

INSTITUTIONAL INVESTMENT IN LISTED PRIVATE EQUITY*

Douglas Cumming

Associate Professor and Ontario Research Chair
York University - Schulich School of Business
4700 Keele Street
Toronto, Ontario M3J 1P3
Canada

<http://ssrn.com/author=75390>
Douglas.Cumming@gmail.com

Grant Fleming

Wilshire Private Markets
Level 4, East Tower, Otemachi First Square
Otemachi, Chiyoda-ku, Tokyo 100-0004
Japan

Email: grant.fleming@wilshire.com

and

Visiting Fellow
School of Finance and Applied Statistics
College of Business and Economics
Australian National University
Canberra, ACT 0200
Australia

Sofia A. Johan

TILEC/AFM Senior Research Fellow
Tilburg Law and Economics Center
Postbus 90153
5000 LE Tilburg
The Netherlands

Email: sofiajohan@email.com

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Abstract

This paper examines institutional investors' propensity to invest in a relatively unknown asset class of listed private equity. Based on data provided by LPEQ and Preqin covering 100 institutional investors in Europe in 2008, we find allocations are primarily a function of size, type, location, decision-making authority and liquidity preferences. Investment in listed private equity is more commonly made by institutions that are smaller, private (not public) pension institutions, institutions that have a preference for liquidity, and institutions that are based in the UK. As well, institutions are more likely to invest in listed private equity when investment decision-making is not empowered to a private equity team, an alternative asset class team, or a board / investment committee, but are more likely when decision-making is delegated to an equities team.

JEL Codes: G23, G24

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1. Introduction

Private equity firms around the world seek to raise capital for closed end funds organized as limited partnerships with clearly defined investment strategies, restrictive covenants setting out each investors' rights and responsibilities, and 10-13 year lock-up periods. Investors in turn seek to gain priority access to equity returns potentially in excess of those available in public markets, albeit at the expense of liquidity and the privilege to rebalance portfolios at will. Private equity has traditionally been offered to institutional investors through private placements. Private placements are seen by the private equity industry as an efficient structure through which funding can be obtained from a specific type of investor with corresponding investment goals, more quickly and more cheaply, while taking advantage of exemptions from registration with relevant securities regulators. However, for many investors a large part of the private equity investment opportunity set has remained out of reach due to minimum size of investment, lack of liquidity and/or the fact that they are not wholesale investors.

Contemporaneous to the growth of the institutional private equity market we have also witnessed an increase in private equity funds (and fund-of-funds) listed on public exchanges.¹ These listed private equity funds provide public or retail equity investors an opportunity to (potentially) achieve the types of returns usually reserved for large institutions in the private market. In addition, as the size and range of listed private equity offerings has grown, institutional investors have had access to an alternative (or sometimes complementary) investment opportunity which provides, all things being equal, improved liquidity and lower transaction costs to private equity returns. Institutions can invest in both listed and limited partnership private equity and can dynamically adjust exposure to listed private equity over time as their limited partnerships draw down commitments.² To date, however, there is no evidence on the extent to which institutional investors utilize listed private equity in their investment portfolios, and if so for what reasons.

We provide the first analysis of the use of listed private equity by institutional investors. Our data is derived from a 2008 survey of 100 institutional investors in Europe, completed by LPEQ, the trade body for European listed private equity, comprising unique details about institutional investors' allocations into listed private equity, as well as demographic characteristics such as size, type of investor, location, decision-making authority and liquidity preference. We hypothesize three motivations to invest in listed private equity based on search costs (size, investor type, and location), specific human capital (level of decision making) and liquidity-time preferences (desire to achieve full exposure to private equity as soon as possible). Our results show that listed private equity is more commonly used among institutions that are smaller, private (not public) pension institutions, institutions that have a preference for liquidity, and institutions that are based in the UK. As well, institutions are more likely to invest in listed private equity when investment decision making is not empowered to a private equity team, an alternative asset class team, or a board / investment committee, but are more likely when decision-making is delegated to an equities team.

This paper is organized as follows. In the first part we review the related literature and develop testable hypotheses. Thereafter we introduce the data and provide summary statistics. Multivariate analyses of institutional investors' decisions to invest in listed private equity are provided after describing the data. Concluding remarks follow in the last section.

2. Literature and Hypotheses

We examine the motivations of an institutional investor to invest in listed private equity. Our hypotheses are based on the premise that differences in institutional investor allocations to listed private equity are primarily a function of the characteristics of the investor. Specifically, we argue that there are three primary motivations to invest, associated with five characteristics: *search costs* (associated with investor size, type, and location), *specific human capital* (associated with the investor's decision-making

structure), and *liquidity time preferences* (associated with the desire to achieve exposure to private equity as soon as possible). We outline briefly below each hypothesis together with relevant literature.

2.1. Search Costs

Empirical studies on venture capital and leverage buyout risk and return show that returns dispersion is relatively high, with mixed findings on the average and median return depending on controls for the extent of unexited investments. Some studies even suggest that after controlling for unexited investments, the average and median manager provided net after fee returns to investors less than public markets.³ However, in a recent study, Jegadeesh, Kräussl and Pollet (2009), examine the performance of private equity fund-of-funds into unlisted private equity funds, and compares the performance to listed private equity funds. Based on data from 26 private equity fund-of-funds and 129 listed private equity funds over 1994-2008, Jegadeesh, Kräussl and Pollet estimate the market's *expectation* of unlisted private equity funds (via fund-of-funds) abnormal returns (and net of their fees) to be 1-2% above the market accounting for risk, while the market's expectation for listed private equity abnormal returns is zero to marginally negative. They find the betas of listed private equity and unlisted private equity (via fund-of-funds) to be close to one. Private equity fund returns are positively correlated with GDP growth and negatively correlated with credit spread. We note an important difference in our dataset relative to that used by Jegadeesh, Kräussl and Pollet is that Venture Capital Trusts (VCTs) are part of the Jegadeesh et al. dataset (as with datasets used in other recent work such as Lahr and Kaserer, 2010), but not our dataset because LPEQ does not consider VCTs to be part of the definition of listed private equity. VCTs are tax subsidized funds with significant statutory covenants that arguably lower their performance, and most investors would not invest but for the tax subsidy (Cumming, 2003; for related work on analogous tax subsidized listed private equity funds in Canada, see Cumming and MacIntosh, 2007).

