

# Foreign institutional investors and stock price synchronicity of Chinese listed firms: further evidence

Tina T. He<sup>1</sup> · Wilson X. B. Li<sup>1</sup> · Gordon Y. N. Tang<sup>2</sup>

Received: 21 August 2018 / Revised: 21 October 2018 / Accepted: 22 October 2018 /

Published online: 2 November 2018

© Eurasia Business and Economics Society 2018

## Abstract

This paper extends a recent study (He et al., *J Bus Policy Res* 11(2):23–44, 2016) and reexamines the information role of foreign institutional investors in the China A-share market. The benchmark result in this study confirms the findings in He et al. (2016) that there is a positive association between the participation of foreign institutional investors via qualified foreign institutional investors (QFII) scheme and stock price synchronicity in the China A-share market. This implies that foreign institutional investors lose the informative advantage in the China A-share environment. The result is robust when we control for the nonlinearity of ownership concentration, exclude financial firms and firms with negative net income in two most recent fiscal years, correct for self-selection bias, and use alternative measure of stock price informativeness. Further analyses find a negative interaction between dividend payments and QFII participation and between Ernst & Young (EY), Deloitte & Touche, KPMG and PricewaterhouseCoopers (PwC) auditors and QFII participation. The results indicate that dividends and big four auditors are more likely to play the role of assisting QFIIs to improve their information position in the China A-share environment where the legal and regulatory protection of investors is poor.

**Keywords** Foreign institutional investors · Stock price synchronicity · QFII · Price information

The authors would like to thank the insightful comments from the reviewer and the editor. All errors remain ours.

✉ Gordon Y. N. Tang  
gyntang@hkbu.edu.hk

Tina T. He  
heting@uic.edu.hk

Wilson X. B. Li  
wilsonli@uic.edu.hk

<sup>1</sup> Division of Business and Management, BNU-HKBU, United International College, Zhuhai, Guangdong, China

<sup>2</sup> Department of Finance and Decision Sciences, Hong Kong Baptist University, Kowloon, Hong Kong

## 1 Introduction

Along with the globalization, foreign institutional investors have substantially increased their presence in the emerging markets including China. The corporate governance role of foreign institutional investors has attracted various research interests (e.g. Dahlquist and Robertsson 2001; Kim and Park 2012; Chen et al. 2015). A strand of literature examines the relationship between foreign institutional investors and stock price synchronicity (e.g., Wurgler 2000; Fernandes and Ferreira 2008). Higher (lower) price synchronicity indicates less (more) firm-specific information incorporated into stock prices, which implies a less (more) efficient information environment. However, the empirical evidence is inconclusive in the literature. Some studies document a positive relation (e.g., Jiang and Kim's (2004) study of the Japanese stock market) while others point to the opposite direction (e.g., Fernandes and Ferreira (2008) study on international cross-listing).

Foreign institutional investors participate in the Chinese A-share market through the program of Qualified Foreign Institutional Investors (QFII). He et al. (2016) document a positive relationship between the participation of foreign institutional investors and stock price synchronicity in the Chinese A-share market. This paper extends He et al. (2016) with further analyses and hopes to enhance the understanding on the information environment in the China stock market in the literature (e.g., Liu and Xu 2017).

This study conducts various robust tests with alternative measure of price informativeness and the analysis before and after the introduction of QFII scheme, but still finds a positive relationship between the foreign institutional investors and stock price informativeness. Then further analyses examine the possible moderating effect of four factors, including dividends yield, state ownership, Ernst & Young (EY), Deloitte & Touche, KPMG and PricewaterhouseCoopers (PwC) auditors and turnover/activeness of trading, on the positive relationship. The results suggest that among the four potential factors, dividends and big four auditors are more likely to play the roles of assisting QFIIs to improve their information position in the China A-share environment where the legal and regulatory protection of investors is poor.

The rest of the paper proceeds as follows: Sect. 2 describes the data and methodologies; Sect. 3 reports the regression results and robustness checks; Sect. 4 examines the possible moderating factors; and Sect. 5 concludes the paper.

## 2 Data and methodologies

The initial sample includes all firms listed on the Chinese stock market for the years 2003 through 2008. Excluding firms with missing data of variables, the final sample contains a total of 7566 firm-year observations.

Stock price synchronicity for firm  $i$  in fiscal year  $t$  is defined as,

$$Synchronicity = \log \left( \frac{R_{it}^2}{1 - R_{it}^2} \right),$$

where, for firm  $i$  in year  $t$ ,  $R^2$  is the coefficient of determination from the estimation of the following market model:

$$RETURN_{it} = \alpha_i + \beta_{1i}Market_t + \beta_{2i}World_t + \varepsilon_{it},$$

where *RETURN* is the weekly return of firm  $i$  traded on either the Shanghai or Shenzhen exchange; *Market* is the value-weighted MSCI China A Index; *World* is the value-weighted MSCI World Index. The return data are retrieved respectively from the CSMAR and Datastream database.

