Institutional Ownership and Private Equity Placements: Evidence from Chinese Listed Firms

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Abstract

This paper examines the impact of institutional ownership on the performance of private equity placements (PEPs) for listed firms in China. We find that the presence of institutional investors can alleviate the information asymmetries between listed firms and the market. The market reaction to PEP announcements is significantly smaller if there is a higher portion of institutional shareholdings. Long-term firm operational performance after PEPs is positively correlated with institutional shareholdings. Moreover, we find that the relationship between institutional shareholdings and PEP performance is mainly driven by non-listed corporate investors and mutual funds. Finally, the relationship between PEP performance and institutional shareholdings is stronger in smaller PEP issuers.

Key words: Institutional ownership; Private equity placements (PEPs); Information asymmetry; Strategic investor; Liquidity investor

JEL Classification: G23, G30, G32, G38, K22

1. Introduction

Institutional shareholders are pivotal players in the capital market. According to Hanouna et al. (2015), the value of assets managed by U.S. mutual funds management companies increased from 4.4 to 12.7 trillion USD during 2000–2014. Institutional investors in emerging markets also expanded rapidly. During 2008–2012, the value of total assets under the management of private equity firms and hedge funds doubled, and that of mutual funds, insurance companies, pension funds and commercial banks increased by 50% in 25 emerging economies.[2]

What is the role of institutional investors in the capital market? Do they simply exploit the information of their portfolio companies, or do they actively participate in external corporate governance? Existing literature has shown that institutional investors conduct progressively stronger external supervision as their shareholdings increase (Black and Coffee, 1994). Marciukaityte et al. (2005) show that an increase in institutional ownership helps alleviate the information asymmetries between corporate boards and outside investors. However, the role of institutional investors still remains unclear in emerging markets. As corporate ownership is highly concentrated in emerging economies, controlling shareholders may extract private benefits at the expense of minority shareholders (Allen et al., 2005; He et al., 2017). Institutional investors may collude with controlling shareholders to expropriate corporate resources (Pound, 1988), especially in emerging economies where financial and legal systems are still underdeveloped.

In this paper, we provide new evidence on the role of institutional investors in China for private equity placements (PEPs). PEPs are a channel through which listed firms can raise external funds (Carey et al., 1993). Unlike public offerings, PEPs

2 These data are from the report "Development and Regulation of Institutional Investors in Emerging Markets" in June 2012, published by *International Organization of Securities Commissions*.

typically involve a small group of investors with a strong capital base. In this way, the cost of raising external capital may be reduced, e.g., a low communication cost between the firm and investors. In the meanwhile, issuing new equity to large shareholders may also help align the interests of corporate insiders with minority shareholders. Studying PEPs provides us a setting in which we can observe the market attitudes toward various institutional investors in China. PEPs have gradually become a dominant financing tool for listed firms since the issuance of *"Measures for the Administration of the Issuance of Securities by Listed Companies"* in May 2006 by China Securities Regulatory Commission (CSRC). About 225 billion RMB was raised through PEPs in 2013, accounting for 80.16% of total funds raised in that year. This percentage was much higher than the fund raised through other external financing channels such as public offerings (e.g. seasoned equity offerings). Thus, an analysis of the participation of institutional investors in the PEPs will shed light on their roles in China's capital markets.

China' unique setting is well-suited to examine the role of institutional investors. First, the number of institutional investors has grown rapidly in recent years in tandem with fast economic growth in the country. The number of mutual funds increased from 50 in 2001 to 2,048 in September 2014, and the value of net assets under the management of mutual funds increased by nearly 30 times in the same period. Second, He and Rui (2016) find that the supervision over managers and largest shareholders has become more efficient in China recently. Investigating the role of institutional investors in China may help us understand the incentives of capital market participants in emerging countries. Finally, since the market-oriented reform in the financial sector in 1994,[3] more and more private and foreign institutional investors

[3] In March 2015, Xiaochuan Zhou, the Governor of the People's Bank of China, stated that "The

have obtained licenses to undertake investments in the capital market. A large number of non-state-owned institutional investors has emerged and played an increasingly important role in China's capital markets. The increasing heterogeneity of institutional investors provides us with a valuable setting to investigate how shareholder identities affect firm performance.

Using the PEP data from *Shanghai* and *Shenzhen Stock Exchanges* during 2005–2013, we find that the market reacts positively to PEP announcements on average, but the reaction is smaller if there are higher institutional shareholdings *ex ante* the PEP announcements. Also, institutional shareholdings *ex ante* have predictive power over the issuing firm's long-term operational performance *ex post* the PEPs. Thus, we argue that institutional shareholdings could alleviate the information asymmetries between listed firms and market investors so that the market would exhibit less over-optimism about PEP announcements. In other words, without the presence of institutional investors *ex ante*, the market reaction to PEP announcements would be higher. With increased participation of the original institutional investors in the PEP, the market reaction would increase significantly.

We show that institutional ownership has an impact on the market return of PEP announcements through the signaling effect. Apart from the fact that institutional ownership has been widely used as a proxy for information asymmetry (O'Brien and Bhushan, 1990), further findings also support our argument that signaling effect leads to the positive market reaction. First, we classify institutional investors into strategic

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continued expansion of *Qualified Foreign Institutional Investors* (QFIIs) is an important part of China's current financial reform. China will expand investment quotas for the *Qualified Domestic Institutional Investors* (QDIIs) and QFIIs." Relevant information can be found on the website of *Xinhua News Agency*, titled "China to expand quotas of QDII, QFII, Xiaochuan Zhou" posted on November 27, 2013 (http://en.xinhua08.com/a/20131127/1278431.shtml).

and liquidity investors following Noe (2002) and Ferreira and Matos (2008). We find that the impact of the participation of original institutional investors on the market reactions is greater for liquidity investors than that for strategic investors. Unlike strategic investors, liquidity investors are normally outside parties who do not share potential business ties with the issuer. Thus, liquidity investors are less likely to collude with the firm and more likely to reveal the true type of the firm. As a result, the signaling effect of liquidity investors is expected to be stronger than that of strategic investors. Second, when the largest shareholder participates in the PEP, higher institutional ownership *ex ante* would be associated with a deeper PEP discount, and such impact is mainly driven by liquidity investors. According to Benveniste and Spindt (1989), in order to induce informed investors to reveal their information about the quality of the IPO, the issuer would lower the offer price (i.e., a deeper discount). Similarly, in order to induce institutional investors to participate in the private placement, the issuer would also offer the shares at a greater discount. Thus, we conjecture that the discount rate is the mechanism through which institutional investors alleviate the information asymmetry. Third, we find that the impact of institutional shareholdings on PEP market reactions is more pronounced in smaller firms. Compared with larger firms, smaller firms have severer information asymmetry due to less analyst coverage and limited market attention, and thus the market is more uncertain about the quality of a PEP issued by them. As a result, the signaling effect of institutional ownership on market reaction is stronger in smaller firms. We also find that market reaction is stronger in SOEs than in private firms (although not

statistically significant). As Chinese SOEs are often quite opaque, the signaling effect is expected to be stronger with higher institutional holdings in SOEs than in private firms.

One may suspect that there is endogeneity in our empirical results. It should be noted that we use the level of institutional ownership in the quarter before the announcement quarter. Thus, it is unlikely that the institutional investors anticipate a lower market reaction and choose to increase their shareholdings. In addition, we control for the fixed effects on the industry, year and season to address the concern that some unobservable factors may concurrently affect market reaction and institutional ownership. As a robustness test, we employ the firm's weighting in the CSI 300 Index as the instrumental variable for institutional ownership. We expect that institutional holdings are positively correlated with a firm's weighting in the CSI 300 Index, while a firm's weighting in the CSI 300 Index is exogenous to the market reaction to a PEP announcement. The results are qualitatively similar when the institutional ownership is instrumented with firms' weightings in the CSI 300 Index. To address the possible selection bias, we also use propensity score matching to identify the control group (PEP firms with institutional ownership less than 5%) and compare the market reaction with the treatment group (PEP firms with institutional ownership no less than 5%). Our results are consistent with the hypothesis that higher institutional holdings *ex ante* lead to smaller market reactions.