Consistent with the work of Jegadeesh, Kräussl and Pollet, empirical studies consistently show private equity investment is a specialized asset class involving high information and search costs as compared with listed equities. As a result, an investor's willingness to incur search costs (e.g. information collection, access to high quality managers etc) in order to generate risk-adjusted excess returns over public markets will be associated with size of the investor, type and ease of access such as that facilitated by locational advantages. First, in respect of size, smaller institutions do not have time (and possibly the experience or skills) to incur high search costs in identifying high quality managers, or to negotiate limited partnership contracts. As well, smaller institutions may face limited access to more reputable private equity funds with existing institutional investors investing in multiple fund vintages within the same private equity firm, which is a significant disadvantage in view of evidence of significant performance persistence among private equity funds. The idea of significant performance persistence among private equity funds is extremely important for limited partnership and listed private equity funds alike, and shows that manager selection is critical.

Hypothesis 1A: *Listed private equity is a more attractive asset class for smaller institutional investors.*

Search costs are likewise a function of location. Our data, described in the next section, comprise institutional investors from the UK and continental Europe. The UK has the most liquid stock market, and home bias is widely documented, thereby leading us to expect greater institutional investor interest in listed private equity in the UK than in continental Europe (Suh, 2005). Added to this is the fact that there are a number of (mainly London-based) broker research analysts who cover the listed private equity sector and provide insightful research to their clients.⁴ Further, extant evidence is consistent with the view that English legal origin countries afford greater protection to investors for publicly listed companies (La Porta *et al.*, 1998).

Hypothesis 1B: *Listed private equity is more commonly considered by institutional investors based in the UK than their counterparts in continental Europe.*

Finally, we may expect search costs to differ depending on the type of institutional investor. Unobserved characteristics of the institutional investors in our data, as described in the next section below, will likely differ depending on their type. Therefore, in our empirical analyses we control for the type of institutional investor.

2.2. Specific Human Capital

In addition to search costs, we posit that the investor's stock of organizational human capital (and decision making process) can have a pronounced impact on an institutional investor's interest in investing in listed private equity. As we noted above, the identification and manager selection process in private equity is relatively costly and successful manager selection can increase the probability of generating excess returns. Indeed, recent studies have found that there are significant differences in institutional investors' ability to select successful investment managers (Lerner, Schoar and Wong, 2007).

An institution's human capital endowment (its investment team) can be organized in a number of ways. Early adopters of private equity have built up specialist investment teams over time, possessing the skills and industry networks to access private placements with the best managers (Lerner, Schoar and Wong, 2007). These "private equity" teams (or "alternative assets" teams) improve the ability of the institutional investor to implement its private equity program through unlisted vehicles. By contrast, private equity selection and implementation could also be handled by a more generalized "equities team", as opposed to a private equity team. Equities teams are trained and experienced in stock picking, and thereby have less time, experience and skill to carry out due diligence and negotiate contracts for limited partnerships. Private equity and alternative asset teams are comparatively more experienced in sourcing

and evaluating limited partnership deals, and negotiating and writing limited partnership contracts. Note that specialist teams, while they do focus on direct PE investment, also use listed private equity as an investment tool and would have more expertise than an equities team to assess listed private equity portfolios and manager selection processes.

Hypothesis 2: *Listed private equity is more likely to be considered by an institutional investor whose decision making is delegated to an equities team as compared to delegation to a private equity team or an alternative asset team.*

In addition to distinguishing between equities teams versus private equity (or alternative asset) teams, in our dataset we further consider whether decisions are centralized and made by a board/investment committee. Investment preferences of board/investment committees are likely most directly influenced by the experience of the particular individuals on the committee. While experience is not observed in our data, we do observe institutional investor investment committee structure and therefore control for this aspect of the decision making process.

In the decision making process, it is worth noting that consultants are often used in selecting PE funds (i.e., an ‘external’ influence on internal decision making). Consultants tend to restrict their advice on unlisted funds to manager/GP selection and partnership terms. In many cases the same GP/manager will offer a listed vehicle which might suit clients who seek greater liquidity or a smaller minimum commitment. This may become increasingly the case as Defined Benefit schemes, which are able to make sizeable long term commitments, are replaced by Defined Contribution schemes for which the provision of alternative assets is problematic, unless listed vehicles are used. Consultants have reported to LPEQ that choosing a listed private equity vehicle involves an element of “stock selection” rather than solely “manager selection”. It seems that consultants rarely provide information on listed private equity,

although evidence from the LPEQ survey indicates many of their clients wish for more information on listed private equity.⁵ We consider the effect of consultants in our empirical analyses below.

2.3. Liquidity-Time Preference

Most institutions with plans to diversify into the alternative asset private equity will have in place, along with their investment mandates, specific allocation amounts budgeted over a two to five and even ten year horizon. These targets have to be met to ensure alignment among all other asset class allocations. Unfortunately, private equity investment through private placements has a distinct disadvantage of taking many years for an investor to achieve the desired level of exposure (i.e., capital invested). There is the initial issue of being “invited” by the right funds to make a placement (although in the post financial crisis period since July 2007, this issue is less pressing). As unproven investors, it may take a few vintages before the private equity firms recognize an institution as a value-adding investor. Once reputation has been established, the second issue is the capital funding duration. Investors commit capital to a fund, but capital is rarely drawn down on completion of legal documentation. The funding obligation (the “commitment”) is drawn down (or “called”) by the private equity firm when required to complete new investments in companies over the investment period (typically five years from the beginning of the fund). A private equity firm typically may call 75% to 80% of capital committed to their fund over the first five years, and reserve the remaining commitment to finance follow-on investments in companies and management fees over the next five years of the fund. Therefore investors are required to pay their commitment over a ten year period, albeit that it is called unevenly during these years. As a result, the amount of capital committed to private equity by an investor and the amount invested in private equity backed companies differs, and investors can take many years to achieve their desired level of exposure to private companies (Takahashi and Alexander, 2002; Cumming, Fleming and Suchard, 2005). Indeed, the modeling of drawdowns shows that private equity fund investment activities vary according to supply of investible opportunities, competition for deals, and cost of financing (especially for buyouts) (Gompers

and Lerner, 1999; Ljungqvist and Richardson, 2003). Similarly, distributions back to investors from private equity firms (following the sale of a portfolio company) are dependent on the state of public finance markets and the economy. Expectations about drawdown and distribution rates influence the investor's capital commitment decisions (Takahashi and Alexander, 2002).

Listed private equity provides two advantages to an investor, especially in its relation to private placements. First, an investor can achieve relatively rapid exposure to private equity through listed vehicles. Second, maintaining a listed private equity exposure alongside private placements provides a dynamic adjustment mechanism for an investor's overall private equity exposure e.g. the investor could start at 100% listed private equity and then graduate listed private equity exposure down as limited partnership exposure increases. The use of listed private equity in this way reveals an investor's liquidity-time preferences – their willingness to trade-off exposure tomorrow from private placement with exposure/flexibility today through listed vehicles.

