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**Highlights**

- Institutional investors improve corporate information transparency in China.
- Institutional ownership enhances accounting and corporate governance transparency.
- Mutual fund and qualified foreign investors play a significant role in increasing transparency.
- Institutional shareholders monitor and protect the interests of minority shareholders.

ACCEPTED MANUSCRIPT

## Institutional Ownership and Corporate Transparency in China

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### Abstract

This letter examines the effect of institutional ownership on corporate information transparency in Chinese listed firms. We find strong evidence that mutual fund and qualified foreign institutional investors significantly improve corporate transparency. Our results suggest that institutional shareholders play an important role in improving both corporate governance and accounting transparency and are consistent with the view that institutional investors monitor and protect the interests of minority shareholders.

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**Key words:** Accounting information transparency; China; corporate governance transparency; institutional ownership; mutual funds.

**JEL Codes:** G14, G23, G34.

## 1. Introduction

It is well known that institutional investors are viewed by managers and regulators as important dominant players within financial markets, and many studies have documented the impact institutional shareholder activism has played on influencing corporate decisions, improving governance structures and firm performance (Gillan and Starks, 2003; Parrino et al., 2003; Graham et al., 2005)<sup>1</sup>. A significant body of research has identified the link between institutional holdings and the information environment but studies to date have mainly focused on developed market economies (e.g. Healy et al., 1999; Bushee and Noe, 2000; Ajinkya et al., 2005; Choi and Skiba, 2015 and Boone and White, 2015). It is important for market participants, regulators, and managers making financial policies and firm disclosures to understand the nature of the relationship between institutional ownership and corporate transparency in developing markets.<sup>2</sup> In this letter, we address the gap in the literature and examine the effect of institutional ownership on the information environment in Chinese publicly traded firms. More specifically, we study the effect of institutional shareholdings on corporate governance and accountancy transparency.

China is the world's largest emerging market and provides a unique environment to examine the effects of institutional ownership on corporate transparency. China's stock markets are characterized by high levels of government intervention and concentrated levels of ownership. Furthermore, investor protection, regulation and disclosure is weak leading to severe information asymmetry (Naughton, 2007; Chan et al., 2008). In recent years investors put pressure on Chinese firms to reform (e.g., Liu, 2006; Allen et al., 2005; Jingu, 2007; Lin et al., 2017). Claessens and Yurtoglu (2013) highlight that the Chinese government implemented several regulatory reforms to improve the capital market and institutional environment. In 2002, the China Securities Regulatory Commission (CSRC) issued an Anglo-Saxon based code of corporate governance. The code required Chinese firms to adopt best practice governance structures, including the separation of CEO and Chairperson roles and increasing the number of independent directors on the board.

In 2003, with the expectation of increased monitoring and oversight, the CSRC allowed qualified foreign institutional investors (QFII) to enter the Chinese stock market. In addition, the Chinese government actively promoted mutual fund ownership as a corporate governance mechanism to enhance monitoring and firm performance (Huang and Zhu, 2015; Yuan et al., 2008). Ferreira and Matos (2008) and Aggarwal et al., (2011) report that mutual funds provide effective monitoring and play an active role in strengthening firm-level corporate governance. Aggarwal et al., (2014) find a strong inverse relation between mutual fund ownership and corporate fraud. Similarly, Kim and Yi (2015) highlight that foreign investors are sophisticated investors that possess superior capabilities and resources to accumulate and process relevant firm-specific information. Furthermore, QFII's are less likely to experience a conflict of interest with the listed

<sup>1</sup>Prior studies document that institutional investors influence corporate performance (Wahal, 1996; Yuan et al., 2008), corporate governance (Karpoff et al., 1996; Aggarwal et al., 2011), executive compensation (Hartzell and Starks, 2003), corporate M&A (Chen et al., 2007; Bi and Wang, 2015), R&D investment behavior (Bushee, 1998), dividend policy (Grinstein and Michaely, 2005), corporate innovation (Luong et al., 2014) and risk management practices (Hutson et al., 2017).