As the time-series dependence or the firm effect and the cross-sectional dependence or the time effect in panel data might produce biased standard errors when estimated by standard techniques, we follow the methodologies adopted by Petersen (2009) and He et al. (2016) to include the time dummies and estimate standard errors clustered at the firm level in running the following regression (with time and firm subscripts omitted).

$$Synch = \beta_0 + \beta_1 QFII + \beta_2 Bshare + \beta_3 Crosslist + \beta_4 Size + \beta_5 Lev + \beta_6 B/M + \beta_7 ROE + \beta_8 Ownership + (IndustryDummies) + (YearDummies) + \varepsilon.$$

All firm level data are obtained from the CSMAR database supplemented with information hand-collected from the sources including firms' annual reports and company websites. Appendix 1 shows the definitions of all variables.

China stock market is characterized by two segmented markets: A shares traded by domestic investors and B shares traded by foreign investors. Foreign investors can also trade the Chinese stocks which are cross-listed on overseas stock exchanges (e.g., H shares in Hong Kong or N shares in New York). In addition to the B-share and H/N-share markets, foreign institutional investors can further participate in the domestic A-share market through the program of Qualified Foreign Institutional Investors (QFII). Appendix 2 shows the four groups of firms in terms of foreign shareholdings and the corresponding legal systems and regulatory requirements.

### 3 Empirical results

Based on the legal bonding hypothesis on cross-listing (Coffee 2002) that stringent regulatory requirements (e.g., a high level of transparency and disclosure) would facilitate market informativeness (Bushman and Smith 2001), we expect  $\beta_3$  (coefficient for *Crosslist*) and  $\beta_2$  (coefficient for *Bshare*) to be negative. Column 1 of Table 1 shows the regression results. Both  $\beta_2$  and  $\beta_3$  are significantly negative at the 1% level, which is consistent with our hypothesis. Moreover, results show that  $\beta_3$  (− 0.344) is smaller than  $\beta_2$  (− 0.170) and the difference is significant at the 1% level, suggesting that foreign ownership is associated with the lowest stock price synchronicity in the environment with common law legal systems and with the stringent regulatory requirements, and the environment of legal system has greater negative impact. Table 1 also shows that  $\beta_1$  is significantly positive, indicating the presence of foreign institutional investors' ownership through the scheme of QFII does not improve (reduce instead) the stock price informativeness.

**Table 1** Regression results and robustness checks of stock price synchronicity

	(1) Basic Model	(2) Including <i>Ownership</i> <sup>2</sup>	(3) Excluding ST stocks	(4) Excluding financials	(5) Excluding outliers
<i>QFII</i>	0.074 (2.56) <sup>b</sup>	0.073 (2.54) <sup>b</sup>	0.078 (2.67) <sup>a</sup>	0.073 (2.50) <sup>b</sup>	0.072 (2.39) <sup>b</sup>
<i>Bshare</i>	-0.17 (-5.07) <sup>a</sup>	-0.169 (-5.03) <sup>a</sup>	-0.192 (-5.22) <sup>a</sup>	-0.172 (-5.12) <sup>a</sup>	-0.18 (-5.08) <sup>a</sup>
<i>Crosslist</i>	-0.344 (-5.53) <sup>a</sup>	-0.35 (-5.61) <sup>a</sup>	-0.338 (-5.07) <sup>a</sup>	-0.346 (-5.47) <sup>a</sup>	-0.299 (-4.87) <sup>a</sup>
<i>Difference in</i> $\beta_2, \beta_3 (\beta_3 - \beta_2)$	-0.174 (-7.02) <sup>a</sup>	-0.181 (-5.03) <sup>a</sup>	-0.146 (-6.72) <sup>a</sup>	-0.174 (-7.03) <sup>a</sup>	-0.119 (-6.21) <sup>a</sup>
<i>Size</i>	0.151 (13.93) <sup>a</sup>	0.154 (13.90) <sup>a</sup>	0.143 (12.36) <sup>a</sup>	0.155 (13.62) <sup>a</sup>	0.153 (12.72) <sup>a</sup>
<i>Lev</i>	-0.763 (-14.70) <sup>a</sup>	-0.766 (-14.72) <sup>a</sup>	-0.753 (-13.10) <sup>a</sup>	-0.767 (-14.78) <sup>a</sup>	-0.725 (-12.73) <sup>a</sup>
<i>B/M</i>	0.725 (11.07) <sup>a</sup>	0.721 (10.94) <sup>a</sup>	0.791 (11.87) <sup>a</sup>	0.726 (11.02) <sup>a</sup>	0.794 (11.53) <sup>a</sup>
<i>ROE</i>	0.002 (0.45)	0.002 (0.45)	0.002 (0.72)	0.002 (0.44)	0.096 (1.83) <sup>c</sup>
<i>Ownership</i>	-0.176 (-2.94) <sup>a</sup>	0.164 (0.60)	-0.235 (-3.82) <sup>a</sup>	-0.187 (-3.08) <sup>a</sup>	-0.138 (-2.22) <sup>b</sup>
<i>Ownership</i> <sup>2</sup>		-0.409 -1.27			
Constant	-4.176 (-19.91) <sup>a</sup>	-4.275 (-18.96) <sup>a</sup>	-3.989 (-17.64) <sup>a</sup>	-4.241 (-19.42) <sup>a</sup>	-4.264 (-18.46) <sup>a</sup>
Industry dummies	Yes	Yes	Yes	Yes	Yes