Hypothesis 3: *Listed private equity enables institutional investors to achieve their target private equity allocations quicker, and as such, institutions that invest in listed private equity are more likely to adjust their listed private equity allocations over time in response to slower adjustments to limited partnership private equity allocations.*

In addition to these institutional investor motivations for investing in listed private equity, we consider other demographic factors which are provided by the LPEQ survey. The dataset and empirical analyses follow in the next sections.

3. Data and Summary Statistics

The data in this study were commissioned by Listed Private Equity (LPEQ),⁶ the trade body for European listed private equity, and conducted by telephone interview by Preqin,⁷ a leading source of information for the alternative assets industry, in October 2008 [hereafter referred to as the 'LPEQ data']. The sample comprises a representative array of 100 European institutional investors that do, and do not use listed private equity. Preqin conducts extensive research among limited partners, and as such were selected by LPEQ to collect the data. The sample herein was initiated with a pilot study of 21 limited partners, which led to refining the questions and interviews. The final sample of 100 was selected to represent the range of European countries, sizes and types of institutions. Variables in the LPEQ data are defined in Table 1, along with summary statistics which illustrate the breadth and depth of coverage of institutions. The confidential details gathered in the data are not publicly available, and as such the data afford a unique and invaluable look at institutional investors' portfolio allocation decisions. Additional details in the survey not presented herein are described by LPEQ.⁸

[Insert Table 1 About Here]

Among the 100 institutional investors, 43 have listed private equity in their investment mandate. Nineteen investors have a variable listed private equity allocation over time. A variable listed private equity allocation enables adjustment of the institutional investor's portfolio allocation over time as, for example, drawdowns increase amongst limited partnership private equity allocations. Nine investors indicated that their decision to invest in listed private equity was influenced by the fact that one of their limited partnership private equity fund managers also managed a listed private equity fund. For all investors (regardless of whether they have listed private equity in their investment mandates or have in fact invested in listed private equity), the average amount invested in listed private equity relative to limited partnership private equity is 2.78%. For investors that have listed private equity in their

investment mandate, the average allocation to listed private equity relative to limited partnership is 7.58%. For all investors in the sample, the percentage of investments into listed private equity relative to total assets under management is 3.92% (and 6.29% for the subset of investors with listed private equity in their investment mandate).

The average institutional investor in the sample manages over €57.7 billion, with the median at €4.8 billion. The sample of 100 institutional investors comprises 1 investment bank, 1 endowment, 9 family offices, 14 banks, 22 private pension funds, 23 insurance companies and 30 public pension funds. Twenty six investors are based in the UK, and the others are in continental Europe, as indicated in Table 1. Decision making for listed private equity investments is carried out by a private equity team amongst 24 institutional investors and by an alternative asset team amongst 12 institutional investors. The board / investment committee makes investment private equity investment decisions for 38 institutional investors, and the equities team by contrast makes private equity investment decisions for 2 of the institutional investors (and an undefined or unspecified process was used by the other institutional investors). For these decision makers, 84% believed that listed private equity offered improved liquidity, 69% believed listed private equity afforded access to private equity without any delay, 54% believed listed private equity was an attractive way to invest after the “J-curve” (meaning lower returns at the start of a fund’s life due to management fees and other costs, but higher returns later in a fund’s life as capital is invested and investments are harvested), and 73% believed that listed private equity simplified administrative burdens and cash flow management relative to limited partnership private equity.

Table 2 presents comparison of means, medians and proportions tests for the different variables in the dataset depending on whether listed private equity is, or is not part of the institutional investor’s investment mandate. The data indicate a significantly higher proportion of private pension funds invest in listed private equity (33%) than those that do not (14%), and this difference is statistically significant at the 5% level of significance. One explanation for this large difference is that in Europe, private pension

funds often have significantly smaller investment teams than public pension funds,⁹ and as such have less time and expertise to carry out due diligence and review and negotiate limited partnership contracts. It is perhaps not surprising that listed private equity is a more attractive asset class for private European pension funds, but a less attractive asset class for public European pension funds. We note, however, that the attributes of public pension funds may not be the same across European countries. For example, Dutch public pension funds tend to be generally larger and better resourced than most of their UK counterparts. A number of UK local authority (public) pension funds invest in listed private equity according to LPEQ. Smaller pension funds may use listed private equity as an easy way to obtain diversification, either via a listed fund of funds or via a portfolio of direct listed private equity vehicles. Such pension funds do so because they may not be large enough to run their own fund program. In effect, investing in listed private equity not only lowers due diligence and review costs, but also improves diversification.

The comparison tests further indicate that investment in listed private equity is more common for institutions where the decision to invest is made by the equities team (4.65% in listed private equity versus 0% not invested), but less common where the decision to invest is made by the alternative asset team (4.65% invested in listed private equity versus 18% not invested). These differences are statistically significant at the 10% and 5% levels, respectively, and consistent with Hypothesis 2 stated above. Listed private equity is much more common when recommended by a consultant (19% versus 2%), and this difference is significant at the 1% level of significance. Finally, in terms of regional differences, the comparison tests indicate investments in listed private equity are less common in Denmark, and this difference is significant at the 10% level. This latter result is weakly consistent with our Hypothesis 1B.

[Insert Table 2 About Here]

Table 3 presents a correlation matrix for the main variables in the dataset. The results are consistent with the comparison tests in Table 2, including the positive and significant correlations of 0.21 between specifying listed private equity on the investment mandate and the investment decisions being made by the equities team and private pension funds. Note that private pension funds are less likely to have private equity investment decision made by an equities team (correlation -0.10). It is also noteworthy that size of assets under management is negatively correlated (-0.19) with listed private equity being part of the investment mandate, which is significant at the 10% level and consistent with Hypothesis 1A. Further, consistent with Hypothesis 2, listed private equity is less likely to feature where an alternative asset team is empowered with the decision to invest (correlation- 0.19, and significant at the 10% level). A number of other correlations are significant in Table 3, which provides guidance in terms of relations across variables as well as potential collinearity issues across potential explanatory variables for the multivariate analyses provided in the next section.

[Insert Table 3 About Here]

4. Multivariate Analyses

In this section, we first explore who invests in listed private equity terms based on logit regressions. Thereafter in the second part of the multivariate tests, we examine in detail the allocations to listed private equity relative to limited partnership private equity, as well as relative to total assets.

