THE DISINTERMEDIATION OF FINANCIAL MARKETS: DIRECT INVESTING IN PRIVATE EQUITY

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This is the first large-sample study of direct private equity investments by institutional investors. The analysis uses a proprietary dataset of all such investments by seven large institutional investors over twenty years. Despite the substantial fee discounts, we find little evidence of attractive relative performance by direct investments. In particular, co-investments underperform traditional fund investments: this poor performance appears to result from fund managers' selective offering of deals at market peaks as co-investments. While some solo direct investments outperform fund investments, this is concentrated in the earlier part of the sample and less information-sensitive transactions. The performance of both co-investments and solo investments deteriorates sharply in the 2000s, suggesting that any information advantage may have disappeared as the private equity industry became more competitive. Overall, our evidence suggests that institutional investors may find it difficult to capture the rents earned by private equity managers by investing directly.

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1. Introduction

In recent years, institutional investors have increasingly invested directly in private equity, bypassing the traditional intermediated fund structure. These deals include transactions in which an institutional investor co-invests in a deal that is originated by a private equity fund manager and ones in which the institutional investor originates and invests in the transaction alone. According to Preqin survey data, in 2012, 43% of investors in private equity funds were actively seeking the right to co-invest, and a further 11% were considering doing so.[1] The growing appetite for direct investments is spread across all types of institutional investors, often at the expense of allocations toward traditional private equity investing. Lower fees—and, consequently, the promise of higher net returns—appear to be the primary reason behind this trend. Yet, as we will show, running a successful direct investing program can be challenging.

Our main contribution is a pioneering empirical assessment of the relative performance of direct and intermediated investing in private equity for a large sample of investments over two decades. In broader terms, this study relates to one of the enduring questions in the corporate finance literature: why intermediaries are ubiquitous in financial markets. In the Arrow-Debreu world of complete information and perfect markets, there is no need for financial intermediaries: individuals and firms can transact seamlessly with each other. But as these strict assumptions are relaxed, an explicit role for financial intermediaries emerges. The widely offered explanations

[1] Preqin, "LP Appetite for Private Equity Co-Investments," https://www.preqin.com/docs/reports/Preqin_Private_Equity_Co-Investor_Report.pdf, 2012. Also see "South Carolina to Start an Investment Firm for Its Private Equity Bets," http://www.nytimes.com/2010/09/28/business/28carolina.html, September 27, 2010; "Abu Dhabi Sovereign Wealth Fund Eyes Direct Investment in Indian Real Estate," http://www.altassets.net/private-equity-news/by-news-type/firm-news/abu-dhabi-sovereign-wealth-fund-eyes-direct-investment-in-indian-real-estate.html, March 9, 2012; and "NY State: Interested in More Direct Private-Equity Investments," http://online.wsj.com/article/BT-CO-20120518-713093.html, May 18, 2012.

for the frequent appearance of intermediaries in financial markets are two-fold.[2] The first involves transaction costs. Many authors, beginning with Gurley and Shaw (1960), have highlighted the presence of frictions which can impose a substantial drag on the returns of investors operating independently. By pooling capital across multiple individuals and institutions, the costs associated with assessing and undertaking investments can be shared, thereby enhancing investors' returns. The second explanation highlighted in the literature builds on the information advantages of financial intermediaries. The possibility that an intermediary may have superior information to that of investors has motivated many models. Notably, Leland and Pyle (1977) argue that intermediaries invest in assets where they have special knowledge, while Diamond (1984) suggests that these financial actors serve as "delegated monitors." The majority of the information-driven models of financial intermediation have focused on banks. But Chan (1982) and Admati and Pfleiderer (1994) highlight how informational advantages may motivate investors to deploy equity capital through private equity funds.

It is against this theoretical backdrop that the recent interest among institutional investors in investing directly in private equity is particularly noteworthy. Private equity might appear to be a textbook case where the benefits from financial intermediation—in this case, specialized funds—would be substantial: not only might these funds have access to a broader set of transactions, but they are likely to be more effective in working with these companies. In particular, the transaction costs associated with structuring these investments are large (for example, see Kaplan and Strömberg, 2003, 2004), and substantial information asymmetries

[2] This discussion is drawn from several review articles, including Allen (2001), Allen and Santomero (1998), and Gorton and Winton (2003). To be sure, the explanations provided here are not exhaustive, especially as they apply to banks as financial intermediaries.

surround the monitoring and nurturing of the investments, giving rise to potential information advantages for specialized investors.

Of course, intermediaries are far from a panacea. A key concern is the classic principal-agent problem: that the intermediary may behave in its own interest, rather than that of the investor.[3] In the private equity setting, investors have been shown to grow fees at the expense of returns (Kaplan and Schoar, 2005; Lopez-de-Silanes, et al., 2011), invest aggressively at market peaks when expected returns are modest (Axelson, et al., 2013b), and exit transactions prematurely to facilitate fundraising (Gompers, 1996). Moreover, the consequences of these behaviors on the part of the managers (agents), which are attributable to agency problems, are compounded by the evidence that many classes of institutional investors (principals) appear to sub-optimally choose which private equity groups to invest with (Lerner, et al., 2007; Hochberg and Rauh, 2011).

In this context, the interest on the part of institutional investors in undertaking direct investments—and thus bypassing intermediaries—calls for a detailed evaluation. Towards this end, we compile a proprietary dataset of direct investments from seven large institutional investors. For these investors we have *complete* coverage of their direct investments programs, including solo investments and co-investments. Our dataset consists of complete and detailed cash flows for 391 direct investments made by these institutions between 1991 and 2011. We examine their investing patterns, as well as the performance of these direct investments. We compare the performance of these direct investments against that of private equity funds, thus

[3] A voluminous literature on the behavior of banks during the run-up to the financial crisis has highlighted how agency problems led them to neglect the interests of their capital providers. Mutual funds and insurance companies have been shown to engage in behaviors that benefit portfolio managers at the expense of their investors (e.g., Chevalier and Ellison, 1997 and Becker and Ivashina, 2013).

directly assessing these two alternative approaches for institutional investors to access private equity investments, and whether the trend towards "going direct" is economically justified. We use a number of different benchmarks from various data sources and performance metrics, including market-adjusted performance (PME, or public market equivalent) and absolute performance measures: the internal rate of return (IRR) and multiple of invested capital (abbreviated TV/PI, "total value/paid in").

The most striking result of our analysis is the consistent absence of evidence of outperformance by direct investments relative to traditional private equity funds, despite the substantial fee savings that direct investors enjoy. Thus, direct investments have substantially lower gross returns, which largely offset any fee savings. Second, the performance of these investments deteriorates sharply in the 2000s, suggesting that the market for direct investments became more efficient. Specifically, we find that co-investments underperform fund investments, with the performance gap widening in the latter half of our sample. This under-performance of co-investments, which are executed alongside private equity groups (often the same ones where the institutions have fund investments) and are the cornerstone of most institutions' direct investment programs, is surprising.[4] This result also holds when we compare the performance of co-investments to the corresponding fund along-side which the investment takes place. We provide evidence that this underperformance appears to be driven by selection (a "lemons problem"): institutional investors can only co-invest in deals that are available to them. In particular, these transactions appear to be concentrated at times when *ex post* performance is relatively poor. We find that co-investments deals are also substantially larger than an average sponsor's deal.

[4] It is common for selected co-investments to be offered as a "sweetener" for the large LPs participating in the traditional fund.

We find that solo transactions, i.e., investments initiated and executed by investors alone, outperform fund investments, but this evidence must be interpreted with caution. Only three of the investors in our sample engage in solo transactions, and the results vary considerably from year-to-year. Furthermore, like co-investments, the performance also exhibited severe deterioration over time. Investors' ability to resolve information problems appears to be an important driver of solo deal outcomes: the performance of solo deals over co-investments is greater in settings where information problems are less intense, such as local and later-stage transactions.

Our results illustrate the theoretical literature summarized above in several ways:

- First, the findings highlight the power of intermediation in the private equity setting. Our findings show that the net returns of the direct investments are in many cases lower than partnership transactions. Because private equity funds charge higher fees, this implies that the gross returns on investments intermediated by fund managers are substantially larger.
- Second, as predicted by theory, the power of intermediation is especially evident in information-sensitive environments. The performance of the non-intermediated deals deteriorates sharply in settings where information problems make either deal selection or monitoring more difficult, consistent with the theoretical arguments in Leland and Pyle (1977) and Diamond (1984).
- Third, our results hint at a complex set of agency problems between intermediaries and the ultimate investors that are not fully captured by most models of financial intermediation: for instance, the tendency of co-investments undertaken by these groups to cluster in the most overheated markets and largest deals; and the evidence that co-

investments offered to the investors are generally of lower quality than other investments. This is surprising from a theoretical perspective, as one would expect managers' reputation concerns should curtail this behavior. One limitation of our data is that the time series is not long enough to investigate this issue in a repeated setting. Overall, our results suggest that it is difficult for investors to capture the "rent" that private equity managers earn by investing directly.

The rest of the paper is organized as follows. In Section 2, we discuss the economics of direct investing. In Section 3, we present the data set that was assembled for this study. Sections 4 and 5 evaluate the performance differentials between the direct investment sample and several benchmarks. Section 6 concludes the paper.

2. The economics of direct investments

Traditionally, institutional investors make private equity investments by committing capital to private equity funds. The funds are managed by professional investors (e.g., the Blackstone Group), known as the general partners (GPs). The institutional investors (e.g., South Carolina's pension fund) are known as limited partners (LPs). The general partners are in charge of the entire investing process, including deal selection, execution, monitoring, and exiting. The limited partners play a passive role as capital providers. In fact, in many nations, they need to remain passive in order to maintain their limited liability status.

Figure 1 depicts different variants of direct investment arrangements. In this paper, we refer to these various types of investments collectively as "direct investments". We use "co-investments" to refer to deals where LPs invest alongside GPs, and "solo investments" to refer to those deals originated and completed by the LPs on their own. The key feature of co-investment

(relative to investments by partnerships) is that the LP plays an active role in deciding whether to invest and typically pays the GP reduced fees and carried interest, if any. (In addition, there are hybrid cases where an institution co-leads a deal with a general partner or another institutional investor; we are unable to distinguish these in our sample.)

[FIGURE 1]

Why are LPs increasingly interested in making investments directly? One clear motivation is the high cost of investing in private equity funds. In the traditional LP-GP setting, GPs are compensated through an annual management fee (typically 1.5 to 2% of committed capital or assets under management) and "carried interest," a percentage (typically 20%) of the fund's investment profits. This "2-and-20" compensation structure implies a cumulative investment cost of 5 to 7 percentage points per year under a wide range of performance assumptions, a large economic magnitude (Gompers and Lerner, 1999; Metrick and Yasuda, 2010).