<sup>2</sup>Bushman et al., (2004) describes corporate information disclosure transparency as "the availability of the firm-specific information to those outside publicly traded firms" and highlights the important role transparency can play in mitigating moral hazard caused by information asymmetries and agency conflicts.

company facilitating stronger monitoring of their portfolios compared to domestic investors (Aggarwal et al., 2014).

Since the reforms Chinese listed firms have made substantial progress in strengthening their corporate governance practices and disclosure (Cheung et al., 2008). However, Haw et al., (2005) suggest that voluntary information is rarely disclosed beyond the mandated regulatory requirements outlined by the CSRC. Moreover, the strong role the Chinese state plays as both the market participant and regulator impacts the effectiveness of governance practices and company performance (Allen et al., 2005; Wei, 2007 and Zou et al., 2008). Chen and Yuan., (2004) and Firth et al., (2011) argue that investors express concerns about the quality of information disclosures, as earnings management practices are pervasive in Chinese enterprises.

The ultimate aim of our study is to examine whether institutional shareholders can play an effective monitoring role and increase corporate transparency in Chinese listed firms. More specifically, we investigate if institutional ownership increases accounting and corporate governance transparency. Furthermore, we examine if the heterogeneity of institutional investors effects the extent of corporate transparency. This letter makes several important contributions to the literature. **First**, using a large longitudinal sample of Chinese listed firms over the period 2002 to 2015 we report strong evidence that institutional investors significantly improve both corporate governance and accounting information transparency. **Second**, we find a robust positive relation between mutual funds, foreign institutional investors and corporate transparency. Consistent with prior literature (e.g. Ferreira and Matos, 2008 and Aggarwal et al., 2014) our findings suggest that mutual fund and foreign investors play an effective monitoring role resulting in increased corporate transparency. **Third**, we examine the issue of reverse causality and endogeneity. Using three-stage least squares regression analysis we confirm that our results are robust and not endogenously determined.

The findings of this study should help both regulators and investors better understand the extent of corporate transparency in China. Moreover, our results highlight the beneficial monitoring role institutional investors play in increasing transparency and protecting the interests of minority shareholders. The results provide practical implications not only for Chinese investors, but also for international investors that are considering investing in the Chinese stock market. While the analysis is focused on the Chinese market the results have broader implications for other developing countries. The remainder of this letter is arranged as follows: section 2 presents the data and methodology. Section 3 discusses the multivariate analysis results. Section 4 presents the robustness test results and section 5 concludes.

## 2. Data and methodology

This letter conducts a longitudinal study examining 1,761 A-shares of publicly listed firms on the Shenzhen Stock Exchange over the period 2002 to 2015.<sup>3</sup> Financial indicator, transparency and institutional ownership data were collected from the Shenzhen Stock Exchange, CSMAR and RESSET database. Originally 13,418 observations were collected. The sample was reduced to 5,498 observations after removing financial firms, ST and \*ST type companies,<sup>4</sup> and firms with missing

<sup>3</sup> The Shanghai and Shenzhen are the two stock exchanges in mainland China. Corporate governance transparency data is only available for the firms listed in Shenzhen Stock Exchange.

<sup>4</sup> According to the guidelines introduced by the China Securities Regulatory Commission (CSRC) in 2002, a listed firm is designated

institutional ownership data.<sup>5</sup>

To examine corporate information transparency, firstly, we follow Bhattacharya et al.,(2003), Francis et al.,(2004) and Ball et al., (2000) and estimate accounting transparency  $ATI_{it}$  where higher values of  $ATI_{it}$  indicate greater levels of accounting transparency.<sup>6</sup> Secondly, we follow Healy and Palepu (2001), Firth et al., (2015) and Boone and White (2015) and utilize the stock exchange evaluation index data to create the corporate governance transparency measure  $CGT_{it}$  where higher values of  $CGT_{it}$  indicate higher levels corporate governance transparency.<sup>7</sup>