**Table 1** (continued)

	(1) Basic Model	(2) Including <i>Ownership</i> <sup>2</sup>	(3) Excluding ST stocks	(4) Excluding financials	(5) Excluding outliers
Year dummies	Yes	Yes	Yes	Yes	Yes
<i>N</i>	7566	7566	6885	7503	7076
Adj. <i>R</i> <sup>2</sup>	36.88%	36.89%	37.47%	36.91%	36.93%

$$\text{Synch} = \beta_0 + \beta_1 QFII + \beta_2 Bshare + \beta_3 Crosslist + \beta_4 Size + \beta_5 Lev + \beta_6 B/M + \beta_7 ROE + \beta_8 Ownership + (IndustryDummies) + (YearDummies) + \varepsilon$$

Numbers in parentheses represent *t*-statistics that are adjusted using standard errors corrected for clustering at the firm level. The superscripts a, b and c indicate statistical significance at the 1%, 5% and 10% levels respectively. All variables are as defined in Appendix 1

We then perform some robustness checks. First, the existing literature documents that there is a nonlinear relation between ownership concentration and firm value or earnings informativeness (e.g. Fan and Wang 2002; Bai et al. 2004). To alleviate the concern of potential nonlinearity of ownership concentration on the results, we include *Ownership*<sup>2</sup> in the regression and the result is shown in Column 2 of Table 1. Second, we exclude a special group of stocks, the “ST stocks”, from the sample and re-run the analysis. In the Chinese A-share market, when the net income of a listed firm is negative in two most recent fiscal years or when a listed firm makes a loss for two consecutive years, the stock of the firm will be prefixed by “ST”—the acronym for “Special Treatment”. The daily price change of these “ST stocks” is restricted within 5% rather than 10% for non-ST stocks, which might bias the level of stock price. Result is shown in Column 3. Third, we exclude financial firms from the sample to see if the benchmark result is influenced by the possible heterogeneity from financial firms. Column 4 shows the regression result. Fourth, to avoid drawing spurious inferences from extreme values, we winsorize the observations at the bottom and top 1% of all the variables and Column 5 presents the result. In all four cases of robust check, the coefficients for *QFII*, *Bshare* and *Crosslist* are qualitatively similar to those in the basic model. Results in Table 1 are in full support of those results reported by He et al. (2016). In fact, results are the same as theirs reported in Tables 3 and 4.

To extend He et al. (2016) study, we adopt the Heckman two stage method to address the concern that the results may be spurious due to endogeneity problem or the existence of latent factor determining foreign shareholding and synchronicity (simultaneity). In the first stage, we estimate a probit model in which the likelihood of QFII participation, B-shares and cross-listings are respectively regressed on a set of firm-specific variables to compute the inverse Mills ratio. In the second stage, we include the inverse Mills ratios as an additional control variable. In the probit model, we include the following variables based on the principle of parsimony: *size*, *Leverage*, *Book-to-market* ratio, *Return* and *Profit* as the literature suggest that larger firms with lower leverage and book-to-market ratio and firms with good performance such as higher stock return and positive net income are more likely to be cross-listed or held by foreign investors (e.g. Dahlquist and Robertsson 2001; Ferreira and Matos 2008). Table 2 presents the results from the Heckman two stage procedures. The coefficients of the inverse Mills ratio in the three regressions are significant, suggesting the presence of endogeneity regarding QFII participation, B-shares, and cross-listings. However, the coefficients for *QFII*, *Bshare* and *Crosslist* are qualitatively similar as in the benchmark regression, indicating that the results are robust to endogeneity concerns.

