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# Competitors' stock price reactions in response to private equity placements: evidence from a transitional economy\*

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## ABSTRACT

This paper examines whether information conveyed by private equity placement decisions transfers to non-applying companies within the same industry. In particular, it investigates the impact of a company's announcements of the application for, withdrawal, rejection, approval and completion of private equity placement, while examining the cross-sectional differences of the market performance of their industry counterparts, both in the short- and long-term. It was found that an intra-industry reaction exists; competitors experience a decrease in stock prices in response to the announcement of the application for, approval and completion of private equity placement and an increase in stock prices around the announcement of the withdrawal or rejection of applications. Further, it was found that competitors experience a decrease in their long-term stock performance following private placements. A higher discount on private equity placement is detrimental for private equity (P.E.) issuing companies in the long-term. This study, therefore, provides evidence of the existence of a contagion effect in the long-term while a competitive effect dominates in the short-term.

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Announcement effect; China; competitive effects; contagion effects; competitor firms; private equity placement regulations

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## 1. Introduction

Over the last decade or so, private equity placements (P.E.P.s) in public markets have shown tremendous growth in developed and emerging stock markets. Private equity placements in U.S. financial markets have recently surpassed public seasoned equity offerings (S.E.O.s) in terms of dollar value and the number of transactions (Chen, Dai, & Schatzberg, 2010; Wruck & Wu, 2009).<sup>1</sup> In 2010, UK companies made 336 P.E.P.s, amounting to \$17.9 billion, while Australian companies offered \$9.5 billion in private equity in 593 placements. In China, P.E.P.s were issued by 85% of companies, accounting for 81% of the value of seasoned equity

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financing during the period from 2006 to 2010 (Abidin, Reddy, & Chen, 2012; Fonseka, Colombaro, & Tian, 2014; Yu & Xu, 2010).<sup>2</sup> As a result of the current financial crisis, people believe that financial markets should be more regulated than they were previously. In recognition of the growing significance of P.E.P.s as a source of financing and the increasing financial risks, the China Securities Regulation Commission (C.S.R.C.) introduced regulation in 2006 requiring companies to meet its approval criteria before making P.E.P.s. China, therefore, provides an example of a highly regulated market setting for private equity financing activities. Chinese P.E.P.s have some features in common with those of other countries, such as non-public offering to specific targets and the existence of certain lock-in periods. Nevertheless, there are also unique characteristics, such as various purchasing methods with cash or assets, regulation of lower limits on the offer price, different lock-in periods for different investors and C.S.R.C. administrative regulations on P.E.P.s (Lu, Li, & Wu, 2011) that distinguish the Chinese private equity market from the rest of the world. Abidin et al. (2012) argue that the new P.E.P. regulations have fewer requirements than those regulating public placements, which has resulted in the dramatic increase in the number of P.E.P.s since 2006. Hence, Chinese P.E.P.s not only affect P.E. issuing companies, but also have an impact on their industry peers. Gou, Hotchkiss, and Song (2011) find that P.E.-backed companies show better market and operating performance compared to the period before such investments. Thus, one can argue that, if P.E.-backed companies perform better, this would improve their competitive position among companies in the same industry.

Stock issue announcements are motivated by managers' desire to communicate information about the future prospects of the company. An under-valuation of the issuing company's stocks can impact other companies in the same industry (contagion effects). The contagion effect suggests that a P.E.P. announcement by one company positively affects the future prospects of competitor companies. Therefore, investors are likely to establish a positive association between the stock price of the company making the announcement and its industry competitors, and the valuation effects will spill over to competitor companies. Alternatively, P.E. issuing companies experience a positive stock price reaction at the expense of competitor companies; thus, rivals will be negatively affected (competitive effects). The competitive effect implies that the information in a P.E.P. announcement changes the existing competitive situation and leads to wealth redistribution of competitor companies in the same industry. Therefore, a P.E.P. announcement by one company negatively affects competitor companies in the same industry. In this study, we investigate whether the C.S.R.C.'s announcement of P.E.P. arrangements generate a spillover effect on the returns of competitor companies.

Although P.E.P.s have increased tremendously in emerging markets recently, to the best of our knowledge, very few studies have explored the information transmission effect of P.E.P. announcements on competitor companies, even in developed markets. China is the second largest economy in the world and the Chinese stock market is one of the largest stock markets in Asia. Hence, the findings of this study are important for P.E. issuing companies, competitor companies, investors and regulators, because they derive from a different regulatory and institutional background and geographical context. Further, Dividend yields (payout ratio divided by Price-Earning (P/E) ratio) in China were very low, because relatively new Chinese companies did not have stable cash dividend policies (Shao & Lin, 2004; Wei & Jiang, 2001). As capital gains are not taxed, Chinese investors are motivated to seek rapid capital gains from short-term stock dividends, leading to high share price volatility

(Powell, Qian, & Shi, 2013). Hence, stock price performance and the events that affect the stock price are important for investors. In this study, we address two research questions: How do the P.E.P. events such as application, approval and rejection, which are created by new P.E. regulations, affect stock price performance of competitor companies in both the short- and long-term? What is the effect of the information content of P.E.P.s on the stock price performance of competitor companies in both the short- and long-term?

This study contributes to the literature in several ways. First, according to the best of our knowledge, this is the first study that examines the information transmission effect of P.E.P. announcements in a highly regulated emerging market. Bo, Huang, and Wang (2011) pointed out that, due to the transition nature of the economy, Chinese stock markets function differently from those of major mature market economies. We describe the institutional and P.E. regulatory differences between the U.S. and China in detail in Section 2. Second, we extend the prior literature of the information transmission effect of equity financing in the context of a highly regulated emerging market. Third, we explain the causes for the information transmission effect of P.E.P. events, both in the short- and long-term in China. One can argue that the financial market should be more regulated to overcome the adverse effects of the recent financial crisis. Further, one may believe that the introduction of regulation on the P.E.P. approval process is of particular interest to regulators in other countries and that China provides an excellent example of this. Our findings demonstrate that the highly regulated Chinese P.E. market offers large discounts due to the restrictions on the category and number of institutional investors and the P.E. offering price. Moreover, in China, the regulator has the authority to reject a P.E. application. We find that the P.E. discount results in a positive stock price reaction simultaneously in both the issuing and competitor companies, providing some evidence of the existence of the contagion effect, but only in the long-term. Cumming, Siegel, and Wright (2007) identified that there is a need for additional studies to consider 'the effects of different institutional contexts on the P.E.P. and the consequent implications for the investment and performance'. Finally, we attempt to bridge the gap of knowledge in understanding the consequences of a P.E.P. on competitors' stock price performance in different institutional backgrounds and market conditions, consistent with the knowledge gap identified by Cumming et al. (2007).

China began reforming its financial market in the early 2000s and integrating it into regional and global structures (Chan, Dang, & Yan, 2012). This study looks at P.E.P. in China, the world's second largest economy and largest emerging economy in terms of gross domestic product (G.D.P.) and where P.E.P. is, by far, the dominant source of seasoned equity financing used by firms. Hence, the findings of this study are important for a large number of investors, researchers and policy-makers. China is an interesting test case for another set of reasons. Unlike in developed markets, private enforcement of investor rights and public enforcement of contractual disputes are neither well defined nor regulated in China, which relies more on an administrative governance structure to regulate the stock market (Pistor & Xu, 2005). Therefore, the findings of this study are useful for regulators and policy-makers of transitional/developing countries.

The Split Share Structure Reform in China started in 2005, which marks a major change in the ownership of the listed Chinese firms (e.g., Firth, Lin, & Zou, 2010; Hou, Kuo, & Lee, 2012). The reform abolished the split share structure (i.e., restricted state-owned and tradable shares), which resulted in the wealth of state shareholders being sensitive to share price movements and align the incentives of all shareholders (both state and private)

to monitor and ensure managers maximise the market value of their firms (Hou et al., 2012). By the end of 2008, most Chinese listed firms had completed the ratification of their compensation payout plans, had enacted the gradual abolishment of their restricted shares, which became fully tradable in the stock market (Hou et al., 2012). Moreover, a new P.E.P.-specific regulatory regime was introduced by the C.S.R.C. in 2006, which is not amended to date. Therefore, findings of this study may be applicable for beyond the sample period and helpful for decision-making for investors, P.E. issuing and non-issuing firms and regulators. Especially, findings of this study help the regulator to understand the effect of P.E.P. regulation on P.E. non-issuing firms during the initial period, and it may provide some guideline on their regulation amendments in the future.

The rest of the paper is organised as follows. Section 2 provides a description of the institutional background and Chinese regulatory requirements for P.E. issuance, which is what motivates this empirical investigation. Section 3 discusses the relevant literature and develops the hypotheses tested in the study. In Section 4, we present data and the empirical research design, while Section 5 provides the empirical findings. Section 6 concludes the paper.

## **2. Review of institutional background and Chinese stock market regulations on P.E.P.s**

Compared with developed countries, most companies in China are owned by the Chinese government, which greatly influences company operations and exerts enormous power in resource allocation and regulation enforcement (Tsai, 2008; Wu & Cheng, 2011). Sun and Tong (2003) demonstrate that the State ownership domination of listed companies is a salient institutional feature in China. This distinct feature, as noted by Qian, Roland, and Xu (1999), is the result of China's step-by-step reform compared to the accelerated privatisation approach engaged by some Eastern European countries. The portion of State-owned companies or institutions accounted for ~ 70% of total shares (Zou & Xiao, 2006) prior to reform.