Our study contributes to the literature in three ways. First, using the data on PEPs in China, our study provides a comprehensive investigation into the role of different

types of institutional investors in the largest emerging market in the world. Despite growing attention on institutional investors in emerging markets, little research has examined their impact on firm performance. Our results suggest that institutional investors can reduce information asymmetry and affect firm performance in China. Second, our research provides new insights into the long-term performance of PEPs. The existing literature documents a poor long-term performance of PEPs (Loughran and Ritter, 1995; Kang et al., 1999; Jeanneret, 2005). We contribute to this strand of literature by showing that institutional investors have predictive power over the long-term performance *ex post* the PEPs. Furthermore, we investigate the heterogeneity of institutional investors and show how it is associated with the reform of Chinese capital market. Despite the introduction of private equity and foreign investors, we do not find any significant enhancing effect on firms' corporate governance and performance. Therefore, in order to enhance market transparency, it is essential to further reform the capital market in China and enhance the diversity of institutional investors.

The rest of this paper is organized as follows. Section 2 describes the institutional background in China and develops hypotheses. Section 3 presents the data and empirical methodology. Section 4 reports estimation results. Section 5 provides a robustness check. Section 6 concludes the paper.

2. Institutional background and hypothesis development

2.1 Institutional background

Institutional investors are financial institutions that have a strong capital base, with a stated purpose of creating capital gains through investment activities. The number of institutional investors in China has grown immensely during the past decade. In particular, mutual funds have quickly recovered from the shocks of the global financial crisis.[4] Figure 1 shows that the number of mutual funds increased more than 22 times from 2004 to September 2014, and a similar upward trend for the total assets under the management of mutual funds is evident. Despite a setback during the global financial crisis, the total assets of mutual funds remained at about 1 trillion RMB, which continued to grow after the crisis. Furthermore, China has allowed qualified foreign institutional investors (QFIIs) to engage in investment activities in the domestic stock market since 2003. The Chinese financial authorities issued the "*Guidance for QFIIs Securities Investment*" in 2003, which allowed QFIIs to invest in certain stocks and bonds listed on the *Shanghai* and *Shenzhen Stock Exchanges*. There are 13 types of institutional investors in the Chinese capital market: QFIIs, private equity, mutual funds, social security funds, brokerage firms, commercial banks, insurance companies, trust funds, pension funds, listed corporate investors, non-listed corporate investors, financial affiliations and specialized financial products.

The PEP market has expanded rapidly in China. The "*Measures for the Administration of the Issuance of Securities by Listed Companies*" released by the *China Securities Regulatory Commission* (CSRC) shows that profitability is not a requirement for PEP issuers. In addition, listed firms are free to raise funds from their controlling shareholders and institutional investors. PEPs could be a suitable channel

[4] According to survey data by the *International Organization of Securities Commissions* (IOSCO) in 2012, the compounded annual growth rate of the total assets under management reached 25.4% during 2008–2010, with 16,633 mutual fund products in total. The quick recovery coincided with a rapid economic recovery in the capital market. It indicates that a high inflow of mutual funds boosted investor confidence and probably contributed to the economic growth.

to raise funds in order to enhance the asset quality and market prospects of a firm. In addition, a more lenient disclosure requirement for PEPs facilitates the flow of funds between investors and fund-raisers. Consequently, PEPs have become a dominant channel for listed firms to raise capital in China. As of November 22 2014, there were 1,546 cases of successful PEPs in China, with the issuance of capital reaching 2,688 billion RMB.

There has been a significant increase of institutional ownership in PEPs. Figure 2 shows that institutional ownership increased from 4.8% in 2005 to 38% in 2013. This increase was accompanied by a rising number of PEPs in the wake of the global financial crisis. Listed firms demanded substantial funds in order to recover from the global financial crisis in China, and the participation of institutional investors in PEPs helped raise sufficient external finance.

(Insert Figures 1 and 2 Here)

2.2 Hypothesis development

First, we examine the effect of institutional ownership on the announcement returns of PEPs. An extensive strand of literature has documented a positive market reaction to the announcement of PEPs, e.g., Wruck (1989) reports a 4.4% average abnormal return when PEPs are announced in the US. Chemmanur and Jiao (2011) find that higher pre-offer net buying by institutional investors is associated with lower discount rates in seasoned equity offerings (SEOs) as institutional investors facilitate the circulation of insider information.

Institutional investors and controlling shareholders are major participants in PEPs. When institutional investors subscribe to substantially large shareholdings (or

all) of new issues, they are informed as much as controlling shareholders on the firm operation, performance and profitability. Furthermore, the information advantage by institutional investors manifests itself not only during the PEP announcement period but also in the pre-offer period when certain insider information may be disseminated to these institutional investors. If institutional investors subscribe over 5% of the issued shares—without going through PEPs—they have to disclose these transactions in accordance with the relevant regulations.[5] Institutional investors may reveal their proprietary information to uninformed investors on the value of PEPs. As a result, the conduct of institutional investors *ex ante* PEPs can alleviate the information asymmetries between the firm and uninformed investors, which may undermine the signaling effect of PEPs. Thus, we propose our first hypothesis:

H1*: The announcement return is negatively related to institutional ownership.*

Existing studies show that PEPs do not produce significant excess returns in the long-term *ex post* performance. However, Chemmanur et al. (2009) find that institutional investors could distinguish seasoned equity offerings with better long-run stock returns, and SEOs with greater pre-offer net buying by institutional investors have a smaller discount. Hence, institutional investors are more likely to select PEPs with attractive investment returns and achieve a better long-term performance. Furthermore, the superior knowledge of institutional investors on stock-picking can help choose PEPs with better investment returns. Thus, we propose our second hypothesis as follows:

H2: *The long-term performance of firms increases with institutional ownership.*

[5] See Articles 13, 14 and 16 in the "*Decision on Amending Article 63 of the 'Administration Measures on Takeover of Listed Companies'*" (CSRC Decree No. 56). When the equities of an investor and its concerted parties reach 5% of a listed firms' total issued shares, they are required to file a report with the CSRC and make an announcement about their further transactions. The requirements vary across different types of transactions.

In terms of the heterogeneity among institutional investors, Noe (2002) divides institutional investors into strategic investors and liquidity investors according to their monitoring incentives even if they are not largest shareholders. Bushee (1998) analyzes the behaviors of institutional investors and classifies them into three categories: transient institutional investors, grey institutional investors and dedicated institutional investors. Ferreira and Matos (2008) classify institutional investors into grey institutional investors and independent investors by the business ties between institutional investors and firms. Chen et al. (2007) argue that only dedicated independent institutions have strong incentives to monitor firms, and grey institutional investors may reduce their holdings in underperforming firms. In this paper, we classify institutional investors into strategic and liquidity investors in order to disentangle the channel through which institutional investors can affect firm performance. We look at independent and grey institutional investors according to the potential business ties with PEP issuers. As liquidity investors only passively gather information and form investment portfolios with the highest return *ex ante*, they are not actively monitoring the firms. We propose our third hypothesis as follows:

H3: *The presence of independent liquidity investors is associated with a better performance of the listed firms that they invest in.*

Due to an absence of supervision by private shareholders, state-owned enterprises (SOEs) is beset by managers' private benefits (Wang, 2010), and the improvement in corporate governance fostered by privatization is well documented in the existing literature. For example, Qian (1996) shows that SOEs are exposed to substantial policy burdens and high agency costs, and Qiang (2003) shows that a

higher proportion of SOE shares is associated with a lower performance in China.[6] In contrast, institutional investors may help alleviate information asymmetries and expropriation of minority shareholders by controlling shareholders in private firms. Schmidt and Fahlenbrach (2017) show that firms with a higher level of passive institutional ownership are associated with poor corporate governance and high agency costs. We rule out the monitoring role of institutional investors and assume they only alleviate information asymmetry. We categorize them into strategic and liquidity investors, and also check their impact on corporate investment behavior. As information asymmetry is more pronounced for small and poorly performing firms (Hong et al., 2000), we propose our fourth hypothesis as follows:

H4: *The effect of institutional ownership is more pronounced in private, small and poorly performing firms.*

3. Data and methodology

3.1 Data

Our sample covers all listed firms on the *Shanghai* and *Shenzhen Stock Exchanges* that have raised capital through PEPs from 2005 to 2013. Firms in financial and utility industries are excluded due to their high sensitivity to government regulations. We drop the firm-year observations if a stock is subject to the special treatment status (known as "ST stock").[7] We finally obtain 972 sample firms that have conducted

6 In August 2013, a listed SOE, the *BOE Technology Group* (000725.SZ), issued the largest PEP at the time in the A-share market, raising 46 billion RMB. This was BOE's fourth round of PEPs since 2006. However, the company's stock returns were quite poor, with an annual return of less than 10%.

