

Monitors or Certifiers? Different Roles of Private Equity Firms at Different Timing of Investments

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Abstract

This paper examines the market response to the announcements of receiving investments from the private equity (PE) firms. It is found that the positive market reaction is due to the certification effect that the PE firms may have inside information about the company value. This insider hypothesis is also found in the subsample of repeated investments: market reacts positively when the underperformed companies receive funding from the same PE firms again. On the other hand, when the companies receive investments from the PE firms for the first time, the investors recognise the monitoring role of the PE investors as well as their certification role.

Key words: Event studies, Private Equity, Repeated investments, Monitoring, Certification

JEL codes: G14, G24

1 Introduction

It is well documented that the private equity (PE) industry attracts attention specifically for the value-creation ability. Similar to argument of Hertz and Smith (1993) for private placements, the value of PE firms can be attributed to the resolution of asymmetry information and/or the anticipated effects of enhanced monitoring. PE firms can act these two roles simultaneously: they can be regarded as the “insider investors” who access to private information and certify the true value of the portfolio companies, as well as the “active investors” who monitor and improve the operating performance of companies. Following the literatures which found that venture capital and PE firms process both functions (for example, Renneboog, Simons, and Wright, 2007; Cressy, Munari, and Malipiero, 2007; Baum and Silverman, 2004), this paper does not take these two roles extramurally exclusive, but to examine which one is emphasised more by the general “outsider” investors. This paper also examines whether the perspective of the general investors different based on the timing of investments by the PE firms; specifically, whether the first-time investment or repeated investment is associated with different functions. Inspired by Lummer and McConnell’s well-cited paper of loan renewal (1989), it is hypothesised that the repeated investments by the same PE firms send a positive signal that the true value of companies are certified by the insiders and financiers, who are willing to inject their money again.

The empirical results of this paper support the hypothesis of “certification effect”. The significantly positive market reaction is found when underperformed companies receive the investments from the PE firms. The outside investors believe that the PE firms are able to identify the true value of the invested targets, therefore restore the confidence toward the underperformed companies. This certification effect is stronger when the underperformed companies have received investments from the same PE firms repeatedly. The empirical test does not contradict to monitoring effect completely though. For a company who receives the investment from a PE firm for the first time, the market recognises its monitoring function as well as certification effect.

Traditionally, PE includes early stage venture capital and later stage buyouts. The investments at different stages are not discrete thought. For example, the mezzanine stage comprises the later-staged venture capital and early-staged of buyouts (Metrick and Yasuda, 2011). Unlike most literature which focused on either the types of issuance (such as private placement or private investment in public equities, PIPE), or specific exit events (such as

initial public offerings or leverage buyouts), this paper provides direct evidence of the wealth effect brought by the PE firms regardless the issuance types. As this paper aims to test shareholders' perspectives when public companies receive investments from PE firms under general circumstance, deals with buyouts purpose are excluded.

Two recent papers which closely related to this study are Stotz, Wanzenried and Döhnert (2010), who examined the home-bias effects by using international data, and Achleitner, Andres, Betzer and Weir (2011) by using German data. Similar to the latter one, this paper also concludes that the PE firms are able to certify undervalued companies. This paper adds contribution to the literatures by distinguishing PE firms' different roles at different timing: The market regards a repeated investment from the same PE firm as an effective certification more than an enhanced monitoring. On the contrary, for the "new kids" who invest the companies for the first time, the market recognises both the monitoring and certification functions from the new PE investors.

2 Literature Review and Hypotheses

Following most literatures about the PE, it is hypothesised that the market recognises PE firms as either certifiers who are inside information about the true value of portfolio companies, or monitors who can solve potential agency problems. When a company receives investments from a PE firm, such announcement should be associated with positive abnormal returns.

Hypothesis 1: Announcements of companies receiving investments from the PE firms are expected to be associated with significantly positive equity market reactions.