4.1. Logit Regressions

Table 4 presents 6 logit models for three different dependent variables. Models 1 and 2 are logit analyses of whether the institutions invest in listed private equity. Models 3 and 4 consider whether the institutional investors' allocation to listed private equity is variable over time. Finally, Models 5 and 6

examine whether the institutional investor's decision to invest in listed private equity is dependent upon whether the fund manager also manages a limited partnership private equity fund. The general specification of the models has the following form:

$$\text{Invest in Listed Private Equity} = f [\text{constant, institutional investor characteristics (size, type), location, decision making (equities team, private equity team, etc.), beliefs of decision makers}]$$

There are 4 variables for the beliefs of the decision makers, including whether the decision makers believe the greater liquidity, quicker access to private equity, avoidance of the J-curve and simplified administrative burden of listed private equity are beneficial. For each of the three dependent variables in Table 4 we present two sets of explanatory variables to show robustness to different specifications. The first specification includes assets under management in a linear specification with dummy variables for private and public pension funds; additional dummy variables for other types of institutional investors were excluded for reasons of collinearity. The second specification uses the natural log of assets under management to account for a potential decreasing importance of size on the decision to invest as size gets larger. Also, the interaction between type of institutional investor and size is analyzed to explore whether larger public pension funds behave differently than larger private pension funds.

[Insert Table 4 About Here]

The regressions in Table 4 show a number of interesting results. Model 1 shows public pension funds are 23.5% less likely to invest in listed private equity relative to non-pension fund institutions (although this effect is marginally insignificant), while private pension funds are 27.8% more likely to invest in listed private equity (this effect is significant at the 10% level). These differences hold in Model 2 when size is interacted with institution type: large public pensions are less likely to invest in listed private equity (although again this effect is marginally insignificant) while larger private pension institutions are more likely to invest in listed private equity (significant at the 10% level), which is in line with Hypothesis 1A. As indicated above, another explanation for this latter finding is that relative to

public European pension funds, private European pension funds have fewer individuals on the investment team, which makes the added due diligence and costs and time with limited partnership private equity much less attractive. Furthermore, note that the data indicate listed private allocations are less likely to be variable for private pension funds and larger private pension funds (these effects are significant at the 1% and 10% levels in Models 3 and 4, respectively).

Model 1 further shows listed private equity is 29.0% more common for institutional investors based in the UK, and this effect is significant at the 10% level. This result is strongly consistent with Hypothesis 1B. This marginal effect is 26.2% and significant at the 10% level in Model 2.

Models 1 and 2 both show very strong results in support of Hypothesis 2. Where decision making is allocated to the private equity team, an alternative asset team, or the board / investment committee, investment in private equity is approximately 28%, 43%, and 38% less likely, respectively, relative to allocating decision making to an equities team (the dummy for the equities team is suppressed for reasons of collinearity). Alternative investment teams are 13% less likely to use variable listed private equity allocations (Models 3 and 4), at least relative to private equity teams and board/investment committee and equities teams. By contrast, consultants that advise of listed private equity opportunities increase the probability of listed private equity investment by 53% (this effect is significant at the 1% level in Models 1 and 2), and increase the probability of listed private equity investment by up to 65% in Model 3 (significant at the 1% level) (this marginal effect is 45% in Model 4, and significant at the 5% level).

Interestingly, Models 1 and 2 do not provide support for Hypothesis 3 in terms of liquidity preferences and beliefs influencing the decision to invest in listed private equity. However, in Models 3 and 4, it is noteworthy that institutional investors that use listed private equity to obtain access to private equity immediately are approximately 15% more likely to have variable allocations to listed private

equity over time, which is consistent with Hypothesis 3. We may infer that as exposure to limited partnership private equity varies over time with a slower drawdown rate, institutional investors make adjustments to adjust to exposure to listed private equity.

In order to complement the analyses in Models 1-4, Models 5 and 6 examine whether the decision to invest in listed private equity depends on whether or not a private equity fund manager in which the institution invests manages both a listed and limited partnership private equity fund. The one variable that is significant in Models 5 and 6 is the variable investment decisions made by the board / investment committee, which shows that investment would be approximately 10% less likely for funds that manage both listed and limited partnership private equity funds. Some investors may wish to diversify into a more liquid investment of a different manager's listed fund while waiting for the capital commitments to be called for its direct investment in an LP fund. One benefit of investing with the different manager of the listed private equity fund is to take advantage of a different maturity profile while managing cash flows (liquidation events) to time commitments to an LP fund. Others investors may feel that having done the due diligence on a manager, that they would like to hold some additional allocation to the same manager in a more liquid form and maintain exposure to similar underlying investments.

4.2. Regression Analyses of percentage allocations

Table 5 presents regression evidence for percentage allocations into listed private equity. In the Table 5 regressions, each of the dependent variables are percentage terms. In order for the residuals and estimates to have properties consistent with assumptions underlying OLS, we therefore transform the dependent variable so that it is not bounded between 0 and 100%, in a standard way of modeling fractions (see, e.g., Bierens, 2003). Specifically, if Y is a dependent variable that is bounded between 0 and 1 (i.e., a fraction), then a possible way to model the distribution of Y conditional on a vector X of predetermined variables, including 1 for the constant term, is to assume that

$$Y = \frac{\exp(\beta' X + U)}{1 + \exp(\beta' X + U)} = \frac{1}{1 + \exp(-\beta' X - U)}$$

where U is an unobserved error term. Then

$$\ln(Y/(1-Y)) = \beta' X + U$$

which, under standard assumptions on the error term U ; can be estimated by OLS.

[Insert Table 5 About Here]

Models 7 and 8 in Table 5 explain the percentage of investment into listed private equity relative to limited partnership private equity. The data indicate that larger institutional investors invest less in listed private equity relative to limited partnership private equity, and this effect is insignificant in Model 7 with a linear specification and at the 10% level in Model 8 with a log specification. The economic significance in Model 8 is such that a change in institutional investor size from €5 billion to €10 billion reduces the amount invested in listed private equity relative to total equity by 0.5%, which is significant because the average amount invested in listed private equity versus limited partnership private equity is 2.78% and the average institutional investor in the sample manages over €57 billion (Table 1). The evidence in Models 9 and 10 is similar in respect of institutional investor size and the amount invested in listed private equity relative to total assets, which shows significant effects in both models at the 5% level. In Model 9 the economic significance is such that an increase in institutional investor size by €5 billion reduces investment in listed private equity by 2%. Overall, Models 7-10 provide very strong support for Hypothesis 1A.

Models 7-10 do not provide support for Hypothesis 1B for location in the UK versus continental Europe. However, Models 7-10 do provide strong support for Hypothesis 2. Investment in listed private

equity relative to limited partnership private equity is significantly smaller for institutions with decision making delegated to the private equity team and for the board / investment committee in Models 7 and 8. Similarly, in Models 9 and 10, investment in listed private equity relative to total assets is significantly smaller for institutions that delegate decision making to an alternative asset team and to the board / investment committee.