In 2005, the C.S.R.C. initiated share-split reform for listed companies and unfroze non-tradable, State-owned shares. Since the reform, publicly listed companies have relied primarily upon private placements to raise equity capital rather than other types of seasoned equity offerings for new investments. The Chinese stock market functions differently to those of the major market economies, due to heavy regulations (Bo et al., 2011). In developed markets such as the U.S., private placements are the sale of unregistered equity and bonds issued by a public company to a selected group of individuals or institutions. On the other hand, in China, the P.E.P.-specific regulatory regime was introduced by the C.S.R.C. in 2006, which made it mandatory for issuing companies to obtain approval from the regulator. This system is quite different from the self-registration P.E.P. system in other countries such as the U.S. Thus, the C.S.R.C. is actively involved in the P.E. issuing process in China; and companies that fail to comply with the regulatory conditions have their P.E.P. applications rejected.

According to C.S.R.C., the purposes of the P.E.P. regulations are to (i) reduce the related-party transactions, (ii) avoid competition, (iii) enhance independence, (iv) improve asset quality, (v) improve financial stability and (vi) enhance the sustained profitability of companies. The new P.E.P. regulations are expected to ensure that non-public offerings

generate legitimate benefits. Further, companies offering P.E.P.s should determine the P.E. issue price, reflecting the best interests of all stakeholders. Regulations also govern the method for determining the P.E. price as well as the category and number of institutional investors/block-holders in a particular P.E. issue.

In the U.S., there are no restrictions on the pricing or size of a P.E.P. and the company has discretion in determining the level of discount. In China, the regulations restrict the categories of investors who can be invited to subscribe for a P.E. issue. The regulations favour passive investors, while limiting the number of institutional investors in any particular P.E. issue. Private equity placements are offered to unlimited 'accredited investors' and up to 35 'sophisticated investors' in the U.S., but in China they must be offered to the top 20 shareholders of the company. Invitees in China should comprise: (i) not less than 20 securities investment fund management companies; (ii) not less than 10 securities companies; and (iii) not less than five insurance and financial institutional investors. However, P.E.P.s can be sold to a maximum of 10 investors who belong to any type of investor category. In China, the market discount for P.E.P.s typically lies above 30%, which is higher than in U.S. companies (Fonseka et al., 2014; Lu et al., 2011).

The primary benefits of issuing P.E. for companies are to obtain low cost capital, to build relationships with strategic investors and to raise much needed funds and, thereby, gain a competitive advantage. However, the C.S.R.C. regulations discriminate between companies by rejecting some P.E.P. applications. Moreover, the C.S.R.C.'s active role in regulating and approving P.E. issuance in China can result in a lengthy process for those companies that lodge an application for a P.E. issue (Yu & Xu, 2010). The P.E.P. should be concluded within 6 months of the date of the C.S.R.C. approval.

The same as the P.E. regulation in the U.S., there is no specific regulation on the value of a P.E.P. in China. However, the board of directors should disclose the maximum amount of capital it wants to raise for the project and the P.E.P. cannot exceed the amount required for the project. If the Board is uncertain about the amount of capital required, companies should disclose the maximum amount expected to be raised from the P.E.P. In the U.S., investors cannot re-sell the registered private placement for at least 6 months, depending on whether or not they are affiliated with the issuer. However, the stock can be sold to 'qualified institutional investors' within a restricted period. In China, all newly-issued P.E.P. stocks cannot be sold within 12 months, irrespective of the category of the investor. If the stocks are bought by the controlling stockholder or any other company controlled by the real controller, they cannot be re-sold within the next 36 months. In China, P.E.P.s are more highly regulated than in the US. Table 1 shows the regulatory requirements for issuing P.E. in China.

According to the C.S.R.C.'s requirements, the decision to approve or reject an application should be published in prescribed mass media, as well as on the C.S.R.C.'s website. Investors are not fully aware of all the price sensitive information available in incomplete markets (Merton, 1987). As a result, there is greater uncertainty about the stocks of companies with lower investor recognition. Rational investors, therefore, would expect such stocks to have a higher discount rate. In developed countries, such as in the U.S., the media is more independent and competitive than in China, where the media is assumed to be under strict controls (Besley & Prat, 2006).

**Table 1.** Summary of important C.S.R.C. regulations on P.E.P.s.

Year of enforcement	Regulation affected area	Description
Prior to 2006	Eligible for applying	<ul style="list-style-type: none"> <li>• 3-year average R.O.E. <math>\geq</math> 6%.</li> <li>• No current director, supervisors or executive was punished by the C.S.R.C. over the past 3 years or publicly reprimanded by the stock exchange over the last year.</li> <li>• No guarantees, litigation, arbitration or other significant matters which seriously affect continuous operations of the company.</li> <li>• Operating earnings shall not have declined more than 50% in last issuance year if the firm had an issuance (including both equity and bond issuing) over the last 2 years.</li> <li>• No qualified, adverse or disclaimer opinion in audit reports over the previous 3 years.</li> <li>• Total cash or stock dividends of last 3 years should be more than 20% of average net distributable earnings of last 3 years.</li> <li>• No material omission, misrepresentation in financial reporting and falsification of financial accounts over the last 3 years.</li> <li>• No violations of securities law and regulations over the last 3 years.</li> </ul>
Effect on 2006	Issue target (target group)	<ul style="list-style-type: none"> <li>• Number: Less than 10 judicial persons, natural persons and other legal investment organisations who have subscribed.</li> </ul>
	Amount of shares	<ul style="list-style-type: none"> <li>• Directors should determine amount of non-public offering. If the amount of non-public offering shares is uncertain, the decision of board of directors shall specify the range of the amount (including upper and lower limit).</li> </ul>
	Pricing Benchmark	<ul style="list-style-type: none"> <li>• Benchmark date: Decision of board of directors or announcement date for decision of stockholders meeting. Price: The issuing prices shall not be lower than minimum prices. Minimum prices is average stock price of previous 20 trading days before pricing benchmark date.</li> <li>• Minimum price = Total trading value of previous 20 trading days before pricing benchmark/Total trading volume of previous 20 trading days</li> </ul>
	Purposes	<ul style="list-style-type: none"> <li>• The decision of board of directors shall specify the upper limit, the needed amount of fund for intended projects, the amount of capital investment, and the funding channel for non-public offering. If the fund is used to replenish working capital or pay back bank loans, the board of directors shall specify the amount of them; if fund is used to purchase assets, the board of directors shall specify the counter party, the target asset and pricing rules.</li> </ul>
	Invitations for subscription	<ul style="list-style-type: none"> <li>• Invitations sent to accepting investors who had submitted a subscribe letter of intent after the board announcement of the resolutions and the top 20 shareholders. Invitees should comprises (1) Not less than 20 securities investment fund management companies; (2) Not less than 10 securities companies; (3) Not less than five insurance institutional investors.</li> </ul>
	Announcements	<ul style="list-style-type: none"> <li>• The listed company received the result of whether the application of is approved or not by C.S.R.C., there should be a public announcement in the next trading day just after the result.</li> </ul>

Notes: In 2006, the Chinese Security Regulatory Commission (C.S.R.C.) placed P.E.P.s on regulatory constraints for the first time in the Chinese capital market history. Prior to 2006, public equity offering regulation was affected on P.E.P. and there was a regulation for qualifying on S.E.O. However, new P.E.P. regulation does not have eligible requirements for applying P.E.P. As a result of that there is an increasing trend of issuing P.E.P.s from 2006 due to fewer regulatory requirements for private equity than public offerings.

Source: Chinese Security Regulatory Commission (CSRC).

### 3. Literature review and hypotheses

A substantial amount of research shows that P.E.P. announcements are associated with significant positive returns for P.E. issuing companies. Wruck (1989), for example, finds that P.E. issuing companies realise statistically significant abnormal returns of 4.4% during the announcement period. A number of arguments have been proposed to justify this positive market response. Hertz and Smith (1993) argue that P.E.P.s are used by companies with limited financial slack to take advantage of profitable investment opportunities. Hertz and Rees (1998) and Hertz, Lemmon, Linck, and Rees (2002) state that the company signals its financial stability to the market by issuing equity privately. They find that P.E. proceeds are mainly used to finance new capital expenditure projects rather than using them to reduce financial leverage. Further, P.E.P.s have the capability to convey special information. Active investors such as mutual funds or other institutional investors who have the resources to monitor management find private placements attractive investments. Private equity placements, therefore, can alter ownership concentration, which can lead to an improvement in monitoring. Further, the change in concentration of ownership after private placements reveals new information to the market, signalling an efficient allocation of scarce resources, which leads to positive wealth effects (Brooks & Graham, 2005; Goh, Gombola, Lee, & Liu, 1999).

In capital markets, the occurrence of major events at a company or the disclosure of operational information by it not only affects its own stock price, but also the equity prices of its competitors. The positive association between the abnormal returns earned by the announcing company and those realised by its competitors is known as the contagion effect, while the negative relationship is referred to as the competitive effect. Our results provide evidence that P.E.P. events generate competitive effect on non-P.E.P. issuing companies in the same industry. Szewczyk (1992) also explores whether announcements of public offerings of common stock elicit abnormal stock price reactions among companies within the same industry. He finds that average abnormal returns are significantly negative for announcing and non-announcing companies. This implies that investors draw inferences about the general prospects of the industry as a whole rather than shifts in competitive advantage between the announcing company and its industry rivals.

Erwin and Miller (1998) find that, depending on the nature of the announcement, the stock prices of non-announcing companies are positively or negatively affected following an announcement by one of its industry rivals. These effects result from the market revising its expectations about the non-announcing companies' prospects upon the receipt of new information from an industry peer. The market's revision can turn out to be accurate if the event occurred as the announcing company carries new information that is relevant to competitive companies in the same industry (Desir, 2012). Few studies have examined whether equity issuing companies' financing activities affect competitors' returns. Akhigbe, Borde, and Whyte (2003) analyse the impact of initial public offerings (I.P.O.s) on rival companies and find that there is no significant impact on rival companies' stock price around I.P.O. issuance dates. However, Hsu, Reed, and Rocholl (2010) focus on the impact of large size I.P.O.s on the performance of competing companies in the same industry and find that the companies in the same industry experience the exact opposite outcome. Slovin, Sushka, and Polonchek (1992) analyse the industry-wide impact of the release of adverse information by investigating competitors' stock price reactions to S.E.O.s in their industry.