The primary independent variable of interest is the level of institutional ownership measured as the percentage of free-trading A shares held by institutional investors relative to the total amount of free-trading shares  $IO_{it}$ . Following Firth et al., (2015), Han et al., (2012), and Boone and White (2015) we control for firm-level characteristics and corporate governance mechanisms including: firm size  $SIZE_{it}$ , percentage of shares held by the largest shareholder  $TOP1_{it}$ , percentage of shares held by management  $MAN_{it}$ , the number of board directors  $BD_{it}$ , percentage of independent directors  $IND_{it}$ , CEO Duality ( $SD_{it}$ ), revenue growth rate of primary business operations  $GR_{it}$ , returns on assets  $ROA_{it}$ , debt-to-asset ratio  $DTA_{it}$ , auditing opinions ( $OP_{it}$ ) and years since initial public offering ( $Y_{it}$ ). We also include year and industry binary control variables. Table 1 provides detailed control variable definitions.

To test the main research question in this article, we employ the following pooled OLS regression analysis;

$$ATI_{it} = \alpha_0 + \beta_1 IO_{it} + \beta_2 SIZE_{it} + \beta_3 TOP1_{it} + \beta_4 MAN_{it} + \beta_5 BD_{it} + \beta_6 IND_{it} + \beta_7 SD_{it} + \beta_8 GR_{it} + \beta_9 ROA_{it} + \beta_{10} OP_{it} + \beta_{11} Y_{it} + \sum \beta_{13} Year_{it} + \sum \beta_{14} Industry_{it} \quad [1]$$

Where:

The suffix i, t = the data for firm i in year t.  $ATI_{it}$  = the two measures of corporate information transparency, (i) accounting information transparency  $ATI_{it}$  and (ii) corporate governance transparency  $CGT_{it}$ . The transparency measures are used separately as dependent variables in the analysis.  $IO_{it}$  = total institutional ownership represented by the percentage of free trading A shares held by institutional investors. The remaining control variables are defined in Table 1.

### 3. Empirical results

#### 3.1 Descriptive statistics

Table 2 provides descriptive statistics for the institutional ownership, corporate transparency measures and controls variables. The mean and median accounting

as a special treatment (ST) firm if it reports net losses for two consecutive years and an \*ST firm if it suffers net losses for three consecutive years. Furthermore, if an \*ST firm suffers losses for one more year, it will be delisted.

<sup>5</sup>To remove outliers continuous variables were winsorized by 1 percent.

<sup>6</sup>Please refer to Appendix A.1 for details on the estimation of the accountancy information transparency variable  $ATI_{it}$ .

<sup>7</sup>The Shenzhen Stock Exchange provides a comprehensive quantitative evaluation index system reflecting corporate governance information including regulatory measures, standard operations, information disclosure and punishments for violations. The stock exchange assigns a rating of A, B, C, or D for each firm indicating the highest to lowest levels of information disclosure, respectively. To estimate the corporate governance transparency measure  $CGT_{it}$  we transform the rating system and assign each firm a value of 4, 3, 2 or 1.

information transparency **GHUB** measure is 5.50 and 5.70, respectively. The mean and median corporate governance transparency measure (**HUB**) is 3.0 and 2.9, respectively. In unreported results we find an increase in corporate transparency over time.<sup>8</sup> The mean and median institutional ownership levels are 8.74 and 1.33 percent, respectively. In unreported analysis, the Spearman rank correlation coefficients between institutional investor ownership **ABCHZ** accounting information transparency **GHUBZ** and corporate governance transparency (**HUB**) are 0.03, and 0.28 **GHUBZ** respectively. The significant positive correlations suggest that institutional investors are influential holders of common stock in domestic publicly listed firms in China and could have the ability to enhance corporate governance and information disclosure practices.<sup>9</sup>

### '**GHUBZ**

Table 3 displays the results for the pooled OLS regression analysis examining the relation between institutional ownership and the two dimensions of information transparency presented in equation [1]. Column (1) reports strong evidence of a positive relation between institutional ownership **ABCHZ** and corporate governance transparency **GHUBZ**. Similarly, column (2) reports findings of a significant positive relation between institutional ownership **ABCHZ** and accounting transparency **GHUBZ**. The positive relation between institutional ownership and firm transparency is supportive of Wang et al., (2009) and Boone and White (2015). The results suggest that institutional owners monitor firm management resulting in improved corporate information transparency in Chinese listed firms.