In the years after the private equity boom of 2005 to 2007, the high levels of compensation that private equity fund managers enjoy attracted increasing attention. A number of earlier papers had suggested that many private equity LPs do not outperform public market benchmarks (e.g., Kaplan and Schoar, 2005; Gottschalg and Phalippou, 2009). In particular, while managers exhibited investment skill—as their gross returns were higher than public equity benchmarks—the lack of superior return for the LPs implied that "rents" were earned by private equity managers. Recently, using more comprehensive data, Harris, et al. (2013) and Axelson, et al. (2013a) show that on a net basis, private equity funds out-perform public benchmarks. However, this outperformance may not account for the higher risk (e.g., leverage) and illiquidity in private equity transactions. Furthermore, not all LPs benefit from GPs' outperformance: many

of the best returns have been at least historically concentrated among funds selected by endowments and foundations, arguably sophisticated investors that started investing in private equity early and built and maintained access to top managers, rather than those that dominate the portfolios of banks, insurance companies, and pension funds (Lerner, et al., 2007).

Fees in direct deals are different from the "2-and-20" compensation structure. In direct deals originated by LPs themselves (solo investments), typically no fees are paid. In the case of co-investments, any fees and carry are negotiated on a deal-by-deal basis. LPs typically resent paying additional charges for transactions originated by fund managers with whom they have invested (see Hoye and Lerner (1996) for an illustrative case). In general, large institutions (which dominate our sample) have a great deal of market power, and are unlikely to be charged such fees by their GPs. The significant savings on fees and carry in direct investments imply that all else being equal, direct investors should enjoy better net returns.

While cost savings are important, our conversations with institutional investors suggested additional motivations behind the movement towards direct investing. In the traditional LP-GP setting, GPs are in charge of deal selection as well as the timing of investments, leaving LPs with little control and flexibility. Direct investments give LPs more control. Investors we interviewed pointed out that the ability to selectively invest in ("cherry pick") deals where the investment opportunities are particularly attractive and where managers can apply sector expertise and active management skills to add value is an important reason for solo investing or co-investing. According to our interviews, some of the institutions pick less than 5% of deals available to them.

In addition, direct investments might give investors a better ability to time the market. This is valuable because private equity funds' performance is highly cyclical (Axelson, et al.,

2013b; Kaplan and Schoar, 2005). According to the theories on delegated investing, a principal-agency problem may arise in the traditional LP-GP setting. (See, for example, Shleifer and Vishny (1993), which discusses the agency problems in delegated investing; Chevalier and Ellison (1999) and Hong, et al. (2000) provide empirical evidence.) GPs' reputational and career concerns may lead them to "herd" and invest heavily at the peak of the private equity market, when inflows into private equity funds are high, credit is cheap, and all other GPs are heavily investing. This cyclical investing behavior may lead to suboptimal performance, as the investments in peak periods are often entered into at high valuations (Gompers and Lerner, 2000; Axelson, et al., 2013b). By investing directly, LPs may circumvent the agency problem in investing. In particular, LPs may not feel as pressured as GPs do to undertake deals at the peak of the market, and may be better able to invest in "cold" markets when few are investing. Such contrarian investing may lead to superior performance. In our interviews, some of the asset managers had indicated to us that they had suspended their investments relatively early in 2007 and did not start to invest again until 2010.

Direct investments also give the LPs a better ability to customize their risk exposures. Because investors can invest selectively, direct investments offer a much sharper tool to manage targeted risk profiles than fund commitments, where the timing and amount of investments—and hence the risk exposures—are controlled by the private equity fund.

Finally, co-investing may also better align the interests between the LPs and GPs to achieve higher investment quality. GPs can be distracted—for example, by underperforming portfolio companies or plans for some portfolio companies to go public—and thus not be wholly focused on investing during potentially attractive times to deploy capital. In co-investments,

because the LPs play a more active role and work closely with the GPs, such a principal-agent problem between the GPs and LPs may be reduced.

Direct investments, however, have downsides as well. For solo investments, the biggest challenge is investment skill. In the traditional fund investing, the LPs' main task is to select the right managers. Thus, traditionally LPs' skills should relate to manager selection. But to do solo deals, the LPs need to step into the GPs' roles, which require deal-level due diligence, operational, and monitoring capabilities that are not in their traditional skillset. To the extent that the LPs' internal staff is less skilled and/or experienced in transaction-related activities than the GPs, solo investments may on average be of worse quality than portfolio companies in funds, generating lower gross returns. If this skill gap is large enough, fee savings alone may not reverse the performance difference, and investors' rationale for "going direct" will be ultimately unjustified.

Co-investments present different challenges. On the one hand, co-investments are executed alongside private equity groups, often the same ones where the institutions have fund investments. The existing relationship between the LP and GP should reduce potential agency problems. Co-investments are offered to LPs whose continued support is sought after by the GPs. GPs' reputational concerns should thus imply that the "best" investments are offered as co-investments; coupled with reduced fees and carry, these investments should out-perform. On the other hand, co-investments are virtually by definition larger deals where additional capital is required. Larger deals generally perform more poorly (Lopez-de-Silanes, et al., 2011). Moreover, the LP is typically offered the investment opportunity with only a limited amount of time to undertake due diligence. It might also be the case that in these instances, the greater information of the private equity group relative to that of the LP creates a "lemons problem": i.e., GPs offer

LPs investments in below-average quality deals. The resulting adverse selection would translate into lower gross returns, which may not be offset by reduced fees and carry.

In sum, the different approaches to private equity investing—the traditional intermediated partnerships versus direct investing—present a tradeoff between cost and investment quality. Fund investing is high cost, but the average deal invested by funds may be of higher quality; direct investing is lower cost, but the typical transaction may be of worse quality. Reinforcing this type of equilibrium is the fact that the staff of the LPs typically receives lower compensation than investment professionals in funds, reflecting the frequent association of institutional investors with government or non-profit bodies. If the labor market for investment skills is reasonably efficient, one would expect that direct investments might on average be of worse quality than the portfolio companies chosen by funds. If the investment quality gap (or gross return gap) is large enough, lower fees and carried interest may not offset this gap. In this case, investors will find "going direct" ultimately unjustified.

3. Data

The data used for the analysis was obtained from seven institutional investors. Getting access to these data posed certain complexities. This information was highly sensitive, and the institutional investors wanted to be sure that neither the individual transactions nor the investors themselves could be identified. This concern necessitated negotiating in each case a data protection agreement. Given these high transaction costs, we focused on eliciting participation from institutions with long-standing direct investment programs (and typically, considerable experience with private equity in general). Thus, it can be anticipated that the participating firms are among the more sophisticated private equity investors in the industry.

Each of the seven contributing investors provided us the *complete* history of their direct investments in private equity. While the groups were generally larger and more sophisticated than the typical LP, we sought to ensure that they were representative in other respects. The investors were based in North America, Europe, and Asia. No more than two groups were from any individual country. They included university, corporate, and government-affiliated entities.

In each case, the institution provided us with two sets of data:

- The first of these was the characteristics of the investments made (date, amount of equity and debt invested, etc.). The total sample contains 391 investments made between 1991 and 2011. In most cases, the firms receiving the funds were identified by name; in two cases, only by code number. In the former cases, we researched the investments' characteristics at the time of the transaction using CapitalIQ and other business databases. In the latter cases, the institution provided us with their characteristics (e.g., industry and headquarters location).
- The second data set consisted of the performance of the investments. This typically consisted of a series of cash flows and valuations for each transaction, running from the time of the investment until either its exit or the time the data was provided (the second or third quarter of 2011). We were able to replicate the performance calculations provided us by the LPs, and resolved any discrepancies through discussions with them. So the differences in performance cannot be attributed to methodological differences.

As with any self-reported data, our sample is likely not representative of the direct investments universe. In Table 1, we evaluate the nature of the reporting bias. Panel A compares basic statistics of the participating institutions in our sample with all others listed in the Thomson Reuters VentureXpert Limited Partners Database. It should be noted that even the data compiled

in this database are far from an exhaustive depiction of LP activity, reflecting institutional investors' unwillingness to communicate their investment choices and the lack of a statutory requirement for most limited and general partners to reveal fundraising activity (see the discussion in Lerner, et al., 2007, and Hochberg and Rauh, 2011).

The comparison suggests that the private equity programs in our sample are newer and larger than the other LPs in the Thomson database. The average year that a private equity investment program was founded in our sample institutions was 1992, five years after the overall Thomson LP universe. On the other hand, total assets under management in mid-2012 averaged $94 billion for our participating institutions, more than double the average size of the investors in the overall Thomson LP universe. Total alternative assets under management averaged $21 billion among our participating groups, 2.6 times the overall average of $8 billion. The average private equity allocation was also slightly higher among our sample than overall: 15.8% versus 13.2%. Finally, our sample investors on average have 31 fund commitments that have been identified by Thomson (their compilations are highly incomplete), more than four times the 7 average in the overall LP universe. Thus, overall, our sample represents large institutional investors who are particularly active in alternative investing and have significant private equity exposures.

[TABLE 1]

A specific concern for our sample is that investors who collaborated with our study could be more experienced or more skilled in direct investing than the average LP. This means that the direct investments in our sample could be better performing than the overall direct investments population. Note that because we have complete information for the investors in our sample,

there are insights that we can learn from comparing solo and co-investments by the *same* investors, even if the set of the investors in our sample is biased.[5]

To understand better if our results are generalizable, we compared the performance of our direct investment sample with a broader sample of direct investments obtained from Capital IQ made by other LPs. For seven investors in our sample, we observe complete cash flow data for their direct investments, but such performance data is not available for a broader set of investors. Instead, we compare the type of exit.[6] The basic idea is that higher propensity to exit investments through an initial public offering (IPO), on average, would be associated with the highest returns and bankruptcy with the lowest returns. To do this analysis, we first manually identified 150 limited partners from over 6,000 private equity investors appearing in Capital IQ. Then we searched for deals that involve one of these 150 limited partners as an investor. In this way, we identified 651 direct investment transactions in Capital IQ. We compare the exit outcomes of this sample with our sample. The results reported in Table 1, Panel B show that there are no significant differences in terms of the exit patterns between the direct investments done by our seven LPs and the other LPs, alleviating the sample selection concern that our results might be over-stating the general performance of direct investment programs.

4. Univariate Comparisons

[5] One potential concern is whether self-reported net asset values (NAVs) could differ between direct and co-investments. The former is determined by the LPs, while the latter is largely in the hands of the GPs. It could be that the LPs have more incentives to set high NAVs than the GPs. However, as will be shown below, the outperformance of solo deals comes mainly from early years, while the NAVs are most relevant for the later investments (many of which are still not exited).

[6] Exit data was generously provided by Per Strömberg, and is used in Strömberg (2008). We supplemented his data with manual searches of recent exits.

In this section, we undertake a series of univariate comparisons between the performance of direct and partnership investments, beginning with PMEs and then turning to other performance measures. We employ a variety of adjustments to address issues such as the relative timing of the investments and the costs of running the direct investment programs.

The distribution of 391 direct investments in our sample is presented in Table 2. The investments are significant in magnitude, totaling more than 22 billion dollars. Roughly 73% of the sample by the number of deals and 61% by the overall amount invested are co-investments. By way of comparison, over the same period from the beginning of 1991 and the third quarter of 2011, LPs' total commitment to private equity funds globally was $1.6 trillion, again as estimated by Thomson Reuters.