The evidence in Models 7 and 8 is very consistent with Hypothesis 3. Allocations to listed private equity versus limited partnership are approximately 7% higher for investors that believe listed private equity affords access to private equity immediately, and this effect is significant at the 5% level in both Models 7 and 8. We note, however, that Hypothesis 3 is not supported in Models 9 and 10.

Models 11 and 12 provide complementary analyses of how far away the institutional investor is from its target private equity allocation. The strongest and robust results across Models 11 and 12 are seen from whether or not the investor uses listed private equity, and if this allocation changes over time. The results are consistent with expectations and are in line with Hypothesis 3. Institutions that use listed private equity are approximately 9% closer to their desired private equity allocation relative to institutions that do not invest in listed private equity. By contrast, where institutions change their desired allocation to listed private equity, they tend to deviate further from their desired overall allocation to private equity by approximately 19%. As well, it is noteworthy from Model 11 that allocations made by an equities team tend to be closer to their desired private equity allocation, consistent with Hypothesis 2 and equities teams using listed private equity, although this effect is marginally insignificant in Model 12. Similarly, larger public pension funds tend to be farther away from their desired allocations to private equity, consistent with the above evidence respecting Hypothesis 1A and complementary evidence that public pensions are less likely to use listed private equity.

5. Conclusions

Recent empirical work by Jegadeesh, Kräussl and Pollet (2009) explores the public equity market's expectations regarding current *expected returns* to investment in listed versus limited partnership private equity. This evidence suggests it is worth exploring factors that affect institutional investor portfolio management and allocations to private equity, and in particular raises the question of how institutional investors allocate capital within different segments of the private equity market. Therefore, in this paper, we explore for the first time various factors that influence such capital allocation decisions to listed versus limited partnership private equity funds.

Our data is derived from a 2008 LPEQ survey of 100 institutional investors in Europe, and shows that smaller institutional investors allocate capital to listed private equity, as do private (not public) pension funds, and those with a preference for liquidity and are based in the UK (not continental Europe). The data further indicated that the empowerment of decision making to an equities team has a pronounced impact for investment in listed private equity. Where institutions allocate decision making to a private equity team, an alternative asset team, or the board / investment committee, investment in listed private equity is much less common. These findings are consistent with the hypotheses that institutions invest in listed private equity in order to reduce search costs associated with the asset class, and improve their ability to achieve a desired investment exposure in as timely a manner as possible.

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Table 1. Definitions and Summary Statistics

This table presents definitions and summary statistics from the Listed Private Equity (LPEQ, 2008) survey. The sample comprises 100 institutional investors in Europe in 2008.

	Definition	Mean	Median	Std Dev	Min	Max
<u>Dependent Variables</u>						
Listed PE Part of Investment Mandate	A dummy variable equal to 1 if listed private equity is part of the institutional investor's investment mandate, and 0 otherwise.	0.43	0.00	0.50	0.00	1.00
Listed PE is a Variable Allocation over Time	A dummy variable equal to 1 if the institutional investor's target listed private equity allocation is variable over time, and 0 if it is a stable target.	0.19	0.00	0.39	0.00	1.00
Listed PE Investment Decision Depends on Whether Fund also has a Private PE Fund	A dummy variable equal to 1 if the institutional investor's decision to consider listed private equity is positively affected by whether a fund manager in which they invest also has a listed private equity fund	0.09	0.00	0.29	0.00	1.00
Percentage of Listed PE versus other PE	The percentage of investments in listed private equity versus other private equity	2.78%	0.00%	10.43%	0.00%	60.00%
Percentage of Listed PE Relative to Total Assets	The percentage of investments into listed private equity relative to total assets under management.	3.92%	2.90%	4.95%	0.00%	30.00%
Difference between Percentage of Target PE Allocation and Actual PE Allocation	The difference between the target private equity allocation and actual private equity allocation.	0.32%	0.00%	1.02%	-2.30%	5.00%
<u>Institutional Investor Characteristics</u>						
Assets Under Management	Assets under management (Euro million)	€ 57,681.40	€ 4,765.80	€ 279,289.00	€ 37.76	€ 2,700,000.00
Investment Bank	A dummy variable equal to 1 for an investment bank institutional investor, and 0 otherwise	0.01	0.00	0.10	0.00	1.00
Bank	A dummy variable equal to 1 for an bank institutional investor, and 0 otherwise	0.14	0.00	0.35	0.00	1.00
Family	A dummy variable equal to 1 for a family investor, and 0 otherwise	0.09	0.00	0.29	0.00	1.00
Endowment	A dummy variable equal to 1 for an endowment institutional investor, and 0 otherwise	0.01	0.00	0.10	0.00	1.00
Public Pension Fund	A dummy variable equal to 1 for a public pension fund institutional investor, and 0 otherwise	0.30	0.00	0.46	0.00	1.00
Private Pension Fund	A dummy variable equal to 1 for a private pension fund institutional investor, and 0 otherwise	0.22	0.00	0.42	0.00	1.00
Insurance Company	A dummy variable equal to 1 for an insurance company institutional investor, and 0 otherwise	0.23	0.00	0.42	0.00	1.00
<u>Location</u>						
UK	A dummy variable equal to 1 for an institutional investor based in the UK, and 0 otherwise	0.26	0.00	0.44	0.00	1.00
Switzerland	A dummy variable equal to 1 for an institutional investor based in Switzerland, and 0 otherwise	0.14	0.00	0.35	0.00	1.00
Denmark	A dummy variable equal to 1 for an institutional investor based in Denmark, and 0 otherwise	0.04	0.00	0.20	0.00	1.00
Netherlands	A dummy variable equal to 1 for an institutional investor based in The Netherlands, and 0 otherwise	0.12	0.00	0.33	0.00	1.00