7 In the *Shanghai* and *Shenzhen Stock Exchanges*, stock identified with an "ST" or "*ST" label means that a firm has suffered losses for at least two consecutive years or has commenced delisting procedures.

PEPs during 2005–2013.[8] Data on PEPs and institutional shareholdings are retrieved from WIND, a leading database on listed firms in China, and the firm characteristics are retrieved from the China Stock Market and Accounting Research (CSMAR) database. We rely on the seasonal data of institutional shareholdings in order to capture the changes of institutional ownership.

3.2 Methodology

Using a balanced panel data, we estimate an OLS model of firm performance following Chemmanur et al. (2009). We examine the role of institutional investors in two ways: original institutional ownership before PEP announcements (*Institutional holding*) and participation by institutional investors in the PEPs following announcements (*Participation*). We also include an interaction term of *Institutional holding* and *Participation* to examine the incremental impact of original institutional investors choosing to participate in the PEPs.

$$
\begin{aligned}
Firm\ Performance \\
&= Institutional\ holding_{i,t} + Participation_{i,t} \\
&+ Institutional\ holding_{i,t} \text{ x } Participation_{i,t} + ROA_{i,t-1} + Size_{i,t-1} \\
&+ Leverage_{i,t-1} + Collect_{i,t} + Prior\_90AR_{i,t} + Discount_{i,t} + Prior\_90Risk \\
&+ SOE + Largest + Board + Independence + Duality + \varepsilon_{i,t}
\end{aligned}
$$

Firm Performance is measured as the short-term stock return, long-term stock return and long-term operational performance. The short-term stock return is measured by the cumulative abnormal return over an event window of [-3, +3] around

[8] We cross-check the confounding events such as SEOs and institutional ownership change (by at least 5%) due to secondary market transactions, debt conversion and M&A (Butler and Wan, 2010; Pontiff and Woodgate, 2008; Affleck-Graves and Miller, 2003; Ikenberry et al., 1995). We find qualitatively similar results, and the results are omitted for brevity.

the announcement date, i.e., CAR [-3, +3].[9] The long-term stock return is measured as the cumulative abnormal return starting from the PEP announcement date till 365 trading days afterwards. In the robustness check, we also measure such returns using alternative asset pricing models, and the results are qualitatively similar. The long-term operational performance is measured by one-year and three-year average *ROA* following the PEPs. Also, we include the change of capital expenditure, *CAPEX [0, 1]*, which is the ratio of net cash flow spent on investment to total asset in the year after the PEPs. Definitions of key variables are listed in the Appendix, and all variables are winsorized at the 1st and 99th percentiles.

ROA, *Size* and *Leverage* are included to control for the characteristics of listed firms. *Collect* is the logarithm of the capital raised by PEPs. *Discount* is the discount rate that the offer taker accepts for the PEPs. We include the average abnormal return (using a market model) for the 90 days before the event window to control for the stock anomalies that are independent of the PEPs and its standard deviation during the same period to control for the volatility. We also control for a set of corporate governance variables: state ownership of the firm (*SOE*), ownership of the largest shareholder (*Largest*), the log of the number of board members (*Board*), the portion of independent directors (*Independence*) and whether the CEO is also the chairman of the board (*Duality*).

3.3 Summary statistics

Table 1 summarizes the frequency of PEPs in China from 2005 to 2013. Since the

[9] The results are qualitatively similar if we use *CAR [-1, +1]*.

implementation of the "*Guidance for Share Issuance*" in 2006,[10] PEPs have become a dominant fund-raising tool for Chinese listed firms. The average institutional ownership of such PEPs rose from 4.8% in 2005 to 38.0% in 2013.[11]

(Insert Tables 1 Here)

To cross-check the consistency with the existing literature, we firstly replicate the market reactions to the announcements of PEPs. We calculate the cumulative abnormal returns (CARs) in the period surrounding the announcements of PEPs and examine whether the CARs are significantly different from zero. Table 2 shows that the average of CAR[-3, +3] is 17.1%, while the median is 4.6%, which are statistically significant at the 1% level and consistent with the existing literature (Wruck, 1989; Lu et al., 2011; Fonseka et al., 2014).[12]

The market reaction to PEP announcements differ significantly from that of public equity offering. There have been different studies on China's public equity offerings. In contrast to our finding that the median CAR[-3, +3] for PEPs in China is 4.6%, Shahid et al. (2010) argue that the SEO's announcement effect has a CAR[-3, +3] of -1.44% in China, while this negative market reaction to the SEO announcements is consistent with other prior studies in China (Cheung et al., 2006; Fung et al., 2008).

The negative market reaction to SEO announcements follows the overvaluation hypothesis developed by Myers and Majluf (1984). Specifically, when there is severe

[10] Before May 2006, only two PEPs took place: *Dazhong Transportation Group* (600611.SH) and *J.S. Corrugating Machinery* (000821.SZ).

[11] Table 1 in the online appendix shows the industry distribution of PEPs, while the three industries with the highest frequencies of PEPs are manufacturing (584), sales (55) and energy (48).

[12] We use unadjusted stock price to calculate the cumulative abnormal returns (CARs). In untabulated tests, we also use adjusted stock price to calculate CARs, and the results are qualitatively similar.

information asymmetry between the issuing firm and the market, a large mispricing would discourage good firms from issuing equity, and thus the market would treat public equity issuance as a bad signal of the firm's quality. However, the story is quite different in private equity placements, in which only a small group of investors are approached by the issuing firm. Since PEP investors mostly consist of corporate insiders and sophisticated institutional investors, the information asymmetry is mitigated to a large extent. Using US data, Hertzel et al. (2002) find that public listed firms that place equity privately have positive announcement returns in the short run but a negative stock-price performance *ex post* in the long run, which is due to investors' over-optimism about the firms' prospects.

In addition, Table 2 also shows summary statistics for other key variables in the model. On the one hand, the short-term stock return to the PEPs is more pronounced than the long-term stock returns. On the other hand, institutional investors account for 21.7% of the shareholdings, which substantiates their essential role in China. In addition, there are wide variations of PEPs characteristics such as the purchase discount and the funds collected (shown as the proportion of total assets). Participants of PEPs can have a 21.5% discount rate based on the market closing price, which induces investors to participate in the PEPs despite a poor performance in the long run (Wruck, 1989).

(Insert Table 2 Here)

3.4 Graphic comparison

To illustrate the impact of the presence of institutional investors in the PEPs, we create a graphic comparison of market reactions to PEP announcements. We define a

firm as with the presence of institutional shareholdings if no less than 5% of its total investors are institutional investors (Group 1); otherwise, the firm is defined as without the presence of institutional shareholdings (Group 0). Figure 3 illustrates the CARs in 60 trading days around PEP announcements, and Figure 4 illustrates the relative trading volume for 120 trading days around PEP announcements. The abnormal return is computed from a market model, and the relative trading volume is calculated using the trading volume scaled by the average trading volume during the 360 trading days before the PEP announcements. Both figures show that the market reaction is smoother with the presence of institutional investors. In particular, Figure 3 shows that the average market reaction to the PEP announcement is positive, regardless of institutional investors' presence *ex ante*. However, with the presence of institutional investors, the market reacts less aggressively, and the stock movement exhibits less volatility. This implies that institutional investors play a role of stabilizer for the stock price of the holding company. The presence of institutional investors *ex ante* helps reveal the true quality of the issuing firm. The signaling effect alleviates the information asymmetry between the PEP issuer and the market, so that the market could perceive the firm's prospects more rationally, which leads to a smaller market reaction. Furthermore, if the original institutional investors participate in the PEP project, it conveys a positive signal to the market on the quality of the PEP project and a better prospect of the PEP issuer.