This paper observes the determinants of P.E.P. announcement information transfer and their spillover effects on the competitor companies. We find that an increasing number of P.E.P. events in a particular industry have a negative spillover effect on competitor companies. Similarly, we find that a higher P.E.P. value also has a negative spillover effect on competitor companies. In contrast, increased P.E.P. discounts have a positive spillover effect on the stock prices of competitor companies. Prior studies do not adequately study the characteristics of P.E. deals and their spillover effects on industry counterparts in both developed and emerging markets. Our findings confirm that P.E. offer characteristics are also important determinants that affect competitor companies' stock price performances.

Hsu, Reed, and Rocholl (2011) study the impacts of large P.E. investment on competing companies in the same industry and find that, in the U.S. and Canadian markets, competitor companies are subjected to negative stock returns and abnormal stock returns in both the long- and short-term. The current study differs from Hsu et al. (2011) in the following respects: (i) in China, mandatory approval from the regulator is required for P.E.P.s, whereas the U.S. has a self-regulatory P.E.P. system (Fonseka et al., 2014); (ii) the Hsu et al. (2011) study sample of P.E.P.s were purchased by large P.E. investments, whereas our study covers the sample of P.E. financing which reflected minority ownership in target companies and our sample is 100% inclusive of P.E.P.s; (iii) the Chinese P.E.P. market is smaller than the U.S. market and has a shorter history of issuing P.E.P.s than the U.S. However, P.E.P.s have largely replaced traditional S.E.O.s in China due to the introduction of new P.E.P. regulations, while the regulations on S.E.O.s have remained unchanged. Hence, the relatively larger market for P.E.P.s reflects a change in corporate ownership; (iv) we investigate the effect of the regulator's announcement of a P.E.P. on the stock price performance of competitor companies in the short- and long-term, while the Hsu et al. (2011) study is restricted to P.E. investment announcements, where the regulator has no involvement in the timing of announcements. Therefore, it is worthwhile studying the effect of P.E.P. announcements on listed but non-P.E. issuing industry competitor stock prices in the context of a highly regulated capital market. From a methodological perspective, our article is related to the literature that considers the valuation effects of capital market transactions on companies in the same industry.

### **3.1. Hypotheses development**

The literature provides several theoretical explanations and related empirical evidence on the effects of P.E.P. activity on industry competitors. The steps in the C.S.R.C. authorisation process involve assessment of an application for a P.E.P. and its subsequent approval or rejection. Some companies may withdraw the P.E.P. offer at any point between the time of application and approval, as well as after approval and before successful completion. It is also possible that some companies may not be able to successfully complete an approved P.E.P. Thus, all the events that include the announcement of a P.E.P. application, rejection or approval, and its subsequent withdrawal or completion have the potential to create an impact on competitors' stock returns.

The first hypothesis relates to the initial submission of a P.E.P. application for C.S.R.C. approval. Since it is likely that the P.E.P. will enable the company to compete successfully against existing companies in the same industry, the P.E.P. application may have a negative

impact on rivals' stock prices (Hsu et al., 2010, 2011). On this basis, we propose the following hypothesis:

**H<sub>1</sub>.** The announcement of a P.E.P. application has a negative impact on the stock prices of competitors in the same industry.

As a P.E.P. is expected to allow the issuing company to compete more successfully against industry competitors, the approval of a P.E.P. may have a negative impact on competitors' stock prices (this is a unique feature in China). Thus, we derive the second hypothesis:

**H<sub>2</sub>.** The announcement of C.S.R.C. approval of a P.E.P. has a negative effect on the stock prices of public listed companies in the same industry.

The successful completion of P.E.P.s provide the issuing company with the funds to invest in new capital expenditure projects and they can, therefore, achieve better performance than their industry counterparts. Hence, the successful completion of P.E.P.s may not be welcome news for competitor companies (Hsu et al., 2010, 2011). On this basis, we propose the following hypothesis:

**H<sub>3</sub>.** The announcement of the successful completion of a P.E.P. has a negative effect on the stock prices of public listed companies in the same industry.

If the application, approval or completion of a P.E.P. is not welcome news for competitors, then it follows that the news that an expected P.E.P. has not succeeded would be welcomed by competitors. A P.E.P. could be unsuccessful due to the application being rejected, withdrawal of the application during the approval process or withdrawal of the approved P.E. issue prior to completion. Considering the information above, we propose:

**H<sub>4</sub>.** The announcement of the rejection or withdrawal of the P.E.P. application by the C.S.R.C. has a positive price effect on publicly traded companies in the same industry.

In theory, stock prices can move due to investors updating expectations of future cash flows or discount rates. Cash flow news and discount rate news of equity financing lead to stock price movements, those factors work as functions of the predictive variables perceived and cash flow and discount rate news has an important bearing on the theoretical modelling of asset prices (Ang & Bekaert, 2007; Chen, 2009; Chen, Da, & Priestley, 2012; Larrain & Yogo, 2008). Wruck (1989), Hertzal and Smith (1993) and Lu et al. (2011) use two variables (private placement discounts and P.E.P. proceedings) to determine the information effect at issuing company level. The discount reflects the 'information price' and the cost of the placement to the company (Hertzal & Smith, 1993). Chung and Hwang (2010) advocate that the value of information and information acquisition has a considerable impact on the discount level in a private placement. Hertzal and Smith (1993) used private placement discount to measure the information effects. They reveal that the stock price effect, based on the information effects, is larger for placements where the potential degree of under-valuation is high. Krasker (1986) find that the size of a stock issue is negatively affected by the stock price. Hertzal and Smith (1993) and Fonseka et al. (2014) point out that the extent of information creation is subject to the economic scale of the P.E.P.s measured, using the Log of proceeds to measure placement size. In line with the studies of Wruck (1989) and Hertzal and Smith (1993), we argue that private placement discounts and the average proceeds from P.E.P.s at the industry level affect competitor companies. Private placement discounts and the value of P.E.P.s at an industry level is important information to transmit to the market.

This information is valuable to investors, competitors and other stakeholders in the market who may act on the information and might impact on competitors' stock price performance.

Rational investors will recognise this incentive and discount their estimates of value unless information is made credible. This credible information leads to over-valuation of competitor companies, which results in a negative stock price reaction. The extent of the information transmission effect is also subject to economies of scale and the size of discounts may be smaller in the industries that have larger placements. Hence, both the information cost of P.E.P.s (average P.E. discount at the industry levels) and the scale of P.E.P.s (average proceeds from P.E.P.s at the industry levels) can also be used to test the information transmission effect hypothesis, in addition to examining whether P.E.P.s exist within a particular industry. Based on the information above, we suggest:

**H<sub>5</sub>.** The scale of P.E.P.s and the number of P.E.P. events at the industry level have a negative price effect and the information cost of issuing companies has a positive effect on competitor companies in the same industry in the short-term.

Chen (2015) study the announcement of S.E.O.s and capital deductions on stock prices of issuing and capital deduction firms on the Taiwan Stock Market and find a positive affect stock price return in the long-term. One can argue that this kind of positive stock price return can be spillover to other firms in the same industry. Along with the arguments of short-term stock price effects, completion of P.E.P. should also affect the stock price performance of industry rivals in the long-term. In particular, the completion of a P.E.P. is expected to give the P.E.P. issuing company a competitive advantage over its competitors and, thus, negatively affect the market performance of competitor companies in the long-term. However, if the information cost is large (P.E.P. discount), this may have a positive effect on competitor companies. Based on the information above, we suggest:

**H<sub>6</sub>.** The scale of P.E.P.s and the number of P.E.P. events at the industry level have a negative price effect and the information cost of issuing companies has a positive effect on competitor companies in the same industry in the long-term.

#### 4. Data and methodology

Private equity placement data were collected manually from C.S.R.C.'s monthly Bulletin for the period 2006–2010. We chose 2006 as the starting year because the C.S.R.C. introduced the regulatory constraints on P.E. in that year. The initial sample includes 518 companies that applied for P.E.P. (615 company-year observations)<sup>3</sup> and 428 companies that successfully completed the process (488 company-year observations) companies<sup>3</sup>. Out of this initial sample, companies in the financial industry including foreign-listed Chinese companies and Chinese companies dual-listed in Hong Kong, and companies with incomplete data, such as where important P.E.P. event dates were missed, were excluded to generate the final sample to be used in our empirical analyses.

We identified companies in the same industry as the P.E.P. issuing company using C.S.R.C. industry classification data and defined them as competitor companies. In order to observe clearly the difference in the pre- and post-stock price performance of the P.E.P. event, we further restricted competitor companies in our sample to those that were publicly listed at least 2 years before the P.E.P. event year and that did not issue P.E. during our sample period. The final sample contains 2544 competitor company observations. Data about the

proceeds of P.E.P.s were obtained from the China Stock Market & Accounting Research (C.S.M.A.R.) seasonal equity offering database. We used the number of P.E.P. issues, average discount and average P.E.P. proceeds in each industry.