2.1 Monitoring effect

Following Jensen's well cited argument that PE reduces agency costs (1986, 1989), monitoring or ownership restructuring or managerial incentive realignment is widely discussed in the literatures of leverage buyouts¹. Masulis and Thomas (2009) suggested that

¹ Cumming, Siegel and Wright (2007) and Wright et al. (2009) provide excellent summary of literature for PE and leverage buyouts. For industrial overview and performance please see Kaplan and Strömberg (2009), Metrick and Yasuda (2011) and Vester (2011).

the governance advantage of the PE investors can be used to monitor financially risky companies, for example, those using derivatives intensively. Cotter and Peck (2001) argued that the active monitoring by buyout specialists such as PE firms functions as tight debt terms to motivate managers. Cronqvist and Fahlenbrach (2013) found that the chief executive contracts become more performance-sensitive when the companies having PE firms as “strong principals”. Mietzner and Schweizer (2014) argued that active investors, such as hedge funds and PE firms, have stronger motivation and ability to reduce agency costs. They found that the change in ownership structure is associated abnormal positive return, but only for the PE sample. Leslie and Oyer (2013) suggested that the top managers of PE-owned firms are more incentive aligned, suggesting that the incentive contracts are implemented by PE firms.

It is expected that the monitoring role from a PE firm should be more valuable when a company’s agency problem is more severe. Level of free cash flows (FCF) is used to proxy agency problem in this study. When a company’s growth declines but still has large amount of free cash on hand, managers have greater incentive to invest in unsound projects (Jensen, 1986). This free cash flow hypothesis is supported by Kieschnick (1998) and Servaes (1994). It is expected that the companies with higher FCF level will be associated with larger positive abnormal return.

Hypothesis 2a: The equity market reaction to the announcements of receiving investments from the PE firms is expected to be more significant for companies with higher level of free cash flows, and the difference in reaction between companies with high- and low-level of free cash flows is expected to be significant.

As agency problem is due to the separation of ownership and management, the effect of managerial ownership is examined as well. It is argued that the relationship between managerial ownership and agency costs is nonlinear (see, for example, Renneboog et al., 2007; Sudarsanam, Wrigth, and Huang, 2011). Agency problem should be more severe when managerial equity stake is at low (issue of incentive realignment) and high level (issue of managerial entrenchment). A positive relationship is expected between the lowest plus the highest quartile of managerial ownership and the abnormal return associated with the announcements.

Hypothesis 2b: The equity market reaction to the announcements of receiving investments from the PE firms is expected to be more significant for companies with lowest and highest

level of managerial ownership, and the difference in reaction between companies with lowest-and-highest-level and median-level of managerial ownership is expected to be significant.

2.2 Certification effect

Hsu (2004) argued that the venture capitalists provide “extra-financial” value more than merely capital providers, as the reputation of venture capitalists can certify the value of start-ups. Renneboog et al. (2007) examined the positive market reaction on the public to private transactions in the UK. They found that companies with lower share price performance lead to higher premium and abnormal returns at the public to private transactions. Weir, Laing, and Wright (2005) also found similar results. Dai (2007) examined the role of venture capital funds in the transaction of PIPEs, and concluded that the significant stock reaction comes from certification effect rather than monitoring effect.

A similar argument close to the certification effect is that PE firms are good at “star-picking”. Cressy et al. (2007) found that the profitability of companies prior to buyouts is highly significant in determining the post-buyouts profitability, which indicates PE firms’ skills in investment selection. Dittmar, Li, and Nain (2012) found that corporate bidders have higher returns when they follow a first bid by a financial buyer (including PE buyer) rather than a corporate bidder. They argued that PE buyers are skilled at selecting undervalued target, therefore their participation certifies the potential companies of value improvement. A more balanced view is proposed by Baum and Silverman (2004). They found that the venture capital firms play both roles of “scout” and “coach”: The portfolio companies are those start-ups with strong technology but in need of management skills.

Based on the above literatures, it is hypothesised that the market may perceive PE firms having access to inside information and therefore can assess the company’s true value. Receiving investments from the PE firms therefore sends a positive signal of certification to the market. As suggested by Kaiser and Westarp (2010) that investing underperforming companies is one of the essential factors for PE industries to function well, the certification effect is expected to be more significant when the companies are underperformed. If the PE firms have a better ability to disclose the security’s true value, then the public may follow PE

firms' actions to find "good investment targets". According to this hypothesis, a positive relationship is expected between abnormal returns and underperformance value.