(Insert Figures 3 and 4 Here)

4. Empirical results

4.1 The impact of institutional ownership on stock returns

Regarding the role of institutional investors in equity issuances, Chemmanur et al. (2009) investigate US public equity offerings and argue that institutional investors possess private information about SEOs and play a role of information production instead of manipulative trading. Consistently, we will show that the institutional investors' role of alleviating information asymmetry between the issuing firm and the market is also significant in private equity placements. First of all, the online Appendix Table 2 shows the results of the univariate test on the relation between institutional ownership and firm performance. When the institutional ownership is sorted by CAR[-3, +3], the institutional ownership in the bottom half of the sample (32.4%) is higher than that in the top half (27.6%), and the difference is statistically significant at the 1% level. However, we do not find any significant difference in the institutional ownership between groups with high versus low levels of long-term stock returns.

Model (1) of Table 3 shows that a higher institutional holding before the PEP announcements is associated with a lower short-term stock return, and the result is statistically significant at the 1% level. Thus, institutional investors *ex ante* may convey insider information to uninformed investors and thus lead to a lower short-term stock return. In addition, the participation of institutional investors in the PEPs also lowers the market reaction, which suggests that institutional investors' involvement in the PEPs may alleviate the uncertainty of the issuer's quality and thus smooth the market reaction. Interestingly, the coefficient of the interaction term between institutional holding and participation is positive and significant at the 5% level in Model (2) of Table 3, while the results are qualitatively similar in Models (3)–(5) with a more comprehensive set of control variables. To put it differently, the participation of institutional investors in the PEPs given a high institutional

shareholdings *ex ante* will induce a higher market reaction on the contrary. We conjecture that such "double certification" by institutional investors conveys a good signal of the PEPs, which leads to a higher market reaction.

(Insert Table 3 Here)

4.2 The impact of institutional ownership on firm performance

When examining the sensitivity between institutional ownership and long-run performance, we also add the market reactions, CAR[-3, +3], as one of the independent variables. In this way, we could identify more clearly whether the predictive power over firm performance comes from the information revealed by institutional investors or by the PEP announcement. Table 4 shows that the long-term firm profitability, i.e., 3-year average ROA, could jointly be predicted by the market reaction, the institutional holdings *ex ante* and the participation of institutional investors in Model (2), and the economic significance of the predictive power is much stronger with the presence of institutional investors compared with Model (1). This implies that institutional investors indeed have superior ability in identifying better performing PEP firms. Model (4) of Table 4 shows that the coefficient of CAR[-3, +3] is significantly negative at the 1% level, i.e., a higher market reaction leads to a lower capital expenditure in the year following the PEP announcement. However, the results suggest that institutional investors are unlikely to affect corporate investment decisions such as capital expenditures. Instead, institutional investors are capable of selecting stocks with better long-run performance. To some extent, it also implies that the information revealed by institutional investors is more about the overall quality of the issuing firm rather than merely the quality of the PEP itself.

(Insert Table 4 Here)

We then conduct multiple cross-sectional tests by firm size, leverage, past performance and state ownership. Specifically, we split the sample by the median value of firm size, leverage, past performance and also by the state ownership. The results of the heterogeneity of market reactions by firm characteristics are reported in Table 5. We find that there is no systematically different performance by firm leverage, past performance and state ownership. However, with higher institutional holdings *ex ante*, the market reaction is significantly lower for small firms than for big firms. Compared with big firms, small firms draw little attention from the market and have less analyst coverage (Hong et al., 2000), and thus the market knows little about small firms. Therefore, the significantly smaller coefficient of institutional holdings in small firms indicates that the signaling effect of institutional ownership is more pronounced in small firms. Not surprisingly, this signaling effect does not exist for big firms as they face less information asymmetry and are more transparent. In contrast, in Table 3 of the online Appendix, we show that there is no significant difference in the long-run performance (i.e., 3-year average ROA) following the PEP announcement across firm size, leverage, operating performance and state ownership.

(Insert Table 5 Here)

In addition, we also try various alternative asset pricing models to measure the abnormal stock returns, including the CAPM, Fama-French 3-factor and 5-factor models (Fama and French, 2015), and Hou et al. (2015) q-factor model. Our results

remain qualitatively similar using these alternative models.[13]

4.3 Investor identity: strategic investors versus liquidity investors

We will examine the heterogeneous monitoring incentives across different types of institutional investors and rule out the possibilities of a monitoring role of institutional investors. Brophy et al. (2004) show that post-issuance performance depends on the identity of the private placement buyer. We classify them into strategic investors versus liquidity investors (Noe, 2002). There are 13 types of institutional investors in the Chinese capital market. Strategic investors have proper monitoring incentives on firms, while liquidity investors do not. We classify listed and non-listed corporate investors, financial institutions (commercial banks, insurance and brokerage firms), state-owned funds (pension and social security funds) and private equity as strategic investors. We define corporate investors and financial institutions as grey institutions as they may have close business ties with PEP issuers, which may help acquire issuers' proprietary information. State-owned funds have been on the rise in China recently. The central government has proper incentives to monitor the operation of PEP issuers for the sake of a stable and safe return, although pension funds may also have business ties with PEP issuers. However, pension funds account for less than 1% of institutional shareholdings, so categorizing pension funds as grey institutional investors does not change our results substantially. In contrast, we include mutual funds, QFIIs and asset managers (trust funds and specialized financial products) as liquidity investors as they mainly focus on selecting stocks and earning returns in the short term.

[13] The results with alternative asset pricing models are available in online Appendix Table 4.

(Insert Table 6 Here)

Table 6 shows that both strategic and liquidity institutional shareholdings *ex ante* can contribute to alleviating information asymmetries. The coefficients of both types of institutional shareholdings before PEP announcements are significantly negative. However, only liquidity investors' shareholdings are associated with better operational performance in the long term (3-year ROA). Interestingly, institutional shareholdings *ex ante* by strategic investors are positively associated with long-term stock returns and are significant at the 5% level, which suggests that some insider information cannot be fully exploited by liquidity investors. The coefficient of the interaction term of institutional shareholdings and institutional participation is negative for strategic investors, which almost cancels out the positive effect of strategic investors on the long-term stock returns. We do not find such patterns for liquidity investors, however. The expropriation of private benefits by strategic investors prevails in emerging market countries, which is harmful to firm valuations. Therefore, despite a signaling role of strategic investors *ex ante* the PEPs, market investors do not welcome their participation in the PEPs. In sum, we find that the monitoring role of institutional investors cannot explain the market reactions or the long-term operational performance of PEP issuers, which further substantiates their role in alleviating information asymmetries.

The online Appendix Table 5 shows the composition of strategic investors and liquidity investors. We find that the weight heavily tilts towards non-listed corporate investors in the strategic investor category and towards mutual funds in the liquidity investor category. Therefore, we conjecture that the results for strategic and liquidity investors are mainly driven by these two types of institutional investors.

Table 6 in online appendix shows that among strategic investors, the alleviation of information asymmetries between issuers and the market can be attributed to non-listed corporate investors. Compared with listed corporate investors, non-listed corporate investors may convey more insider information that is not publicly available. Therefore, the market can retrieve more valuable signals from non-listed corporate investors, and the marginal effect on the market reaction should be higher than listed corporate investors. Furthermore, shares held by financial institutions are positively associated with firms' operational performance. Commercial banks, for example, have expertise in acquiring the proprietary information of their borrowers and thus can select firms with better prospects (He et al., 2016). Therefore, when commercial banks become strategic investors, the operational performance of PEP issuers should be higher in the long run. However, as commercial banks may have business ties with PEP issuers, they also have a chance to collude with the controlling shareholders. This may explain the negative coefficient of the interaction term between bank ownership and banks' participation in the PEPs for the operational performance. Finally, there is no significant impact of private equity shareholdings on the operational performance in the long run, although private equity can typically improve corporate governance and operational performance in industrial countries.

Online Appendix Table 7 shows that among liquidity investors, mutual funds not only reduce information asymmetries but also have superior knowledge about selecting better stocks in the long run. With the participation of new mutual funds, the announcement effect is higher by 8.3% and significant at the 10% level for the CAR [0, 365]. Also, despite a small weight in the composition of institutional investors, asset managers such as various financial products can also select stocks with better operational performance. Finally, foreign institutional investors have limited power in

explaining operational performance, which may be due to limited presence in China.