We employed the event study methodology to measure the market reaction of competitor (non-P.E.P. issuing) companies to the regulator’s announcements of P.E.P. events. For the purpose of generating the expected return, we first estimated the following market model:

$$R_{it} = \alpha_i + \beta_i R_{mt} + \varepsilon_{it} \tag{1}$$

Where  $R_{it}$  is the return on the  $i^{\text{th}}$  stock,  $R_{mt}$  is the return on the market index and  $\varepsilon_{it}$  is an error term. This model is estimated using the daily return data for an estimation period of 255 days that ends 45 days prior to the event day—i.e., from  $t-300$  day to  $t-45$  day, where  $t$  is the event day. The alpha and beta parameters of the model were then used to estimate expected returns as follows:

$$AR_{it} = R_{it} - \hat{R}_{it} = R_{it} - \hat{\alpha}_i - \hat{\beta}_i R_{mt} \tag{2}$$

Once abnormal returns were calculated for the sample companies for a particular day, the average abnormal returns were calculated as follows:

$$\overline{AR}_t = \frac{\sum_{i=1}^n AR_{it}}{n} \tag{3}$$

where  $n$  is the number of sample observations on day  $t$ . The mean cumulative abnormal return over a given event period is the sum of the daily mean abnormal returns and is expressed as follows:

$$CAAR_i(-l, k) = \sum_{t=-l}^k \overline{AR}_{it} \tag{4}$$

We used a cross-sectional standard deviation test to assess the significance of event window cumulative average abnormal returns (C.A.A.R.s).

$$T_{CAAR} = \frac{CAAR_{(t_{-1}|t_k)}}{\hat{\sigma}_{CAAR_{(t_{-1}|t_k)}} / \sqrt{N}} \tag{5}$$

where  $N$  is the number of observations,  $CAAR_{(t_{-1}|t_k)}$  is the mean C.A.A.R. <sub>$i$</sub>  over the  $(-1|+k)$  event window and  $\hat{\sigma}_{CAAR_{(t_{-1}|t_k)}}$  is the event window standard deviation (Brown & Warner, 1985).

We used the following regression models to test the influence of information transmission variables related to the successfully completed P.E.P. events of  $(-5, 5)$  on the abnormal return:

$$CAAR_{it} = \alpha + \beta_1(\text{PEP Discounts}_{it}) + \beta_2(\text{No. of PEP Events}_{i,j,t}) + \beta_3(\text{PEP Proceeds}_{i,j,t}) + \sum \beta_j(\text{Controls}_{i,t-1}) + \varepsilon_{i,t} \tag{6}$$

We also used the following regression analyses to determine whether information transmission effects on market performance of competitors are significantly related to the successfully completed P.E.P. events in the long-term. Specifically, we employed the following two models:

$$RET_{i,t} = \alpha + \beta_1(\text{PEP Event Dummy}_{i,t}) + \sum \beta_j(\text{Controls}_{i,t-1}) + \varepsilon_{i,t} \quad (7)$$

$$AR_{i,t} = \alpha + \beta_1(\text{PEP Event Dummy}_{i,t}) + \sum \beta_j(\text{Controls}_{i,t-1}) + \varepsilon_{i,t} \quad (8)$$

where  $RET_{i,t}$  is the annual stock return for each company  $i$  in year  $t$ .  $AR_{i,t}$  is the annual abnormal return for each company  $i$  in year  $t$ . The  $i, j$  and  $t$  denote competitor companies, industry and time, respectively. The benchmark for abnormal returns is based on the equal weighted market return.

We estimated annual abnormal stock returns based on the three-factor model of Fama and French (1993) using the calendar-time portfolio approach. Portfolios of private placements are formed daily, in calendar time. The regression model is:

$$R_{i,t} - R_{ft} = \alpha_i + \beta_{1i}(R_{mt} - R_{ft}) + \beta_{2i}SMB_t + \beta_{3i}HML_t + \varepsilon_{i,t} \quad (9)$$

where  $R_{i,t}$  is the return on portfolio  $i$  in day  $t$ ,  $R_{ft}$  is the risk free return on an average day  $t$ ,  $R_{mt}$  is the return on a market index in day  $t$ ,  $SMB_t$  is the difference in the returns of a portfolio of small and big stocks in day  $t$ ,  $HML_t$  is the difference in the returns of a portfolio of high book-to-market stocks and low book-to-market stocks in day  $t$  and  $\varepsilon_{i,t}$  is the error term for portfolio  $i$  in day  $t$ . The estimate of the intercept coefficient ( $\alpha_i$ ) provides an average abnormal return for portfolio  $i$ . S.M.B. and H.M.L. portfolios factors were obtained from the RESSET database and all other data were obtained from the C.S.M.A.R. market database. The P.E.P. Event Dummy $_{i,t}$  is an indicator variable which is equal to 1 if year  $t$  in company  $i$ <sup>th</sup> belonged to industry  $j$  and there were one or more P.E.P. events, and zero otherwise. The sample comprises years for companies in which each company has data from P.E.P. and non-P.E.P. years. The P.E.P. Event Dummy variable tests the effect of P.E.P. events on competitor companies' annual returns and annual abnormal returns.

To identify the important determinants of the information transmission effects in the long-term, we employed the following two models:

$$RET_{i,t} = \alpha + \beta_1(\text{PEP Discounts}_{i,j,t}) + \beta_2(\text{PEP Proceeds}_{i,j,t}) + \sum \beta_j(\text{Controls}_{i,t-1}) + \varepsilon_{i,t} \quad (10)$$

$$AR_{i,t} = \alpha + \beta_1(\text{PEP Discounts}_{i,j,t}) + \beta_2(\text{PEP Proceeds}_{i,j,t}) + \sum \beta_j(\text{Controls}_{i,t-1}) + \varepsilon_{i,t} \quad (11)$$

where  $RET_{i,t}$  is the annual total return for each company  $i$  in year  $t$ .  $AR_{i,t}$  is the annual abnormal return for each company  $i$  in year  $t$ . The  $i, j$  and  $t$  denote competitor companies, industry and time, respectively. The variables, their definitions and the source of the data used in the regressions are summarised in Table 2.



**Table 2.** Variables used in regression analyses.

Variable name	Type of variable	Definition	Data source
C.A.A.R.	Dependent	Cumulated Average Stock Return (C.A.A.R.), which is calculated stock return data	C.S.M.A.R. - Market Trading Database
R.E.T.	As above	Annual Stock Return	As above
A.R.	As above	Annual Abnormal Stock Return	As above
PEP_E	Independent	PEP_E is Private Equity Placement (PEP) Event, 1 if PEP event in the industry, otherwise 0	C.S.M.A.R. - Seasonal Equity Database
N_PEPs	As above	The logarithm of number of Private Equity Placement of the industry	C.S.M.A.R. - Seasonal Equity Database
V_PEPs	As above	The logarithm value of Private Equity Placement proceeds in the industry	C.S.M.A.R. - Seasonal Equity Database
Dis_PEPs	As above	Average of Discounts in particular industry level in the industry	C.S.M.A.R. - Seasonal Equity Database
Age	Control	The logarithm of operating years of each firm at the beginning of the time	C.S.M.A.R. - Financials Database
Size	As above	The logarithm of the value of total assets in each firm at the beginning of the time	As above
Leverage	As above	The ratio of interest bearing liability to equity in each firm at the beginning of the time	As above
Beta	As above	Annual beta in each firm at the beginning of the year which calculates daily return data	C.S.M.A.R. - Market Trading Database
Z-score	As above	Altman Z-score in each firm at the beginning of the year. It is calculated by: $Z = 0.012 X_{10} + 0.014 X_{20} + 0.033 X_{30} + 0.006 X_{40} + 0.999 X_{50}$ ; where, $X_{10}$ = Working Capital/Total Assets, $X_{20}$ = Retained earnings/Total Assets, $X_{30}$ = Earnings Before Interest and Tax/Total Assets, $X_{40}$ = Market Value of Equity/Book Value of Total Debts, $X_{50}$ = Sales/Total Assets, $Z$ = Overall Index	C.S.M.A.R. - Financials Database
R.O.A.	As above	Return on Assets at the beginning of the time	As above
M.B.V.	As above	Market to book value ratio at the beginning of the time	As above
O.W.N.	As above	We use dummy variable, if 1 for controlling shareholder is State and 0 otherwise.	C.S.M.A.R. - Shareholder Database
H_INDEX	As above	Herfindahl Index measures firm size in relation to the industry and, thereby, indicates the amount of competition. We apply the three-digit Chinese S.I.C. code for this measure. Thus, the sum of the squares of the market shares of each individual firm ranges from 0 to 1.	C.S.M.A.R. - Financials Database
I.N.D.D.	As above	C.S.R.C. industry classification and we apply the three-digit Chinese SIC code	C.S.M.A.R. - Data series
YEAR	As above	Years from 2006 to 2010	C.S.M.A.R. - Financials Database

Source: Authors

## 5. Empirical results and discussion

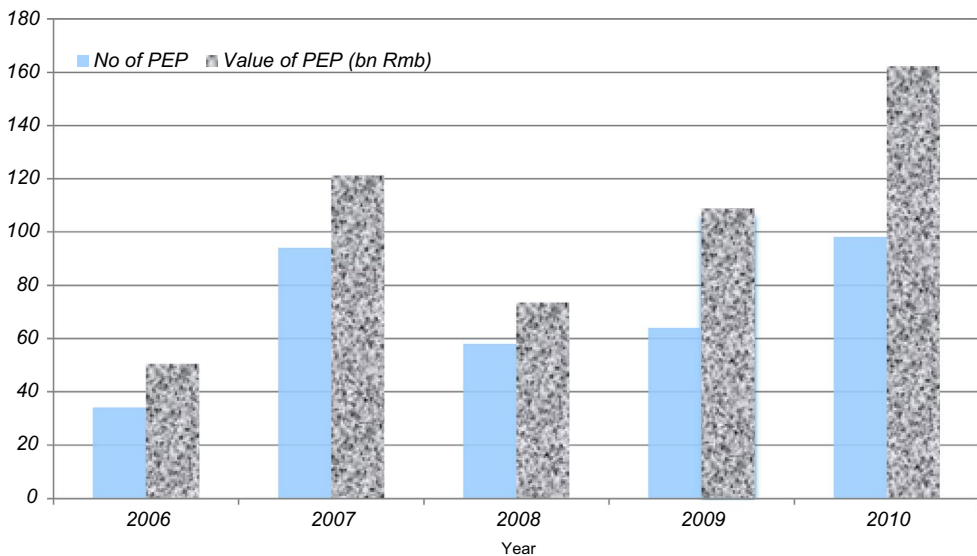
We analysed competitors' short-term price reactions to P.E.P. events, the univariate change in their market performance before and after P.E.P.s and the cross-sectional responses to the number and value of P.E.P.s in their respective industry sectors. Further, we also analysed the change in competitors' stock price performance in terms of presence (a dummy variable), number and value of P.E.P.s. Figure 1 shows the number and value of P.E.P.s by year and Figure 2 shows the number and value of P.E.P.s by industry.