Following Ferreira and Matos (2008), Gul et al., (2010), Aggarwal et al., (2011) and Aggarwal et al., (2014) we examine the heterogeneity of institutional ownership on corporate transparency. We divide institutional ownership into the following categories: mutual funds, qualified foreign institutional investors, security funds and pension funds. Table 4, Panel A presents the mutual fund ownership summary statistics over time. Consistent with Aggarwal et al., (2014) we report an increase in ownership from 5 percent in 2002 to 16 percent in 2008. Following the year 2008, ownership declines to 6.8 percent in 2015. Panel B displays the qualified foreign institutional ownership. Since entry to the Chinese Stock market in 2003, foreign ownership levels increased from 1.4 percent to 2.2 percent in 2008, post 2008 ownership levels decreased to 1.45 percent in 2010, followed by an increase to 1.52 percent in 2015. Panel C displays similar trends for pension fund ownership reporting an average ownership level of 1.37 percent. In contrast, Panel D reports that security fund ownership increased from 0.95 percent in 2003 to 2.96 percent in 2008 and then declined to 2.38 in 2015.<sup>10</sup>

Table 5 presents the results for the pooled OLS regression analysis examining the effects of alternative measures of institutional ownership on transparency. Panel A displays a positive relation between mutual fund investors and corporate governance transparency **GHUBZ**. Panel B reports a positive relation between mutual fund investors, foreign investors and accounting transparency **GHUBZ**. These positive findings support prior research that highlights foreign and mutual fund ownership exert greater monitoring and

<sup>8</sup> For example, from the year 2002 to 2012 the number of firms that has a corporate governance transparency (**HUB**) rating of B and above increases from 60 – 90 percent.

<sup>9</sup> For the sake of brevity we do not report these results but are available upon request to the corresponding author.

<sup>10</sup> In 2003, the China Securities Regulatory Commission (CRSC) allowed qualified foreign institutional investors to enter the Chinese stock market. Similarly, in 2000, the National Social Security Fund and Chinese public pension fund was established but these institutions did not begin to invest in the stock market until June 2003.

influence over firms than individual investors (Ferreira and Matos, 2008; Aggarwal et al., 2011; Gul et al., 2010 and Aggarwal et al., 2014). We do not find a significant relation between security, pension funds and information transparency—supporting the argument that only certain types of investors play an important monitoring role in emerging markets (Aggarwal et al., 2014)

#### 4. Robustness tests

We report five additional analyses confirming the robustness of the inferences we have made based on Table 3. **1. ILS** We run three-stage least squares simultaneous equation analysis to ensure the positive relation between institutional ownership and corporate transparency is not endogenously determined. The lagged corporate information transparency measures **HUB** and lagged institutional ownership **BCH** are used as instrumental variables. Table 6, Columns (1) and (3) report a strong positive relation (at the 1 percent level) between institutional ownership **ABCH** and the two measures of transparency ; **HUB** and **5HUB**, respectively. The robust results suggest that institutional ownership has a significant positive effect on corporate information transparency. Furthermore, columns (2) and (4) utilize the corporate transparency measures as explanatory variables, we do not find evidence that firms with greater levels of transparency attract higher levels of institutional ownership. **2. GMM** We examine alternative instrumental variables including the industry average percentage of institutional holdings and marketization index (Fan, Wang and Zhu, 2011). The unreported results provide strong evidence identifying the causal relationship that institutional ownership facilitates increased corporate transparency.<sup>11</sup> **3. HJES** In our longitudinal study includes the global financial crisis period, we control for this systematic shocks by including a binary variable **FCR** that assigns a value of one for the global financial crisis period from 2007 – 2009, and zero otherwise. **4. CIB** We control for additional market factors including the volume of trade **ICL** and the book-to-market capitalization ratio **ICAP**. **5. HUB** We adjust for possible bias we cluster standard errors at the firm level. In unreported results we confirm results are strongly robust.<sup>12</sup>