Although stock price synchronicity is a widely used measure of price informativeness, it may distort the estimated regression result due to some limitations as documented in the literature (e.g. De Cesari and Huang-Meier 2015; Fresard 2012). We use the illiquidity ratio (*Illiq*) of Amihud (2002) as an alternative measure of price informativeness and estimate the following model:

$$\begin{aligned} Illiq = & \beta_0 + \beta_1 QFII + \beta_2 Bshare + \beta_3 Crosslist + \beta_4 Size + \beta_5 Lev + \beta_6 B/M \\ & + \beta_7 ROE + \beta_8 Ownership + (IndustryDummies) + (YearDummies) + \varepsilon, \end{aligned}$$

**Table 2** Self-selection bias estimates of stock price synchronicity on participation of foreign institutional investors, regulatory requirements and legal systems

	(1)		(2)		(3)	
	Probit	Heckman	Probit	Heckman	Probit	Heckman
Constant	8.561 (428.06) <sup>a</sup>	– 3.050 (– 13.79) <sup>a</sup>	3.820 (86.20) <sup>a</sup>	5.619 (4.06) <sup>a</sup>	14.508 (508.13) <sup>a</sup>	– 3.874 (– 19.53) <sup>a</sup>
<i>QFII</i>		0.078 (2.69) <sup>a</sup>				
<i>Bshare</i>				– 0.143 (– 4.35) <sup>a</sup>		– 0.216 (– 3.78) <sup>a</sup>
<i>Crosslist</i>						0.187 (16.31) <sup>a</sup>
<i>Size</i>	– 0.358 (317.21) <sup>a</sup>	0.251 (14.69) <sup>a</sup>	– 0.088 (19.03) <sup>a</sup>	0.209 (14.99) <sup>a</sup>	– 0.599 (379.82) <sup>a</sup>	– 0.810 (– 15.41) <sup>a</sup>
<i>Lev</i>	0.778 (34.73) <sup>a</sup>	– 0.936 (– 16.36) <sup>a</sup>	– 0.003 (3.25) <sup>c</sup>	– 0.709 (– 13.02) <sup>a</sup>	1.544 (53.36) <sup>a</sup>	0.670 (10.32) <sup>a</sup>
<i>BM</i>	0.777 (55.91) <sup>a</sup>	0.443 (6.03) <sup>a</sup>	– 0.682 (51.82) <sup>a</sup>	1.191 (12.93) <sup>a</sup>	– 0.871 (20.53) <sup>a</sup>	0.001 (0.18)
<i>ROE</i>		– 0.000 (– 0.09)		0.001 (0.17)		– 0.132 (– 2.22) <sup>b</sup>
<i>Ownership</i>		– 0.125 (– 2.09) <sup>b</sup>		– 0.179 (– 3.00) <sup>a</sup>		
<i>Return</i>	– 0.025 (0.68)		– 0.012 (0.10)		– 0.074 (1.56)	
<i>Profit</i>	– 0.409 (10.71) <sup>a</sup>		0.213 (9.01) <sup>a</sup>		0.804 (42.71) <sup>a</sup>	
<i>Inverse Mills Ratio</i>		2.862 (8.43) <sup>a</sup>		11.066 (7.04) <sup>a</sup>		1.011 (7.18) <sup>a</sup>
Industry dummies	Yes	Yes	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes
<i>N</i>		7214		7214		7214
Adj. <i>R</i> <sup>2</sup>		38.28%		38.37%		38.32%

In the first stage, we estimate a probit model in which the likelihood of QFII participation, B-shares and cross-listings are respectively regressed on a set of firm-specific variables to compute the inverse Mills ratio. In the second stage, we include the inverse Mills ratios as an additional control variable. All variables are as defined in Appendix 1. The sample period is from 2003 to 2008. Numbers in parentheses represent Chi square statistics in the probit model and *t*-statistics in the Heckman model that are adjusted using standard errors corrected for clustering at the firm level. The superscripts a, b and c indicate statistical significance at the 1%, 5% and 10% levels respectively

**Table 3** Alternative measure of price informativeness and analysis before and after the introduction of QFII scheme

	Model (1)	Model (2)
Dependent variable	<i>Illiq</i>	<i>SynchDif</i>
<i>QFII</i>	− 0.001 (− 1.77) <sup>c</sup>	0.403 (1.51)
<i>Bshare</i>	0.006 (2.02) <sup>b</sup>	
<i>Crosslist</i>	0.005 (3.5) <sup>a</sup>	
<i>Size</i>	− 0.003 (− 6.45) <sup>a</sup>	0.299 (6.99) <sup>a</sup>
<i>Lev</i>	0.008 (3.82) <sup>a</sup>	0.009 (0.05)
<i>B/M</i>	− 0.002 (− 0.43)	− 1.192 (− 4.56) <sup>a</sup>
<i>ROE</i>	0.000 (1.55)	0.011 (2.62) <sup>a</sup>
<i>Ownership</i>	0.003 (2.31) <sup>b</sup>	− 0.479 (− 2.33) <sup>b</sup>
Constant	0.072 (5.89)	− 5.696 (− 7.06) <sup>a</sup>
Industry dummies	Yes	Yes
Year dummies	Yes	N/A
<i>N</i>	7649	1075
Adj. <i>R</i> <sup>2</sup>	4.26%	8.53%