These graphs show that sample P.E.P.s are relatively evenly distributed across the sample period. Table 3 shows descriptive statistics of the variables which used in regression both competitors firms and P.E. issuing firms.

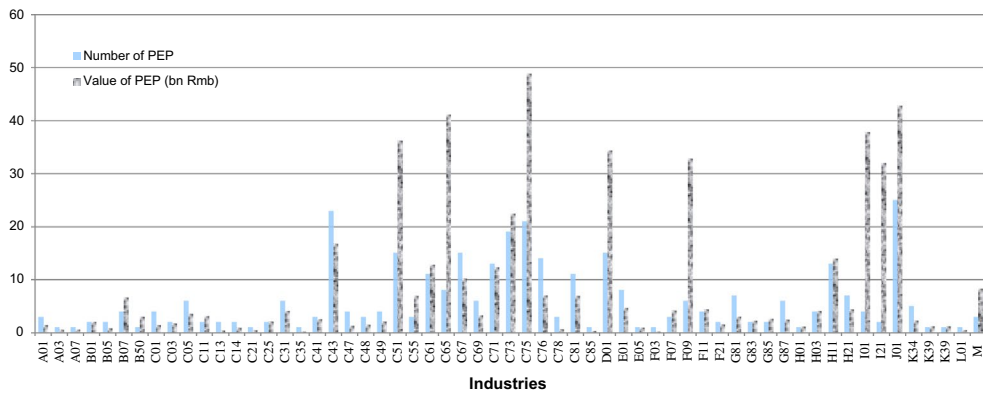
### 5.1. Competitor companies' short-term price reactions

Considering the impact of the information transmission effect, the prior literature calculates C.A.A.R. from 10 days before the event date to 10 days after the date of the event (Hsu et al., 2010, 2011). Consistent with the literature, we chose similar time lags as our event windows. Table 4 shows the C.A.A.R. for different event windows, which range from 10 days before the event date to 10 days after the event date. C.A.A.R.s are shown for announcement of the application, approval or rejection, withdrawal and completion of P.E.P. events.

According to panel A of Table 4, the results report significantly negative abnormal returns for competitors for alternative window periods around the announcement of an application for a P.E.P. For example, the reported C.A.A.R.s for the (-5, 5) and (-10, 10) event windows are -0.50% and -0.79%, respectively. These results support hypothesis 1, which predicts that competitors experience negative returns around the application for a P.E.P. by their counterparts within the industry. Similar results are observed in respect of approval events. For example, the C.A.A.R. of -0.18% reported for the (-5, 5) event window increased to



**Figure 1.** Distribution of P.E.P.s by year. Source: C.S.R.C. data, which was also used by Fonseca et al. (2014).



**Figure 2.** Distribution of P.E.P.s by industry. Source: C.S.R.C. data, which was also used by Fonseca et al. (2014).

Notes: The industry classification is based on the two-digit C.S.R.C. industry codes. Industries are as follows: A<sub>01</sub> Agriculture; A<sub>03</sub> Forestry; A<sub>07</sub> Fishery; B<sub>01</sub> Coal mining and dressing; B<sub>05</sub> Ferrous metal ore mining; B<sub>07</sub> Non-ferrous metal ore mining; B<sub>50</sub> Mining service; C<sub>01</sub> Food processing; C<sub>03</sub> Foodstuff manufacturing; C<sub>05</sub> Beverage manufacturing; C<sub>11</sub> Textile (Cotton Mills); C<sub>13</sub> Cloth production (Garments); C<sub>14</sub> Leather; C<sub>21</sub> Wood manufacture; C<sub>25</sub> Furniture; C<sub>31</sub> Paper; C<sub>35</sub> Printing; C<sub>41</sub> Oil processing and refining; C<sub>47</sub> Chemical fibres; C<sub>48</sub> Rubber; C<sub>49</sub> Plastic; C<sub>51</sub> Electronics components; C<sub>55</sub> Electrical Equipment (Appliances); C<sub>61</sub> Non-metal mineral products; C<sub>65</sub> Ferrous metal foundries; C<sub>67</sub> Non-ferrous metal foundries; C<sub>69</sub> Metal products; C<sub>71</sub> Common machines; C<sub>73</sub> Special equipment manufacturing; C<sub>75</sub> Traffic equipment manufacturing; C<sub>76</sub> Electric equipment; C<sub>78</sub> Instrument and office machine; C<sub>81</sub> Medicine manufacturing; C<sub>85</sub> Biological; D<sub>01</sub> Utility; E<sub>01</sub> Civil engineering construction; E<sub>05</sub> Building fitting up and decoration; F<sub>03</sub> Highway Transport; F<sub>07</sub> Shipping; F<sub>09</sub> Air transport; F<sub>11</sub> Transportation subsidiary service; G<sub>81</sub> Communications and related equipment; G<sub>83</sub> Computer and related equipment; G<sub>85</sub> Communications service; G<sub>87</sub> Computer application service; H<sub>01</sub> Wholesale of food and household products; H<sub>03</sub> Wholesale of energy, materials and equipment; H<sub>11</sub> Retail trade; I<sub>01</sub> Banking; I<sub>21</sub> Securities and futures; J<sub>01</sub> Real estate; K<sub>34</sub> Travel industry; K<sub>37</sub> Healthcare and nursing service; K<sub>39</sub> Leasing service; L<sub>01</sub> Publishing industry; M, Comprehensive.

**Table 3.** Descriptive statistics of independent variables of Competitor and P.E. issuing firms.

Variable	Competitor firms		P.E. issuing firms	
	Average	(SD)	Average	(SD)
Age	13.085	(3.909)	12.611	(4.197)
Size	18.099	(1.491)	15.624	(0.992)
L.E.V.	1.016	(2.948)	1.283	(1.018)
F.D.	2.360	(3.012)	1.444	(0.739)
Beta	1.004	(0.430)	1.048	(0.156)
R.O.A.	0.421	(1.614)	0.398	(1.026)
R.O.E.	0.041	(2.432)	0.114	(0.076)
M.B.	0.896	(1.201)	2.894	(1.607)
O.W.N.-S.O.E. No.	1633	N/A	165	N/A
-Non-S.O.E. No.	911	N/A	110	N/A
H-Index	0.158	(0.089)	0.175	(0.107)
Proceeds	N/A	N/A	20.462	(1.019)
Discount	N/A	N/A	0.36	(0.758)
N	2544		275	

Notes: Age represents the log value of number of operating years from establishment. Size is measured by the log of the total assets. L.E.V. is financial leverage and measured by the ratio of interest bearing liability to equity in each firm at the beginning of the year. F.D. is financial distress and calculated by Altman Z-score. Beta is the systematic market risk at the beginning of the year and is calculated using the past 36 months of daily returns. R.O.A. is Return on Assets at the beginning of the year. M.B.V. is Market to book value ratio at the beginning of the year. O.W.N. is ownership and is a dummy variable; 1 if controlling shareholder is State and 0 otherwise. H-Index is Herfindahl Index, which measures firm size in relation to the industry and, thereby, indicates the amount of competition. Proceeds is the logarithm value of Private Equity Placement proceeds of sample issuing firms. Discount is average of discounts in the sample firms.

Source: Authors.



**Table 4.** Short-term abnormal returns for competitor and P.E. issuing firms for all P.E.P. events.

Days	Application			Approval			Completion			Rejection or Withdrawal		
	C.A.A.R.	t-value	p-value	C.A.A.R.	t-value	p-value	C.A.A.R.	t-value	p-value	C.A.A.R.	t-value	p-value
(-3,1)	-0.24%	-4.46	0.001	-0.08%	-1.01	0.049	-0.16%	-1.51	0.021	0.97%	6.41	0.001
(-5,1)	-0.32%	-5.46	0.001	-0.03%	-0.41	0.089	-0.14%	-1.96	0.025	0.77%	4.42	0.001
(-5,5)	-0.50%	-6.77	0.001	-0.18%	-2.09	0.018	-0.15%	-1.51	0.066	0.59%	0.95	0.071
(-5,10)	-0.60%	-6.61	0.001	-0.36%	-3.35	0.001	-0.32%	-2.87	0.002	0.51%	0.77	0.218
(-10,10)	-0.79%	-7.45	0.001	-0.46%	-3.62	0.001	-0.43%	-3.37	0.001	-0.43%	-0.62	0.734
Panel B: P.E. issuing firms for all PEP events												
(-3,1)	0.48%	1.81	0.035	0.98%	3.02	0.001	0.53%	1.52	0.065	0.47%	0.467	0.321
(-5,1)	0.58%	1.88	0.031	0.86%	2.42	0.008	0.39%	0.89	0.084	-0.48%	-0.367	0.643
(-5,5)	0.42%	0.98	0.063	0.72%	2.27	0.005	0.17%	0.31	0.623	-2.09%	-1.355	0.092
(-5,10)	1.04%	2.06	0.020	0.66%	2.27	0.004	-0.91%	-1.81	0.964	-1.36%	-0.674	0.252
(-10,10)	1.43%	2.48	0.007	-0.41%	-0.58	0.718	-1.05%	-1.53	0.937	-1.87%	-0.744	0.230

Notes: We report the C.A.A.R. of competitor firms in the industry around the C.S.R.C. announcement of application (filing), approval, rejection and withdrawal dates and completion dates of P.E.P. events in panel A. Abnormal returns are computed as the difference between the actual stock price return and the expected market model return over each window. We also report the C.A.A.R. of issuing firms in the industry around the C.S.R.C. announcement of application, approval, rejection and withdrawal dates and completion dates of P.E.P. events in Panel B. We report both the t-statistic and the corresponding p-values. We also use C.S.R.C. data and obtained a similar result for P.E. issuing firms as Fonseka et al. (2014).