#### 5. Conclusion

This letter examines the relation between institutional ownership and corporate information transparency. We report strong evidence highlighting the positive effect of institutional investors on both accounting and corporate governance transparency. Furthermore, our findings suggest that mutual funds and qualified foreign institutional investors monitor and exert influence over Chinese firms resulting in increased information transparency. We mitigate endogeneity concerns utilizing three-stage least squares simultaneous equations regression models and a selection of instrumental variables. A series of additional tests confirm the robustness of our results. We conclude that institutional investors monitor the actions of management resulting in enhanced levels of corporate transparency in China.

<sup>11</sup>The calculation of the industry average percentage of institutional holdings excludes the firm being examined. The marketization index is the province product market index (Fan, Wang and Zhu, 2011). The Sargan test results confirm the validity of the instrumental variables. Results are available on request to the corresponding author.

<sup>12</sup>Results are available on request to the corresponding author.



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**Table 1: Variable definitions**

Variable Name	Variable definition
<b>Dependent variables</b>	
GTran	Corporate governance transparency
ATran	Accounting information transparency. See appendix A.1 for further information.
<b>Independent variables</b>	
INST	The proportion of free trading A shares held by institutional investors, defined as the number of tradable shares held by institutional investors as a proportion of the total number of shares
MUTUAL_IO	Proportion of mutual fund investor ownership
SECURITY_IO	Proportion of security fund investor ownership
PENSION_IO	Proportion of pension fund investor ownership
FOREIGN_IO	Proportion of qualified foreign institutional investor ownership
<b>Control variables</b>	
Size	The size of the firms measured by the natural logarithm of total assets
Top1	The ratio of the largest shareholder
Mghold	The proportion of executive holdings
BN	The number of directors on the board
Indeprt	The proportion of independent directors of the board
Dual	A binary variable assigned a value of one if the CEO and chairman positions are held by the same person, and zero otherwise.
Grow	Main business revenue growth rate.
Roa	Return on total assets.
Lev	The debt-to-asset ratio measured as total debts divided by total assets.
Audit	A binary variable assigned a value of one if the audit firm gives a standard unqualified opinion, and zero otherwise.
Age	The natural logarithm of the number of years the firm has been publically listed.
GFC	A binary variable indicating the global financial crisis period is assigned a value of 1 if the year is 2007, 2008 and 2009, and zero otherwise.
SOE	A binary variable assigned a value of 1 if the firm is state controlled and zero otherwise.
Year	We use binary variables to control for the year.
Industry	We use binary variables to control for industries classified by the (CSRC) China Securities Regulatory Commission.
<b>Notes:</b> This table presents the detailed definitions for the dependent, independent and control variables.	

**Table 2: Descriptive statistics**

		(1)	(2)	(3)	(4)	(5)	(6)	(7)
		Mean	Std. Dev	Min	25th Percentile	Median	75th Percentile	Max
1	GTran	2.904	0.646	1.000	3.000	3.000	3.000	4.000
2	ATran	5.568	2.088	1.000	4.000	5.500	7.000	10.000
3	Inst	8.740	14.553	0.000	0.197	1.332	10.937	66.695
4	Size	21.870	1.259	19.021	20.981	21.815	22.645	25.237
5	Top1	34.179	15.353	8.630	22.365	30.480	44.780	74.980
6	Mghold	0.007	0.032	0.000	0.000	0.000	0.000	0.225
7	BN	9.102	1.867	5.000	8.000	9.000	9.000	15.000
8	Indeprt	0.363	0.051	0.250	0.333	0.333	0.375	0.571
9	Dual	0.164	0.370	0.000	0.000	0.000	0.000	1.000
10	Grow	0.221	0.742	-0.685	-0.045	0.103	0.273	5.877
11	Roa	0.033	0.065	-0.236	0.009	0.029	0.059	0.247
12	Lev	0.519	0.223	0.063	0.360	0.528	0.664	1.369
13	Audit	0.947	0.225	0.000	1.000	1.000	1.000	1.000
14	Age	2.540	0.402	1.099	2.303	2.639	2.833	3.135
15	SOE	0.604	0.489	0.000	0.000	1.000	1.000	1.000

