reported by prior literature, is conditional on market-level regulatory quality and firm-level internal control. Our empirical investigation is conducted with Chinese cross-listing AH-shares, because those firms and their short sellers face a different regulatory environment on A-share markets, as opposed to the H-share market, which enables meaningful comparisons.

Chinese listed firms issue class A shares to domestic investors, but a limited number of A-share listed firms also issue B shares to foreign investors[1] or H shares to Hong Kong investors. Class A and B shares are traded on Shanghai or Shenzhen stock exchanges, whereas H shares are traded on the Hong Kong Stock Exchange, subject to the Hong Kong listing rules. This phenomenon is called dual listing or cross listing for AH firms.[2] In this paper, we focus on the firms with AH shares trading in both mainland China and Hong Kong. Historically, AH-share firms were requested to prepare two sets of financial statements: one set prepared under Chinese GAAP[3] for domestic investors, and the other prepared for investors on the H-share market according to the Hong Kong GAAP (HKFRS hereafter): that is, they are IFRS-based (Liu and Liu, 2007). Although the Hong Kong Stock Exchange agrees to accept the annual reports prepared by AH-share firms using the mainland 2007 version of GAAP (ASBE hereafter), to reduce costs associated with preparing two sets of financial statements and to improve market efficiency since 2010 (HKEX, 2010), the majority of AH-share firms have continued since to report two sets of financial statements. Studies demonstrate significant disparities in earnings, revenues and total assets reported on the financial statements, due to the differences between HKFRS and mainland ASBE, to accounting practices, and to discretions applied by managers (Ding and Su, 2008). This raises an important research question of whether there is a discrepancy in accounting information quality, as proxied by discretionary accruals, under the two sets of financial statements.

Meanwhile, the shares traded on A-share markets have a larger price premium compared to their H-share counterparts, despite being issued by the same firm. The share price disparity between the A- and H-share markets is one of the most intriguing puzzles in the Mainland and Hong Kong financial markets (Chung, Hui, and Li, 2013; Kim, Kim, Park, and Min, 2015). Chung et al. (2013) reveal that the price disparity is due to the investors' perception of firm's asset volatility and, hence, to different valuations of the same firm resulting from different levels of information asymmetry between the two markets. Since low earnings quality accentuates information asymmetry (Bhattacharya, Desai, and Venkataraman, 2013), we posit

[1] B-shares are issued to attract foreign capital. The first B-share was issued in 1992. Firms can choose to list their B-shares on either of Shanghai or Shenzheng Stock Exchanges, but not both. B-shares could be bought with foreign currency only and traded among foreign investors before March 2001. B-shares were traded in either U.S. dollars (in the SHSE) or H.K. dollars (in the SZSE). From March 2001, Chinese citizens were allowed to trade B-shares with legal foreign currency accounts.

[2] Dual listings are mainly AB (AB-shares) and AH (AH-shares). There are also a few AS (A + Singapore shares) and AN (A + NASDAQ shares) dual listing firms.

[3] The Chinese GAAP experienced significant revisions in recent years, with the latest phase of internationalization in China's accounting standards that was completed in 2006. The new standards, named as Accounting Standards for Business Enterprises (ASBE), take effect on January 1, 2007 (Ding and Su, 2008).

that the discrepancy in AH-shares' earnings quality may provide a potential explanation for the differential information environment and, therefore, price disparity of cross listing AH-share firms.

Short sales were restricted in the mainland until 31 March 2010, when a pilot scheme allowing short selling and margin trading in China A-share markets was launched for 90 designated stocks to improve information efficiency. In contrast, Hong Kong lifted restrictions on short sales after January 1994, and has been identifying eligible stocks every year through a selection mechanism ever since. Although the literature finds strong corroborative evidence of short sellers' governance function in disciplining managers' opportunistic reporting (e.g., Massa et al., 2015), it is unclear whether the effect of short sellers' monitoring varies with the strength of firms' internal and external governance. To investigate whether the effect of short selling is conditional on the strength of market-level institutions, AH-shares offer the perfect setting, because an AH-share with the same fundamentals trades in two different markets where the strength of institutions is polarized, in that the H-share market has a much stronger institutional environment than the A-share, according to several international organizations' surveys and independent studies.[4]

Using a sample of AH-shares over the period of 2010 to 2015, we find a significant difference in the magnitude of discretionary accruals estimated using financial statements prepared under mainland ASBE and HKFRS. Importantly, the results reveal that short sale plays a monitoring role in restricting earnings management in A-share markets but not in the H-share market. Furthermore, the restricting effect of short sale on earnings management found in A-markets is driven by the inferiority of the regulatory quality of A-share markets compared to that of the H-share market, and is accentuated when the cross-listing AH-share firms have weak internal control. Taken together, the results indicate that the external monitoring imposed by short sellers on managerial opportunistic reporting is salient, when short sellers perceive a great likelihood of managerial expropriation in a weak legal environment, or in firms with weak internal control.

The paper adds to the short sell literature, as well as having regulatory implications. First, the results pinpoint that the monitoring role of short sellers is conditional on their evaluation of the legal environment in which financial reports are prepared, and on the strength of firms' internal control. Therefore, the findings suggest that the discipline that short sellers

[4] Examples include the Worldwide Governance Indicators by Kaufmann, Kraay and Mastruzzi (2015), the worldwide governance index by World Economic Forum (2012), and the anti-self-dealing index and legal protection developed by Djankov, La Porta, Lopez-de-Silanes and Shleifer (2008).

impose on firms complements market-level and firm-level governance. A recent study by Khurana, Ni and Shi (2017) demonstrates that the role of Big 4 auditors in global primary markets in reducing IPO under-pricing is significant only in countries where investors are protected less. Our investigation is similar to that of Khurana et al. (2017) in spirit, but with a focus on short selling interest. Meanwhile, our findings highlight the benefits of lifting the short sale restriction in mainland China, from the perspective of financial reporting: that is, the findings suggest that when formal market- and firm-level governance mechanisms are deficient, short sale constricts managers' opportunistic reporting as an important complementary market mechanism.