Source: Authors.

-0.46% in the (-5, 20) window and -0.46% in the (-10, 10) window. These results support hypothesis 2, suggesting that competitors experience a decrease in their stock returns around the approval of a P.E.P. in the same industry. The results of our estimation also support hypothesis 3, which predicts negative returns for competitors around the announcement of the successful completion of P.E.P.s. This is confirmed by the fact that the C.A.A.R. of -0.14% reported for the (-5, 1) window is eventually increased to -0.32% and -0.43% in the (-5, 10) and (-10, 10) event windows, respectively. These values have lower negative values compared to the results associated with the application and approval, possibly reflecting the fact that the market has already discounted the effects of potential completion given the prior knowledge of the decision to grant approval. Descriptive data shows that the successful approval rate of Chinese P.E.P.s is ~ 83%. However, success in approval is not guaranteed for P.E. issuing companies obtaining much required capital from the P.E. market for their future investment projects. Hence, this information conveyed by P.E.P. decisions transfers to competitor firms within the same industry and they show a negative stock price reaction. However, uncertainty at the approval stage is lower compared to at the application stage; we observe that the less negative stock price reaction as competitor companies know what the P.E. market conditions are like in China.

In contrast, consistent with hypothesis 4, competitors' returns increase around the withdrawal or rejection of the P.E.P. application by companies in the same industry. For the (-5, 1) event window, competitors generated a 0.77% C.A.A.R., which is statistically significant at the 1% confidence level and a C.A.A.R. of 0.59% for the (-5, 5) event window, which is also significant at the 10% level. The C.A.A.R. for longer window periods are not statistically significant. Furthermore, we observed that the rejection or withdrawal of P.E.P. applications leads to an upward adjustment of competitive companies' stock price to the level at which they were at prior to the issuing companies' P.E. application. According to Panel B of Table 3, P.E. issuing companies have positive market reactions to their application, approval and successful P.E.P. event completion announcements. Rejection and withdrawal of P.E.P. events are associated with a negative C.A.A.R., although the coefficients are not statistically significant.

Application, approval and successful completion of P.E.P.s are likely to be unwelcome news for competitor companies and such events are associated with negative returns for competitors. Competitor companies' C.A.A.R.s are significantly negative for the periods around the application for P.E.P.s by their counterparts in the same industry than for the period around the approval and completion of P.E.P.s. These results suggest that competitor companies react strongly to the P.E.P. applications of their rivals, given that it is the first time information about potential P.E.P.s is known by the market participants. According to the C.S.R.C., one stated objective of P.E.P. administrative regulations is to minimise competition. However, the above analyses show that completion of P.E.P.s have a negative effect on stock returns of industry competitors in the short-term. These findings are consistent with the prior literature based on developed markets (Hsu et al., 2010, 2011).

The successful completion of P.E.P.s provide the issuing company with the funds to invest in new capital expenditure projects and they can, therefore, achieve better performance than their industry counterparts. The successful completion of P.E.P.s is a most important event which contains more information for investors' reaction that might affect competitor firms' stock price movements. To investigate whether the information transmission determinants of P.E.P. completion events affect the competitor companies' stock price performance in the

short-term, we incorporate average discounts, the log value of average P.E.P. proceeds and the number of P.E.P. events at industry levels as explanatory variables at the completion of the P.E.P. event and the regression results presented in Table 5. We include the number of P.E.P. events in the same industry and event window (-5, 5) in order to conduct a robustness test. The results show that a 1% increase in the PEP events leads to a 0.01% decrease in the competitor companies' C.A.A.R. This result supports the argument that the P.E.P. events have a competitive effect on non-P.E.P. issuing companies in the same industry. The results also show that an average market discount at the industry level is negatively significant. A 1% increase in the average discount leads to a reduction in competitor companies' short-term C.A.A.R. by 0.02%. The value of P.E.P. proceeds is also a statistically significant negative value, suggesting that an increase of 1% in the natural log value of average proceeds received from a P.E.P. leads to a decrease in the competitor companies' C.A.A.R. by 0.01%. Further, these findings reveal that the information transmission of a P.E.P. negatively affects competitor companies' stock price performance in the short-term. In addition, the market

**Table 5.** The information transmission effects of Private Equity Placements on Industry Competitors' C.A.A.R.

Variables	Control	Model (1)	Model (2)	Model (3)
	C.A.A.R.	C.A.A.R.	C.A.A.R.	C.A.A.R.
Constant	-0.428*** (0.109)	-0.220 (0.153)	-0.212 (0.144)	-0.284*** (0.110)
Age	-0.001 (0.001)	-0.001 (0.001)	-0.001 (0.001)	-0.001* (0.001)
Size	0.013*** (0.004)	0.010** (0.004)	0.010*** (0.004)	0.013*** (0.004)
L.E.V.	0.001*** (0.002)	0.001*** (0.002)	0.001*** (0.002)	0.001*** (0.002)
F.D.	0.001** (0.001)	0.001** (0.001)	0.001*** (0.001)	0.004*** (0.002)
Beta	-0.001 (0.014)	-0.001 (0.014)	-0.005 (0.015)	-0.003 (0.014)
R.O.A.	-0.003 (0.002)	-0.008 (0.009)	-0.003* (0.002)	-0.006 (0.009)
M.B.V.	-0.001*** (0.001)	-0.001*** (0.001)	-0.001*** (0.001)	-0.001*** (0.001)
O.W.N.	0.002 (0.005)	-0.001 (0.005)	-0.001 (0.005)	-0.001 (0.005)
H-Index	-0.006** (0.003)	-0.004** (0.003)	-0.004* (0.003)	-0.007** (0.003)
N_P.E.P.s		-0.008*** (0.008)		
V_P.E.P.s			-0.011*** (0.009)	
Dis_P.E.P.s				-0.016*** (0.018)
N	2544	2544	2544	2544
Adj. R <sup>2</sup>	0.041	0.045	0.046	0.047

Notes: Robust standard errors clustered with industries and time are in parentheses. C.A.A.R. is Cumulated Average Abnormal Return in (-5, 5) event window used as dependent variable. Age represents the log value of number of operating years from establishment. Size is measured by the log of the total assets. L.E.V. is financial leverage and measured by the ratio of interest bearing liability to equity in each firm at the beginning of the year. F.D. is financial distress and calculated by Altman Z-score. Beta is the systematic market risk at the beginning of the year and is calculated using past 36 months of daily returns. R.O.A. is Return on Assets at the beginning of the year. M.B.V. is Market to book value ratio at the beginning of the year. O.W.N. is ownership and is a dummy variable; 1 if controlling shareholder is State and 0 otherwise. H-Index is Herfindahl Index, which measures firm size in relation to the industry and, thereby, indicates the amount of competition. N\_P.E.P.s is the logarithm of number of private equity placements of the industry. V\_P.E.P.s is the logarithm value of Private Equity Placement proceeds in the industry. Dis\_P.E.P.s is average of discounts in a particular industry level.

\*\*\*Significance at 1%; \*\*Significance at 5%; \*Significance at 10%.

Source: Authors.

discount and the value of P.E.P. proceeds is the most important information that transfers to competitor companies from P.E. issuing companies.

## **5.2. Competitor companies' long-term stock price performance**

Table 6 presents the correlation coefficients of the variables included in the regression analyses. Significant and negative correlations exist between P.E.P. events and stock returns/abnormal returns and between P.E.P. proceeds and stock returns/abnormal returns, while significant and positive correlations are reported between P.E. discounts and stock returns/abnormal returns of competitor companies, which provides some preliminary evidence for the relationship mentioned in hypotheses 5 and 6.

We also attempt to explain the negative long-term market performance of competitor companies in the years in which P.E.P.s were completed by their industry rivals. This is accomplished by relating competitors' annual returns or annual abnormal returns to a P.E.P. event dummy variable after controlling for the number of factors that are known to have impacted on the long-term stock price performance.<sup>4</sup> The results are shown in Table 7. Models 1 and 3 show the relationship between the long-term stock returns and control variables. Consistent with hypothesis 6, a P.E.P. event is negatively related to competitors' stock price performances. In particular, the estimates for Model 2 show a statistically significant 0.032% decrease in stock returns associated with the P.E.P. event. Similarly, estimates for Model 4 show a significant -0.03% decrease in abnormal stock returns associated with the P.E.P. event. According to the Table in Appendix A, a P.E.P. event has a positive effect on annual stock and abnormal stock returns of P.E. issuing companies.<sup>5</sup> The significant coefficients, outlined above, generated in our estimation confirm that P.E.P. events have a competitive effect on the share prices of intra-industry counterparts.