**Notes:** This table provides the descriptive statistics for the control variables during the period 2002 - 2012. Columns 1 to 7 presents the mean, standard deviation, minimum, 25<sup>th</sup> percentile, median, 75<sup>th</sup> percentile and maximum values for each of the variables respectively. Please refer to Table 1 for control variable definitions.

**Table 3: Institutional investors and corporate information transparency**

	(1) GTran	(2) ATran
INST	0.006*** (8.147)	0.009*** (3.795)
SOE	0.124*** (6.183)	0.062 (0.906)
Size	0.087*** (8.953)	-0.077** (-2.321)
Top1	0.002*** (2.828)	-0.006*** (-3.150)
Mghold	0.626** (2.128)	-0.323 (-0.346)
BN	0.011** (2.074)	-0.017 (-0.990)
Indeprt	-0.067 (-0.362)	-0.604 (-0.986)
Dual	-0.084*** (-3.429)	-0.082 (-1.016)
Grow	-0.011 (-1.013)	0.123*** (2.635)
Roa	1.343*** (7.434)	-4.798*** (-9.916)
Lev	-0.282*** (-5.472)	0.675*** (3.978)
Audit	0.349*** (6.273)	-0.820*** (-5.120)
Age	-0.150*** (-4.304)	-0.195* (-1.836)
Year dummies	YES	YES
Industry dummies	YES	YES
Constant	0.435** (2.004)	8.178*** (11.132)
Adjusted R <sup>2</sup>	23.1%	14.7%

**Notes:** This table presents the pooled OLS regression results. The t-values are reported in the parentheses. \*, \*\* and \*\*\* indicates significance at the 0.10, 0.05 and 0.01 percent levels respectively. Please refer to Table 1 for control variable definitions.

Table 4: Alternative measures of institutional ownership over time

(1)	(2)	(3)	(4)	(5)
<b>Panel A: Mutual fund ownership (<i>MUTUAL_IO</i>)</b>				
Year	Average	Change in Average	Median	St. Dev
2002	4.899	-	2.734	6.151
2003	5.922	1.023	0.992	9.737
2004	5.789	-0.133	0.024	12.486
2005	6.329	0.54	0.009	12.415
2006	9.251	2.922	3.051	14.135
2007	15.467	6.216	8.219	16.775
2008	15.923	0.456	8.402	17.374
2009	11.625	-4.298	6.310	13.208
2010	13.249	1.624	8.462	13.756
2011	10.299	-2.95	4.422	13.449
2012	8.500	-1.799	2.161	12.645
2013	7.541	-0.959	1.890	11.622
2014	6.732	-0.809	3.032	9.032
2015	6.805	0.073	3.404	8.578
<b>Panel B: Qualified foreign institutional ownership (<i>FOREIGN_IO</i>)</b>				
Year	Average	Change in Average	Median	St. Dev
2002	-	-	-	-
2003	1.415	-	0.693	1.801
2004	3.914	2.499	2.083	4.347
2005	4.085	0.171	2.773	3.755
2006	3.585	-0.5	2.615	3.046
2007	3.271	-0.314	2.459	3.011
2008	2.198	-1.073	1.945	1.593
2009	1.539	-0.659	1.045	1.688
2010	1.446	-0.093	1.132	1.241
2011	2.017	0.571	1.265	2.403
2012	1.787	-0.23	1.178	1.971
2013	1.598	-0.189	1.207	1.559
2014	1.482	-0.116	0.854	1.872
2015	1.520	0.038	0.982	1.570
<b>Panel C: Pension fund ownership (<i>PENSION_IO</i>)</b>				
Year	Average	Change in Average	Median	St. Dev
2002	-	-	-	-
2003	0.430	-	0.466	0.212
2004	0.474	0.044	0.288	0.434
2005	-	-	-	-
2006	-	-	-	-
2007	0.812	-	0.812	-
2008	3.285	2.473	2.733	2.564
2009	1.079	-2.206	0.888	0.901
2010	1.599	0.52	0.982	1.668
2011	2.244	0.645	1.484	2.038
2012	1.744	-0.5	1.522	1.195
2013	1.451	-0.293	0.748	1.318
2014	1.089	-0.362	0.842	0.745
2015	0.873	-0.216	0.561	1.342
<b>Panel D: Security fund ownership (<i>SECURITY_IO</i>)</b>				
Year	Average	Change in Average	Median	St. Dev
2002	-	-	-	-
2003	0.949	-	0.679	0.696
2004	2.412	1.463	1.924	1.905
2005	2.802	0.39	2.007	2.324
2006	3.542	0.74	2.847	2.619
2007	3.149	-0.393	2.553	2.239
2008	2.961	-0.188	2.225	2.684
2009	2.438	-0.523	1.954	1.928
2010	2.571	0.133	1.775	2.073
2011	2.700	0.129	2.056	2.177
2012	3.022	0.322	2.507	2.232
2013	2.346	-0.676	1.747	1.982
2014	2.372	0.026	1.671	2.054
2015	2.378	0.006	1.791	1.906