As Figure 2 and Table 2 show, the majority of the direct investments in our sample are concentrated in the most recent period. Thus, direct investing represents still a small, but a growing, part of institutional investors' total private equity investing. One striking pattern is the manner in which the number, and especially the dollar volume, of investments appears to crest around years that are among the peak of private equity investing more generally, particularly in 2007.

[TABLE 2 & FIGURE 2]

Figure 3 presents summary of the data by industry. In Panel A, we look at the number of transactions: co-investments are dominated by transactions in healthcare, telecommunications, and business services. Solo deals most frequently are in telecommunications, retail, and business services. In Panel B, we examine the total amount invested by our seven investors. Here, the most popular industries for the two classes of investments diverge to a greater extent. Co-

investments are most frequently in telecommunications, business services, and machinery. Solo investments, on the other hand, are dominated by oil, telecommunications, and household goods.

[FIGURE 3]

We focus on three measures of performance: (i) the market-adjusted performance of private equity relative to public equity markets (PME), (ii) the ratio of LPs' total value—measured as the sum of distributed and residual capital—to the amount paid into the fund (TV/PI), and (iii) the internal rate of return. We focus on these measures, as most published performance benchmarks for private equity funds employ these metrics.

All three measures have significant limitations, including not adjusting for the risk of the investments (IRRs in particular have been subject numerous critiques in the academic literature). In this paper, we will be focusing on the differences between the performance of the direct investments in our sample and the fund performance benchmarks. Thus, we implicitly assume that the leverage and other risk characteristics for the transactions in our sample are comparable to that of the benchmarks. (Where possible, we will match the benchmarks by type of investments and geography.)

We begin by examining the PMEs. This methodology compares the (present value of) proceeds generated by the private equity investment with those from investing the same amount in a chosen public market index. If the proceeds from the private equity investments exceed the reference return from the public investment, the value of the PME exceeds 1 and indicates that the private equity investment outperforms the public market; if not, the PME is below 1 and private equity underperforms.

Table 3 shows the average PME ratios of the investments in our sample by year of investment, comparing private equity returns to equivalently timed investments in the market

index. We use two benchmarks: the blended index uses the S&P 500 index for U.S. buyouts, the Russell 2000 for U.S. venture, and the MSCI EAFE Standard and Small Cap indices for non-U.S. buyout and venture, respectively. As an alternative, we use the S&P 500 index for all investments. The latter approach is comparable to that of Harris, et al. (2013). We present the simple average of each year's PME, as well as weighted averages, using the total capital invested in direct deals in a given year by the seven institutions in our sample as weights. These calculations are presented in the Panel A for all investments, as well as for co-investments and solo investments separately. In Panel B, we present the results for buyouts, and in Panel C, for venture capital transactions.

[TABLE 3]

One important feature of the data is summarized in Figure 4. The benchmarks computed by Preqin, Thomson, and Burgiss are reported net of fees and carried interest paid to the general partners. The direct investment returns were also universally provided to us on a net basis, that is, less any transaction fees and carried interest charged by the GPs. We present here a comparison is of the net returns to the LPs (the third line of Figure 4).

[FIGURE 4]

Table 3 suggests that in most cases, the direct investments return more than the public markets: the PMEs generally exceed 1. This is a remarkable result. The question, however, is whether public markets are the relevant benchmark? As mentioned earlier, LPs allocate funds to direct investments in private equity primarily at the expense of investing in traditional fund structure. As traditional private equity investments, direct investments—and particularly co-investments— are highly illiquid. Similarly, direct investments are much closer to traditional private equity in terms of risk characteristics. The idea of comparing direct investments to

traditional private equity is also consistent with the lower fees being the primary reason behind interest in direct investments. Traditional private equity is also the relevant benchmark for the understanding the value proposition of private equity groups as intermediaries.

Recent work by Harris, et al. (2013) and others has suggested that private equity funds also have PMEs that exceed 1. To facilitate comparisons, we also present in the second and third panels the PMEs for buyout and VC funds as a whole presented by Harris, et al. (2013), which are derived from Burgiss data. These measures use the S&P 500 as the public market benchmark. We only include direct investments through 2008 to facilitate comparisons to the numbers in Harris, et al. (2013).

Next, for each investment in our sample, we directly compute the difference between its PME and a relevant PME benchmark from Harris, et al. (2013). To do so, for each investor in our sample we construct a portfolio of buyouts and venture investments in a given year, and match it to the corresponding benchmark. We also need to address a subtle issue of timing that arises when we select benchmarks. For the direct deals, we have the dates when the transactions were undertaken. The year of the direct deals corresponds to the actual year of the investment. The performance of private equity partnerships, however, is compiled by the major data vendors using the date of closing of the fund. Private equity partnerships do not typically invest all their capital in the year that they close, but instead over several subsequent years. To deal with this issue, we compare the performance of the direct deals to funds raised in the same year as the transaction ("Lag 0"), as well as funds raised one and two years ("Lag 1" and "Lag 2") before

the direct investment was made. Overall, as we move to longer lags (which is probably a more accurate comparison), the relative advantage of the direct investments diminishes.[7]

[TABLE 4]

The results are summarized in Table 4. The first striking observation from Table 4 is that there appears to be extremely limited additional performance associated with the direct investments, whether co-investments or solo transactions are considered. These investments in aggregate either very slightly outperform or under-perform, depending on the methodology used. Second, the relative performance of the direct deals is considerably stronger for the buyout deals than the venture capital transactions. For the buyout transactions using simple averages, for instance, the PME performance advantage ranges from 0.05 and 0.15 (that is, 5% to 15% better returns for the direct private deals). In venture capital, however, the range is between -0.03 and -1.06. A third pattern is the general deterioration of performance of direct investments during the 2000s. The returns of funds in the latter decade are lower, regardless of the performance metric employed.[8]

Table 5 introduces a second adjustment. The return metrics reported in Tables 3 and 4 did not net out the LPs' internal costs of running the investment programs. In particular, it might be anticipated that the staff salary and bonus costs incurred per unit of capital in direct investments would be greater than those associated with a similar-sized partnership investment. The reason is

[7] Private equity fund returns are known to exhibit the J-curve effect: New funds have low (or negative) returns, which improve over time as investments are made, mature, and are exited. Thus comparing performance to an older fund will reduce the advantage of the direct investments.

[8] All performance metrics are weighted within investors. Because categories are not evenly distributed (e.g., there are more co-investments than solo investments), a simple average of the subsamples will not equal the mean of the entire sample.

that direct investments require greater due diligence, more intensive structuring, and ongoing monitoring. The legal costs may also be greater.

[TABLE 5]

Several of the institutional investors in our study provided us with detailed data on their costs of managing direct and partnership investment programs. These data allowed us to calculate and compared what might be termed a "net-net" performance, i.e., the performance after considering all costs. (This comparison is depicted on the bottom line of the first panel of Figure 4). In particular, we received internal cost data (or at least estimates) from four of our institutional investors. The estimates from all four were tightly bunched: the mean annual internal cost for investing in private equity partnerships was 0.11% of committed capital, and the mean annual cost of direct investing was 0.91% of committed capital. As we expected, investors' internal cost of running direct investments was much higher than the cost of investing in funds. In order to calculate "net-net" returns from direct investments, we assumed that these costs were incurred over five years. We based this assumption on the estimates provided by institutional investors in our sample.[9] For LPs' investments in private equity funds, we assume the annual 0.11% internal cost will be incurred over five years, which is based on the unpublished tabulations of the estimated duration of investments in funds by Stücke (2012). We adjust the numbers accordingly and re-compute the IRR. As Table 5 reports, the subtraction of the larger fees for direct investments naturally further diminishes the relative performance of direct investments over the fund benchmarks.

[9] Strömberg (2008) concluded that the average holding period for exited deals by private equity partnerships was 49 months. For obvious reasons, the use of a five-year horizon produces more conservative estimates of differential performance of the direct investments. The overall conclusions in this paper are qualitatively unaffected by using the Strömberg estimate.

We continue in Tables 6 and 7 with the performance measures most typically used in practice, TV/PI and IRR, again presenting the absolute returns of the direct investments in Table 6, and then the numbers net of fund benchmarks (i.e., average TV/PI or IRR of private equity funds) in Table 7.

[TABLES 6 AND 7]

We obtain our benchmarks—the average TV/PI and IRR for private equity funds—from three major private equity data sources: Preqin, Burgiss, and Thomson VentureXpert. Which of these benchmarks accurately reflect the private equity industry as a whole is a controversial issue (see the discussion of concerns about the Thomson database, for instance, in Stücke, 2011). Rather than designating one benchmark as the best, we sought to use all three.

We obtained the three benchmarks for funds closed in each vintage year, for each distinct geographic region reported (typically the U.S. and all other, or else the U.S., Europe, and all other) and deal type (venture capital or buyout). We compute these benchmarks through September 30, 2011 to most closely match the data we received from our LPs. For each data source and for each vintage year, we downloaded the unweighted and capital-weighted average rate of return (IRR) and unweighted and capital-weighted average investment multiple (TV/PI).[10] To conserve space, we only report results using capital-weighted averages; results using simple

[10] An important difference between direct investing and traditional private equity investing is the absence of a fund structure. Typical performance measures such as those provided by Preqin, Thomson, and Burgiss (which we use later to benchmark our results) use fund, or portfolio performance, whereas in our direct investment sample each investment is treated individually. Given that we look at capital-weighted averages, this does not make a difference for TV/PI. But this does affect the IRR calculation: the IRR of a portfolio is not the value-weighted average of the IRR of its investments. Thus we also calculate pseudo "portfolio IRRs" for our direct investments. This is done by treating investments initiated in the same year by the same investor as one portfolio regardless of the year of any follow-on investments. The last three columns of Table VI reports these "portfolio IRRs".

averages are similar. We also only report in Table 7 co-investments and solo deals separately, rather than the blended overall sample. The first vertical panel in Table 7 (the first six columns) pertains to the 1991– 2010 period; the latter two vertical panels are for the earlier (1991 – 1999) and later (2000 – 2010) sub-periods respectively.

Two strong patterns are apparent in Table 7. The first is the poor performance of the co-investments, which lag the fund benchmarks. Using TV/PI as the metric, co-investments underperform fund investments by 0.07-0.22 (7%-22% of capital) over the entire sample period. In terms of IRR, the underperformance is about 5%-8% per year. The poor performance of co-investments appears to be highly related to the "hotness" of the private equity market, measured by total fund commitments. In unreported analysis, we find that the correlation between TV/PI of co-investments and total fund commitments is -0.54; the correlation between IRRs and total fund commitments is similar, -0.52. Thus, the under-performance of co-investments is related to the well-documented cyclicality of private equity performance.

Second, we see the deterioration of investment performance over time, with substantially worse relative performance in the 2000s than in the 1990s. In particular, while co-investments generally out-performed fund investments in the earlier decade, the relative performance measures are uniformly negative in the later period. This pattern is consistent with that observed in the PME analysis in Tables 4 and 5.