The rest of the paper proceeds as follows. Section 2 provides an overview of related literature followed by a testable hypothesis. Section 3 describes the research design and sample selection procedures. Section 4 provides the main test results. Section 5 concludes with the implications and limitations of the study.

2. Literature Survey and Institutional Background of AH-shares

Short sale is a transaction in which short sellers borrow securities to sell in anticipation of a price decline, and will return an equal number of the borrowed shares in the future. Consequently, short seller make profit if the security goes down in price as anticipated. Although illegal and abusive short-selling practices, such as bear raids and rumour-mongering to drive a stock price low, are highly risky to the stability of financial markets and, thereby, have been banned in some countries, recent literature also finds strong evidence that short selling provides liquidity to the markets, and prevents stocks from being bid up to ridiculously high levels on hype and over-optimism. Specifically, studies document that short selling eases overpricing (Berkman, Cole, and Fu, 2009; Boehmer and Wu, 2013; Chang, Cheng, and Yu, 2007), improves liquidity (Boehmer, Jones, and Zhang, 2013), and speeds up information incorporation into prices (Bris, Goetzmann, and Zhu, 2007; Chen and Rhee, 2010; Saffi and Sigurdsson, 2011). Thus, short sale contributes to market informational efficiency, and restrictions on short sales are found to reduce the efficiency of stock markets (e.g., Jones and Lamont, 2002). Literature reaches general consensus that short sellers represent an informed subset of investors (Aitken, Frino, McCorry, and Swan, 1998; Boehmer, Jones, and Zhang, 2008; Dechow, Hutton, Meulbroek, and Sloan, 2001; Diether, Lee, and Werner, 2009; Engelberg, Reed, and Ringgenberg, 2012).

Ban on short sale in China was recently lifted. Articles 48 to 56 in the "Rules on Supervision over Securities Companies", released upon approval of the executive meeting of

the State Council on April 23, 2008, specified securities companies' margin trading and securities lending, and provided a legal basis for establishing the margin trading and securities lending system. Then, a pilot scheme for the short selling and margin trading in the China A-share markets was launched on 31 March 2010 for 90 designated stocks. According to the China Securities Regulatory Commission (CSRC), the main purpose of sanctioning short selling and margin trading in the Shanghai and Shenzhen stock exchanges is to improve information efficiency, allowing investors to form proper stock prices and to generate trading liquidity. Since then, the list of eligible stocks has been revised several times. By May 2015, there were around 900 securities eligible to be sold short or bought on margin in the Shanghai and Shenzhen stock exchanges.[5] Using daily data on Chinese stocks' short selling and margin trading activities, Chen, Kadapakkam, and Yang (2016) find that short selling (margin buying) escalates during the 5 days immediately before significant negative (positive) information events, suggesting that short sellers (margin buyers) anticipate forthcoming news. Using the adverse selection component of the bid-ask spread as a proxy, they report an improved information environment as a result of short selling and margin trading in mainland China.

Hong Kong has a much longer history of short selling in that the pilot scheme of short selling was introduced by the HKSE in January 1994. Nowadays, the list of stocks eligible for short selling is revised quarterly based on liquidity and market capitalization criteria. To be eligible for short selling on the HKSE, a stock must be a constituent stock of an index, or have underlying options or futures, or maintain high liquidity (a market capitalization of not less than HK$3 billion and an aggregate turnover during the preceding 12 months of 50 per cent of the capitalization), or satisfy other conditions. The essential difference of short selling rules between China A-share and Hong Kong H-share markets is the mechanism for generating the list of securities eligible for short selling (Chen, Tourani-Rad, and Yi, 2016). Several studies explore the adverse effects of short selling constraints in the HKSE (Bai and Qin, 2014; Bai and Qin, 2015; Chang et al., 2007; Chen and Rhee, 2010). Chang et al. (2007) find that short-sales constraints in Hong Kong tend to cause stock overvaluation, and that the overvaluation effect is more dramatic for individual stocks for which a wide dispersion of investor opinions exist. This is consistent with Miller's (1977) overpricing theory. Chen and Rhee (2010) examine the asymmetric speed of price adjustment to new information between shortable and non-shortable stocks. They find short sales contribute to market efficiency by increasing the

[5] Detailed information on the short selling and margin trading regulations in China please refer to Bryan et al. (2010), Sharif et al. (2014) and the China Securities Regulatory Commission report available at: http://www.csrc.gov.cn/pub/csrc_en/newsfacts/release/200812/t20081229_69251.html

speed of price adjustment not only to private/public firm-specific information, but also to market-wide information. Bai and Qin (2015) find that the short sales restriction in HKSE affects market efficiency adversely, in that non-shortable stocks due to the restriction are overpriced before negative earnings announcements and, thus, investors tend to over-react to negative earnings news on the earnings announcement day.

Short sale is understudied in the context of cross-listing with the exception of Chen, Tourani-Rad, and Yi (2016). Chen, Tourani-Rad, and Yi (2016) examine the price discovery of cross-listed Chinese firms having A-shares that are allowed to be sold short or bought on margin on the Shanghai Stock Exchange (SSE) and the Shenzhen Stock Exchange (SZSE), and also shortable and buyable on margin on the Stock Exchange of Hong Kong (SEHK). They find that for a group of Chinese cross listing firms that are not shortable or eligible for margin trading, the home (A-share) market contributes more to the price discovery process over time. However, they observe no significant difference in the contribution of either A- or H-share markets to price discovery for the group of cross listing firms that are eligible for short selling or margin trading. Their findings imply that the removal of short selling constraints appears to improve the contribution of the respective markets to the process of price discovery in the case of the larger cross listing firms. Collectively, evidence from the mainland, Hong Kong and the cross listing AH firms suggests an information dissimilating role for short sellers, as sophisticated investors.