**Notes:** This table reports the trends in institutional ownership over the period 2002 to 2015. Panels A – D present the summary statistics for the total institutional, mutual fund, qualified foreign institutional, pension fund and security fund ownership, respectively. Columns 2 to 5 provide the average, change in average, median and standard deviation in ownership levels, respectively. Please refer to the Table 1 for detailed variable definitions.

**Table 5: Transparency and alternative measures of institutional ownership**

Panel A	GTran	GTran	GTran	GTran
	(1)	(2)	(3)	(4)
MUTUAL_IO	0.013*** (6.955)			
SECURITY_IO		-0.026 (-1.135)		
FOREIGN_IO			0.072** (2.071)	
PENSION_IO				0.236 (1.167)
Control variables	YES	YES	YES	YES
Industry & year dummies	YES	YES	YES	YES
Adjusted R <sup>2</sup>	9.6%	9.9%	11.5%	3.1%
Panel B	ATran	ATran	ATran	ATran
MUTUAL_IO	0.004*** (6.633)			
SECURITY_IO		0.001 (0.163)		
FOREIGN_IO			0.018* (1.770)	
PENSION_IO				-0.022 (-0.432)
Control variables	YES	YES	YES	YES
Industry & year dummies	YES	YES	YES	YES
Adjusted R <sup>2</sup>	20.0%	15.3%	21.7%	13.3%

**Notes:** This table presents the pooled OLS results examining the relation between the alternative measures of institutional ownership and transparency. The dependent variables in Panels A and B are ; **HUB** and **SHUB** respectively. All regressions include control variables, industry and year dummies. The t-values are reported in the parentheses. \*, \*\* and \*\*\* indicates significance at the 0.10, 0.05 and 0.01 percent levels, respectively. Please refer to Table 1 for control variable definitions.

**Table 6: Three-stage least squares simultaneous equation**

	(1)	(2)	(3)	(4)
	GTran	INST	ATran	INST
Inst	0.006*** (8.657)		0.009*** (3.39)	
Trans		-0.19 (-0.055)		-0.605 (-0.473)
LagTrans		-0.171 (-0.121)		-0.034 (-0.098)
LagInst		0.989*** (72.427)		0.992*** (105.326)
Control variables	YES	YES	YES	YES
Year dummies	YES	YES	YES	YES
Industry dummies	YES	YES	YES	YES
Constant	0.635*** (2.722)	-2.999 (-1.635)	8.428*** (10.518)	2.027 (0.271)
Adjusted R <sup>2</sup>	23.30%	96.80%	15.60%	96.10%

**Notes:** This table presents the three-stage least squares regression results. Where, Trans, LagTrans in columns (2), (4), (6) are the current and lag number of the transparency measures ; **HUB** and **SHUB** respectively. The t-values are reported in the parentheses. \*, \*\* and \*\*\* indicates significance at the 0.10, 0.05 and 0.01 percent levels, respectively. Please refer to Table 1 for control variable definitions.