Regarding solo investments, while we observe that they generally outperform fund investments in TV/PI and IRR in the entire sample period as well as in both sub-samples, we caution against drawing strong conclusions. First, solo investments represent much smaller dollar amount of capital deployed. Second, only three out of our seven investors made solo investments, and the results vary substantially from year to year. However even among solo

investments, we also see the significant erosion of performance over time, with their outperformance in the latter half significantly smaller than in the earlier period.[11]

The results regarding co-investments are particularly striking. Since institutions often co-invest with the same funds in which they are limited partners, but with dramatically lower fees, one might think that outperformance would be nearly automatic. We have already seen one reason for their poor performance—the bunching of co-investments in poor investment periods (typically around market peaks), but this question deserves further investigation. To do this, we match co-investments in our sample to the corresponding fund that invested in the same deal and compare the performance of the deal to the performance of the fund as a whole from Pitchbook, Preqin, and other sources. We are able to identify 73 co-investments where we know the performance of one or more associated funds. These transactions have 114 fund matches because of "club deals," or transactions with multiple private equity sponsors.

The first thing to note is that deals with co-investments are substantially larger than typical deals in the GPs' portfolios. Table 8 compares the typical co-investment—across the

[11] In an unreported result, we re-examined the result in Table 7 by looking at the performance net of the public market return. Our rationale for examining market-adjusted returns is based on the work of Robinson and Sensoy (2011). These authors argue that even though the absolute returns of private equity partnership investments in peak years is lower, the returns in these years relative to public market benchmarks do not differ significantly. This distinction is important because of the way in which institutional investors make investment decisions. In particular, institutions frequently have a target amount reserved for investments in equities, whether public or private. The returns of public and private equities are often highly correlated. Thus, the poor performance of private equity during years with large numbers of investments may be not as damaging, because the public market investments would be reduced by a corresponding amount. In other words, for every dollar invested in direct investments, there is one less dollar invested in public equities. (Indeed, Lerner, et al. (2013) presents an example of an institution that explicitly reduces public equity holdings when making direct private investments.) We reduce the returns of both the direct investments and the corresponding private equity benchmarks by the performance of the public markets over the same period, assuming a holding period of five years for both the direct investments and the partnerships and using the blended index as in Table 3. The results are little changed.

entire sample, the mean enterprise value in the co-investments is $2,692 million—with the GPs' other deals as identified in CapitalIQ. We restrict the comparison to transactions done two, three, and five years before the transaction to ensure comparability. Each of the differences reported is statistically significant and economically large. For instance, using a five-year window, the median co-investment's enterprise value is three times larger than the median contemporaneous deal done by the same GP. The large size discrepancy between deals with co-investments and the GPs' other investments indicates that there is selection on the GP side: LPs are invited to co-invest when GPs need extra capital.

To understand whether these deals are as attractive as the other transactions undertaken by the fund, we look at their ex-post performance as compared to that of the fund. The results are shown in Figure 5. On average, IRRs of investments with co-investments are more than 8% lower than the overall fund performance, a difference which is significant at the five percent confidence level.[12] The difference for TV/PI however is not economically or statistically significant. Put together, if performance is used as an ex-post (albeit imperfect) measure of deal quality, the result does indicate that co-investments are of lower quality; in particular, although these investments may generate the same cash multiples as the funds, they take longer to exit (and hence have significantly lower IRRs).[13]

[TABLE 8 & FIGURE 5]

5. Regression Analyses

[12] The difference is understated, since the fund performance is not net of the deal where the co-investment was made.

[13] Lopez-de-Silanes, et al. (2011) also provide evidence that deals that take longer to exit typically have the same return multiples as quick exits, but have significantly lower IRRs.

To better understand the drivers of the performance, we conduct multivariate regression analyses of the differences between the returns of direct investments and their *deal-matched* benchmarks. In particular, we match each transaction to the most appropriate industry and deal type (stage, geography, and year) benchmark, and relate this performance measure with deal characteristics.

We first perform a simple assessment of the performance. The results are reported in Table 9. The dependent variable is the performance difference between direct investments and the most comparable private equity fund benchmark: that is, we subtract the benchmark and exclusively focus on relative performance of solo and co-investments. The addition of investor fixed effects (as well as clustering of standard errors by investor) ensures that results are derived from a comparison of the different transactions by each investor, and not from the cross-section of investors.

For non-U.S. deals, we are missing many of the benchmarks: for instance, benchmarks by stage of deal are frequently missing from the commercial data sources. So for each deal, we compute a benchmark in one of two ways. First, we compute the returns net of either (i) the aggregate index for private equity returns of funds of that investment type, regardless of geography, as well as (ii) the aggregate index for private equity returns of funds of that region, regardless of investment type. These two sets of corrections are denoted as "Investment type" and "Region." The number of observations drops where the benchmark is not available. (For the PME regressions, we only use the former approach.) We use the benchmark lagged by one year ("Lag 1" in the previous tables); i.e., a direct investment in year *T* is compared to performance of funds closed in year *T-1*. All measures are net of fees; in some regressions, we also examine "net-net" returns, i.e., those net of in-house investment cost. For the PME analysis, we used the

Harris, et al. (2013) benchmark; for the IRR in TV/PI analyses, we used Preqin data. The results are robust the use of other benchmarks.

Table 9 indicates that the constant term, which estimates the mean outperformance of direct investments relative to their deal-specific benchmarks, is never significant using PME and TV/PI and always significantly negative using IRR, implying that direct investments underperform traditional private equity investments on that one measure. Solo investments more consistently perform better than the co-investments, as indicated by the coefficient on the solo investment indicator in all three sets of regressions. (The exceptions are the TV/PI analyses with investor fixed effects, where the result flips.)

[TABLE 9]

In Tables 10 and 11, we examine the impact of information problems on the performance of direct investments. We employ two proxies for information problems. First, we examine venture deals, which constitute 14% of our sample. Due to their early-stage nature, venture deals generally entail more uncertainty and information barriers and potentially require more active management and monitoring on the part of the investor. This is the type of setting where intermediaries should be more critical and worse performance for direct investments expected.

This is exactly what we find in Table 10. As before, solo investments substantially outperform co-investments, but not when the deals are venture. The result is the opposite for these transactions, consistent with the information story.

As a second proxy for information costs, we use the proximity between the institutional investor and the investment target, measured in hundreds of kilometers. The evidence in Table 11 is again generally consistent with the prediction that information problems will affect direct investment returns. More local solo investments have higher PMEs; indeed, once an interaction

between solo investments in distances added, the significance of the solo investment dummy in the regressions for PME disappears. This suggests that solo investments made in targets far away from the institutional investors' location perform worse, all else equal (for similar evidence from public markets, see Coval and Moskowitz, 2001). The interaction is of a similar sign, but statistically insignificant in the IRR regressions (the unreported TV/PI regressions resemble the IRR analyses). Collectively, our evidence suggests that, consistent with theoretical predictions, information problems enhance the value of intermediation, and reduce the attractiveness of direct investing.

[TABLES 10 &11]

Finally, we examine the timing of investments. Recall that, without a fund structure, solo investors have more flexibility as to when to enter or exit investments. The results of the analysis are presented in Table 12. The focus is on the recession dummy variable, which flags investments made in National Bureau of Economic Research-identified recession years. We hypothesize that LPs should be under less pressure to deploy substantial amounts of capital in recession years.

Surprisingly, we find that the recession dummy itself significantly reduces the performance of direct investments relative to benchmarks, in both the PME and IRR regressions. These results withstand even the addition of industry fixed effects. More generally, solo investments—which generally outperform co-investments—experience a sharp deterioration in performance during recession years. This result suggests the difficulties in either selecting or adding value to these companies without the assistance of a private equity partner in these years, despite the fact that LPs should face lesser pressure to invest than funds and should be able to "stay on the sidelines" during unfavorable economic times.

[TABLE 12]

6. Concluding remarks

Financial intermediation has been a subject of considerable study in the finance literature. On the one hand, these middlemen should be able overcome transaction cost and information problems; on the other, they may be prone to agency conflicts which affect their performance and may charge high fees. The value of intermediation is an important question.

This paper focuses on the private equity setting, where disintermediation—limited partners making investments directly— has become an emerging trend. Despite the growing interest among LPs in "going direct," no empirical evidence exists on this phenomenon. Do LPs do better with their direct investments than with their fund investments? Within direct investments, do co-investments (which are generated by the GPs) outperform solo deals (which are generated by the LPs)? One might expect this to be the case if GPs are more "skilled" in selecting investments and if the higher costs (fees and carry) do not dissipate all the upside. But the opposite may be true if LPs are just as skilled in deal selection or if there are severe agency costs.

Using proprietary data, we offer the first large sample evidence of the relative performance of direct investments by large institutional investors. Our sample includes 391 deals by a set of seven institutions, both co-investments and direct investments, covering over twenty years. We find little evidence of outperformance of the direct deals in this sample. Moreover, the performance of these transactions has deteriorated over time, doubtless reflecting the increased competition in and efficiency of these markets. The absence of outperformance in the co-investments, which are typically done alongside the same private equity groups in which the institutions invest, is particularly surprising. This effect appears largely driven by the timing of

these transactions at market peaks and the larger size of the deals. We find that the performance of solo direct investments is better when institutions can exploit their information advantages, e.g., by investing locally and in settings where information problems are not too great.

Turning to the future, our results do not suggest optimism about the current wave of direct investing. First, our sample consists of large and sophisticated investors, and thus their lackluster track record with direct investing programs should serve as a cautionary note to others: small investors implementing a direct investment strategy are unlikely to replicate the resources that these larger investors have, and may thus experience even worse results. Moreover, the deterioration of returns in direct investing over time is sobering. This result suggests returns on direct investment deals may continue to deteriorate as institutional investors expand their direct investment programs.

One puzzle for future research is the relatively poor performance of co-investment deals, which suggests that there may be an agency problem when general partners selectively offer deals to limited partners for co-investing. One question that arises is whether repeated investment relationships between the LPs and the GPs, and hence the reputational risk that GPs have vis-à-vis the LPs, mitigate this agency problem. To fully assess this important question, more data and experience with direct investments is needed.

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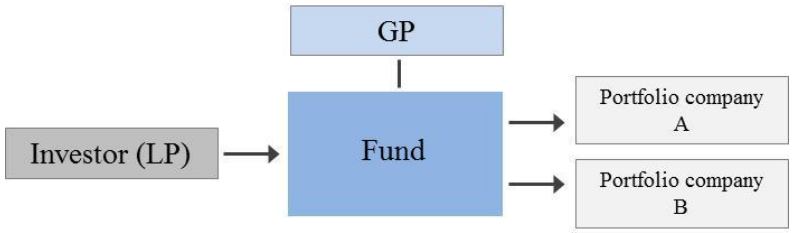
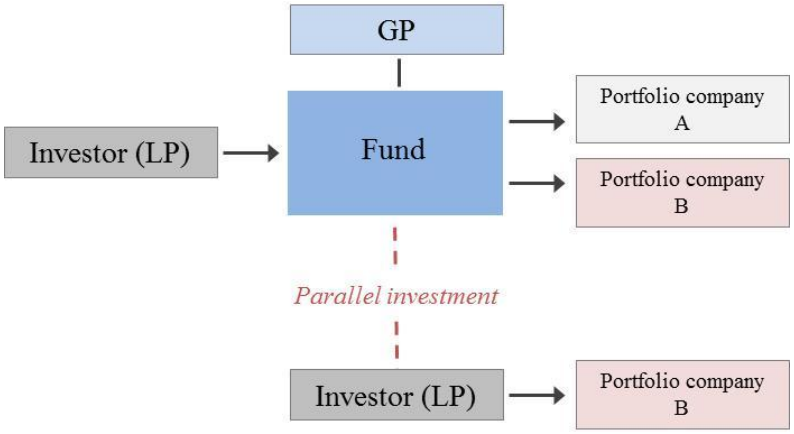
Figure 1
Different forms of private equity investing

A. Traditional fund investing



B. Co-investing



C. Direct investing

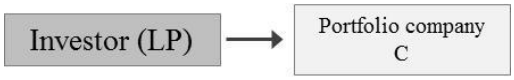


Figure 2
Direct investments over time

This figure plots the amount of direct investments (solo investments and co-investments) in our sample over time. We use all private equity funds raised globally (from Preqin) as a benchmark for direct investment amounts.