A- and H-share markets are segmented. Chong and Su (2006) investigate the co-movement between the A and H shares of cross-listed Chinese firms, and find that only a small portion of the cross listing Chinese firms experienced co-movement in their A and H share prices. In addition, AH shares have phenomenal price disparity in that A-, B- and H-shares coexist in one firm and are entitled to exactly the same rights and obligations, but are traded at significantly different prices (e.g., Zhang and Zhao, 2003). Zhang and Zhao (2003) examine the reasons, and find that the valuation differential between A-shares and H-shares is more related to firm-specific risk and market risk premium differentials between two markets. From an information asymmetry perspective, Chung, Hui and Li (2013) find that the price disparity between A- and H-shares is due to the investors' perception of firm's asset volatility and, hence, to different valuations of the same firm resulting from different levels of information asymmetry on the two markets.

Before 2010, Chinese AH shares must prepare financial statements using both China GAAP for the China Securities Regulatory Commission (CSRC) and HKFRS for investors on the Hong Kong stock exchange. A-share investors who receive accounting information

prepared under the Chinese GAAP are often audited by mostly local CPA firms, whereas financial statements prepared under the HKFRS are audited primarily by the Big international accounting firms. Therefore, Liu and Liu (2007) find that, although accounting information is value-relevant in all the A-, B-, and H-share markets, the accounting information in the B- (under IFRS) and H-share (under HKFRS) markets is more value-relevant than that of the A-share market (under Chinese GAAP), indicating greater information quality prepared for Hong Kong and foreign investors in the H- and B-markets.

This difference in accounting standards has reduced substantially after 2007, when Chinese publicly-listed companies were mandated to follow Accounting Standards for Business Enterprises (ASBE) on and from January 1, 2007. Despite being a major convergence towards the International Financial Reporting Standards (IFRS), ASBE waived many clauses of the IFRS. For instance, ASBE's disapproval of applying fair value to long-term assets has had a substantial impact on Chinese firms' annual reports (Peng, Tondkar, van der Laan Smith, and Harless, 2008). Other major differences remain between the HKFRS and the Chinese ASBE include reversal of impairment on depreciable assets, asset revaluation, non-financial long-term asset investments and fair value application, and methods concerning business combinations (Ding and Su, 2008). In addition, although a veneer of uniformity in standards may be achieved, real differences in financial reporting quality can still arise from divergent accounting practices (Ball, 2006). Ball, Robin, and Wu (2003) find that, although firms in East Asian countries adopt accounting standards of common law origin, their disclosure quality is not necessarily better than that of firms in code law countries. They conclude that the institutional environments of such countries diminish firms' incentive to issue financial reports of high quality. Collectively, evidence suggests that standards *per se* do not necessarily determine accounting information quality, but the incentive presented by an operational environment, and the strength of corporate governance, play essential roles.

3. The Development of Hypotheses

As sophisticated investors making arbitrage gains from short selling, short sellers search actively for unfavourable information on the stocks they follow. Using their in-depth knowledge of the stocks, short sellers conduct analyses on the firms' operations, prospects and financial standing and, as a result, short sellers often uncover aggressive financial reporting (Desai, Krishnamurthy, and Venkataraman, 2006; Karpoff and Lou, 2010). Therefore, managers' potential costs of earnings management increase with an increase in short selling activities (Fang, 2016). The presence of short selling potential, restricts the extent of accrual

manipulation (Fang, 2016; Massa et al., 2015), uncovers misconduct of firms (Hirshleifer et al., 2011; Karpoff and Lou, 2010), and curbs real earnings management (Jiang et al., 2017).

Compared to Hong Kong, mainland China has a less developed legal and enforcement system. According to the Worldwide Governance Indicators (WGI) created by the World Bank database[6], mainland China has a much lower index for all indicators than does Hong Kong, where H shares trade. A shares are exposed to high country-level risk, because mainland China, as a transitional economy, has partially reformed institutions, poorly-defined property rights, and inadequate legal protection of investor rights (Zhang and Zhao, 2003). In contrast, Hong Kong has a well-established and more transparent stock market compared to that of China (Zhang and Zhao, 2003).

In addition, to investigate the reason for the price disparity between A- and H-shares, Chung, Hui and Li (2013) find that the price disparity is due to investors' perception of firms' asset volatility and, hence, different valuations of the same firm resulting from different levels of information asymmetry on the two markets.[7] Specifically, Chung et al. (2013) state that the trading of an A-share at a premium over its corresponding H-share is explained by the higher level of asset volatility anticipated by mainland investors. Following this line of reasoning, short sellers on A-share markets may have higher levels of anticipation of asset volatility than those on H-share markets and, thus, may be more vigilant about firms' reporting quality. Furthermore, in a weak institutional environment with lower levels of shareholder protection and law enforcement, short sellers are presented with more arbitrage gain, which drives them to be watchful investigators of corporate misreporting. In line with this reasoning, we argue that short sellers on the market play alternative governance roles in supervising managers' financial reporting, and the monitoring effect of short sellers should be more salient for A shares than H shares due to the higher level of information asymmetry and potentially larger arbitrage gain for short sellers on A-share markets than on the H-share market. The testable hypothesis is formatted as follows.

[6] The Worldwide Governance Indicators (WGI) are retrieved from www.govindicators.org

[7] Other explanations for why a price disparity exists between onshore and offshore financial markets can be classified into six hypotheses including (1) onshore and offshore investors requesting different risk premiums; (2) different investment demands of onshore and offshore investors who face different investment opportunities; (3) differences in liquidity conditions between the Mainland and Hong Kong financial markets; (4) disparity in the severity of information asymmetry faced by onshore and offshore investors; (5) differences in aggregate market conditions between the Mainland and Hong Kong; (6) the strong macroeconomic conditions on mainland China (see detailed literature in Chung, Hui and Li, 2013).

H1: The negative effect of short sale on accrual earnings management is stronger on A-share markets than it is on the H-share market.