Based on Wruck (1989) and Hertz and Smith (1993), we argue that discounts and proceeds from P.E.P.s measure information effects and that stock price effects are based on the implication that the information effects are larger for placements where the potential degree of under-valuation is high. The discounts and proceeds from P.E.P.s at industry level transmit to the investors, competitors and other stakeholders in the market who react on this information. To strengthen our argument, we also assess whether the size of the P.E.P. event, as measured by the average value of P.E.P. events in a given year, is related to competitors' long-term stock price performance. The results provided in Table 8 show that the value of P.E.P.s is significantly negatively related to competitor companies' stock returns and abnormal returns. In particular, stock returns and abnormal stock returns show a significant 0.01% and 0.006% decrease associated with the average value of P.E.P.s at the industry level. A P.E.P. discount at the industry level is significantly positive and stock returns and abnormal stock returns show a significant 0.05% and 0.014% increase associated with the P.E.P. discount at industry level.

Furthermore, our results show that the C.S.R.C.'s announcement of P.E.P. arrangements generates a spillover effect on the stock returns of industry competitors in China. In general, this information transmission effect of P.E.P. announcements can be categorised into contagion and competitive effects. As revealed in our results, the information in a P.E.P. announcement changes the original competitive situation and leads to the short-term wealth redistribution of competitor companies in the same industry. Thus, we confirm that P.E.P. announcements have competitive effects in the short-term. The results of 9 also show that

**Table 6.** Pearson correlation matrix of repressors.

Panel A: Correlation between control variables														
	R.E.T.	A.R.	C.A.A.R.	Age	Size	L.EV	F.I.N.D.I.S.	Beta	R.O.A.	M.B.V.	O.W.N.	H_INDEX	L.A.G.R.E.T.	L.A.G.A.R.
R.E.T.	1													
A.R.		1												
C.A.A.R.			1											
Age	-0.102*	-0.002	-0.018	1										
Size	-0.069*	-0.078*	0.048*	-0.030	1									
L.E.V.	0.007	0.017	0.024	0.015	0.011	1								
F.D.	0.004	0.021	0.02	-0.024	0.219*	0.001	1							
Beta	-0.002	0.010	0.020	-0.096*	0.215*	0.029	0.067*	1						
R.O.A.	-0.007	0.016	0.002	-0.027	0.149*	0.001	0.235*	0.065*	1					
M.B.V.	0.006	0.007	0.003	0.009	0.017	0.749*	0.009	0.018	0.001	1				
O.W.N.	-0.001	-0.037*	0.006	-0.114*	0.279*	0.011	0.037*	0.116*	0.026	0.025	1			
H-INDEX	-0.012	-0.007	-0.006	-0.070*	0.191*	0.002	0.093*	0.205*	0.108*	-0.001	0.284*	1		
L.A.G.R.E.T.	-0.432*	-0.032*		0.086*	0.003	-0.028	0.003	0.041*	0.007	-0.028	-0.028	0.045*	1	
L.A.G.A.R.	-0.084*	-0.063*		0.041*	0.002	-0.026	0.018	0.049*	0.015	-0.037*	-0.022	0.041*	0.652*	1

Panel B: Correlation between test and dependent variables			
	R.E.T.	A.R.	C.A.A.R.
Discounts	0.272*	0.018*	-0.013*
V_P.E.P.s	-0.018*	-0.008*	-0.005*
N_P.E.P.s	-0.034*	-0.009*	-0.001*

Notes: R.E.T. and A.R. are annual stock returns and abnormal stock returns, respectively. C.A.A.R. is Cumulated Average Abnormal Return in (-5, 5) event window. Age represents the log value of number of operating years from establishment. Size is measured by the log of the total assets. L.E.V. is financial leverage measured by the ratio of interest bearing liability to equity in each firm at the beginning of the year. F.D. is financial distress calculated by Altman Z-score. Beta is the systematic market risk at the beginning of the year. R.O.A. is Return on Assets at the beginning of the year. M.B.V. is Market to book value ratio at the beginning of the year. O.W.N. is ownership and a dummy variable; 1 if controlling shareholder is State and 0 otherwise. H-Index is Herfindahl Index, which measures firm size in relation to the industry and, thereby, indicates the amount of competition. L.A.G. R.E.T. and L.A.G.A.R. are 1 year lagged annual stock returns and abnormal stock returns, respectively. N\_P.E.P. is the logarithm of number of private equity placement of the industry. V\_P.E.P.s is the logarithm value of Private Equity Placement proceeds in the industry. Dis\_P.E.P.s is the average of discounts in a particular industry level.

\*Significance at 5%.  
Source: Authors.

**Table 7.** The effects of information transmission of successfully completed P.E.P. events on industry competitors' long-term return.

	Control (1)	Model (4)	Control (2)	Model (5)
Dependent variable:	R.E.T.	R.E.T.	A.R.	A.R.
Constant	2.862*** (0.315)	2.863*** (0.324)	1.441*** (0.316)	1.451*** (0.319)
Age	0.021 (0.040)	0.034 (0.041)	0.020 (0.041)	0.029 (0.041)
Size	-0.060*** (0.014)	-0.061*** (0.014)	-0.060*** (0.014)	-0.059*** (0.014)
L.E.V.	0.001** (0.003)	0.001** (0.003)	0.001** (0.003)	0.001** (0.003)
F.D.	0.001*** (0.001)	0.001*** (0.001)	0.001*** (0.001)	0.001*** (0.001)
Beta	0.063** (0.032)	0.109** (0.046)	0.063** (0.032)	0.065** (0.033)
R.O.A.	-0.001*** (0.000)	-0.001*** (0.000)	-0.001*** (0.000)	-0.001*** (0.000)
M.B.V.	-0.001* (0.001)	-0.001 (0.001)	-0.001* (0.001)	-0.002** (0.001)
O.W.N.	-0.032 (0.028)	-0.028 (0.029)	-0.032 (0.028)	-0.028 (0.029)
Lagged dependent variable	-0.089*** (0.014)	-0.090*** (0.014)	-0.092*** (0.014)	-0.092*** (0.014)
H-Index	0.083*** (0.022)	0.085*** (0.021)	0.083*** (0.022)	0.082*** (0.020)
P.E.P._E		-0.032** (0.022)		-0.038** (0.022)
N	2539	2539	2539	2539
Adj. R <sup>2</sup>	0.596	0.603	0.063	0.066

Notes: Robust standard errors clustered with industries and time are in parentheses. R.E.T. and A.R. are annual stock returns and abnormal stock returns, respectively, and used as dependent variables. Age represents the log value of number of operating years from establishment. Size is measured by the log of the total assets. L.E.V. is financial leverage and measured by the ratio of interest bearing liability to equity in each firm at the beginning of the year. F.D. is financial distress and calculated by Altman Z-score. Beta is the systematic market risk at the beginning of the year and it is calculated using the past 36 months of daily returns. R.O.A. is return on assets at the beginning of the year. M.B.V. is Market to book value ratio at the beginning of the year. O.W.N. is ownership and is a dummy variable; 1 if controlling shareholder is State and 0 otherwise. H-Index is Herfindahl Index, which measures firm size in relation to the industry and, thereby, indicates the amount of competition. P.E.P.\_E is Private Equity Placement (P.E.P.) Event; 1 if P.E.P. event in the industry, otherwise 0.

\*\*\*Significance at 1%; \*\*Significance at 5%; \*Significance at 10%.

Source: Authors.

P.E.P. events are negatively correlated with stock returns in the long-term, while suggesting the presence of competitive effects that are driven by the negative association between the stock return of the issuing firms and its industry competitors.

## 6. Conclusions

Private placements are becoming a popular means of secondary equity offering among companies operating across different international capital markets, regardless of the stage of development of the market. This paper provides empirical evidence of the effect of P.E.P.s on competitors' stock price using data from the highly transitional and regulated Chinese market. We find that competitors experience a decrease in stock prices in response to the announcements of application, approval and completion of P.E.P. events and an increase in stock prices around the announcements of withdrawal or rejection of P.E.P. events. Further,

**Table 8.** The effects of detailed information transmission of successfully completed P.E.P. events on industry competitors' long-term return.

Variables	Control (3)	Model (6)	Model(7)	Control (4)	Model (8)	Model (9)
	R.E.T.	R.E.T.	R.E.T.	A.R.	A.R.	A.R.
Constant	2.658*** (0.889)	2.824*** (0.936)	2.540** (1.033)	3.080*** (0.869)	3.239*** (0.916)	3.001*** (1.019)
Age	0.003 (0.004)	0.002 (0.004)	0.003 (0.004)	0.003 (0.004)	0.002 (0.005)	0.003 (0.004)
Size	-0.169*** (0.032)	-0.177*** (0.035)	-0.156*** (0.029)	-0.169*** (0.032)	-0.177*** (0.035)	-0.156*** (0.028)
L.E.V.	0.006* (0.004)	0.006* (0.004)	0.005* (0.003)	0.006* (0.004)	0.006* (0.004)	0.005** (0.004)
F.D.	0.004*** (0.000)	0.009*** (0.009)	0.004*** (0.000)	0.001*** (0.000)	0.002* (0.009)	0.004*** (0.000)
Beta	0.089 (0.099)	0.084 (0.108)	0.102 (0.092)	0.087 (0.099)	0.081 (0.108)	0.100 (0.092)
R.O.A.	-0.017 (0.012)	-0.013 (0.064)	-0.017 (0.011)	-0.023+ (0.012)	-0.016 (0.064)	-0.023+ (0.012)
M.B.	-0.001 (0.002)	-0.001 (0.002)	-0.001 (0.002)	-0.001 (0.002)	-0.001 (0.002)	-0.001 (0.002)
O.W.N.	-0.059 (0.037)	-0.055 (0.039)	-0.053 (0.038)	-0.060 (0.038)	-0.056 (0.039)	-0.053 (0.037)
Lag dependent variable	-0.087*** (0.018)	-0.094*** (0.020)	-0.084*** (0.019)	-0.087*** (0.018)	-0.094*** (0.020)	-0.084*** (0.019)
H-Index	0.083*** (0.022)	0.087*** (0.021)	0.082*** (0.020)	0.083*** (0.022)	0.087*** (0.021)	0.082*** (0.020)
Dis_P.E.P.s		0.051** (0.079)			0.014** (0.021)	
V_P.E.P.s			-0.009*** (0.013)			-0.006*** (0.011)
N	2539	2539	2539	2539	2539	2539
Adj. R <sup>2</sup>	0.596	0.583	0.619	0.063	0.065	0.067