5. Robustness tests

5.1 Endogeneity

We have employed the event study approach to examine the impact of institutional investors on firm performance, which mitigates the endogeneity concerns. We use private equity placement as the event in which we study the role of institutional investors. In order to further strengthen the robustness of our findings, we employ our sample firms' weightings in the CSI 300 Index as the instrumental variable for institutional ownership.[14] Institutional investors tend to pay more attention to constituent stocks of market index and increase their shareholdings in constituent stocks with higher weightings (Boone and White, 2015; Crane et al., 2016). Therefore, we expect that institutional holdings are positively correlated with a firm's weighting in the CSI 300 Index, while a firm's weighting in the CSI 300 Index is exogenous to the market reaction to a PEP announcement. Table 7 shows the first and the second stage estimations of the IV regressions.

(Insert Table 7 Here)

The first stage regression shows that institutional holdings in a firm are well instrumented by the firm's weighting in the CSI 300 Index (significant at the 1% level). In addition, the second stage regressions show that the impact of institutional ownership on market reaction as well as long-run firm performance are consistent with our earlier findings, i.e., higher institutional holdings *ex ante* are associated with

[14] The CSI 300 Index is a capitalization-weighted stock market index designed to replicate the performance of 300 representative stocks traded in Shanghai and Shenzhen stock exchanges. The index is compiled by the China Securities Index Company, Ltd.

a smaller market reaction and a better long-run firm performance.

5.2 Channel: Institutional shareholdings and PEP discount rate

We run additional tests to rule out some alternative explanations. As the coefficient of institutional holdings is negative, one potential explanation is that institutional investors may collude with the largest shareholders and destroy firm value. However, the interaction term with participation is significantly positive, which indicates that market investors still interpret such PEPs as beneficial to firm valuations. Also, the average CAR is significantly positive around the PEP announcements in Figure 3, which indicates that the market welcomes the presence of institutional investors. Another explanation is that institutional investors are actively monitoring the firm, so that the market expects an improvement of corporate governance in the PEP issuers with the presence of institutional investors.

To rule out these two alternative explanations, it is essential to investigate the relationship between institutional investors and largest shareholders. We analyze the impact of institutional shareholdings *ex ante* on the PEP discount rate. Brophy et al. (2004) show that post-issue performance depends on the nature of PEP terms. Hertzel and Smith (1993) find that the discount rate in the PEPs is lower if the controlling shareholder participates. We expect that the discount rate will be lower if institutional investors can monitor the controlling shareholders.

(Insert Table 8 Here)

Table 8 shows that when the controlling shareholder participates in the PEP, higher institutional shareholdings will induce a higher PEP discount rate. Thus, it is unlikely that institutional investors monitor the controlling shareholders. The results

are consistent with Kalcheva and Lins (2007), who show that the expropriation risk is positively associated with insider control and discount rates in the context of weak external governance. If anything, such relation has been dominated by the controlling shareholder as the coefficient of *Participation* is statistically negative, i.e., the discount rate is lower when institutional investors participate in the PEPs. Do institutional investors collude with the controlling shareholders? It shows that the coefficients are significant for liquidity investors but not for strategic investors, despite the fact that the latter are more likely to collude with the largest shareholders. In sum, our results suggest that institutional investors are unlikely to play a monitoring role according to the patterns of market reactions and operational performance of PEPs.

5.3 Propensity score matching

Another potential endogeneity issue is that both firm performance and institutional shareholdings could be driven by some omitted variables. We have used multiple approaches to rule out this endogeneity concern. On the one hand, we investigate the impact of institutional ownership on firm performance in the context of PEP issuance, i.e., how the stock market interprets the presence of institutional investors *ex ante*, and also how the participation of institutional investors affects the firm valuation, which may alleviate this endogeneity concern. On the other hand, we have used industry and year fixed effects to control for some unobserved factors.

We will use the propensity score matching method to further check the robustness of our results. We conduct a counterfactual test in order to examine whether the presence of institutional ownership affects the performance of PEPs

through alleviating information asymmetries. Figure 5 shows that institutional ownership mostly lies in the [0, 5%] interval, while a substantial drop is observed beyond 5%. We define 5% as a threshold beyond which institutional investors become insiders of a firm with more proprietary information. We focus on firms with institutional ownership close to 5%, as crossing the threshold of 5% may be caused by firm behaviors that are exogenous to institutional investors (such as stock dividends or share repurchases). We define the treatment group as firms with institutional ownership of no less than 5%, and others with institutional ownership of less than 5% are classified as the control group.

(Insert Figure 5 Here)

We employ the propensity score matching method to identify firms in the control group that have a similar likelihood for the presence of institutional investors. The nearest neighbor matching technique is employed to identify the matched firms. In order to obtain a score for the presence of institutional investors, we match firms' financials, governance characteristics and PEP terms. To alleviate selection issues for the control group, we perform the random matching for 200 times and find the two closest neighbors. Panel A of Table 9 shows that 133 pairs of firms are matched successfully. We do not find any significant difference between the treatment and control groups in terms of these key matching variables.

(Insert Table 9 Here)

Panel B of Table 9 shows that the results are not qualitatively different from our earlier results. The presence of institutional investors *ex ante* is associated with a lower short-term stock return and better long-term operational performance, whereas the institutional holdings are not correlated with long-term stock returns. These results

substantiate a causal relationship between institutional shareholdings and short-term market reactions, and institutional investors can select PEP issuers with better operational performance in the long term.

6. Conclusion

This paper examines the impact of institutional investors on the performance of firms raising funds through PEPs from 2005 to 2013. We find that the market reaction to the PEP announcements is smaller for issuers with higher institutional shareholdings *ex ante*. In other words, without the presence of institutional investors, the market reaction to PEP announcements would have been higher. Also, the long-run firm performance can be explained not only by the information conveyed by the event of PEP announcement but also by the institutional ownership *ex ante*, which is consistent with Chemmanur et al. (2009), who indicate that institutional investors have private information on picking better performing firms. Furthermore, capital expenditure after a PEP announcement could be predicted by the market reaction but not by institutional ownership, which suggests that institutional investors do not have any impact on corporate investment behaviors. It also implies that the information revealed by institutional investors is more about the fundamental quality of the issuing firm, rather than the prospect of a particular private equity placement. Conditional on the participation of institutional investors in the PEPs, the discount is significantly deeper when the largest shareholder also participates in the PEPs. Also, our results suggest that the relation between institutional ownership and firm performance is mainly driven by liquidity investors rather than strategic investors, and they convey proprietary information to the market instead of monitoring the PEP issuers. Put it

differently, independent financial institutions have superior knowledge about selecting stocks as compared to other corporate investors with potential business ties with the PEP issuers. In addition, the so-called “qualified market participants” such as private equity and foreign investors are still limited in their presence in China, which needs more support during the reform of the Chinese capital market. Furthermore, the sensitivity of firm performance to institutional ownership is more pronounced in small firms, which exhibit severer information asymmetry.

Institutional investors respond actively to corporate events. Chemmanur et al. (2009) find that for SEOs with better earnings persistency, institutional investors achieve higher stock returns by increasing their shareholdings in these firms. With the participation of institutional investors, information asymmetries between the issuers and the market are mitigated substantially. One policy implication of our results is that independent financial institutions should be encouraged more to participate in the stock market in China, in particular the QFIIs, which only accounts for less than 1% of institutional ownership. The presence of these financial institutions will be helpful in screening the issuers of PEPs with better operational performance, thus leading to a more efficient capital market in China.