To provide an explanation of why short sellers are more sensitive and, thus, impose a stronger monitoring effect on financial reporting quality in A-share markets than in H-share markets, we delve our investigation into internal and external governance mechanisms. External and internal governance mechanisms of firms shape managers' financial reporting decisions and information quality fundamentally (Bushman, Piotroski, and Smith, 2004; Bushman and Smith, 2001). Literature suggests the substitutive role of firm-level governance mechanisms in the absence of shareholder protection at country-level. Chen, Chen and Wei (2009) find a significantly negative effect of firm-level corporate governance on the cost of equity capital in emerging markets, and this negative effect is more pronounced in countries with relatively weak legal protection. Thus, in emerging markets, firm-level corporate governance and country-level shareholder protection seem to substitute for each other in reducing the cost of equity. Boubakri, Cosset, and Guedhami (2005)'s international study of firms' post-privatization performance also finds that the positive effect of ownership concentration on firm performance is concentrated in countries with weak investor protection, suggesting the substitutive role of the monitoring imposed by alternative governance mechanisms in the absence of shareholder legal protection at country-level. More directly, when shareholder protection and the legal environment are weak at macro-level, market participants and other stakeholders play active roles in assessing firms' information quality and, thus, should play a strong role in restricting managers' opportunistic reporting behaviours. Khurana et al. (2017) analyse the monitoring role of the Big 4 in an international context, and find that Big 4s reduce the likelihood of IPO stock under-pricing only in countries with weak institutions, because Big 4 auditors tend to provide a higher level of audit quality to compensate for institutional constraints. Following this line of argument, we would observe a more pronounced negative effect of short selling on earnings management in A-share markets, because of their weaker regulatory environment than that of the H-share market. We state hypothesis 2 as follows.

H2: The stronger constraining effect imposed by short sellers on earnings management in A-share markets when compared with the H-share market, is driven by the relatively inferior regulatory quality of A-share markets.

Short sellers' monitoring function on financial reporting quality found in A-share markets may be conditional on the strength of firms' internal governance. We focus on internal control and argue that short sellers in A-share markets are likely to be more sensitive to earnings quality in firms with weak internal control for several reasons. First, weak internal control is often a manifestation of feeble corporate governance, an incapable management team and low audit quality (e.g., Ashbaugh-Skaife, Collins, and Kinney Jr, 2007; Krishnan and Visvanathan, 2007). Thus, firms with weak internal control are prone to corporate failure. Second, the most common internal control weaknesses are related to the misapplication of accounting rules and inadequate accounting documentation, policies and procedures, as well as material year-end adjustments, or accounting personnel errors (Scarborough and Taylor, 2007). As a result, weak internal controls often facilitate opportunistic behaviours and reduce financial reporting quality, as evidenced by the increase in earnings restatements (Li and Wang, 2006), low quality accruals (e.g., Ashbaugh-Skaife, Collins, Kinney, and LaFond, 2008; Doyle, Ge, and McVay, 2007) and less conservative financial reporting (Goh and Li, 2011). Lastly, firms with weak internal controls are more likely to resort to opportunistic reporting to conceal distressed financial situations and impending bankruptcy (Jiang, Rupley, and Wu, 2010).

Short sellers should be observers of firms' internal control, because prior research finds profound market responses to internal control weakness. As a comprehensive literature review on internal control studies using US data, Schneider, Gramling, Hermanson, and Ye (2009) report that disclosing non-material internal control weakness reduces market uncertainty (Kim and Park, 2009), whereas firms with material internal control weakness show a divergence of investor opinion with regard to firm valuation and a high probability of future stock price crash risk due to information asymmetry (Lobo, Wang, and Yi, 2017). Ji, Lu and Qu (2015) find that internal control weaknesses voluntarily disclosed by a group of Chinese listed firms, significantly reduce the earnings response coefficients (ERCs). Therefore, we conjecture that short sellers' monitoring of reporting quality is likely to be accentuated in firms with internal control weakness, because of the potential risks of impaired reporting quality in firms with weak internal control.

H3: Short sale's constraining effect on earnings management is stronger in firms with weak internal control.

4. Methodology

4.1 Sample and variables

Our sample consists of 86 Chinese AH-shares and a total of 284 (289)[8] firm-year observations from A-share (H-share) markets. The daily information on short selling, in number of shares, is collected from the websites of the two Chinese stock exchanges, the SSE and SZSE, over the sample period.) Financial data is extracted from the China Stock Market and Accounting Research (CSMAR) database.

We measure earnings management as discretionary accruals estimated using the performance-matched Jones model following Kothari, Leone, and Wasley (2005). Discretionary accruals are the difference between the actual accruals and the normal level of accruals. The modified Jones model is estimated for each industry and year by every country, based on a one-digit SIC, which means that country-wide- and industry-year-specific changes in economic conditions that affect total accruals are controlled for. To run this regression, we also require at least eight observations in one industry-year for that country. Kothari et al. (2005)'s model is as follows:

$$\frac{TA_t}{A_{t-1}} = \alpha_1 \frac{1}{A_{t-1}} + \alpha_2 \frac{\Delta S_t - \Delta AR_t}{A_{t-1}} + \alpha_3 \frac{PPE_t}{A_{t-1}} + \alpha_4 ROA_{t-1} + \varepsilon_t \ldots\ldots\ldots\ldots \quad \textbf{(1)}$$

where TA_t is the total accruals calculated as *(ΔCA-ΔCash) – (ΔCL-ΔSTD-ΔTP)-DEP.*[9] ΔCA is the change in current assets; ΔCash is the change in cash and cash equivalents; ΔCL is the change in current liability; ΔSTD is the change in short term debt included in current liabilities; ΔTP is the change in income tax payable; DEP is depreciation and amortization expense. A_{t-1} is total assets at the end of period t-1 (i.e. lagged assets). S_t is the sales/ turnover/operating revenue during period t. ΔS_t is the change in sales/ turnover/operating revenue in year t. $\Delta S_t = S_t - S_{t-1}$. ΔAR_t is the change in accounts receivable in year t from the preceding year. PPE_t is the gross property, plant and equipment in year t. ROA is the return on assets in the last year. The coefficient estimates from above equation are then used to calculate the firm-specific non-discretionary accruals. The discretionary accruals (DA) is the residual from the Equation (1) estimation. We use the absolute value of discretionary accruals for regression analysis as short sellers should be concerned about both positive and negative

[8] There are more observations in the H-share market than in the A-share markets, because two AH-share stocks (601800 and 601633) had no data for short selling activities in 2013-2015 in the mainland and one AH-share stock (564) lacked the financials needed to calculate the independent variable in the H-share market in 2015.