The regression in Model 1 is specified as follows

$$Illiq = \beta_0 + \beta_1 QFII + \beta_2 Bshare + \beta_3 Crosslist + \beta_4 Size + \beta_5 Lev + \beta_6 B/M + \beta_7 ROE + \beta_8 Ownership + (IndustryDummies) + (YearDummies) + \epsilon$$

where *Illiq* is a proxy for the amount of private information embodied into the prices

The regression in Model 2 is specified as follows

$$SynchDif = \beta_0 + \beta_1 QFII + \beta_4 Size + \beta_5 Lev + \beta_6 B/M + \beta_7 ROE + \beta_8 Ownership + (IndustryDummies) + \epsilon,$$

where *SynchDif* is the difference in the price synchronicity between 2001 and 2003

Numbers in parentheses represent *t*-statistics that are adjusted using standard errors corrected for clustering at the firm level in Model 1 and *t*-statistics based on robust standard errors in Model 2. All variables are as defined in Appendix 1. The superscripts a, b and c indicate statistical significance at the 1%, 5% and 10% levels respectively

where *Illiq* is a proxy for the amount of private information embodied into the prices and is computed as below:

$$Illiq_{i,t} = \frac{1}{D_{i,t}} \sum_{t=1}^{D_{i,t}} \frac{|r_{i,t}|}{VOLD_{i,t}},$$



**Table 4** The role of dividend payout, government ownership, audit quality and trading activity in the relation between QFII participation and stock price synchronicity

	(1)	(2)	(3)	(4)
<i>QFII</i>	0.128 (0.036)a	0.157 (0.052)a	0.103 (0.031)a	0.059 (0.055)
<i>Dividend</i>	4.717 (0.543)a			
<i>QFII*Dividend</i>	− 3.705 (1.168)a			
<i>State</i>		0.031 (0.022)		
<i>QFII*State</i>		− 0.104 (0.063)		
<i>Big4</i>			0.083 (0.047)c	
<i>QFII* Big4</i>			− 0.233 (0.123)c	
<i>Turnover</i>				0.028 (0.006)a
<i>QFII*Turnover</i>				0.011 (0.015)
<i>Size</i>	0.138 (0.012)a	0.156 (0.012)a	0.156 (0.012)a	0.163 (0.012)a
<i>Lev</i>	− 0.738 (0.055)a	− 0.800 (0.055)a	− 0.797 (0.056)a	− 0.827 (0.056)a
<i>B/M</i>	0.740 (0.070)a	0.755 (0.071)a	0.762 (0.071)a	0.762 (0.070)a
<i>ROE</i>	0.001 (0.004)	0.002 (0.004)	0.002 (0.004)	0.002 (0.004)
<i>Ownership</i>	− 0.190 (0.062)a	− 0.164 (0.064)b	− 0.148 (0.064)b	− 0.080 (0.065)
Constant	− 3.956 (0.223)a	− 4.311 (0.226)a	− 4.309 (0.228)a	− 4.529 (0.224)a
Industry dummies	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes
<i>N</i>	6892	6875	6892	6892
Adj. <i>R</i> <sup>2</sup>	37.38%	36.71%	36.72%	36.92%

We estimate the following regression for Group 1 and Group 2 Firms

$$\text{Synch} = \beta_0 + \beta_1 \text{QFII} + \alpha_1 Z + \alpha_2 \text{QFII} \times Z + \beta_2 \text{Lev} + \beta_3 \text{Size} + \beta_4 \text{B/M} + \beta_5 \text{ROE} + \beta_6 \text{Ownership} \\ + (\text{IndustryDummies}) + (\text{YearDummies}) + \varepsilon,$$

Where *Z* is alternatively *Dividend*, *State*, *Big4* and *Turnover*. All variables and grouping of firms are as defined respectively in Appendix 1 and 2. The sample period is from 2003 to 2008. Numbers in parentheses represent *t*-statistics that are adjusted using standard errors corrected for clustering at the firm level. The superscripts a, b and c indicate statistical significance at the 1%, 5% and 10% levels respectively

where  $D_{i,t}$  is the number of valid observation days for firm *i* in year *t*,  $r_{i,t}$  is firm *i*'s daily return and  $VOLD_{i,t}$  is the dollar volume of firm *i* on day *t*. The illiquidity ratio measures the extent to which stock trades causes stock prices to change. The result in Model (1) of Table 3 shows that shareholding by QFIIs is negatively associated with the illiquidity ratio, which indicates QFIIs do not improve the price information in stock transactions, and thus the results with two measures are consistent.