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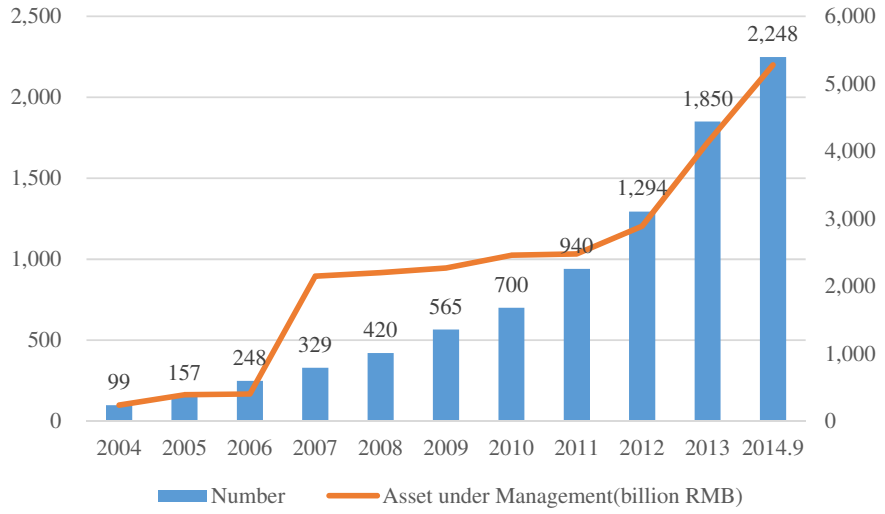

Figure 1: Development of mutual funds in China, 2004–2014.9

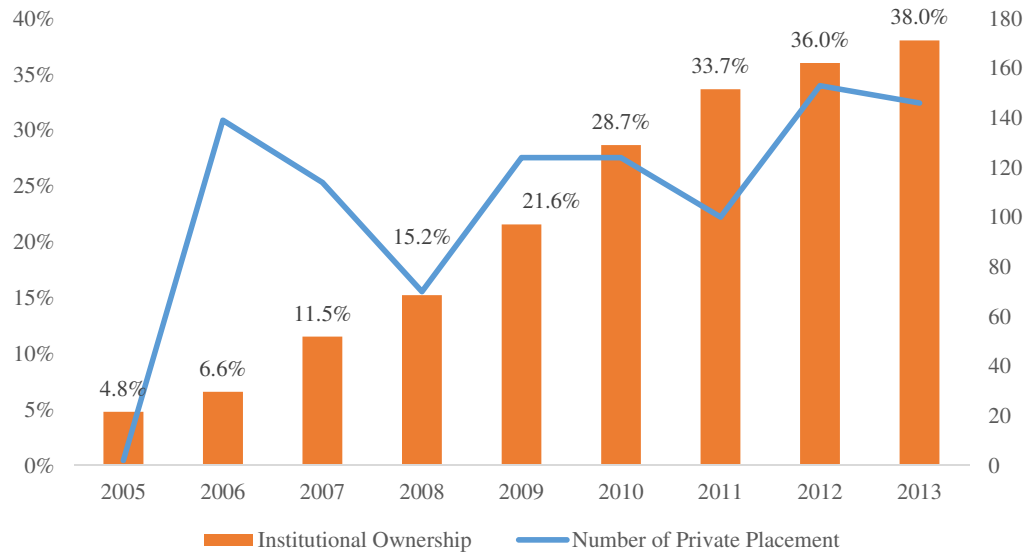

Figure 2: Institutional ownership and private equity placements in China, 2005–2013

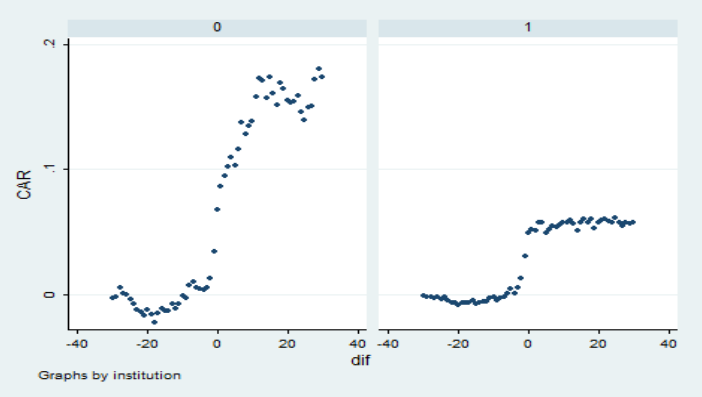

Figure 3: CAR[-30, +30] of PEP announcements

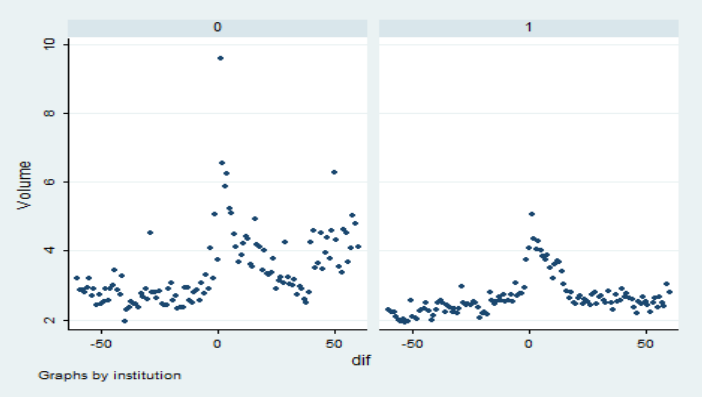

Figure 4: Relative trading volume [-30, +30] of PEP announcements

Note: In Figure 3 and Figure 4, "0" stands for PEP firms without the presence of institutional investors (ownership of less than 5%), while "1" represents those with institutional investors whose ownership is no less than 5%. CAR is the cumulative abnormal return computed by the market model. Relative trading volume is computed by the daily trading volume divided by the average trading volume in the recent 360 days prior to the event period, which starts from the 30th day before the PEP announcements and ends on the 30th day afterwards.

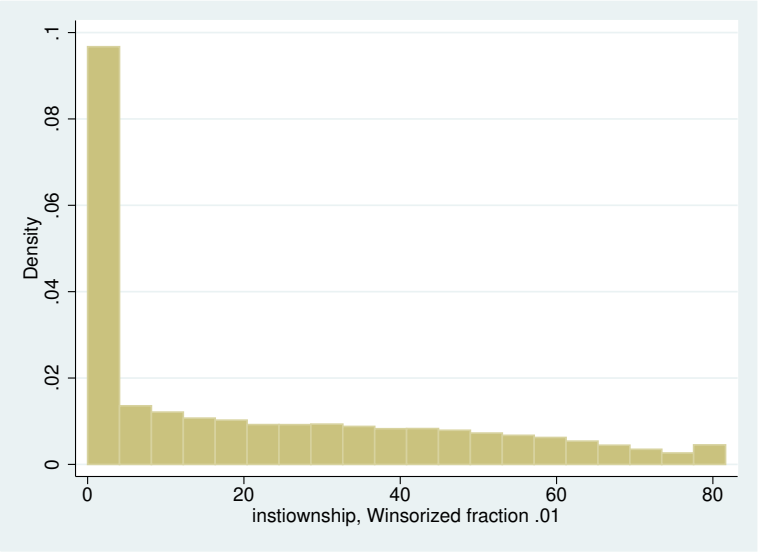

Figure 5: Histogram of institutional shareholdings

Table 1: Distribution of private equity placements (PEPs) and institutional ownership.
This table reports the annual distribution of PEP events of listed firms on Chinese A-share stock market from 2005 to 2013. *Institutional Ownership* represents the average proportion of institutional ownership in these PEP issuers. *Increase* and *Decrease* describe the number of the listed firms with PEPs, whose institutional ownership changes in each period.

Year	Number	Institutional ownership	Change of institutional ownership in PEPs			
			Increase	%	Decrease	%
2005	2	4.8%	2	7.3%	0	2.3%
2006	139	6.6%	78	14.2%	61	3.3%
2007	114	11.5%	60	22.2%	54	6.1%
2008	70	15.2%	34	27.0%	36	9,7%
2009	124	21.6%	67	34.5%	57	14.3%
2010	124	28.7%	59	37.8%	65	22.3%
2011	100	33.7%	55	40.1%	45	28.5%
2012	153	36.0%	58	40.4%	95	32.4%
2013	146	38.0%	68	44.4%	78	33.6%
Total	972	21.4%	481	30.0%	491	16.5%

Table 2: Summary statistics.
This table presents descriptive statistics of the key variables. CAR[-X, +Y] is the cumulative abnormal return during the announcement periods of PEPs, starting from X days before and ending Y days afterwards. The event date is defined as the date on which the PEP plan is first issued. *ROA* is the proportion of net profits over total assets. Both the *ROA* one year later and the 3-year-average *ROA* are documented. *Institutional holding* is the proportion of equity shares held by institutional investors. *Participation* equals 1 if institutional ownership increases during the season when the PEP plan is first announced. All variable definitions are in Appendix 1.