[9] We do not compute accruals from the cash flow statement directly, because the data are not available in the cash flows of all the countries in the sample. Instead, accruals are calculated in this way following Diamond and Verrecchia (1987).

abnormal accruals, because either can distort earnings. We estimate Equation (1) using financial statements prepared on A-share markets and the H-share market, respectively, because two sets of financial statements are prepared for AH-shares. As a result, the same firm has two different values of discretionary accruals – one is estimated using financial statements prepared under Chinese ASBE for A-share markets and the other is based on financial statements prepared under HKFRS for the H-share market.

To measure the strength of institution, we use the Worldwide Governance Indicators (WGI) developed by the World Bank. WGI is a research dataset[10] summarizing views on the quality of governance provided by a large number of enterprise, citizen and expert survey respondents in industrial and developing countries. These data are gathered from a number of survey institutes, think tanks, non-governmental organizations, international organizations, and private sector firms. The indices are provided for each country (including independent economic regions) and year. Specifically, we focus on the Regulatory Quality of WGI, which reflects perceptions of the ability of the government to formulate and implement sound policies and regulations that permit and promote private sector development. Thus, it has direct bearing on corporate operations and investor protection.

We extract scores of Regulatory Quality for mainland China, where A shares trade, and Hong Kong, where H shares trade. The mainland has a consistently higher score than Hong Kong, so the difference of Regulatory Quality between the mainland and Hong Kong is negative each year, showing the weak regulatory quality in the mainland. Then, the yearly differences of Regulatory Quality between both mainland China and Hong Kong are used to compute the median difference in the scores between the two markets. If a particular sample year's difference in Regulatory Quality between the mainland and Hong Kong is lower than the median difference, we assign a value of one to the DIFF_Market, and zero otherwise. In this way, we can gauge the severity of regulatory inferiority in A-share markets compared to that in the H-share market on a yearly basis.

To measure internal control weakness, we use an internal control index developed by the Shenzhen Dibo Internal Control Database. The index evaluates the company's overall internal control efficiency at the aggregate level, rather than its internal control of financial reporting only. The index is a construction of firm-specific internal control strength scores in each year in relation to five aspects of internal control, including internal control strategies,

[10] Worldwide Governance Indicators (WGI) published by the World Bank cover five aspects of market-level governance indicators, including the Control of Corruption, Rule of Law, Regulatory Quality, Government Effectiveness, Political Stability and Voice and Accountability.

operation efficiency, reporting quality, legal compliance, and asset safety. The Dibo internal control dataset is widely used in research on internal controls in Chinese listed firms (e.g., Jiang and Zhang, 2017; Shu, Wang, Zhao, and Zheng, 2015).[11] By construct, the greater the score, the stronger a firm's internal control. For easy exposition, the scores are multiplied by -1 so that the higher the value is, the weaker the internal control.

4.2 Research design

To test H1 proposing the differential effect of short sale on discretionary accruals between A-share and H-share markets, we regress short sell on discretionary accruals in A-share and H-share markets respectively using Equation (2).

$$DA = \beta_0 + \beta_1 SS + \beta_2 LAG_DA + \beta_3 SIZE + \beta_4 ROA + \beta_5 GROWTH + \beta_6 LEV + \varepsilon \text{.....}(2)$$

Where, *DA* is absolute value of discretionary accruals estimated using Equation (1). Firm and time subscripts are omitted in the equation. *SS* is the ratio of the number of shares short sold each day to daily trading volume. Then, the average ratio is calculated for year t. *LAG_DA* is the lagged discretionary accrual estimated using Equation (1); firm size (*SIZE*) is a natural logarithm of the market capitalization. Profitability (*ROA*) is calculated as the net profit after tax deflated by total assets; and *GROWTH* is measured as the market to book ratio. Lastly, we control for leverage (*LEV*) that is calculated as total liability divided by total assets. If the negative effect of short sale on accrual earnings management is stronger on A-share markets than it on the H-share market as predicted in H1, we should observe a stronger negative coefficient on short selling activities (*SS*) in A-share markets than in the H-share market. For all regression estimations, we control for industry and year fixed effect. We also cluster the standard errors by firms in order to control for potential heteroskedasticity and autocorrelation problems and to provide robust standard error estimation with reliable t-statistics (Gow, Ormazabal, and Taylor, 2010; Petersen, 2009).

[11] An alternative internal control measure is constructed by Chen et al. (2016), but it only covers the period between 2007 and 2010. In addition, the *Internal Control Application Guidelines*, *the Internal Control Evaluation Guidelines* and *the Internal Control Audit Guidelines are issued in* April 2010 instructs listed firm's self-evaluation on their internal control effectiveness and the responsibilities required of auditors. However, because of the voluntary natures of these guidelines, many listed firms had not disclosed any information on internal control weakness (Ji, Lu and Qu, 2015). Thus, we are not certain whether those firms did not follow the rules to conduct self-evaluation of the internal control, or simply did not have any internal control weakness.

To test H2, we estimate Equation (3) and Equation (4) is estimated to test H3. Both Equations are estimated for A-share and H-share sample observations respectively. If H2 (H3) is supported, we would observe a significantly more negative coefficient on the interactive term SS×DIFF_MARKET (*SS*×*IC*) in A-share markets than in the H-share market.

$$DA = \beta_0 + \beta_1 SS + \beta_2 DIFF_MARKET + \beta_3 SS \times DIFF_MARKET + LAG_DA + \beta_3 SIZE + \beta_4 ROA + \beta_5 GROWTH + \beta_6 LEV + \varepsilon \quad (3)$$

$$DA = \beta_0 + \beta_1 SS + \beta_2 ICW + \beta_3 SS \times ICW + LAG_DA + \beta_3 SIZE + \beta_4 ROA + \beta_5 GROWTH + \beta_6 LEV + \varepsilon \quad (4)$$

where *DIFF_MARKET* is a dummy variable taking value of 1 if the difference between the mainland and Hong Kong's Regulatory Quality scores in a specific year is greater than the median difference between two markets over sample years, suggesting a severely weaker regulatory environment in A-share markets than in the H-share market in that year. The value of this dummy variable is 0 when the difference in a specific year is below the median, suggesting a less weak regulatory quality in A-share markets than in the H-share market. *ICW* stands for internal control weakness, measured as a dummy variable taking value of 1 if the firm's internal control weakness score is lower than the sample median, and 0 otherwise. Internal control weakness is the Dibo internal control strength score multiplied by -1. As the result, the dummy variable, ICW measures the severity of internal control weakness in a firm.