Notes: Robust standard errors clustered with industries and times are in parentheses. R.E.T. and A.R. are annual stock returns and abnormal stock returns, respectively, used as dependent variables. Age represents the log value of number of operating years from establishment. Size is measured by the log of the total assets. L.E.V. is financial leverage and measured by the ratio of interest bearing liability to equity in each firm at the beginning of the year. F.D. is financial distress and calculated by Altman Z-score. Beta is the systematic market risk at the beginning of the year and it is calculated using the past 36 months of daily returns. R.O.A. is Return on Assets at the beginning of the year. M.B.V. is Market to book value ratio at the beginning of the year. O.W.N. is ownership and is a dummy variable; 1 if controlling shareholder is State and 0 otherwise. H-Index is Herfindahl Index, which measures firm size in relation to the industry and thereby indicates the amount of competition. Dis\_P.E.P.s is the average value of discounts in a particular industry level. V\_P.E.P.s is the logarithm value of Private Equity Placement proceeds in the industry.

\*\*\*Significance at 1%; \*\*Significance at 5%; \*Significance at 10%.

Source: Authors.

competitors experience a decrease in their long-term stock performance following P.E.P. events, suggesting the existence of a competitive effect both in the short- and the long-term. Hence, the outcome of our analysis confirms that information associated with a P.E.P. announcement changes the original competitive situation and leads to the short- and long-term wealth redistribution of competitor companies within the same industry. Moreover, the short-term effect of discounts on P.E.P.s on a competitor company's C.A.A.R. is negative. However, the short-term effect of discounts on P.E.P.s positively affects the long-term stock returns and abnormal stock returns of competitor companies. Chinese companies place P.E. at a higher discount than U.S. companies (Fonseka et al., 2014; Lu et al., 2011). In the context of information spillover, the competitive effect dominates the contagion effect. Offering higher discounts on P.E.P.s assists issuing companies to raise the required amount of funds for their potential investment projects in the short-term. In addition, industry

**Table 9.** The information effects of successfully completed P.E.P. on .P.E.P issuing firms in long-term returns.

Variables	(1)	(2)	(3)	(4)	(5)	(6)
	RET	RET	RET	AR	AR	AR
Constant	1.826 (1.366)	1.420 (1.381)	0.949 (1.403)	1.394 (1.381)	1.004 (1.382)	0.512 (1.424)
Age	0.019 (0.023)	0.016 (0.022)	0.013 (0.024)	0.018 (0.023)	0.015 (0.022)	0.012 (0.024)
Size	-0.033 (0.059)	-0.018 (0.0591)	-0.113 (0.082)	-0.033 (0.060)	-0.017 (0.059)	-0.114 (0.082)
L.E.V.	-0.200* (0.163)	-0.193* (0.157)	-0.191* (0.164)	-0.201* (0.163)	-0.194* (0.157)	-0.192* (0.164)
F.D.	0.0015* (0.010)	0.010* (0.010)	0.016** (0.010)	0.003** (0.010)	0.011** (0.010)	0.0151** (0.010)
Beta	0.219 (0.318)	0.185 (0.313)	0.242 (0.314)	0.215 (0.318)	0.182 (0.314)	0.238 (0.315)
R.O.A.	0.195*** (0.048)	0.028** (0.012)	0.242*** (0.047)	0.229*** (0.042)	0.060*** (0.015)	0.275*** (0.045)
M.B.V.	0.002 (0.025)	-0.002 (0.024)	-0.004 (0.025)	0.003 (0.025)	-0.001 (0.024)	-0.004 (0.026)
O.W.N.	0.076 (0.138)	0.084 (0.139)	0.070 (0.138)	0.074 (0.138)	0.081 (0.139)	0.068 (0.138)
Lag dependent variable	-0.003 (0.057)	-0.013 (0.058)	-0.008 (0.056)	-0.005 (0.057)	-0.016 (0.058)	-0.010 (0.055)
Discount		0.053*** (0.031)			0.049*** (0.002)	
Proceeds			0.134** (0.089)			0.034** (0.009)
N	275	275	275	275	275	275
Adj. R <sup>2</sup>	0.501	0.505	0.503	0.062	0.070	0.066

Notes: Robust standard errors clustered by firms and time are in parentheses. R.E.T. and A.R. are annual stock returns and abnormal stock returns, respectively, used as dependent variables. Age represents the log value of number of operating years from establishment. Size is measured by the log of the total assets. L.E.V. is financial leverage and measured by the ratio of interest bearing liability to equity in each firm at the beginning of the year. F.D. is financial distress and calculated by Altman Z-score. Beta is the systematic market risk at the beginning of the year and it is calculated using the past 36 months of daily returns. R.O.A. is Return on Assets at the beginning of the year. M.B.V. is Market to book value ratio at the beginning of the year. O.W.N. is ownership, which is a dummy variable; 1 if controlling shareholder is State and 0 otherwise. Discount is the market discount of private equity placement and it is computed by (Closing Price of 10th day after announcement - Placement Price)/Closing Price of 10th day after announcement. Proceeds is the logarithm value of Private Equity Placement.

\*\*\*Significance at 1%; \*\*Significance at 5%; \*Significance at 10%.

Source: Authors.

level discounts also have a positive impact on the stock price performance of their industry counterparts in the long-term.

## Notes

1. The total dollar amount of private equity investments in public listed firms increased from \$2 billion to \$88 billion in the period 1995–2006, whereas the total dollar amount of S.E.O.s in 2006 was \$76 billion.
2. In the U.S., P.E.P.s reflect minority ownership stakes in target firms unless they represent a full buyout. On the other hand, average Chinese P.E.P.s are relatively larger and regulations on private equity (P.E.) attract large institutional buyers (see Section 2). Hence, we were compelled to restrict our analysis to placements by issuing firms and their spillover effects on competitor firms.
3. According to C.S.R.C. regulation, a company that obtained approval should complete the P.E.P. within 6 months. On average, sample companies took 2 months to complete their



P.E.s. Hence, application, approval/rejection announcement events were not contaminated (clustered) by time (event windows).

4. Correlation matrix and VIF factors suggested that there is no multicollinearity problem.
5. P.E. issuing firm-year observations and their corresponding non-P.E. issuing observations were selected for P.E.P. firms. We created dummy variable for measuring P.E.P. events (if a firm has issued P.E. the variable is 1 and if the firm did not issue P.E. for the rest of the period that is indicated as 0).

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### Appendix A: Effects of successfully completed PE event on PE issuing firms in long term returns.

Variables	(1)	(2)	(3)	(4)
	R.E.T.	R.E.T.	A.R.	A.R.
Constant	0.726 (0.965)	0.720 (0.981)	0.794 (0.991)	0.804 (1.052)
Age	0.016 (0.025)	0.013 (0.026)	0.015 (0.026)	0.012 (0.025)
Size	-0.028 (0.068)	-0.012 (0.069)	-0.027 (0.067)	-0.014 (0.064)
L.E.V.	-0.188** (0.123)	-0.173* (0.116)	-0.189* (0.123)	-0.174* (0.118)
F.D.	0.0005*** (0.001)	0.005*** (0.001)	0.002*** (0.001)	0.002*** (0.010)
B.E.T.A.	0.119 (0.206)	0.085 (0.201)	0.115 (0.204)	0.082 (0.201)
R.O.A.	0.095*** (0.012)	0.008** (0.002)	0.029*** (0.006)	0.006*** (0.002)
M.B.V.	0.012 (0.045)	-0.007 (0.044)	0.003 (0.018)	-0.001 (0.12)
O.W.N.	0.051 (0.098)	0.063 (0.099)	0.052 (0.098)	0.061 (0.099)
Lag dependent variable	-0.003 (0.017)	-0.006 (0.028)	-0.002 (0.016)	-0.008 (0.033)
P.E.P._E1		0.033*** (0.017)		0.039*** (0.014)
N	756	756	756	756
Adj. R <sup>2</sup>	0.301	0.315	0.042	0.052

Notes: Robust standard errors clustered with industries and time are in parentheses. R.E.T. and A.R. are annual stock returns and abnormal stock returns, respectively, and used as dependent variables. Age represents the log value of number of operating years from establishment. Size is measured by the log of the total assets. L.E.V. is financial leverage and measured by the ratio of interest bearing liability to equity in each firm at the beginning of the year. F.D. is financial distress and calculated by Altman Z-score. B.E.T.A. is the systematic market risk at the beginning of the year and it is calculated using past 36 months of daily returns. R.O.A. is return on assets at the beginning of the year. M.B.V. is Market to book value ratio at the beginning of the year. O.W.N. is ownership and is a dummy variable; 1 if controlling shareholder is State and 0 otherwise. P.E.P.\_E1 is Private Equity Placement (P.E.P.) event; if a firm has issued P.E. it is 1 and if the firm did not issue P.E. for the rest of the period it is 0.

\*\*\* Significance at 1%; \*\* Significance at 5%; \* Significance at 10%.

Source: Authors.