Table 1 (Continued)	Definition	Mean	Median	Std Dev	Min	Max
Finland	A dummy variable equal to 1 for an institutional investor based in Finland, and 0 otherwise	0.08	0.00	0.27	0.00	1.00
Germany	A dummy variable equal to 1 for an institutional investor based in Germany, and 0 otherwise	0.12	0.00	0.33	0.00	1.00
Liechtenstein	A dummy variable equal to 1 for an institutional investor based in Liechtenstein, and 0 otherwise	0.01	0.00	0.10	0.00	1.00
Sweden	A dummy variable equal to 1 for an institutional investor based in Sweden, and 0 otherwise	0.06	0.00	0.24	0.00	1.00
France	A dummy variable equal to 1 for an institutional investor based in France, and 0 otherwise	0.02	0.00	0.14	0.00	1.00
Italy	A dummy variable equal to 1 for an institutional investor based in Italy, and 0 otherwise	0.02	0.00	0.14	0.00	1.00
Austria	A dummy variable equal to 1 for an institutional investor based in Austria, and 0 otherwise	0.03	0.00	0.17	0.00	1.00
Belgium	A dummy variable equal to 1 for an institutional investor based in Belgium, and 0 otherwise	0.02	0.00	0.14	0.00	1.00
<u>Internal Investment Decision Making</u>						
The Private Equity Team	A dummy variable equal to 1 if the institutional investor's decision making for private equity is done by the private equity team.	0.24	0.00	0.43	0.00	1.00
The Equities Team	A dummy variable equal to 1 if the institutional investor's decision making for private equity is done by the equities team.	0.02	0.00	0.14	0.00	1.00
The Alternative Asset Team	A dummy variable equal to 1 if the institutional investor's decision making for private equity is done by the alternative asset team.	0.12	0.00	0.33	0.00	1.00
The Board / Investment Committee	A dummy variable equal to 1 if the institutional investor's decision making for private equity is done by the board / investment committee.	0.38	0.00	0.49	0.00	1.00
Consultant	A dummy variable equal to 1 if a consultant presented or advised of listed private equity opportunities	0.09	0.00	0.29	0.00	1.00
<u>Beliefs of Decision Makers</u>						
Listed Private Equity Offers More Liquidity than Limited Partnerships	A dummy variable equal to 1 if the decision makers investing in private equity believe listed private equity offers more liquidity than limited partnership private equity	0.84	1.00	0.37	0.00	1.00
Listed Private Equity Allows Access to Private Equity Immediately	A dummy variable equal to 1 if the decision makers investing in private equity believe listed private equity enables access to private equity immediately	0.69	1.00	0.46	0.00	1.00
Listed Private Equity Companies are Attractive to Invest After the J Curve	A dummy variable equal to 1 if the decision makers investing in private equity believe listed private equity is an attractive way to invest after the "J-curve" (meaning low returns on investment in initial periods with spiked returns later on).	0.54	1.00	0.50	0.00	1.00
Listed Private Equity Simplifies the Administrative Burden and Cash Flow Management Associated with Private Equity	A dummy variable equal to 1 if the decision makers investing in private equity believe listed private equity offers less administrative costs and cash flow management burden than limited partnership private equity	0.73	1.00	0.45	0.00	1.00

Table 2. Comparison Tests

This table presents comparison of means, medians and proportions for select variables in the data for whether listed PE is part of the institutional investor's investment mandate (43% of the investors).
 *, **, *** Significant at the 10%, 5% and 1% levels, respectively.

	Listed PE Part of Investment Mandate		Listed PE Not Part of Investment Mandate		Comparison of Means (Medians) and Proportions for dummy variables
	Mean (or Proportion for Dummy Variables)	Median	Mean (or Proportion for Dummy Variables)	Median	
<u>Institutional Investor</u>					
<u>Characteristics</u>					
Assets Under Management	€ 82,924.70	€ 3,587.60	€ 37,945.80	€ 5,000.00	0.70 (P<=0.53 for comparison of medians)
Investment Bank	0.00	0.00	0.02	0.00	-0.87
Bank	0.116279	0.00	0.16	0.00	-0.59
Family	6.98E-02	0.00	0.11	0.00	-0.61
Endowment	2.33E-02	0.00	0.00	0.00	1.16
Public Pension Fund	0.23	0.00	0.35	0.00	-1.28
Private Pension Fund	0.33	0.00	0.14	0.00	2.21**
Insurance Company	0.23	0.00	0.23	0.00	0.05
<u>Location</u>					
UK	0.33	0.00	0.21	0.00	1.30
Switzerland	0.14	0.00	0.14	0.00	-0.01
Denmark	0.00	0.00	7.02E-02	0.00	-1.77*
Netherlands	0.16	0.00	8.77E-02	0.00	1.14
Finland	9.30E-02	0.00	7.02E-02	0.00	0.42
Germany	6.98E-02	0.00	0.157895	0.00	-1.34
Liechtenstein	2.33E-02	0.00	0.00	0.00	1.16
Sweden	9.30E-02	0.00	3.51E-02	0.00	1.21
France	0.00	0.00	3.51E-02	0.00	-1.24
Italy	0.00	0.00	3.51E-02	0.00	-1.24
Austria	0.00	0.00	5.26E-02	0.00	-1.53
Belgium	0.00	0.00	3.51E-02	0.00	-1.24
<u>Internal Investment</u>					
<u>Decision Making</u>					
The Private Equity Team	0.23	0.00	0.25	0.00	-0.15
The Equities Team	4.65E-02	0.00	0.00	0.00	1.65*
The Alternative Asset Team	4.65E-02	0.00	0.18	0.00	-1.96**
The Board / Investment Committee	0.35	0.00	0.40	0.00	-0.56
Consultant	0.19	0.00	0.02	0.00	2.90***

Table 2 (Continued)	Listed PE Part of Investment Mandate		Listed PE Not Part of Investment Mandate		Comparison of Means (Medians) and Proportions for dummy variables
	Mean (or Proportion for Dummy Variables)	Median	Mean (or Proportion for Dummy Variables)	Median	
<u>Beliefs of Decision Makers</u>					
Listed Private Equity Offers More Liquidity than Limited Partnerships	0.86	1.00	0.82	1.00	0.48
Listed Private Equity Allows Access to Private Equity Immediately	0.70	1.00	0.68	1.00	0.14
Listed Private Equity Companies are Attractive to Invest After the J Curve	0.58	1.00	0.51	1.00	0.72
Listed Private Equity Simplifies the Administrative Burden and Cash Flow Management Associated with Private Equity	0.74	1.00	0.72	1.00	0.28