To address another concern that foreign institutional investors make no random pick, we analyze the change in price synchronicity before and after the introduction of QFII scheme in 2002 (Yeo 2003). We first select firms that were listed on the stock exchange in both 2001 and 2003, then calculate the difference in the price synchronicity between 2001 and 2003, and estimate the following regression model:

$$\text{SynchDif} = \beta_0 + \beta_1 \text{QFII} + \beta_4 \text{Size} + \beta_5 \text{Lev} + \beta_6 \text{B/M} + \beta_7 \text{ROE} + \beta_8 \text{Ownership} \\ + (\text{IndustryDummies}) + \varepsilon,$$

where *SynchDif* is the difference in the price synchronicity between 2001 and 2003.

For all firms, the mean synchronicity reduces from (− 0.22) in 2001 to (− 0.81) in 2003. This suggests that in general, the information environment in the China A-share market improves after the policy change or with the introduction of QFII scheme in 2002. In 2003, only 16 firms in our subsample have QFII shareholdings. The result in Model (2) of Table 3 shows no significant difference in the change of price synchronicity between firms with and without QFII shareholdings.

#### 4 Moderating Factors in the Relation between QFII Participation and Synchronicity

As there is a positive association between foreign institutional ownership via QFII scheme and synchronicity ( $\beta_1$  is significantly positive in Table 1) or negatively related to price informativeness ( $\beta_1$  is significantly negative in Model 1 of Table 3) found in the A-share environment, implying these QFIIs lose the informative advantage in this environment (regarded as with poor legal protection), we further examine the possible moderating effect of four factors, including dividends yield, state ownership, big four auditors and turnover/activeness of trading, on the relation between foreign institutional ownership and price synchronicity in the specific China A-share environment.

First, the agency cost theory (Jensen 1986) argues that higher dividends are associated with better investor protection; and the signaling view (Miller and Rock 1985) posits that dividends could be used to convey firm's private information. Therefore, we conjecture that dividends might moderate the relation between QFII participation and stock price synchronicity.

To test whether dividends may influence the relation between QFII participation and stock price synchronicity, we estimate the following regression:

$$\begin{aligned} Synch = & \beta_0 + \beta_1 QFII + \alpha_1 Z + \alpha_2 QFII \times Z + \beta_2 Lev + \beta_3 Size + \beta_4 B/M + \beta_5 ROE \\ & + \beta_6 Ownership + (IndustryDummies) + (YearDummies) + \epsilon, \end{aligned}$$

where  $Z = Dividend$ , defined as dividends per share divided by the closing price of the firm's outstanding shares at the end of the year. Column 1 of Table 4 presents the result. The coefficient for the *Dividend* variable is significantly positive, suggesting that firms with high dividends yield tend to exhibit a higher level of stock price synchronicity. However, the interaction variable ( $QFII \times Dividend$ ) coefficient is significantly negative, which implies that the presence of QFIIs reduce the impact of dividends and relatively lowers the synchronicity (or improve the price informativeness). The results indicate that QFIIs improve stock price informativeness through selecting firms with higher dividends in the China A-share market.

Second, the recent literature documents that although state ownership is associated with poor corporate governance, higher stock volatility and lower stock returns (e.g. Fan et al. 2007), the benefits associated with government ownership may outweigh the costs associated with government ownership for Chinese listed firms (Calomiris et al. 2010), and foreign institutional investors value political connections

higher than domestic investors (Fernald and Rogers 2002). Therefore, we hypothesize that the relationship between QFII participation and stock price synchronicity may be moderated by the ultimate state/government ownership.

To test whether state ownership can influence the relation between QFII participation and stock price synchronicity, we estimate the above regression with  $Z = State$ , which is a dummy variable that equals 1 if a firm is ultimately state controlled and 0 otherwise. Column 2 of Table 4 presents the result. The coefficient for the *State* variable is insignificant and coefficient for the interaction variable ( $QFII \times State$ ) is also insignificant, indicating that state ownership is not likely to moderate the relation between QFII participation and stock price synchronicity.

Third, previous research provides evidences that the involvement of high quality external auditors, proxied by big four auditors, is associated with better disclosure of firms (Shi et al. 2012), which would facilitate reducing information asymmetry between outsider and management, and big four auditors are found to be associated with low stock price synchronicity (Gul et al. 2010). Therefore, as sophisticated investors, it is reasonable to expect QFIIs to use the function of big four auditors in reducing agency conflicts to make up their informative disadvantage. We hypothesize that big four auditors can moderate the relation between QFII participation and stock price synchronicity.