4.3 Data description

The descriptive statistics in Table 1 are reported for A- and H-share markets respectively. Panel A shows that the mean of discretionary accruals (DA) in the H-share market is -0.64, but is 3.10 in A-share markets, suggesting much greater discretionary accruals in the financial reports disclosed by the AH-share firms on A-share markets where they prepare financial statements according to Chinese ASBE, compared with discretionary accruals estimated using HKFRS-based financial statements. This finding is important as it points out the disparity between the levels of discretionary accruals of AH-shares in their preparation of two sets of financial statements under different accounting standards. We note that our study does not intend to identify the underlying reason for this phenomenon, but merely uncovers the difference.

Profitability (ROA) in A-share markets appears to be much greater, with a value of 6.05 compared with that in the H-share market, with a mean of 3.91. In addition, short selling activities, measured as the ratio of shares short sold to trading volume, are much less in A-share markets (0.01) when compared to those in the H-share market (0.09), which is consistent with the longer short selling history and less restrictive short selling regulation in Hong Kong. These differences are evident in the results of the mean comparisons in Panel B of Table 1.

[Table 1 about here]

Table 2 reports the correlation matrix. Discretionary accruals (DA) are correlated with both leverage (LEV) and profitability (ROA) positively on the H-share market, but these correlations do not hold on A-share markets where discretionary accruals (DA) are correlated positively with firm size (SIZE). Therefore, the discretionary accruals have distinctive characteristics in two markets. Short sale (SS) shows no significant correlations with discretionary accruals (DA) in either the H- or A-share markets, so further regression analysis is necessary to uncover possible association. In addition, Hong Kong short sellers seem to follow smaller firms, because short selling interest (SS) shows a significantly negative correlation with firm size (SIZE). Lastly, profitability (ROA) and firm size (SIZE) are also positively correlated with raw Dibo internal control strength on both markets, suggesting profitable and large firms tend to implement better internal control.

[Table 2 about here]

5. Empirical results

To test the effect of short sale on discretionary accruals as predicted in H1, we regress discretionary accruals on short selling interest and other control variables using A-share and H-share observations respectively, and then compare the coefficients on short selling interest. The regression results reported in Table 3 show that short sale (SS) is associated with discretionary accruals negatively for A-shares but not for H-shares (coefficient - 0.9867, t statistic -2.75 for A-share $p < 0.01$, but coefficient -0.0004, t statistic -0.36 for H-share). The Chow test also supports that the independent variable, SS, has a more restrictive effect on discretionary accruals for A-share than H-share subsamples. Among control variables, lagged discretionary accruals (LAG_DA) are associated negatively with contemporaneous discretionary accruals in accordance with earnings management literature. In addition,

profitability (ROA) shows only a marginal association with discretionary accruals for A-shares. Although the comparatively small number of AH listings restricts the sample size, the general fitness of the model is satisfactory, providing validity for our models.

[Table 3 about here]

To test H2 and H3, we employ Equations (3) and (4), and report the results in Table 4. Equation (3) is estimated to test H2. The first three columns show a moderating effect of the difference in regulatory quality at market-level between the A-share and H-share markets (*DIFF_MARKET)* on the association between short sale (*SS*) and discretionary accruals (*DA*) (coefficient on *SS*DIFF_MARKET* -0.3615 and -0.0027, t stat -1.91 and – 1.70 for H-share and A-share respectively, $p < 0.10$). In addition, the Chow test shows that the negative coefficient on *SS*DIFF_MARKET* in A-share markets is stronger than it is in the H-share market. (The difference in coefficients is -0.3588, F stat of Chow test 3.64, $p < 0.1$). Therefore, the results suggest that weaker regulatory quality in A-share markets compared to that in the H-share market (*DIFF_MARKET*) explains profoundly the constraining effect of short selling interest on managers' earnings management activities in A-share markets. In addition, after controlling for the effect of difference in regulatory quality in Equation (3), the effect of short sale (SS) on discretionary accruals for A-shares is mitigated, although it is still negative (coefficient - 0.6887, t stat – 1.76, $p < 0.01$) and SS also has a greater restricting effect on discretionary accruals than it has in H-shares (F stat of Chow test 3.09). Thus, the results support H2 showing short sellers impose stronger monitoring to reduce discretionary accruals at A-share markets because of their weaker market-level institutions compared with those of H-shares.

[Table 4 about here]

H3 proposes internal control weakness as an explanation for short sellers' monitoring of earnings quality. We test H3 using Equation (4) and report the results in Table 4. Our variable of interest is the interactive term, SS*ICW, which shows a marginally significant and negative coefficient for A-shares (coefficient -1.2427, t stat – 1.70, $p < 0.10$), while it is insignificant for H-shares, resulting statistically different coefficients between two markets (The difference in coefficients is -1.2492, F stat of Chow test is 2.93, $p < 0.10$). As predicted in H3, short sale's constraining effect on earnings management is stronger in firms with weak

internal control than in firms with strong internal control. The results support this prediction only in A-share markets, but not in the H-share market. In addition, after controlling for internal control weakness (ICW) in Equation (4), the effect of short sale (SS) is no longer significant (coefficient 0.0256 and 0.0007, t stat 0.04 and 0.17 for A-share and H-share markets respectively), suggesting that the restricting effect of short sale we observed in Table 3 is explained away when internal control weakness is taken into account. Collectively, the evidence shows that the restricting effect of short sale on earnings management is found only in A-markets, and this is explained by the weaker regulatory quality in A-share markets than in Hong Kong. The monitoring of short sellers is also accentuated in A-share markets when the cross-listing AH-share firms have weak internal control.