Dependent Variable	**Obs.**	**Mean**	**Median**	**Sd.**	**Min.**	**Max.**
CAR[0]	972	0.018	0.001	0.051	-0.141	0.168
CAR[-1,+1]	972	0.211	0.071	0.072	-0.048	0.575
CAR[-3,+3]	972	0.171	0.046	0.381	-0.182	0.895
CAR[-5,+5]	972	0.093	0.050	0.183	-0.524	0.822
CAR[-7,+7]	972	0.101	0.056	0.209	-0.580	1.018
CAR[-30,+30]	972	0.104	0.061	0.340	-2.603	1.658
CAR[-3,+1]	972	0.065	0.046	0.110	-0.258	0.456
CAR[-5,+1]	972	0.070	0.048	0.119	-0.231	0.529
CAR[-7,+1]	972	0.073	0.051	0.129	-0.307	0.570
CAR[-30,+1]	972	0.075	0.048	0.207	-1.274	1.217
CAR[0,365]	695	0.026	0.005	0.477	-1.385	1.888
ROA[0,1]	932	0.024	0.021	0.044	-0.148	0.166
ROA[0,3]	896	0.026	0.025	0.035	-0.148	0.166
Independent Variables						
Institutional holding	78,444	0.217	0.127	0.238	0	0.816
Participation	972	0.495	0.000	0.500	0	1
Control Variables						
Firm size	76,860	21.723	21.551	1.343	18.729	26.533
Leverage	76,860	0.500	0.491	0.264	0.040	1.921
ROA	59,517	0.023	0.017	0.042	-0.148	0.166
Collect	845	0.314	0.170	0.492	0.015	4.307
Discount	796	0.215	0.214	0.290	-0.919	0.798
Prior_90AR	972	0.000	0.000	0.004	-0.020	0.009
Prior_90Risk	845	0.027	0.026	0.008	0.010	0.057
SOE	78,444	0.600	1.000	0.490	0	1
Largest	76,824	0.386	0.369	0.166	0.008	1
Board	76,860	2.194	2.197	0.204	1.609	2.708
Independence	76,860	0.368	0.333	0.053	0.273	0.571
Duality	76,860	0.230	0.000	0.421	0	1

Table 3: The impact of institutional ownership on the market reaction to PEP announcements. The dependent variable CAR[-3,+3] is the cumulative abnormal return to the announcement of PEPs, starting from 3 days ahead of and ending on the third day after the event. *Institutional holding* is the proportion of equity shares held by institutional investors. *Participation* equals 1 if institutional ownership increases during the season when the PEP plan is first announced. All variable definitions are in Appendix 1. Heteroscedasticity robust standard errors are in parentheses. ***, ** and * indicate significance at the 1%, 5% and 10% levels.

	CAR[-3,+3]				
	(1)	(2)	(3)	(4)	(5)
Institutional holding	-0.251***	-0.347***	-0.231***	-0.225***	-0.228***
	(0.053)	(0.067)	(0.066)	(0.075)	(0.076)
Participation	-6.553***	-12.636***	-7.330**	-7.970**	-7.604**
	(2.256)	(3.445)	(3.245)	(3.453)	(3.473)
Institutional holding x Participation		0.231**	0.156*	0.223**	0.207**
		(0.099)	(0.092)	(0.101)	(0.102)
Firm size			-6.210***	-3.577***	-3.791***
			(0.950)	(1.132)	(1.204)
Leverage			43.630***	37.607***	38.117***
			(3.778)	(4.099)	(4.126)
ROA			1.571***	1.369***	1.393***
			(0.241)	(0.253)	(0.258)
Collect				-1.558	-2.112
				(2.465)	(2.490)
Discount				-0.050	-0.049
				(0.040)	(0.040)
Prior 90AR				-37.314***	-37.288***
				(3.390)	(3.421)
Prior 90Risk				12.128***	12.142***
				(1.623)	(1.632)
SOE					1.686
					(2.357)
Largest					9.792
					(7.601)
Board					-6.258
					(6.612)
Independence					5.535
					(24.374)
Duality					-1.396
					(2.875)
Constant	29.067**	31.415***	135.227***	63.100*	71.866**
	(11.906)	(11.917)	(22.150)	(32.599)	(36.185)
Industry, year and	Yes	Yes	Yes	Yes	Yes
Observation	896	896	875	713	713
Adjusted-R square	0.149	0.153	0.295	0.436	0.435

Table 4: The impact of institutional ownership on firm performance.
Firm performance is measured by 1-year and 3-year average ROA, and 1-year cumulative abnormal returns (CAR[0,365]) after the PEP announcement. ROA is net profits over total assets. *Institutional holding* is the proportion of equity shares held by institutional investors. *Participation* equals 1 if institutional ownership increases during the season when the PEP plan is first announced. All variable definitions are in Appendix 1. White heteroscedasticity robust standard errors are in parentheses. ***, ** and * indicate significance at the 1%, 5% and 10% levels.

	Firm performance			
	ROA[0,1]	ROA[0,3]	CAR[0,365]	CAPEX[0,1]
	(1)	(2)	(3)	(4)
CAR[-3, +3]	0.008	0.010**	0.384*	-0.001***
	(0.005)	(0.004)	(0.209)	(0.000)
Institutional holding	0.017	0.026***	0.063	0.001
	(0.011)	(0.009)	(0.141)	(0.001)
Participation	0.251	1.087**	-0.883	0.017
	(0.520)	(0.431)	(6.998)	(0.032)
Institutional holding x Participation	-0.002	-0.014	0.047	-0.000
	(0.014)	(0.012)	(0.191)	(0.001)
Firm size	0.227	-0.030	-0.966	-0.010
	(0.179)	(0.149)	(2.409)	(0.011)
Leverage	-1.492**	-0.224	9.327	0.109***
	(0.637)	(0.528)	(9.713)	(0.039)
ROA	0.391***	0.358***	-0.536	-0.004*
	(0.037)	(0.031)	(0.598)	(0.002)
Collect	-0.265	-0.300	8.915	0.001
	(0.398)	(0.330)	(6.972)	(0.026)
Discount	0.616	0.089	24.657***	-0.027
	(0.564)	(0.468)	(7.802)	(0.034)
Prior_90AR	-0.985*	-0.684	-8.919	-0.029
	(0.555)	(0.461)	(7.659)	(0.034)
Prior_90Risk	-0.044	-0.394*	-2.124	-0.006
	(0.267)	(0.222)	(3.601)	(0.016)
SOE	-0.327	-0.656**	2.967	0.007
	(0.340)	(0.283)	(4.483)	(0.021)
Largest	-0.227	0.450	-19.810	0.007
	(1.106)	(0.917)	(14.407)	(0.067)
Board	-0.214	-0.939	12.117	-0.057
	(0.951)	(0.789)	(12.608)	(0.058)
Independence	-6.496**	-4.188	45.535	-0.138
	(3.292)	(2.752)	(43.259)	(0.199)
Duality	1.021**	0.441	2.742	0.001
	(0.408)	(0.338)	(5.434)	(0.025)
Constant	-1.714	8.522*	26.314	0.297
	(5.080)	(4.642)	(67.963)	(0.308)
Industry, year and season fixed	Yes	Yes	Yes	Yes
Observation	585	584	498	574
Adjusted R-square	0.332	0.327	0.156	0.100

Table 5: Subsample analysis

To address heterogeneity among PEP issuers, we classify firms by firm size, leverage, past performance and state ownership. Firm size is the log of total assets. Leverage is a ratio of total debts in year t to the total assets at the end of year t-1. Past performance is measured by the ROA in year t-1. We split the sample by the median value of the firm size, leverage and past performance, and also by the state ownership. State ownership is a dummy variable equal to 1 if the ultimate controller of the PEP issuer is government or government agencies, such as State-owned Asset Supervision and Administration Commission (SASAC). *Diff. of coefficient* measures the difference in the coefficient of *Institutional holding* across subsamples, and the p-value of the difference is in the parentheses below.