Table 3. Correlation Matrix

This table presents correlations across select variables in the data. Correlations greater than 0.17, 0.20, 0.26 in absolute value are statistically significant at the 10%, 5%, and 1% levels, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)
(1) Listed PE Part of Investment Mandate	1.00																	
(2) Listed PE is a Variable Allocation over Time	0.45	1.00																
(3) Listed PE Investment Decision Depends on Whether Fund also has a Private PE Fund	0.34	0.42	1.00															
(4) Percentage of Listed PE versus other PE	0.34	0.37	0.54	1.00														
(5) Percentage of Listed PE Relative to Total Assets	0.13	-0.10	0.25	0.34	1.00													
(6) Difference between Percentage of Target PE Allocation and Actual PE Allocation	0.09	0.02	-0.12	-0.12	-0.12	1.00												
(7) Assets Under Management	-0.19	-0.08	-0.07	-0.09	-0.14	-0.04	1.00											
(8) Public Pension Fund	-0.08	0.09	0.01	-0.06	-0.10	0.01	-0.10	1.00										
(9) Private Pension Fund	0.21	-0.22	-0.17	-0.07	-0.11	-0.06	-0.15	-0.46	1.00									
(10) United Kingdom	0.13	0.13	0.04	0.10	-0.06	0.05	-0.19	0.44	-0.12	1.00								
(11) The Private Equity Team	-0.02	-0.07	-0.14	-0.13	0.13	-0.08	-0.08	-0.07	0.06	-0.35	1.00							
(12) The Equities Team	0.21	0.21	0.28	0.02	-0.05	-0.07	-0.02	-0.14	-0.10	-0.13	-0.09	1.00						
(13) The Alternative Asset Team	-0.19	-0.13	-0.10	0.04	-0.17	-0.18	0.24	-0.17	-0.09	-0.24	-0.17	-0.06	1.00					
(14) The Board / Investment Committee	-0.10	-0.01	-0.11	-0.09	-0.18	0.17	-0.05	-0.05	0.23	0.29	-0.40	-0.14	-0.28	1.00				
(15) Consultants	0.21	0.21	-0.05	-0.04	0.00	0.00	-0.06	0.04	0.10	0.25	-0.09	-0.03	-0.06	-0.14	1.00			
(16) Listed Private Equity Offers More Liquidity than Limited Partnerships	0.04	0.17	-0.03	0.10	-0.04	-0.13	0.07	-0.07	-0.02	-0.37	0.22	-0.16	0.15	-0.14	-0.16	1.00		
(17) Listed Private Equity Allows Access to Private Equity Immediately	0.01	0.24	0.06	0.17	-0.14	0.00	0.18	0.04	-0.14	-0.09	0.08	-0.08	0.01	-0.14	-0.08	0.41	1.00	
(18) Listed Private Equity Companies are Attractive to Invest After the J Curve	0.03	0.19	0.06	0.23	-0.07	-0.16	0.12	-0.03	0.03	0.06	-0.11	-0.18	0.05	0.00	0.00	0.12	0.46	1.00
(19) Listed Private Equity Simplifies the Administrative Burden and Cash Flow Management Associated with Private Equity	0.04	0.21	0.03	0.14	-0.12	-0.07	-0.08	-0.07	-0.07	-0.13	-0.08	0.10	0.08	-0.05	-0.11	0.22	0.40	0.35

Table 4. Logit Analyses of Listed PE Allocation

This table presents logit analyses of whether listed PE is part of the investment mandate (Models 1 and 2), whether the listed PE allocation is variable over time (Models 3 and 4) and whether the listed PE decision is influenced by the presence of a fund manager in which the institution is investing already has a separate private PE limited partnership fund. Sample comprises 100 institutional investors from Europe in 2008. Variables are as defined in Table 1, and include variables for institutional investor characteristics, location, internal investment decision making and the beliefs of decision makers. Dummy variables are suppressed for non-pension fund institutions, continental Europe, equities team decision making, and disagreement with statements pertaining to beliefs of decision makers. Marginal effects are presented to explicitly show economic significance. White's (1980) HCCME is used in all regressions. *, **, *** Significant at the 10%, 5% and 1% levels, respectively.

	Listed PE Part of Investment Mandate				Listed PE is a Variable Allocation over Time				Listed PE Investment Decision Depends on Whether Fund also has a Private PE Fund			
	Model 1		Model 2		Model 3		Model 4		Model 5		Model 6	
	Marginal Effect	t-statistic	Marginal Effect	t-Statistic	Marginal Effect	t-statistic	Marginal Effect	t-Statistic	Marginal Effect	t-statistic	Marginal Effect	t-Statistic
Constant	-0.064	-0.287	-0.104	-0.301	-0.277	-2.297**	-0.238	-1.298	-0.104	-1.507	-0.091	-0.948
<u>Institutional Investor Characteristics</u>												
Assets Under Management	5.043E-08	0.094			-2.261E-07	-1.477			-3.762E-08	-0.393		
Log (Assets Under Management)			0.004	0.133			-0.006	-0.437			-0.001	-0.134
Public Pension Fund	-0.235	-1.635			-0.082	-1.373			-0.061	-1.570		
Private Pension Fund	0.278	1.936*			-0.142	-2.643***						
Public Pension Fund * Log (Assets Under Management)			-0.029	-1.486			-0.011	-1.081			-0.009	-1.478
Private Pension Fund * Log (Assets Under Management)			0.033	1.763*			-0.027	-1.916*				
<u>Location</u>												
UK	0.290	1.875*	0.262	1.682*	-0.015	-0.217	-0.003	-0.039	0.090	0.958	0.093	1.010
<u>Internal Investment Decision Making</u>												
The Private Equity Team	-0.280	-2.069**	-0.284	-2.113**	-0.045	-0.678	-0.021	-0.263	-0.013	-0.342	-0.008	-0.206
The Alternative Asset Team	-0.429	-4.341***	-0.426	-4.283***	-0.130	-2.774***	-0.128	-2.443**	-0.021	-0.530	-0.016	-0.399
The Board / Investment Committee	-0.383	-3.004***	-0.365	-2.865***	-0.056	-0.848	-0.041	-0.541	-0.102	-2.020**	-0.099	-2.008**
Consultants	0.527	4.334***	0.532	4.535***	0.650	3.247***	0.454	2.107**	-0.007	-0.150	-0.015	-0.400
<u>Beliefs of Decision Makers</u>												
Listed Private Equity Offers More Liquidity than Limited Partnerships	0.179	1.096	0.182	1.114	-0.021	-0.195	-0.024	-0.202	-0.083	-0.744	-0.106	-0.862
Listed Private Equity Allows Access to Private Equity Immediately	-0.018	-0.119	-0.028	-0.186	0.151	2.429**	0.149	2.214**	0.030	0.775	0.031	0.845

**Table 4
(Continued)**

	Listed PE Part of Investment Mandate				Listed PE is a Variable Allocation over Time				Listed PE Investment Decision Depends on Whether Fund also has a Private PE Fund			
	Model 1		Model 2		Model 3		Model 4		Model 5		Model 6	
	Marginal Effect	t-statistic	Marginal Effect	t-Statistic	Marginal Effect	t-statistic	Marginal Effect	t-Statistic	Marginal Effect	t-statistic	Marginal Effect	t-Statistic
Listed Private Equity Companies are Attractive to Invest After the J Curve	-0.056	-0.425	-0.052	-0.394	0.048	0.732	0.039	0.538	0.040	0.911	0.036	0.856
Listed Private Equity Simplifies the Administrative Burden and Cash Flow Management Associated with Private Equity	0.077	0.518	0.092	0.622	0.066	0.962	0.054	0.707	0.032	0.768	0.034	0.909
<u>Goodness of Fit</u>												
Pseudo R ²		0.205		0.202		0.265		0.216		0.175		0.173