We also conduct two sensitivity tests. Firstly, among our sample there are some firms that have decided to file one set of financial statements with the CSRC and the HKSE in very recent years, mainly in 2014 and 2015, based on the HKSE's recent acceptance of AH share annual reports prepared under Chinese ASBE. After deleting about fewer than 30 per cent of sample observations from firms that have adopted one set of financial statements, we re-run all regressions. The un-tabulated results show that the main results presented in Table 3 on H1 testing are stronger, and the results of H2 and H3 testing still hold. In addition, to capture the difference in institutional strength between the two markets, we replace the index of Regulatory Quality with the index of Rule of Law, also published as WGI. The results conform to our main results on H2 testing.

6. Conclusion

This study examines whether the effect of short sale on managerial opportunistic reporting is stronger in A-share markets than in H-share markets, and whether this monitoring effect of short sale is conditional on the strength of institutions where the shares are traded and the strength of internal control at firm level. Using a sample of Chinese cross-listing AH-shares, we reveal that short sale's restricting function on accrual earnings management is stronger in A-share markets than in the H-share market, that is driven by the inferior regulatory quality of A-share markets to that of the H-share market. In addition, the results show a stronger short sellers' monitoring effect in an environment where shareholder rights are less likely to be protected in firms with weak internal control. Thus, the findings indicate a supplementary role of market mechanisms, proxied by short selling interest, in disciplining managers' reporting behaviour in the presence of inadequate external market-level governance and internal control weakness.

The findings have important policy implications for security regulators worldwide in their decision making regarding short selling restrictions. In countries where regulatory quality is inferior, short sellers together with other market participants, such as institutional shareholders and financial analysts, may become an important additional mechanism to discipline managerial behaviour.

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Table 1 Descriptive Statistics

Panel A: Descriptive statistics by market

A-shares (number of observations: 284)							
Variable	Mean	Std Dev	Min.	Q1	Median	Q3	Max.
Raw_DA	3.10	18.90	-32.99	-3.92	-0.12	3.24	50.25
SS	0.01	0.03	0.00	0.00	0.00	0.02	0.31
SIZE	19.98	1.94	17.13	18.46	19.54	21.40	23.89
ROA	6.05	6.19	-8.52	2.48	4.35	9.44	19.26
GROWTH	1.91	0.94	0.71	1.21	1.66	2.29	4.09
LEV	0.13	0.13	0.00	0.02	0.10	0.21	0.41
Regulatory Quality	-0.26	0.03	-0.1	-0.27	-0.26	-0.24	-0.21
Raw Dibo	742.07	132.78	279.58	670.04	755.83	816.15	985.60
H-shares (number of observations: 289)							
Variable	Mean	Std Dev	Min.	Q1	Median	Q3	Max.
Raw_DA	-0.64	6.82	-17.36	-3.49	0.01	2.80	13.28
SS	0.09	0.06	0.01	0.04	0.07	0.12	0.23
SIZE	19.50	1.82	17.14	18.17	18.90	20.66	23.35
ROA	3.91	3.27	-0.72	1.49	2.74	5.68	11.78
GROWTH	1.94	0.97	0.79	1.21	1.67	2.29	4.26
LEV	0.13	0.13	0.00	0.02	0.10	0.21	0.41
Regulatory Quality	1.90	0.04	1.80	1.89	1.92	1.93	1.94

Panel B: Mean comparison

Variable	Difference in Means	t statistics
DA	3.74	2.86***
SS	-0.08	-5.53***
SIZE	0.48	3.04***
ROA	2.15	5.11***
GROWTH	-0.03	-0.33
LEV	0.00	0.00
Regulatory Quality	-2.16	-521.66***

Variable definitions:

DA is the discretionary accruals calculated with Kothari et al. (2005)'s model. *SS* is short selling interest, measured as the average ratio of the number of shares short sold each day to daily trading volume. *SIZE* is firm size, measured as the natural logarithm of the market capitalization. *ROA* is profitability, calculated as the net profit after tax deflated by total assets. *GROWTH* is measured as the market to book ratio. *LEV* is leverage, calculated as total liability divided by total assets. Regulatory quality statistics are based on the yearly raw scores of the Regulatory Quality index as a part of the Worldwide Governance Indicators (WGI) developed by the World Bank. Raw_Dibo is the original Dibo internal control strength score.

Table-2: Correlation Matrix

Panel A- H-shares

Variable	Raw_DA	SS	SIZE	ROA	GROWTH	LEV	Regulatory Quality	Raw_Dibo
Raw_DA	1							
SS	0.064	1						
SIZE	-0.288	-0.269***	1					
ROA	0.174***	0.117*	-0.424***	1				
GROWTH	-0.103	0.09	-0.400***	0.411***	1			
LEV	0.161**	0.08	-0.296***	-0.02	-0.07	1		
Regulatory Quality	-0.107	-0.198	0.073	0.127	0.165	-0.086	1	
Raw_Dibo	0.002	-0.048	0.165***	0.268***	-0.011	-0.020	0.229***	1

Panel B: A-shares

Variable	Raw_DA	SS	SIZE	ROA	GROWTH	LEV	Regulatory Quality	ICW
Raw_DA	1							
SS	-0.013	1.000						
SIZE	0.296***	-0.030	1.000					
ROA	-0.093	-0.029	-0.206***	1.000				
GROWTH	-0.117*	0.028	-0.384***	0.300***	1.000			
LEV	-0.111*	-0.055	-0.277***	-0.004	-0.045	1.000		
Regulatory Quality	0.058	0.051	0.007	-0.101*	-0.006	0.0790	1.000	
Raw_Dibo	-0.034	-0.085	0.145**	0.280***	-0.005	-0.122**	-0.114*	1.000

Note: ***, **, and * represent statistical significance at the 1%, 5% and 10% levels respectively (two-tailed test). The correlation for A-share (H-share) markets is based on a sample of 289 (284) firm-year observations. All variables are defined in Table 1.