	CAR[-3,+3]							
	Firm size		Leverage		Past performance		State Ownership	
	Small	Big	Low	High	Poor	Good	Private	SOE
Institutional holding	-0.393***	0.043	-0.259***	-0.312**	-0.352***	-0.264*	-0.295**	-0.300**
	(0.125)	(0.118)	(0.092)	(0.131)	(0.111)	(0.154)	(0.145)	(0.124)
Participation	-19.945***	11.861*	-15.032***	-7.625	-19.586***	1.496	-10.465	-10.080*
	(5.517)	(6.429)	(4.436)	(6.305)	(5.402)	(7.275)	(6.712)	(5.874)
Institutional holding x Participation	0.468***	-0.333**	0.344***	0.224	0.431***	-0.100	0.252	0.223
	(0.176)	(0.152)	(0.117)	(0.178)	(0.160)	(0.189)	(0.197)	(0.160)
Constant	224.047***	-19.066	126.605**	10.757	163.947***	0.502	187.854**	54.318
	(75.902)	(62.174)	(51.866)	(53.998)	(52.273)	(71.692)	(74.172)	(52.467)
Financial characteristics	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Corporate governance	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
PEP characteristics	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry, year and season fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observation	365	225	228	362	342	248	282	308
Adjusted-R-squared	0.509	0.024	0.265	0.471	0.486	0.348	0.443	0.354
Diff. of coefficient	-0.436		0.053		-0.088		0.005	
P-value	(0.001)		(0.737)		(0.612)		(0.9752)	

Table 6: Differed impact of strategic or liquidity investors on firm performance.

Following Noe (2002), institutional investors are classified as strategic investors and liquidity investors. Strategic investors include private equity, pension funds, social security funds, commercial banks, insurance companies, brokerage firms, listed corporate investors and non-listed corporate investors. Liquidity investors include mutual funds, qualified foreign institutional investors (QFIIs), trust funds and financial products. The control variables are the same as in the regression models in Tables 4–5, whose coefficients are omitted for brevity. Industry, year and season fixed effects are controlled for. All variable definitions are in Appendix 1. The results reported below are qualitatively similar if we include pension funds as grey institutional investors. White heteroscedasticity robust standard errors in are parentheses. ***, ** and * indicate significance at the 1%, 5% and 10% levels.

	Strategic investors				Liquidity investors			
	1-Year ROA	3-Year ROA	CAR [-3,+3]	CAR [0,365]	1-Year ROA	3-Year ROA	CAR [-3,+3]	CAR [0,365]
Institutional holding	0.002	0.010	-0.266***	0.324**	0.055***	0.051***	-0.255**	-0.184
	(0.012)	(0.010)	(0.091)	(0.162)	(0.016)	(0.014)	(0.129)	(0.232)
Participation	0.025	0.431	-8.251***	3.938	0.502	0.790***	-5.159*	6.605
	(0.389)	(0.324)	(3.013)	(5.404)	(0.362)	(0.299)	(2.845)	(4.966)
Institutional holding x	-0.017	-0.020*	0.232**	-0.354*	-0.010	-0.005	0.386**	0.123
Participation	(0.014)	(0.012)	(0.110)	(0.193)	(0.022)	(0.018)	(0.176)	(0.315)
Constant	-2.272	4.022	75.624**	0.954	1.234	7.703**	66.080*	3.882
	(4.356)	(3.780)	(36.105)	(71.456)	(4.390)	(3.757)	(36.933)	(72.392)
Control	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry, year and season	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observation	712	710	713	603	712	710	713	603
Adjusted R-square	0.342	0.309	0.437	0.161	0.357	0.338	0.432	0.160

Table 7: Endogeneity.

Institutional holding is instrumented by the weight of the stock as a constituent in the CSI 300 index in the same quarter. PEP firms that have never been a CSI 300 index constituent in our sample period are excluded. Both the first stage and the second stage results are presented. Market reaction is measured by the cumulative abnormal return in a 7-day window (CAR[-3, +3]). Firm performance is measured by 3-year ROA after the PEP announcement. ROA is net profits over total assets. Institutional holding is the proportion of equity shares held by institutional investors. All variable definitions are in Appendix 1. White heteroscedasticity robust standard errors are in parentheses. ***, ** and * indicate significance at the 1%, 5% and 10% levels.

	CAR[-3,+3]		3-year average ROA	
	First Stage	Second Stage	First Stage	Second Stage
Weight in CSI 300 index	0.134***		0.148***	
	(0.019)		(0.017)	
Instrumented institutional holding		-0.375*		0.046**
		(0.197)		(0.023)
Constant	0.540**	0.327	0.479	-1.556
	(0.240)	(0.348)	(0.349)	(6.943)
Control	Yes	Yes	Yes	Yes
Industry, Year, Season	Yes	Yes	Yes	Yes
Observation	166	166	222	222
R-square	0.478	0.591	0.506	0.250

Table 8: Institutional shareholdings and PEP discount rate.
The discount rate is in percentage on the left-hand side. Largest shareholder participation equals 1 if the largest shareholder (or the controlling shareholder) is one of the subject at which the PEP is targeted. Subsample regressions are conducted to test the different impact of institutional investors on the PEP discount rate. White heteroscedasticity robust standard errors are in parentheses. ***, ** and * indicate significance at the 1%, 5% and 10% levels.

	Discount rate					
	All		Strategic investors		Liquidity investors	
Largest shareholder	Yes	No	Yes	No	Yes	No
Institutional holding	0.244*	0.139	0.205	0.057	0.389*	0.221
	(0.139)	(0.090)	(0.155)	(0.104)	(0.219)	(0.164)
Participation	-13.395**	3.561	-5.804	-3.313	-9.157*	6.012
	(6.228)	(4.619)	(5.297)	(4.145)	(4.757)	(3.714)
Institutional holding x Participation	0.037	-0.160	-2.174	-4.480**	0.176	-0.443*
	(0.174)	(0.127)	(1.883)	(1.757)	(0.343)	(0.236)
Constant	102.937*	70.117	107.829*	63.177	109.819*	81.258*
	(55.632)	(43.563)	(57.941)	(43.655)	(57.552)	(44.589)
Control	Yes	Yes	Yes	Yes	Yes	Yes
Industry, Year, Season	Yes	Yes	Yes	Yes	Yes	Yes
Observation	275	315	275	315	275	315
Adjusted-R-squared	0.290	0.232	0.251	0.230	0.265	0.236

Table 9: Propensity score matching.
We employ propensity score matching method to measure the propensity of institutional presence in a PEP firm. ATT means average treatment effect on the treatment group. The treatment group is PEP firms with institutional ownership between 5% and 10%. The control group is PEP firms with institutional ownership of less than 5%. Nearest neighboring matching is employed as the matching method. In order to have more matched pairs of firms, we look for 2 neighbors for each sample firm.

	Panel A: Matching within each industry, year and season		
	Pre-PEP Institutional holdings [5%,10%] (N=133)	Pre-PEP Institutional holdings (0, 5%) (N=133)	T-stat of difference
Firm size	21.140	21.135	0.02
Leverage	0.580	0.539	0.69
ROA	1.384	2.616	-1.12
Collect	0.350	0.267	1.04
Discount	0.263	0.269	-0.11
AR_90	0.025	-0.017	0.67
Risk_90	0.028	0.030	-1.39
SOE	0.519	0.519	0.00
Largest	0.367	0.342	0.91
Board size	2.215	2.192	0.54
Independence	0.368	0.373	-0.55
Duality	0.135	0.115	0.29
	Panel B: Ex post PEP performance		
CAR[-3,+3]	0.088	0.361	-1.97
CAR[0,365]	0.199	0.038	1.02
ROA[0,1]	0.037	0.015	2.15
ROA[0,3]	0.031	0.021	1.68

Appendix: Definitions of key variables

Variable	Definition
CAR[-3,+3]	Sum of abnormal returns during the [-3, 3] window calculated with a market model
ROA	Net profits over total assets
CAPEX[0,1]	The ratio of net cash flow on investment in period t+1 to total asset in year t
Institutional holding	Proportion of equity shares held by institutional investors
Participation	Equals 1 if institutional ownership rises after announcement, and 0 otherwise
Size	Logarithm of total assets
SOE	Equals 1 if it is a state-owned firm, and 0 otherwise
Leverage	Total liabilities over total assets
Collect	Logarithm of the amount of money raised from PEPs, in RMB
Discount	Issuing price of PEPs minus the benchmark price scaled by the benchmark price (i.e., the stock price for 20 days prior to the announcement date)
Prior_90AR	Abnormal return in 90 days prior to the PPE announcement, i.e., the average of the actual daily return minus expected daily return following a market model for the 90 days before the announcement
Prior_90Risk	Standard error of the abnormal return in 90 days prior to the PPE announcement
Largest	Proportion of equity shareholdings of the largest stockholder
Board	Logarithm of the number of directors on board
Independence	Proportion of independent directors on board
Duality	Equals 1 if the CEO also holds the chairman position, and 0 otherwise