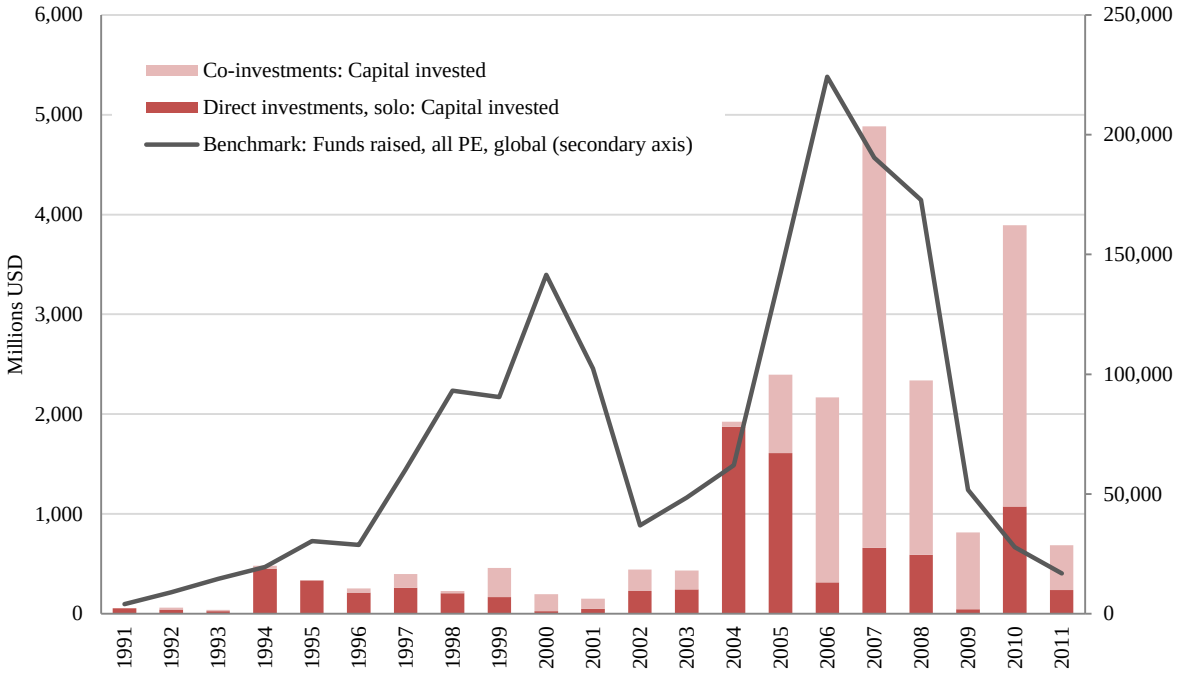
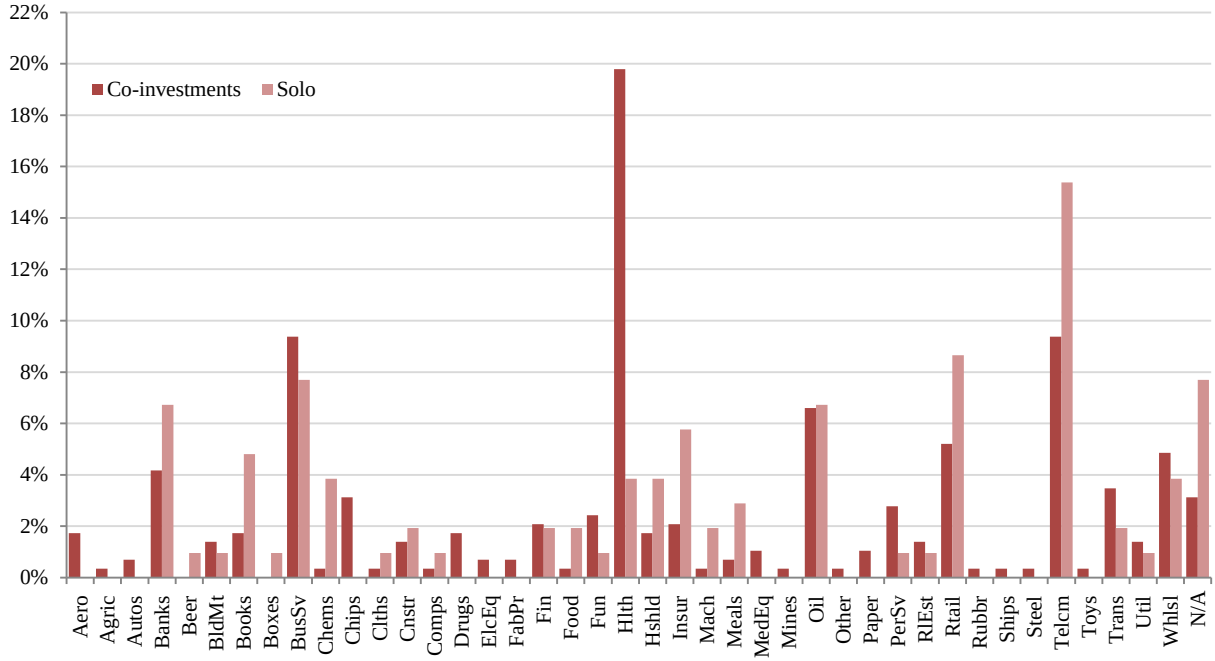


Figure 3
Industry of direct investments

This figure plots the distribution of direct investments (solo investments and co-investments) in our sample across industries. We use the Fama and French (1997) 48-industry classification.

Panel A: By number of deals



Panel B: By volume

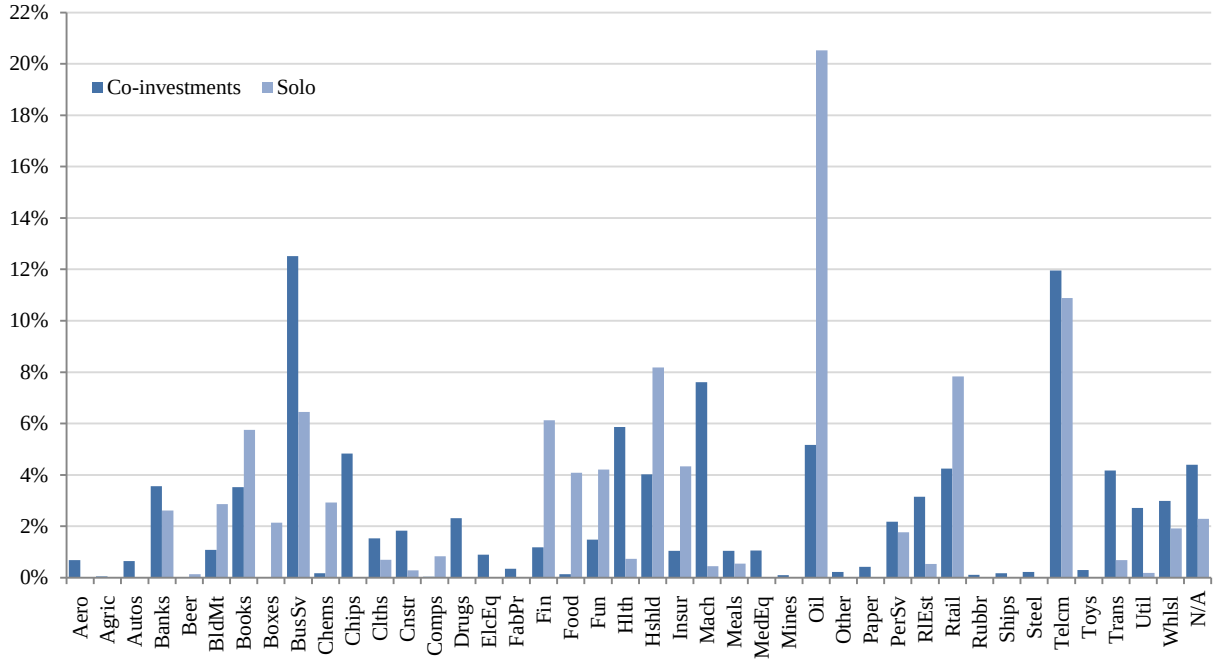
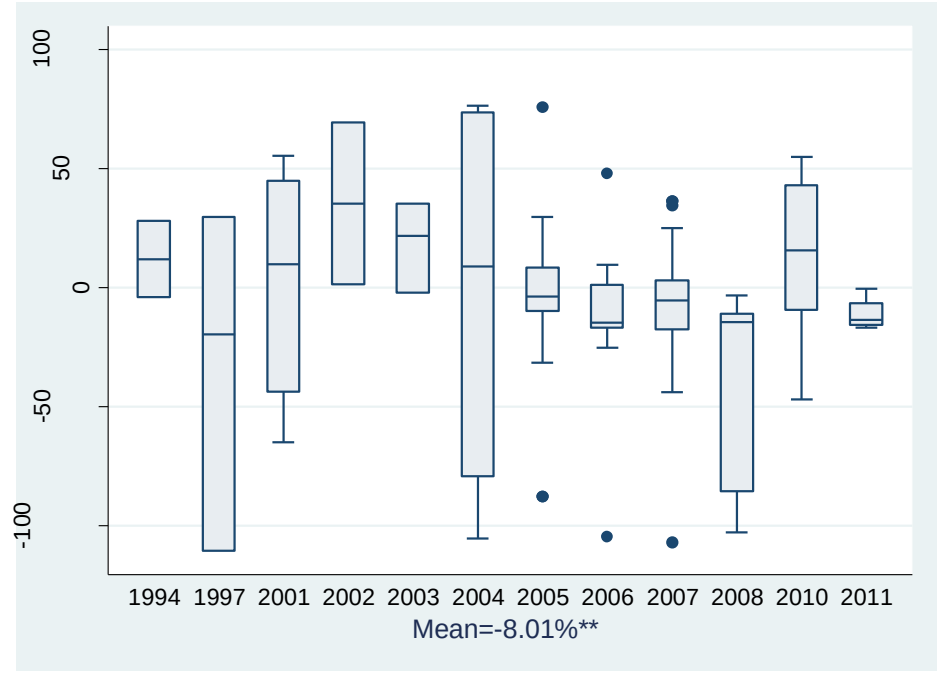


Figure 4
Alternative performance measures

Traditional partnership investment:	Direct investment:
Gross return	
- Fee	- Fee (different structure than in traditional investment)
= Net return (Preqin, Thomson, and Burgiss)	**= Net return** (Our data)
- Administrative cost (0.11% of committed capital incurred annually up to 5 years)	- In-house investment cost and administration costs (0.91% of committed capital incurred annually up to 5 years)
= Imputed net return ("net-net")	

Figure 5
Co-investments vs. fund performance by year of investment
Where possible, we match co-investments in our sample to the corresponding fund. (Co-investments typically are done through a separate investment vehicle alongside the traditional private equity fund investment.) The sample has 73 co-investments and 114 fund matches, due to transactions with multiple sponsors. The figure plots distribution of differences in performance between co-investments and the corresponding fund. Data for the funds is compiled from Preqin. This is the standard box plot: the band inside the box corresponds to the median, bottom and top of the box are the first and third quartile, dots are the adjoin values. ** indicates statistical significance at the 5% level.