Hypothesis 2c: The equity market reaction to the announcements of receiving investments from the PE firms is expected to be more significant for companies with higher underperformance, and the difference in reaction between high-underperformed and low-underperformed companies is expected to be significant.

2.3 Repeated investments

Sequential investments, or staged financing, are well researched in venture capital and PE literatures. Theoretically, staged financing is used as collateral to solve commitment problem (Neher, 1999), as options to mitigate uncertainty (Hellmann, 1994; Bergemann and Hege, 1998; Cornelli and Yosha, 2003), or as a complementary contracting mechanism to control agency problem (Sahlman, 1990; Wang and Zhou, 2004). Empirically, Gompers (1995) found companies which need greater monitoring (for example, in the industries with less tangible assets or are R&D intensive) receive more rounds of financing, indicating that staging is used to minimise agency costs. Dai (2011), using sample of PIPEs, found that the issuing companies with higher agency costs are associated with higher probability and higher frequency of staged financing.

Repeated investments can also certify the quality of investees. Lummer and McConnell (1989) found that the bank loans per se are not informational; only favourable loan revisions are associated with positive excess return, and vice versa. They concluded that the banks (which are another type of institutions having access to private information, just like PE firms) transmit company information to the market. Iqbal, Akbar and Shiwakoti (2013) used the case of rights issues to prove that the multiple issuances certify the quality of issues. Unlike the general cases of right issues, the issuers who have multiple issues didn't experience significant long-term performance.

This paper examines whether the timing of investment conveys different value to the outside investors; specifically, whether the repeated investments enhance the monitoring or certification effect of the PE firms.

Hypothesis 3a: The equity market reaction to the announcements of receiving repeated investments from the same PE firms is expected to be more significant for companies with higher level of free cash flow.

Hypothesis 3b: The equity market reaction to the announcements of receiving repeated investments from the same PE firms is expected to be more significant for companies with the lowest plus the highest level of managerial ownership.

Hypothesis 3c: The equity market reaction to the announcements of receiving repeated investments from the same PE firms is expected to be more significant for highly-underperformed companies.

3 Data and Methodologies

3.1 Data description

Announcements of receiving investments from the PE firms in the U.S. were collected from 2000 to 2008. Several steps were employed to get clean data.

First, list of public companies which have received investments from the PE firms was extracted from Thomson database. This sample was then hand matched with Factiva for accurate announcement dates. Only those announcements which meet requirements listed below were kept:

- 1) Returns are available for the period from 241 days prior to 15 days after the announcement date to ensure that there is sufficient returns for estimation period, and no company is delisted within 15 days after announcement day.
- 2) There were no other events from one day before to one day after the announcement day.
- 3) Excluded sample of which purposes involve merger and acquisition deal, or leverage buyout.

Table 1 lists the summary of sample statistics. The mean of market value (\$203.46 million) is higher than the median (\$94.12 million), indicating there are some extremely large companies in the sample. Almost 60% of the deals are syndicated, with two PE firms on average participating in an investment deal. The mean and median size of one investment

deal is \$22.64 million and \$14.93 million, respectively. It represents about 15.73% equity stake in median, indicating that most of the PE firms are substantial shareholders².

3.2 Methodologies

Event study methodology, univariate test and cross-sectional regressions are used to test the hypotheses mentioned in section 2.

3.2.1 Even study

The market model is used to estimate abnormal security returns associated with announcements. The intercept and slope coefficients in the market model are estimated over a 150-day period, from day t-240 to day t-91, relative to the announcement day (t=0). The announcement day is defined as the date of the first report of an announcement. The standardised abnormal return approach is used to generate z-test statistics (SCS Z). The generalized sign test (GSIGN Z) is used to test for the fraction of positive and negative average abnormal returns. The null hypothesis for the GSIGN Z states that the fraction of positive returns is the same as in the estimation period.