## Appendix A.1

To estimate accounting information transparency **5HUB** we utilize the deciles assignment method that incorporates two accounting indicators; (i) earnings aggressiveness (EA) and (ii) earnings smoothing (ES) (Bhattacharya et al., 2003 and Francis et al., 2004).

Earnings aggressiveness (**95**) is the practice of misreporting items in the firm's financial statements to make the company appear more attractive (Ball et al., 2000).

Earnings aggressive (**95**) is calculated as:

$$\mathbf{95}_{i,t} = \mathbf{577}_{i,t} = (\Delta \mathbf{75}_{i,t} - \Delta \mathbf{7@}_{i,t} - \Delta \mathbf{75G}_{i,t} + \Delta \mathbf{CB}_{i,t} - \mathbf{89D}_{i,t} + \Delta \mathbf{HD}_{i,t}) / \mathbf{H5}_{i,t} \quad [2]$$

Where:

ACC<sub>i,t</sub> = the items accrued for firm i, year t;  $\Delta CA_{i,t}$  = changes in the current assets for firm i, year t;  $\Delta CL_{i,t}$  = changes in the current liabilities for firm i, year t;  $\Delta CASH_{i,t}$  = changes in the cash holdings for firm i, year t;  $\Delta STD_{i,t}$  = changes in the long-term liabilities for firm i, year t;  $\Delta DEP_{i,t}$  = amortization and depreciation for firm i, year t;  $\Delta TP_{i,t}$  = changes in income taxes payable for firm i, year t;<sup>13</sup>TA<sub>i,t</sub> = the total assets for firm i, year t.

Earnings smoothing (**9G**) is the degree to which fluctuations in public firm earnings deviate from the degree of actual earnings fluctuations. We define **9G** as the ratio of changes in cash flows from operating activities to changes in firm net profits, it measures the relation between the smoothness of earnings and the actual earnings of the company.

Earnings smoothing (**9G**) is calculated as:

$$\mathbf{9G}_{i,t} = \sigma(\mathbf{7: C}_{i,t}) / \sigma(\mathbf{B}_{i,t}) \quad [3]$$

Where:

ES<sub>i,t</sub> = earnings smoothing for firm i, year t; CFO<sub>i,t</sub> = net cash flows from operating activities for firm i, year t; NI<sub>i,t</sub> = net profits for firm i, year t.  $\sigma$  = the standard deviation calculated within the period of year (t<sub>2</sub>, t).

Higher values of **95** and **9G** demonstrate higher levels of earnings aggressiveness and smoothness, respectively, indicating higher opacity and thus lower firm-level accounting information transparency. As **95** and **9G** are contrary indicators, for convenience, we multiply these two indicators by -1. After transformation higher values of **95** and **9G** indicates higher accounting information transparency.

We follow Bhattacharya et al., (2003) to calculate the comprehensive accounting information transparency measure (**5HUB**) and apply the following decile assignment method:

$$\mathbf{5HUB} = (\mathbf{8WY95} + \mathbf{8WY9G}) / 2 \quad [4]$$

Greater values of **5HUB** indicate higher levels of accounting information transparency.

<sup>13</sup>The current level of income taxes payable is not shown in financial reports but it can be indirectly calculated from income tax expenses and deferred income taxes. We calculate the current income taxes payable as follows: current income taxes payable = current income tax expenses – deferred income taxes, where deferred income taxes = increase in deferred income tax liabilities (deferred tax credits) - increase in deferred income tax assets (deferred tax debits).