To test whether auditor quality can influence the relation between QFII participation and stock price synchronicity, we estimate the regression with  $Z = Big4$ , which is a dummy variable that equals 1 if a firm has its financial statement audited by one of the big four auditors and 0 otherwise. Column 3 of Table 4 presents the result. Despite the positive (marginally significant) coefficient for the *Big4* variable, the coefficient for the interaction variable ( $QFII \times Big4$ ) is significantly negative, which implies the presence of QFIIs in firms with big four auditors reduces stock price synchronicity. Our results suggest that foreign institutional investors may choose firms with big four auditors to help compensate their information disadvantages in the A-share market through the monitoring role of external auditors.

Fourth, we examine whether the trading activities moderate the relation between QFIIs shareholdings and the price synchronicity, as the existing literature documents that actively traded stocks are associated with higher stock price synchronicity (Fernandes and Ferreira 2008). We use turnover as a measure of trading activity and hypothesize that the relationship between QFIIs ownership and stock price synchronicity may be moderated by turnover. To test whether trading activity can influence the relation between QFII participation and stock price synchronicity, we estimate the regression with  $Z = Turnover$ , defined as the total number of shares traded in a year divided by the total number of shares outstanding at the end of fiscal year. Column 4 of Table 4 presents the result. Although the coefficient for the *Turnover* variable is significantly positive, the coefficient for the interaction variable ( $QFII \times Turnover$ ) is insignificant, suggesting trading activity is not likely to moderate the relation between QFII participation and stock price synchronicity.

In summary, the additional results suggest that among the four potential factors, dividends and big four auditors are more likely to play the roles of assisting QFIIs to improve their information position in the China A-share environment where the legal and regulatory protection of investors is poor.

## 5 Conclusions

The benchmark result in this study confirms the findings in He et al. (2016) that there is a positive association between the participation of foreign institutional investors via QFII scheme and stock price synchronicity in the China A-share market. This implies that foreign institutional investors lose the informative advantage in the China A-share environment where the legal and regulatory protection of investors is poor. The result is robust when we control for the nonlinearity of ownership concentration, exclude financial firms and firms with negative net income in two most recent fiscal years, correct for self-selection bias, use alternative measure of stock price informativeness and conduct comparison before and after the introduction of QFII scheme. We further examine the possible moderating effect of four factors, including dividends yield, state ownership, big four auditors and turnover/activeness of trading, on the positive relation between foreign institutional ownership and price synchronicity. Among the four factors, dividend payments and big four auditors interact significantly negatively with QFII participation. The results indicate that QFIIs improve stock price informativeness through selecting firms with higher dividends and the monitoring role of external auditors help QFIIs to compensate their information disadvantages in the A-share market.

## Appendix 1

### Variable definitions

Variable	Definition
<i>Synch</i>	Stock price synchronicity
<i>SynchDif</i>	Difference in the price synchronicity between 2001 and 2003; computed as (synchronicity in 2003-synchronicity in 2001)
<i>Illiq</i>	Illiquidity ratio; an alternative measure of price informativeness
<i>QFII</i>	A dummy variable which equals 1 if QFIIs hold tradable A-shares of a firm and 0 otherwise
<i>Bshare</i>	A dummy variable which equals 1 if a firm issues A-share and B-shares at the same time and 0 otherwise
<i>Crosslist</i>	A dummy variable which equals 1 if a firm issues A-shares and other shares cross-listed on overseas stock exchanges at the same time and 0 otherwise
<i>Size</i>	Firm size, computed as $\log(\text{total assets})$
<i>Lev</i>	Leverage, computed as $(\text{total liabilities})/(\text{total assets})$ ;
<i>B/M</i>	Book-to-market ratio, computed as $(\text{book assets at the end of fiscal year})/(\text{market value of equity} + \text{book assets} - \text{book value of equity at the end of fiscal year})$
<i>ROE</i>	Return on equity, computed as $(\text{net income})/(\text{book value of equity})$
<i>Ownership</i>	The percentage of shares held by the largest shareholder at year-end
<i>Dividend</i>	Dividend yield = $(\text{dividends per share})/(\text{closing price at year-end})$
<i>State</i>	A dummy variable which equals 1 if a firm is ultimately state controlled and 0 otherwise
<i>Turnover</i>	Turnover rate = $(\text{total no. of shares traded in a year})/(\text{total no. of shares outstanding at the end of fiscal year})$

Variable	Definition
<i>Big4</i>	A dummy variable which equals 1 if a firm is audited by one of the Big Four auditors 0 otherwise
<i>Return</i>	The yearly return on the shares of the firm
<i>Profit</i>	A dummy variable which equals 0 if a firm makes a loss for two consecutive years and 1 otherwise