3.2.2 Univariate test

Univariate tests are used to test for significant differences in the cumulative average abnormal returns (CAAR) between groups. Sample is divided into different sub-groups based on the median value or a predefined criterion of each variable listed below, and then compares the mean difference of CAAR

Free cash flows (FCF): Level of free cash flows is defined as operating activity cash flows minus cash dividend minus capital expenditures, divided by total assets. A positive relationship between FCF level and abnormal returns is expected.

² About 84% of the deal has more than 5% equity stake, and 64% has more than 10% equity stake.

Managerial ownership (MGMT): Managerial ownership is defined as the equity proportion owned by directors and officers in the previous quarter to announcement date. Because of the non-linearity between managerial ownership and agency costs, sample is divided into the extreme quartile (the lowest plus the highest quartile) and the median quartile (second and third quartile). A positive relationship is expected between the extreme quartile of managerial ownership and abnormal returns.

Performance (PERFORMANCE): Past performance is defined as the cumulative excess returns over 12-month period ending one month before the announcement date, derived from Renneboog et al. (2007). A negative relationship is expected between past performance and abnormal returns.

The following variables are also examined:

Size (SIZE): Size is a common proxy for information asymmetry. Helwege, Pirinsky and Stulz (2007) argued that the larger firms should have lower agency costs as they are monitored by investors and regulators more frequently. Weir, Wright, Scholes (2008) and Sudarsanam et al. (2007) found that there is a significant relationship between firm size and abnormal returns associated with announcements of going private. Log of market value one year prior to the announcement date is used to proxy firm size, and a negative relation is expected between size and abnormal returns.

Relative amount of investment (DEAL): This is the amount of PE investment divided by company's market value. PE firms should have stronger monitoring power while they hold larger percentage of stake. A positive relationship is expected between this variable and abnormal return.

To test whether the timing of investment matters, sample is categorised into repeated investments versus first-time investments. The first one is companies which receive repeated investments from the same PE firms; specifically, the same PE firms had invested in the companies before their IPOs. The latter one is companies which receive investments from a particular PE firm for the first time. These two categories are related, and used to measure the same thing: whether a PE firm has invested and monitored a company in the past, or it is the first time a company is targeted by a PE firm.

Companies receiving repeated investments from the same PE firms (PREIPO) or for the first time (FIRSTTIME): As suggested by literatures, staged finance can be used as monitoring mechanism or functioned as certification. PREIPO is a dummy for those companies who received investments from the same PE firms before they went to public³. A repeated capital injection may indicate such companies worth investing (certification effect), or an enhanced monitoring from higher ownership (monitoring effect). This paper examines which role is more emphasised by the investors. On the contrary, FIRSTTIME is a dummy for those companies being picked up by the PE firms for the first time. Again, whether the market recognises those new active investors more as certifiers or monitors is tested empirically.

3.2.3 Regression analysis

Regression analysis is used to examine whether shareholder will react differently depending on the variables mentioned in last section. Four control variables are added in the regression model, discussed below.

Number of participants (PART): This is the number of participants involving in the investment deal. Brander, Amit and Antweiler (2002) found that venture capital deals with syndicated investment are associated with higher return, indicating syndication provides complementary value-added management skills. The monitoring power may increase when there are multiple PE firms in one deal, or it may be weaker due to delegation.

Cumulative average abnormal return of pre-event window (PRE): Pre-event window is defined as 15 days before to two days before the announcement date. A negative relationship is expected between this variable and abnormal return.

Leverage (LEV): Total liabilities divided by total assets is used to proxy leverage. A high leverage may indicate the company is already under the watch of the other effective monitor,

³ We also test when the same PE firms has invested before, but not necessarily before IPOs. The results are qualitatively consistent.

the banks. A negative relationship is therefore expected between this variable and abnormal return.