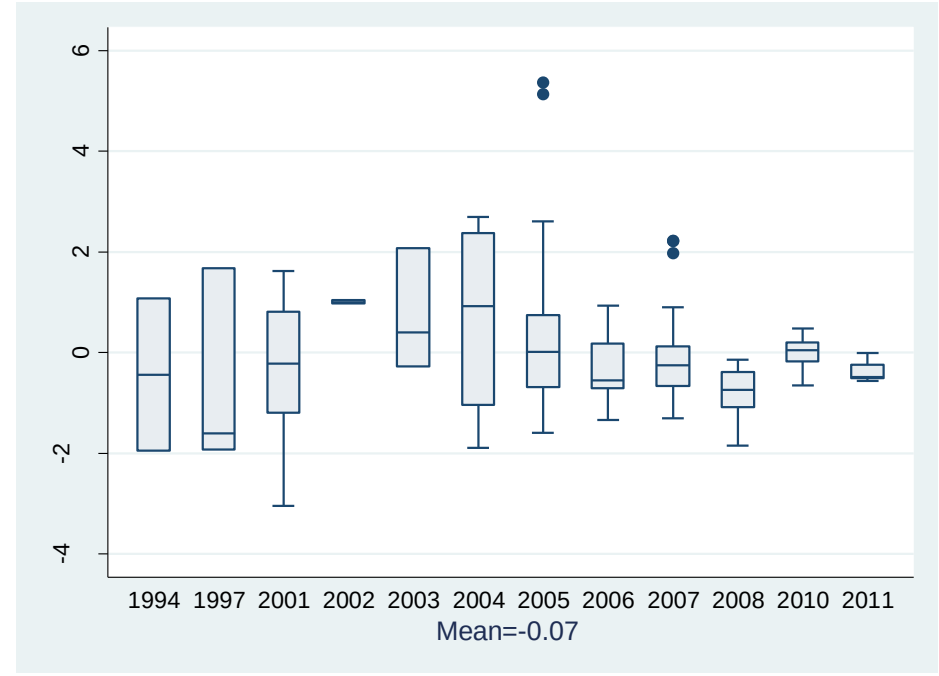


Table 1
Sample characteristics and the evaluation of selection bias
Panel A compares the basic statistics of the participating institutions in our sample with all others listed in the Thomson Reuters VentureXpert Limited Partners Database. Panel B compares the exits in our sample and other direct investments. We manually identified out-of-sample limited partners and the direct investments they made from Capital IQ. Initial public offering (IPO), trade sale, secondary buyout, and bankruptcy are different exit types. "All exits" includes confirmed exits of an unknown type.

Panel A: Sample characteristics

	Mean (7 Investors in our sample)	Mean Other LPs (873 investors)
Private equity program founded (year)	1991.6	1986.1
Total assets under management ($US billion)	94.4	44.3
Total alternative assets under management ($US billion)	20.6	7.9
Private equity (as a % of assets under management)	15.8	13.2
Total identified PE fund commitments (number)	31.3	7.4

Panel B: Exit information

	In sample LPs	Out of sample LPs	Diff. *t*-stat
IPO	23.8%	23.9%	-0.01
Trade sale	66.7%	57.5%	0.79
Secondary buyout	0%	5.2%	-1.07
Bankruptcy	0%	6.0%	-1.15
Unknown exits	9.5%	7.5%	0.33

Table 2
Direct investments sample, 1991-2011
This table summarizes the direct investments in our sample by year. *All* corresponds to the full sample of direct investments. *Co-inv.* and *Solo* correspond to the co-investment and direct investment sub-samples, respectively.

Deal year	Number of transactions			Total capital invested ($million USD)		
	All	Co-inv.	Solo	All	Co-inv.	Solo
1991	4	0	4	54.37	--	54.37
1992	6	2	4	60.73	17.38	43.35
1993	6	2	4	38.77	12.14	26.63
1994	10	3	7	482.79	32.98	449.81
1995	9	1	8	376.24	1.10	375.14
1996	19	10	9	261.25	48.46	212.79
1997	20	11	9	402.35	138.41	263.94
1998	11	3	8	232.90	23.43	209.46
1999	13	8	5	458.12	290.41	167.72
2000	10	8	2	195.96	169.83	26.12
2001	10	9	1	151.93	103.99	47.94
2002	12	10	2	450.54	222.45	228.09
2003	13	9	4	436.87	192.92	243.95
2004	12	5	7	2,138.40	50.98	2,087.42
2005	35	28	7	2,398.22	789.29	1,608.92
2006	41	39	2	2,168.79	1,852.63	316.16
2007	59	56	3	4,885.55	4,222.79	662.76
2008	27	25	2	2,341.02	1,751.50	589.52
2009	15	13	2	815.49	770.79	44.70
2010	41	31	10	3,895.09	2,819.69	1,075.40
2011	18	14	4	686.51	447.86	238.65
Total:	391	287	104	22,931.89	13,959.04	8,972.85
1991-2010	373	273	100	22,245.38	13,511.18	8,734.20
1991-1999	98	40	58	2,367.53	564.31	1,803.22
2000-2010	275	233	42	19,877.85	12,946.87	6,930.98

Table 3
Public Market Equivalent (PME) ratios (by year of investment), 1991-2011

This table shows the average PME ratios by year of investment, comparing the returns of the direct investments to equivalently timed investments in the market index. Weighted averages use the total capital invested in given year by managers in our sample as weights. *Blended index* uses the S&P 500 index for U.S. buyouts, the Russell 2000 for U.S. venture, and the MSCI EAFE Standard and Small Cap indices for non-U.S. buyout and venture, respectively. *S&P 500* uses the S&P 500 index for all type of investments and is comparable to the results in Harris, et al. (2013). Harris, et al. (2013) results are at the fund level.

Panel A: Co-investments vs. solo direct investments

	All direct investments				Co-investments				Solo investments			
	Blended index		S&P 500		Blended index		S&P 500		Blended index		S&P 500	
	Average	Weighted average	Average	Weighted average	Average	Weighted average	Average	Weighted average	Average	Weighted average	Average	Weighted average
1991	0.45	0.45	0.38	0.38	--	--	--	--	0.45	0.45	0.38	0.38
1992	1.50	1.50	1.34	1.34	1.27	1.27	1.27	1.27	1.58	1.58	1.37	1.37
1993	1.83	1.94	1.48	1.67	2.33	2.33	2.25	2.25	1.73	1.76	1.34	1.41
1994	1.98	1.90	1.64	1.58	1.82	1.82	1.24	1.24	1.98	1.91	1.65	1.61
1995	1.06	1.00	0.97	0.88	1.17	1.17	1.17	1.17	1.01	1.00	0.88	0.88
1996	1.53	2.06	1.33	1.73	0.74	0.85	0.72	0.82	1.80	2.33	1.56	1.94
1997	1.44	1.37	1.42	1.27	1.15	1.60	1.10	1.40	1.46	1.25	1.43	1.20
1998	1.05	1.14	1.11	1.13	3.03	4.57	3.08	4.50	0.75	0.75	0.75	0.75
1999	1.82	3.11	1.95	3.13	1.92	2.64	2.06	2.72	2.67	3.92	2.62	3.83
2000	0.26	0.51	0.25	0.50	0.26	0.52	0.25	0.50	0.43	0.43	0.48	0.48
2001	1.02	1.52	1.08	1.60	0.95	1.38	0.99	1.44	1.83	1.83	1.96	1.96
2002	1.60	1.82	1.70	1.83	1.88	1.42	1.98	1.45	2.21	2.21	2.20	2.20
2003	1.20	1.96	1.27	2.10	1.30	2.01	1.38	2.13	1.92	1.92	2.08	2.08
2004	1.30	1.29	1.44	1.33	1.05	1.55	1.15	1.70	1.45	1.28	1.58	1.32
2005	1.41	1.13	1.41	1.09	1.36	1.20	1.35	1.16	1.09	1.09	1.05	1.05
2006	1.04	1.05	0.96	0.96	1.14	1.15	1.04	1.05	0.48	0.48	0.48	0.48
2007	1.20	1.24	1.13	1.14	1.13	1.14	1.06	1.05	1.85	1.85	1.77	1.77
2008	0.60	0.40	0.58	0.39	0.76	0.45	0.73	0.43	0.26	0.25	0.24	0.24
2009	1.37	1.64	1.34	1.62	1.34	1.65	1.32	1.64	1.52	1.52	1.30	1.30
2010	1.10	0.98	1.04	0.95	1.09	0.92	1.03	0.88	1.10	1.14	1.00	1.11
2011	1.07	1.06	1.04	1.04	1.08	1.06	1.05	1.03	1.10	1.07	1.03	1.06
Average 1991-2010	1.24	1.40	1.19	1.33	1.35	1.56	1.33	1.52	1.38	1.45	1.30	1.37
Average 1991-2008	1.24	1.41	1.19	1.34	1.37	1.59	1.34	1.55	1.39	1.46	1.32	1.39
Average 1991-1999	1.41	1.61	1.29	1.46	1.68	2.03	1.61	1.92	1.49	1.66	1.33	1.49
Average 2000-2008	1.07	1.21	1.09	1.22	1.09	1.20	1.10	1.21	1.28	1.26	1.31	1.29