## Appendix 2

### Definitions of Grouping of firms

Group of firms	Group 1	Group 2	Group 3	Group 4
Trading of Foreign Investors	No	Trading A-shares (QFII)	Trading B-shares	Trading H-shares or shares cross-listed on stock exchanges outside Mainland China
Legal System	Chinese civil law	Chinese civil law	Chinese civil law	Common law in Hong Kong or other developed market
Regulatory Requirements	The least stringent requirements	The least stringent requirements	More stringent requirements	The most stringent requirements

## References

- Amihud, Y. (2002). Illiquidity and stock returns: Cross-section and time-series effects. *Journal of Financial Markets*, 5, 31–56.
- Bai, C. E., Liu, Q., Lu, J., Song, F. M., & Zhang, J. (2004). Corporate governance and market valuation in China. *Journal of Comparative Economics*, 32, 599–616.
- Bushman, R. M., & Smith, A. J. (2001). Financial accounting information and corporate governance. *Journal of Accounting and Economics*, 32, 237–333.
- Calomiris, C. W., Fisman, R., & Wang, Y. (2010). Profiting from government stakes in a command economy: Evidence from Chinese asset sales. *Journal of Financial Economics*, 96, 399–412.
- Chen, Y., Li, L., Wang, H., & Wang, P. (2015). Institutional investors and conservative financial reporting: Evidence from China. *Eurasian Economic Review*, 5, 161–178.
- Coffee, J. (2002). Racing towards the top? *The Impact of Cross-Listings and Stock Market Competition on International Corporate Governance*, *Columbia Law Review*, 102, 1757–1831.
- Dahlquist, M., & Robertsson, G. (2001). Direct foreign ownership, institutional investors, and firm characteristics. *Journal of Financial Economics*, 59, 413–440.
- De Cesari, A., & Huang-Meier, W. (2015). Dividend changes and stock price informativeness. *Journal of Corporate Finance*, 35, 1–17.
- Fan, P. H., & Wang, T. J. (2002). Corporate ownership structure and the informativeness of accounting earnings in East Asia. *Journal of Accounting and Economics*, 33, 401–425.

- Fan, P. H., Wang, T. J., & Zhang, T. (2007). Politically connected CEOs, corporate governance, and post-IPO performance of China's newly partially privatized firms. *Journal of Financial Economics*, 84, 330–357.
- Fernald, J., & Rogers, J. H. (2002). Puzzles in the Chinese stock market. *Review of Economics and Statistics*, 84, 416–432.
- Fernandes, N., & Ferreira, M. (2008). Does international cross-listing improve the information environment? *Journal of Financial Economics*, 88, 216–244.
- Ferreira, M. A., & Matos, P. P. (2008). The color of investors' money: The role of institutional investors around the world. *Journal of Financial Economics*, 88, 499–533.
- Fresard, L. (2012). Cash savings and stock price informativeness. *Review of Finance*, 16, 985–1012.
- Gul, F., Kim, J. B., & Qiu, A. (2010). Ownership concentration, foreign shareholding, audit quality, and stock price synchronicity: Evidence from China. *Journal of Financial Economics*, 95, 425–442.
- He, Tina T., Li, X. B. W., & Tang, G. Y. N. (2016). A study on impact of legal system, regulatory system and foreign investment on stock price synchronicity in China. *Journal of Business and Policy Research*, 11(2), 23–44.
- Jensen, M. C. (1986). Agency cost of free cash flow, corporate finance, and takeovers. *American Economic Review*, 76, 323–329.
- Jiang, L., & Kim, J. B. (2004). Foreign equity ownership and information asymmetry: Evidence from Japan. *Journal of International Financial Management & Accounting*, 15, 185–211.
- Kim, H., & Park, S. Y. (2012). The relation between cash holdings and R&D expenditures according to ownership structure. *Eurasian Business Review*, 2, 25–42.
- Liu, N., & Xu, W. (2017). Stock liquidity on China NEEQ exchange. *Eurasian Economic Review*, 7, 255–275.
- Miller, M. H., & Rock, K. (1985). Dividend policy under asymmetric information. *Journal of Finance*, 40, 1031–1051.
- Petersen, M. A. (2009). Estimating standard errors in finance panel data sets: Comparing approaches. *Review of Financial Studies*, 22, 435–480.
- Shi, Y., Magnan, M., & Kim, J. B. (2012). Do countries matter for voluntary disclosure? Evidence from cross-listed firms in the US. *Journal of International Business Studies*, 43, 143–165.
- Wurgler, J. (2000). Financial markets and the allocation of capital. *Journal of Financial Economics*, 58, 187–214.
- Yeo, S. (2003). The PRC qualified Foreign institutional investors market. *China Economic Review*, 14, 443–450.