The regression model below is applied to full sample and subsamples of repeated investments from the same PE firms, and first-time investments from new PE firms.

$$\text{CAAR} = c + \alpha_1\text{FCF} + \alpha_2\text{MGMT} - \alpha_3\text{PERFORMANCE} - \alpha_4\text{SIZE} + \alpha_5\text{DEAL} +/\!-\ \alpha_6\text{PART} \\ + \alpha_7\text{PRE} + \alpha_8\text{LEV} + \varepsilon_i$$

Where:

CAAR:	cumulated average abnormal returns during the announcement window,
FCF:	free cash flows divided by total assets;
MGMT	dummy equals 1 if the managerial ownership is at the lowest or highest quartile;
PERFORMANCE:	cumulative excess returns over 12-month period ending one month prior to the announcement date;
SIZE:	log of market value;
DEAL:	value of PE investments divided by market value;
PART:	number of PE firms in the investment,
PRE:	cumulated average abnormal returns during the period 15 days before to 2 days before the announcement date, and
LEV:	total liability divided by total asset.

4 Results

Table 2 presents the results for the event study test. The significant abnormal returns are found at the announcement day, two-day and three-day windows. The mean abnormal return on the announcement date is 1.43%, which is statistically significant at 0.1% level for t-test and at 1% level for generalised sign test. CAAR for three-day window is 5.04%, which is significant at 0.01% levels for both t-test and generalised sign test. These results support Hypothesis 1 that investors recognise PE firm's value.

Table 3 contains results of univariate tests for different hypothesised variables. For the three-day window (CAAR3), significant differences in abnormal returns are associated with undervaluation and relative size of investment. Those companies with below median

past share returns have significant higher CAAR (6.66% higher and is significant at 5% level) than those with better past performance. This result supports certification effect (Hypothesis 2c) that the investors trust PE firms' ability of identifying a company's intrinsic value. The results do not support monitoring effect (Hypothesis 2a and 2b); companies with higher level of free cash flows or extreme quartiles of managerial ownership are not associated with higher returns as expected, although the difference is not significant. Smaller companies and higher equity stake in PE investments are associated with higher returns as expected, but the difference is not significant either.

The effect of repeated versus first-time investments is presented in Table 4. Panel A shows that a higher positive return is found when the companies receive repeated investments from the same PE firms, although the difference is not statistically significant. Panel B shows the results for companies which receive repeated investments from the same PE firms. The certification effect is evidently supported; companies with poor past performance are associated with strong positive returns, and the difference in returns between poor-performed and well-performed companies is at 5% significance level. It indicates that repeated investments from the same PE firms send a strong signal to the market that the underperformed company is still worth investing. The results does not support monitoring effect, as companies with higher FCF level do not experience higher returns, and companies with the extremely managerial ownership have higher returns just marginally.

Panel C in Table 4 shows the results for companies which receive investments from a particular PE firm for the first time. Monitoring effect is supported marginally: When a PE firm invests in a company for the first time, such investment announcements are associated with higher positive reaction for companies with high FCF level. It indicates that investors value a new monitor in the board for the companies with severe agency problem.

Table 5 reports the cross-sectional regression results for three-day windows. Variables used for univariate tests are jointly examined after controlling company size, PE investment amount relative to market value, number of PE investors, and leverage. The regression model is applied to full sample, subsample of repeated investments, and subsample of first-time investments. The results of regression are consistent with of the univariate tests. The result of full sample and subsample of repeated investment supports the certification effect. The outside investors trust PE firms' private knowledge, hence react positively when the underperformed companies are certified by these inside investors again. For the subsample of

first-time investments, there is significantly positive relationship between the abnormal return and level of free cash flow as well as under-performance of the investees. This indicates that, in addition to recognising the PE firms' ability of picking up potential investees, investors also welcome the new external expertise joining in as an effective monitor.

5 Conclusion

This paper examines the market reaction to the announcements when a public company receives investments from PE firms in the U.S. market. Positive and significant abnormal return is found for three-day window around the announcement dates, which is consistent with the convention that the public investors expects an increase in company value upon the investments by the PE firms. This paper further tests whether the positive response is because the general investors trust PE firms as effective monitors and therefore mitigate agency problem, or because they believe that PE firms have private information and therefore can certify the true value of an underperformed company. The results of univariate tests as well as regression analysis, after controlling the company and investment size, support the certification effect. This certification effect is more emphasised when the underperformed companies receive the investment from the same PE firms again. On the other hand, for the companies receive investments from a new PE firm for the first time, the market also recognises its monitoring effect as an active investor.