Table 3 - continued

Panel B: Buyouts

Deal year	Blended index		S&P 500		Benchmark Harris, et al. (2013)	
	Average	Weighted average	Average	Weighted average	Average	Weighted average
1989	--	--	--	--	1.26	1.22
1990	--	--	--	--	1.57	2.34
1991	0.46	0.46	0.39	0.39	1.23	1.32
1992	1.55	1.55	1.39	1.39	0.79	0.89
1993	2.04	2.04	1.78	1.78	1.35	1.24
1994	2.00	2.00	1.68	1.68	1.48	1.75
1995	1.09	1.03	1.00	0.90	1.34	1.20
1996	1.54	2.21	1.35	1.86	1.13	0.90
1997	1.29	1.42	1.25	1.31	1.23	1.30
1998	1.18	1.18	1.17	1.17	1.35	1.21
1999	2.44	3.30	2.45	3.31	1.19	1.27
2000	0.54	0.54	0.53	0.53	1.42	1.47
2001	1.75	1.69	1.74	1.73	1.31	1.38
2002	1.68	1.88	1.69	1.89	1.42	1.53
2003	1.82	2.08	1.91	2.23	1.75	1.58
2004	2.04	1.34	2.24	1.39	1.40	1.51
2005	1.67	1.17	1.64	1.13	1.20	1.23
2006	1.12	1.11	1.04	1.01	1.03	0.99
2007	1.36	1.31	1.28	1.21	1.03	1.02
2008	0.49	0.35	0.48	0.37	0.91	0.90
2009	1.61	1.81	1.61	1.81	--	--
2010	1.12	0.99	1.05	0.96	--	--
2011	1.07	1.07	1.06	1.06	--	--
Average 1991-2010	1.44	1.47	1.38	1.40	--	--
Average 1991-2008	1.45	1.48	1.39	1.40	1.25	1.26
Average 1991-1999	1.51	1.69	1.38	1.53	1.23	1.23
Average 2000-2008	1.39	1.27	1.40	1.28	1.27	1.29

Table 3-continued

Panel C: Venture capital

Deal year	Blended index		S&P 500		Benchmark Harris, et al. (2013)	
	Average	Weighted average	Average	Weighted average	Average	Weighted average
1989	--	--	--	--	1.34	1.52
1990	--	--	--	--	1.50	1.66
1991	--	--	--	--	1.37	1.35
1992	--	--	--	--	1.27	1.34
1993	1.75	1.75	1.26	1.26	2.79	2.74
1994	2.12	2.12	1.74	1.74	2.40	2.86
1995	--	--	--	--	2.16	2.09
1996	0.87	0.87	0.78	0.78	3.79	4.17
1997	1.34	1.34	1.43	1.43	2.43	2.65
1998	0.87	0.87	1.08	1.08	1.43	1.48
1999	0.83	0.83	1.21	1.21	0.76	0.9
2000	0.00	0.00	0.00	0.00	0.79	0.85
2001	0.63	1.14	0.77	1.38	0.80	0.84
2002	1.82	1.76	2.22	2.14	0.82	0.88
2003	0.70	0.49	0.81	0.58	0.88	0.99
2004	0.07	0.06	0.10	0.09	0.90	0.96
2005	0.93	0.84	1.02	0.93	1.27	1.23
2006	0.50	0.87	0.45	0.78	0.93	0.97
2007	0.74	0.74	0.76	0.76	0.97	0.99
2008	1.56	1.35	1.74	1.36	0.84	0.84
2009	1.01	1.05	0.96	0.94	--	--
2010	1.06	1.17	0.99	1.07	--	--
2011	1.08	1.08	1.02	1.02	--	--
Average 1991-2010	0.99	1.02	1.02	1.03		
Average 1991-2008	0.98	1.00	1.03	1.04	1.48	1.56
Average 1991-1999	1.30	1.30	1.25	1.25	2.04	2.18
Average 2000-2008	0.77	0.81	0.88	0.89	0.91	0.95

Table 4
Comparative analysis of direct investments performance, PME ratios

This table builds on the results reported in Table 3. Each number corresponds to a difference in the mean PME ratios between deals in our direct investments sample and the benchmark computed by Harris, et al. (2013) using Burgiss data. Harris, et al. (2013) results correspond to performance by fund vintage year. "Lag 0" corresponds to a contemporaneous, 1991-2008, comparison of returns. In columns "Lag 1" and "Lag 2," the benchmark is lagged one year (1990-2007) and two years (1989-2006) respectively. Weighted averages use the total capital invested in given year by managers in our sample as weights. In this table PME ratios are computed using S&P 500 index for all type of investments.

	Simple averages			Weighted average		
Benchmark lag:	Lag 0	Lag 1	Lag 2	Lag 0	Lag 1	Lag 2
	Panel A: Direct investments					
Co-investments						
1991-2008	0.17	0.10	0.02	0.30	0.31	0.21
1991-1999	0.34	0.24	0.13	0.62	0.67	0.50
2000-2008	0.02	-0.02	-0.09	0.02	-0.02	-0.05
Solo direct investments						
1991-2008	0.00	0.01	0.03	0.17	0.10	0.09
1991-1999	-0.08	-0.03	0.05	0.29	0.19	0.19
2000-2008	0.09	0.06	0.02	0.04	0.00	-0.02
	Panel B: Buyouts					
1991-2008	0.14	0.10	0.09	0.14	0.06	0.05
1991-1999	0.15	0.11	0.12	0.30	0.18	0.18
2000-2008	0.12	0.09	0.05	-0.01	-0.06	-0.08
	Panel C: Venture capital					
1991-2008	-0.43	-0.44	-0.44	-0.52	-0.50	-0.53
1991-1999	-1.02	-1.06	-0.99	-1.22	-1.16	-1.16
2000-2008	-0.04	-0.03	-0.08	-0.06	-0.06	-0.12

Table 5
Comparative analysis of direct investments performance, PME ratios ("net-net")

This table builds on the results reported in Table 3. Each number corresponds to a difference in the mean PME ratios between deals in our direct investments sample and the benchmark computed by Harris, et al. (2013) using Burgiss data. The cash flows used to construct PMEs in our sample are net of in-house investment cost and administrative cost, or "net-net" returns. (See Figure 4 for definitions.) Harris, et al. (2013) results correspond to performance by fund vintage year. "Lag 0" corresponds to a contemporaneous, 1991-2008, comparison of returns. In columns "Lag 1" and "Lag 2," the benchmark is lagged one year (1990-2007) and two years (1989-2006) respectively. Weighted averages use the total capital invested in given year by managers in our sample as weights. In this table PME ratios are computed using S&P 500 index for all type of investments.

	Simple averages			Weighted average		
Benchmark lag:	Lag 0	Lag 1	Lag 2	Lag 0	Lag 1	Lag 2
	Panel A: Direct investments					
Co-investments						
1991-2008	0.12	0.05	-0.03	0.24	0.25	0.16
1991-1999	0.29	0.18	0.08	0.56	0.61	0.44
2000-2008	-0.03	-0.06	-0.13	-0.03	-0.07	-0.10
Solo direct investments						
1991-2008	-0.05	-0.04	-0.01	0.11	0.04	0.03
1991-1999	-0.13	-0.08	0.00	0.23	0.13	0.13
2000-2008	0.04	0.01	-0.03	0.00	-0.04	-0.07
	Panel B: Buyouts					
1991-2008	0.09	0.05	0.04	0.09	0.01	0.00
1991-1999	0.10	0.06	0.07	0.24	0.12	0.12
2000-2008	0.07	0.04	0.00	-0.07	-0.11	-0.13
	Panel C: Venture capital					
1991-2008	-0.48	-0.52	-0.54	-0.56	-0.61	-0.63
1991-1999	-0.83	-0.91	-0.90	-0.96	-1.04	-1.05
2000-2008	-0.07	-0.06	-0.11	-0.09	-0.09	-0.15

Table 6
Direct investments performance (by year of investment): TV/PI and IRR, 1991-2011

This table shows the performance of the direct investments by year. *All* corresponds to the full sample of direct investments. *Solo* and *Co-inv.* correspond to the direct investment and co-investment sub-samples, respectively. TV/PI is the total value (sum of distributed and residual capital) divided by paid in capital. We calculate the capital-weighted average TV/PI for investments done in a given year for each investor; the reported numbers are the simple averages across investors. *IRR* corresponds to value-weighted average IRR for investments done in a given year for each investor. *Portfolio IRR* treats all investments done by the same investor in a given year as one portfolio (regardless of the date of other cash flows). Both set of IRR numbers correspond to the simple average across investors in our sample. For seven (out of 391) investments, we do not have cash flows data, but only the IRR: we include these as separate observations in computing the portfolio IRR.

Deal year	TV/PI			IRR (%)			Portfolio IRR (%)		
	All	Co-inv.	Solo	All	Co-inv.	Solo	All	Co-inv.	Solo
1991	0.80	--	0.80	-24.51	--	-24.51	-7.70		-7.70
1992	2.79	2.50	2.91	-1.42	23.27	-11.33	25.00	21.40	27.00
1993	2.38	2.76	2.35	53.53	131.01	39.73	41.85	108.30	27.90
1994	2.81	2.74	2.79	30.48	34.20	29.78	31.10	28.80	30.30
1995	1.95	2.45	1.70	18.07	17.80	18.21	16.47	16.90	16.25
1996	1.92	0.86	2.21	65.42	20.09	93.35	28.80	-20.40	100.17
1997	1.82	1.50	1.79	9.71	-0.23	12.31	17.07	8.87	18.25
1998	1.33	3.80	0.89	-1.55	4.64	-9.43	14.73	13.30	-4.10
1999	1.82	1.95	2.49	13.40	28.83	5.02	15.27	29.63	16.80
2000	0.23	0.23	0.46	-62.45	-76.36	152.94	-50.00	-50.00	0.00
2001	1.19	0.99	2.72	-21.30	-24.19	28.53	-15.53	-18.50	36.00
2002	2.38	2.58	2.96	51.42	45.88	102.90	53.00	42.20	133.40
2003	1.79	1.87	3.13	20.39	31.33	45.11	27.77	34.33	49.20
2004	1.83	1.52	1.89	21.66	-26.15	35.92	35.25	41.33	36.15
2005	1.75	1.67	1.21	18.89	16.10	7.34	18.84	17.82	8.20
2006	1.06	1.15	0.51	-12.95	-7.82	-56.41	2.12	3.58	0.00
2007	1.14	1.08	1.73	-5.84	-7.15	-16.95	3.32	3.15	14.20
2008	0.67	0.83	0.30	-29.94	-18.23	-43.00	-6.36	-5.66	0.00
2009	1.67	1.65	1.58	41.94	41.59	26.26	42.87	42.10	26.80
2010	1.26	1.28	1.07	15.80	17.10	4.16	24.58	27.62	5.60
2011	1.02	1.02	1.00	0.90	0.06	1.31	15.48	14.08	4.05
Total:	--	--	--	--	--	--	--	--	--
Simple average									
1991-2010	1.63	1.76	1.77	10.04	13.25	22.00	15.92	18.15	26.72
1991-1999	1.96	2.32	1.99	18.13	32.45	17.01	20.29	25.85	24.99
2000-2010	1.36	1.35	1.60	3.42	(0.72)	26.07	12.35	12.54	28.14
Weighted average									
1991-2010	1.38	1.23	1.59	5.67	2.10	13.66	14.82	11.39	22.76
1991-1999	2.02	1.91	2.04	20.67	22.26	22.98	20.59	20.93	27.35
2000-2010	1.30	1.20	1.47	3.89	1.22	11.23	14.14	10.98	21.56

Table 7

Comparative analysis of direct investments performance, net returns

Each number in this table is a difference in the mean performance measures between deals in our direct investment sample (reported in Table II) and a private equity benchmark. The benchmarks—from Preqin, Thomson, and Burgiss—correspond to the cumulative performance as of September 30, 2011 by fund vintage year. "Lag 0" corresponds to a contemporaneous, 1991-2010, comparison of returns. In columns "Lag 1" and "Lag 2," the benchmark is lagged one year (1990-2009) and two years (1989-2008) respectively. Shaded cells are those where the direct investments perform better.