Table-3: Regression of short sale on discretionary accruals in A-share and H-share markets

$$DA = \beta_0 + \beta_1 SS + \beta_2 LAG_DA + \beta_3 SIZE + \beta_4 ROA + \beta_5 GROWTH + \beta_6 LEV + \varepsilon \ldots\ldots\ldots\ldots\ldots (2)$$

D.V.= DA Variable	A-share Coefficient (t stat)	H-share Coefficient (t stat)	Chow Test
Intercept	20.3494	0.8435	19.5060
	(0.64)	(4.86)***	(0.38)
SS	-0.9867	-0.0004	-0.9863
	(-2.75)***	(-0.36)	(7.55)***
LAG_DA	-0.1467	-0.1606	0.0139
	(-2.45)**	(-2.03)**	(0.04)
SIZE	-0.6684	-0.0008	-0.6676
	(-0.38)	(-0.10)	(0.14)
ROA	0.4447	0.0012	0.4435
	(1.76)*	(0.77)	(3.08)*
GROWTH	0.1373	0.0001	0.1372
	(0.14)	(0.01)	(0.02)
LEV	0.1361	-0.0315	0.1676
	(0.02)	(-1.02)	(0.00)
Year Effects	Yes	Yes	
Industry Effects	Yes	Yes	
# of observations	284	289	
Adjusted R-squared	10.67%	13.28%	
F-value	1.77**	2.08***	

Note: ***, **, and * represent statistical significance at the 1%, 5% and 10% levels respectively (two-tailed test).
The table shows the results of the regression of absolute value of discretionary accruals (DA) on short sale (SS) and a set of control variables.
All variables are defined in Table 1.

Table-4: Regression of discretionary accruals of A-shares after controlling for the market index level of governance

$$DA = \beta_0 + \beta_1 SS + \beta_2 DIFF_Market + \beta_3 SS \times DIFF_Market + LAG_DA + \beta_3 SIZE + \beta_4 ROA + \beta_5 GROWTH + \beta_6 LEV + \varepsilon \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (3)$$

$$DA = \beta_0 + \beta_1 SS + \beta_2 ICW + \beta_3 SS \times ICW + LAG_DA + \beta_3 SIZE + \beta_4 ROA + \beta_5 GROWTH + \beta_6 LEV + \varepsilon \ldots\ldots\ldots\ldots\ldots\ldots (4)$$

D.V. = DA Variable	Eq. (3) A-shares Coefficient (t stat)	Eq. (3) H-shares Coefficient (t stat)	Chow Test (F stat)	Eq. (4) A-shares Coefficient (t stat)	Eq. (4) H-shares Coefficient (t stat)	Chow Test (F stat)
Intercept	17.5764	0.9388	16.6376	17.2648	0.9183	16.3465
	(0.18)	(5.69) ***	(0.44)	(0.55)	(5.17)***	(0.28)
SS	-0.6887	0.0061	-0.6947	0.0256	0.0007	0.0249
	(-1.76) *	(1.23)	(3.09) *	(0.04)	(0.17)	(0.00)
DIFF_MARKET	-2.0215	-0.0156	-2.0059			
	(-0.05)	(-1.03)	(0.00)			
SS*DIFF_MARKET	-0.3615	-0.0027	-0.3588			
	(-1.91) *	(-1.70) *	(3.64)*			
ICW				0.0039	-0.00002	0.0039
				(0.62)	(-0.42)	(0.39)
SS*ICW				-1.2427	0.0065	-1.2492
				(-1.70)*	(1.44)	(2.93) *
LAG_DA	-0.1425	-0.1607	0.0182	-0.1563	-0.1312	-0.0251
	(-2.39) **	(-2.12) **	(0.03)	(-2.62)***	(-1.68)*	(0.04)
SIZE	-0.7278	-0.0065	-0.7213	-0.7171	-0.0057	-0.7115
	(-0.41)	(-0.88)	(0.17)	(-0.40)	(-0.76)	(0.16)
ROA	0.4522	0.0012	0.4510	0.3706	0.0015	0.3691
	(1.78) *	(0.74)	(3.16) *	(1.55)	(1.06)	(2.39)
GROWTH	-0.0459	-0.0004	-0.0455	0.4054	-0.0008	0.4062
	(-0.05)	(-0.08)	(0.00)	(0.44)	(-0.14)	(0.19)
LEV	0.0034	-0.0389	0.0423	0.2584	-0.0638	0.3223
	(0.00)	(-1.27)	(0.00)	(0.04)	(-2.62)***	(0.00)
Year Effects	Yes	Yes		Yes	Yes	
Industry Effects	Yes	Yes		Yes	Yes	
# of observations	284	289		284	289	
Adjusted R-squared	10.51%	14.11%		11.11%	10.19%	
F-value (Fitness of Model)	1.74**	2.12***		1.75**	1.74***	

Note: ***, **, and * represent statistical significance at the 1%, 5% and 10% levels respectively (two-tailed test). The table shows the results of the regression of absolute discretionary accruals (DA) on short sale (SS), the severity of A-share markets' regulatory quality being inferior to that of the H-share market (DIFF_MARKET), their interaction as well as other control variables. DIFF_MARKET is dummy variable taking value of 1 if the difference between mainland and Hong Kong's Regulatory Quality scores in a specific year is greater than the median difference between two markets over sample years, suggesting a severely weaker

regulatory environment of A-share markets than H-share market in that year. The value of this dummy variable is 0 when the difference in a specific year is below the median, suggesting a less weak regulatory quality in A-share markets than in the H-share market. *ICW* stands for internal control weakness, measured as a dummy variable taking the value of 1 if the firm's internal control weakness score is lower than the sample median, and 0 otherwise. Internal control weakness is the original Dibo internal control strength score multiplied by -1. As the result, the dummy variable, *ICW* measures the severity of internal control weakness in a firm.
All variables are defined in Table 1.