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Table 1
Characteristics of the Samples of Announcements when PE Firms Investing in Companies

Table one provides the statistic summary of key accounting variables and independent variables for announcements of PE investments. MV is market value of one year prior to announcement year. Deal is the dollar amount invested by PE firms in a deal. Deal/MV is the percentage of the total private investment deal value from the invested company's market value. No. of Participates is the number of private investment firms involved in a private investment deal. For the given category, MIN is the minimum, MAX is maximum values, MEAN is the arithmetic average, MEDIAN is the middle observation, and STD is the standard deviation.

VAR	N	MIN	MAX	MEAN	MEDIAN	STD
MV (million \$)	195	4.55	4,688.79	203.46	94.12	399.99
Deal (million \$)	181	0.25	225.00	22.64	14.93	28.86
Deal Value/MV (%)	181	0.16	985.95	81.40	15.73	80.52
No. of Participates	181	1.00	10.00	2.46	2	1.77

Table 2**Daily average abnormal returns and cumulative average abnormal returns for Announcements**

Day lists a cut-out of the event window relative to the announcement day (t-0). N is the number of returns for a given category. AAR is mean abnormal return, MAR is median abnormal return, CAAR is mean cumulative abnormal return, and CMAR is median cumulative abnormal return. SCS Z is the statistical test for a significant difference in the average abnormal return from zero. GSIGN Z is the generalised sign Z, which is the non-parametric test statistic for a significant difference from zero, considering the ratio of positive to negative returns. P:N shows how many of the returns are positive or negative on a given day.

Day	N	AAR (%)	MAR (%)	P:N	SCS Z	GSIGN Z
-1	195	1.43	0.12	102:93	1.546	1.503
0	195	2.53	0.96	113:82	4.305***	3.082**
1	195	1.08	0.31	102:93	1.884\$	1.503

Days	N	CAAR (%)	CMAR (%)	P:N	SCS Z	GSIGN Z
[-1,+1]	195	5.04	1.47	114:81	3.918***	3.225**
[-1,0]	195	3.96	0.89	115:80	3.733***	3.369***
[0,+1]	195	3.61	1.86	117:78	4.355***	3.656***
[-15,-2]	195	3.17	2.21	105:90	1.474	1.934\$
[+2,+15]	195	3.41	2.06	103:92	2.852**	1.647\$

***, **, * and \$ indicate significance at the 0.1%, 1%, 5% and 10% levels, respectively.

Table 3
Equity Market Reaction of Hypothesized Variables to Announcements

N is the number of returns for a given category. CAAR3 and CAAR2 are mean cumulative abnormal return for three-day (t-1, t+1) and two-day (t-1, t0) window. FCF is the level of free cash flows. MGMT is managerial ownership (Q is quartile). PERFORMANCE is cumulative excess returns over 12-month period ending one month before the announcement date. SIZE is log of market value. DEAL is value of investment divided by market value. Sample is divided into two groups according the median of each variable. Difference is the above median CAAR minus the below median CAAR, unless specified otherwise.

	N	CAAR3		CAAR2	
		CAAR (%)	t-value	CAAR (%)	t-value
FCF					
above median	90	3.44**		2.28**	
below median	90	6.55*		5.30*	
difference	--	-3.11	-1.10	-3.02	-1.27
MGMT					
Q1+Q4	92	4.73**		3.33*	
Q2+Q3	92	5.21***		4.74***	
difference	--	-0.49	-0.21	-1.41	-0.71
PERFORMANCE					
above median	98	1.73*		1.20*	
below median	97	8.39***		6.75**	
difference	1	-6.66*	-2.53	-5.30*	-2.50
SIZE					
above median	98	3.23**		2.76**	
below median	97	6.87**		5.17*	
difference	1	-3.64	-1.37	-2.41	-1.07
DEAL					
above median	90	8.27**		5.57***	
below median	91	2.40*		2.46*	
difference	-1	5.87*	2.09	3.11	1.30