Table 5. Regression Analyses of Percentage Allocations to Listed PE

This table presents OLS analyses of the proportion of listed PE versus limited partnership PE in the institutional investor's portfolio (Models 7 and 8), the proportion of listed PE relative to the institutional investor's total assets under management (Models 9 and 10) and the difference between the proportion of target PE allocation and actual PE allocation (Models 11 and 12). All dependent variables are transformed with the logistic transformation $[\log(y\%/1-y\%)]$ where $y\%$ is the percentage indicated in the dependent variable in each model. Sample comprises 100 institutional investors from Europe in 2008. Variables are as defined in Table 1, and include variables for institutional investor characteristics, location, internal investment decision making and the beliefs of decision makers. For Models 7-10, dummy variables are suppressed for non-pension fund institutions, continental Europe, equities team decision making, and disagreement with statements pertaining to beliefs of decision makers. Models 11 and 12 include dummies for listed PE allocations. White's (1980) HCCME is used in all regressions. *, **, *** Significant at the 10%, 5% and 1% levels, respectively.

	Percentage of Listed PE versus other PE				Percentage of Listed PE Relative to Total Assets				Difference between Percentage of Target PE Allocation and Actual PE Allocation			
	Model 7		Model 8		Model 9		Model 10		Model 11		Model 12	
	Coefficient	t-statistic	Coefficient	t-Statistic	Coefficient	t-statistic	Coefficient	t-Statistic	Coefficient	t-statistic	Coefficient	t-Statistic
Constant	-4.280	-10.394***	-3.230	-4.226***	-2.375	-6.727***	-1.302	-2.000**	-4.421	-38.996***	-4.750	-14.323***
<u>Institutional Investor Characteristics</u>												
Assets Under Management	-3.164E-07	-1.638			-2.071E-06	-2.126**			-1.785E-07	-0.822		
Log (Assets Under Management)			-0.116	-1.681*			-0.133	-2.469**			0.025	0.806
Public Pension Fund	-0.469	-1.578			-0.354	-1.424			0.270	1.060		
Private Pension Fund	-0.183	-0.580			-0.333	-1.269			0.216	0.821		
Public Pension Fund * Log (Assets Under Management)			-0.053	-1.701*			-0.019	-0.712			0.057	1.658*
Private Pension Fund * Log (Assets Under Management)			-0.028	-0.976			-0.031	-1.135			0.050	1.442
<u>Location</u>												
UK	0.549	1.453	0.365	1.036	-0.003	-0.012	-0.190	-0.818	0.026	0.107	0.018	0.074
<u>Internal Investment Decision Making</u>												
The Private Equity Team	-0.738	-2.066**	-0.680	-2.010**	-0.203	-0.629	-0.088	-0.301				
The Equities Team									-0.400	-1.826*	-0.340	-1.602
The Alternative Asset Team	-0.319	-0.618	-0.248	-0.517	-0.929	-2.643***	-0.843	-2.439**				
The Board / Investment Committee	-0.745	-2.132**	-0.733	-2.138**	-0.502	-2.061**	-0.480	-1.995**				
Consultants	-0.574	-1.710*	-0.630	-2.056**	-0.014	-0.051	-0.039	-0.149	0.184	0.355	0.179	0.407
<u>Beliefs of Decision Makers</u>												
Listed Private Equity Offers More Liquidity than Limited Partnerships	0.313	1.262	0.218	0.961	0.029	0.112	-0.176	-0.644				
Listed Private Equity Allows Access to Private Equity Immediately	0.250	1.815*	0.313	2.077**	-0.258	-1.114	-0.151	-0.651				
Listed Private Equity Companies are Attractive to Invest After the J Curve	0.248	1.359	0.183	1.029	-0.120	-0.556	-0.286	-1.352				
Listed Private Equity Simplifies the Administrative Burden and Cash Flow Management Associated with Private Equity	0.097	0.613	0.100	0.595	-0.104	-0.495	-0.020	-0.102				

Table 5 (Continued)	Percentage of Listed PE versus other PE				Percentage of Listed PE Relative to Total Assets				Difference between Percentage of Target PE Allocation and Actual PE Allocation			
	Model 7		Model 8		Model 9		Model 10		Model 11		Model 12	
	Coefficient	t-statistic	Coefficient	t-Statistic	Coefficient	t-statistic	Coefficient	t-Statistic	Coefficient	t-statistic	Coefficient	t-Statistic
<u>Listed Private Equity Allocation</u>												
Dummy=1 for Currently Invested in Listed PE									-0.367	-2.682***	-0.276	-1.771*
Dummy=1 for Listed PE Allocation Varies Over Time									0.805	2.637***	0.777	2.595***
<u>Goodness of Fit</u>												
Adjusted R ²	0.052		0.094		0.057		0.128		0.066		0.012	

NOTES

¹ One of the first listed private equity funds in the U.K. was 3i, which began operations in 1945 (see <http://www.3i.com/>). 3i has grown to operate offices in 12 countries around the world, and manage over €3 billion in assets under management.

² We exclude from our analysis the more recent development of private equity firms listing their management companies (e.g. Blackstone) (see Godineni and Megginson 2010).

³ See, for example, Woodward and Hall (2003), Woodward (2004), Cochrane (2005), and Caselli et al. (2009) on venture capital risk and returns, and Ljungqvist and Richardson (2003), Jones and Rhodes-Kropf (2003), Kaplan and Schoar's (2005), Wright et al. (2007), Martynova and Renneboog (2009), Diller and Kaserer (2009) on buyout risk and returns. There are few studies of listed private equity returns; exceptions include Bergmann *et al.* (2010) and Jegadeesh, Kräussl and Pollet (2009).

⁴ LPEQ members were very surprised that in a recent survey, only 24% of those who were invested in LPE received broker research, despite it being very useful for increasing understanding of both listed private equity and private equity trends more generally.

⁵ See http://www.lpeq.com/pdfs/LPEQ_Preqin_LPE_Report.pdf. LPEQ reports that 9% of institutional investors have had a consultant discuss LPE opportunities with them, 33% engage a consultant who advises on private equity, and of those with consultants, only 26% say the consultants have presented or advised on listed private equity and over half (51%) feel it would be very or somewhat useful for their consultants to provide information on listed private equity.

⁶ <http://www.lpeq.com/>

⁷ <http://www.preqin.com/>

⁸ http://www.lpeq.com/pdfs/LPEQ_Preqin_LPE_Report.pdf

⁹ This observation is based on anecdotal evidence from different private equity fund-of-funds managers.