***, **, * and \$ indicate significance at the 0.1%, 1%, 5% and 10% levels, respectively.

Table 4
Equity Market Reaction of Repeated Investments and First-time Investments

N is the number of returns for a given category. CAAR3 and CAAR2 are mean cumulative abnormal return for three-day (t-1, t+1) and two-day (t-1, t0) window. Sample is divided into two groups according to whether the same PE firm has invested in the past. Difference is the above median CAAR minus the below median CAAR, unless specified otherwise

	N	CAAR3		CAAR2	
		CAAR (%)	t-value	CAAR (%)	t-value
Panel A: PE firm has invested before IPO					
Yes	84	7.03**		5.17*	
No	111	3.54**		3.05***	
Difference	-27	3.49	1.30	2.12	0.93
Panel B: PE firm has invested before IPO					
FCF					
above median	38	1.63		0.62	
below median	38	14.00*		10.61\$	
difference	--	-12.37*	-2.21	-9.99*	-2.06
MGMT					
Q1+Q4	39	9.83**		7.22**	
Q2+Q3	41	1.73		1.07	
difference	2	8.10\$	1.95	6.15\$	1.87
PERFORMANCE					
above median	42	-0.08		-0.30	
below median	42	14.14*		10.64*	
difference	--	-14.22**	-2.83	-10.94*	2.51
Panel C: PE firm has not invested before					
FCF					
above median	41	6.38**		5.19**	
below median	40	1.42		2.07	
difference	1	4.96\$	1.76	3.12	1.36
MGMT					
Q1+Q4	42	3.90*		3.83*	
Q2+Q3	40	5.42**		3.93**	
difference	2	-1.52	-0.53	-0.10	-0.04
PERFORMANCE					
above median	43	2.56\$		1.85\$	
below median	43	5.69**		5.63**	
difference	--	-3.13	1.14	-3.78\$	1.74

Table 5
Cross-Sectional Regression Results for PE Investments Announcement Day Returns

The full sample is divided into two subsamples. Repeated investments are the companies which have received investments from the same PE firms before the IPOs. First-time investments are the companies which receive investments from a new PE firm for the first time. The dependent variable is the cumulative average abnormal return (CAAR) during the three-day (t-1, t+1) announcement period. Ind. Var. is the independent variable. Par. Est. refers to the parameter estimate. N is the number of announcements in a given category. FCF is the level of free cash flows. MGMT is a dummy equals to one if managerial ownership is at the lowest and highest quartile. PERFORMANCE is cumulative excess returns over 12-month period ending one month before the announcement date. SIZE is log of market value. DEAL is value of investment divided by market value. PART is the number of PE firms involved in the investment. PRE is CAAR over the period (t-15, t-2). LEV is total liabilities divided by total assets.

Independent variable	Full Sample		Repeated Investments		First-time Investments	
	Par. Est.	t-value	Par. Est.	t-value	Par. Est.	t-value
Constant	0.102	1.41	0.003	0.02	0.260**	3.04
FCF	-0.009	-0.31	-0.063	-1.19	0.418**	3.19
MGMT	0.010	0.39	0.062	1.43	-0.007	-0.24
PERFORMANCE	-0.050**	-2.92	-0.083*	-2.20	-0.060**	-2.86
SIZE	-0.014	-1.19	-0.004	-0.16	-0.031*	-2.23
DEAL	0.040*	2.40	0.041\$	1.91	0.058	1.22
PART	0.001	0.14	0.003	0.28	-0.002	-0.20
PRE	-0.140*	-2.58	-0.135*	-1.97	-0.115	-1.50
LEV	-0.032	-0.75	-0.048	-0.60	-0.051	-0.96
N	160		70		71	
F-value	3.40**		2.67**		2.56*	
Adjust R-square	10.76		16.25		15.12	

***, **, * and \$ indicate significance at the 0.1%, 1%, 5% and 10% levels, respectively.