	Weighted average 1991-2010						Weighted average 1991-1999						Weighted average 2000-2010					
	Co-investments			Solo			Co-investments			Solo			Co-investments			Solo		
Benchmark lag:	Lag 0	Lag 1	Lag 2	Lag 0	Lag 1	Lag 2	Lag 0	Lag 1	Lag 2	Lag 0	Lag 1	Lag 2	Lag 0	Lag 1	Lag 2	Lag 0	Lag 1	Lag 2
Panel A: IRR																		
Direct investment sample	2.10	2.10	2.10	13.66	13.66	13.66	22.26	22.26	22.26	22.98	22.98	22.98	1.22	1.22	1.22	11.23	11.23	11.23
Differences (as compared to):																		
Preqin, U.S., all PE	-6.94	-7.01	-7.18	4.62	4.55	4.38	9.09	5.92	0.58	9.81	6.64	1.30	-6.36	-6.09	-6.10	3.65	3.92	3.91
Preqin, U.S., buyouts	-7.14	-7.21	-7.42	4.42	4.35	4.14	12.52	11.91	5.55	13.24	12.63	6.27	-7.85	-7.80	-7.07	2.16	2.21	2.94
Preqin, global, all PE	-7.11	-6.85	-7.37	4.45	4.71	4.19	7.97	5.05	0.01	8.69	5.77	0.73	-6.40	-5.98	-6.34	3.61	4.03	3.67
Preqin, global, buyouts	-7.86	-7.89	-8.05	3.70	3.67	3.51	9.21	8.43	2.56	9.93	9.15	3.28	-7.79	-7.85	-7.47	2.22	2.16	2.54
Thomson, U.S., all PE	-6.06	-6.12	-6.06	5.50	5.44	5.50	10.83	7.02	2.78	11.55	7.74	3.50	-5.87	-5.32	-5.15	4.14	4.69	4.86
Thomson, U.S.,	-5.27	-5.43	-5.42	6.29	6.13	6.14	14.16	13.58	8.89	14.88	14.30	9.61	-5.91	-6.00	-5.30	4.10	4.01	4.71
Thomson, global, all	-5.65	-5.71	-5.46	5.91	5.85	6.10	10.33	7.07	3.73	11.05	7.79	4.45	-5.30	-5.02	-4.71	4.71	4.99	5.30
Thomson, global,	-5.37	-5.48	-5.12	6.19	6.08	6.44	12.27	11.96	7.90	12.99	12.68	8.62	-5.52	-5.74	-4.92	4.49	4.27	5.09
Burgiss, global, all PE	-6.13	-6.41	-6.37	5.43	5.15	5.19	11.63	10.34	7.07	12.35	11.06	7.79	-6.71	-6.95	-6.81	3.30	3.06	3.20
Burgiss, global,	-6.12	-6.28	-6.31	5.44	5.28	5.25	11.68	10.41	6.72	12.40	11.13	7.44	-6.66	-6.79	-6.70	3.35	3.22	3.31
Panel B: TV/PI																		
Direct investment sample	1.23	1.23	1.23	1.59	1.59	1.59	1.91	1.91	1.91	2.04	2.04	2.04	1.20	1.20	1.20	1.47	1.47	1.47
Differences (as compared to):																		
Preqin, U.S., all PE	-0.16	-0.17	-0.20	0.20	0.19	0.16	0.15	-0.03	-0.37	0.28	0.10	-0.24	-0.07	-0.08	-0.09	0.20	0.19	0.18
Preqin, U.S., buyouts	-0.16	-0.17	-0.19	0.20	0.19	0.17	0.33	0.30	0.00	0.46	0.43	0.13	-0.13	-0.15	-0.14	0.14	0.12	0.13
Preqin, global, all PE	-0.16	-0.17	-0.20	0.20	0.19	0.16	0.13	-0.02	-0.29	0.26	0.11	-0.16	-0.07	-0.09	-0.11	0.20	0.18	0.16
Preqin, global, buyouts	-0.19	-0.19	-0.22	0.17	0.17	0.14	0.21	0.18	-0.03	0.34	0.31	0.10	-0.13	-0.15	-0.17	0.14	0.12	0.10
VE, U.S., all PE	-0.10	-0.11	-0.13	0.26	0.25	0.23	0.30	0.14	-0.14	0.43	0.27	-0.01	-0.05	-0.04	-0.05	0.22	0.23	0.22
VE, U.S., buyouts	-0.07	-0.08	-0.09	0.29	0.28	0.27	0.48	0.49	0.26	0.61	0.62	0.39	-0.06	-0.07	-0.07	0.21	0.20	0.20
VE, global, all PE	-0.09	-0.10	-0.11	0.27	0.26	0.25	0.28	0.14	-0.08	0.41	0.27	0.05	-0.03	-0.04	-0.05	0.24	0.23	0.22
VE, global, buyouts	-0.08	-0.09	-0.09	0.28	0.27	0.27	0.39	0.41	0.23	0.52	0.54	0.36	-0.05	-0.07	-0.07	0.22	0.20	0.20
Burgiss, global, all PE	-0.07	-0.09	-0.10	0.29	0.27	0.26	0.32	0.25	0.05	0.45	0.38	0.18	-0.07	-0.08	-0.10	0.20	0.19	0.17
Burgiss, global,	-0.08	-0.09	-0.11	0.28	0.27	0.25	0.32	0.25	0.03	0.45	0.38	0.16	-0.07	-0.09	-0.10	0.20	0.18	0.17

Table 8
Co-investment deal size

This table compares the enterprise value of the co-investments in our sample with other deals in the same general partners' portfolios. To make this comparison, we look at deals where the GP name or the name of the target is available. For each co-investment, we construct benchmarks using all of the same GP's deals from CapitalIQ in the five-, three-, and two-year window preceding the co-investment. ***, **, and * indicates statistical significance at the 1%, 5%, and 10% level, respectively.

Benchmark window:	Obs.	GP's average deal ($million USD)	Diff.	*t*-stat		GP's median deal ($million USD)	Diff.	*t*-stat	
5-year	114	1,841.61	1,291.16	3.10	***	1,016.68	2,116.08	4.67	***
3-year	109	2,059.68	1,179.98	2.74	***	1,194.02	2,045.64	4.41	***
2-year	104	2,232.04	989.34	2.36	**	1,313.42	1,907.97	4.17	***

Table 9

Multivariate analysis of direct investments and co-investments performance

In this table, we look at the cross-section of deals; each observation is a separate direct investment. The dependent variable is the deal performance minus the corresponding benchmark; these are performance measures *net* of benchmark. The difference with the non-parametric analysis reported in earlier tables is that now the benchmark is customized for each deal based on investment type or the geographical region of the investment. (The number of observations drops when the benchmark is not available.) The benchmark is lagged by one year ("Lag 1" in the previous tables); i.e., a direct investment in year *T* is compared to performance of a fund closed in year *T-1*. All measures are net of fees. "Net-net" returns are, in addition, net of in-house investment cost. (See Figure 4 for definitions.) Standard errors are clustered by the investor from which we obtained the data. ***, **, and * indicates statistical significance at the 1%, 5%, and 10% level, respectively.

Panel A: PME (Benchmark: Harris, et al., 2013)

Benchmark matched on:	Net of fees				"Net-net"			
	Investment type				Investment type			
	Average	Weighted average	Average	Weighted average	Average	Weighted average	Average	Weighted average
All direct investments (constant)	1.24 [1.166]	--	1.24 [1.174]	--	1.16 [1.125]	--	1.15 [1.133]	--
Solo direct investments (marginal effect)	2.84** [1.024]	0.27** [0.109]	2.83** [1.019]	0.23* [0.101]	2.75** [0.991]	0.27** [0.109]	2.74** [0.986]	0.23* [0.101]
Investor fixed effects	--	Yes	--	Yes	--	Yes	--	Yes
Observations	333	333	333	333	333	333	333	333
R-squared	0.003	0.022	0.003	0.022	0.003	0.022	0.003	0.022

Panel B: IRR (Benchmark: Preqin)

Benchmark matched on:	Net of fees				"Net-net"			
	Investment type	Investment type	Region	Region	Investment type	Investment type	Region	Region
All direct investments (constant)	-5.35*** [1.228]	--	-5.09*** [1.205]	--	-9.14** [2.799]	--	-8.88** [2.755]	--
Solo direct investments (marginal effect)	13.11*** [1.779]	16.11*** [2.132]	12.98*** [1.882]	16.20*** [2.484]	13.60** [3.718]	16.31*** [3.787]	13.48** [3.878]	16.40*** [4.231]
Investor fixed effects	--	Yes	--	Yes	--	Yes	--	Yes
Observations	327	327	327	327	327	327	327	327
R-squared	0.005	0.006	0.005	0.006	0.007	0.018	0.007	0.017

Panel C: TV/PI (Benchmark: Preqin)

Benchmark matched on:	Net of fees				"Net-net"			
	Investment type	Investment type	Region	Region	Investment type	Investment type	Region	Region
All direct investments (constant)	0.97 [0.995]	--	0.98 [0.992]	--	0.92 [0.991]	--	0.93 [0.988]	--
Solo direct investments (marginal effect)	2.60** [0.801]	-0.15 [0.259]	2.60** [0.799]	-0.13 [0.240]	2.32** [0.744]	-0.40* [0.196]	2.32** [0.741]	-0.39* [0.178]
Investor fixed effects	--	Yes	--	Yes	--	Yes	--	Yes
Observations	391	391	391	391	391	391	391	391
R-squared	0.003	0.019	0.003	0.019	0.002	0.019	0.002	0.019

Table 10

Factors influencing the performance differences: Venture deals

Each observation in the sample used for the analysis is a direct investment. The dependent variable is the deal performance minus the corresponding benchmark; these are performance measures *net* of benchmark. Each investment is matched to a benchmark based on the type of the investment. The benchmark is lagged by one year ("Lag 1" in the previous tables); i.e., a direct investment in year *T* is compared to performance of a fund closed in year *T-1*. All measures are net of fees. "Net-net" returns are, in addition, net of in-house investment cost. (See Figure 4 for definitions.) *Venture deal* is a dummy indicating whether the deal is a venture deal (as opposed to a buyout investment). Standard errors are clustered by investor from which we obtained the data. ***, **, and * indicates statistical significance at the 1%, 5%, and 10% level, respectively.

	PME (Benchmark: Harris, et al., (2013); weighted average)		IRR (Benchmark: Preqin; matched on investment type)	
Return type:	Net	"Net-net"	Net	"Net-net"
Solo direct investments	0.26**	0.26**	15.99***	16.88***
(marginal effect)	[0.079]	[0.079]	[1.826]	[4.480]
Solo DI*Venture deals	-0.51***	-0.51***	-21.79**	-20.75***
	[0.103]	[0.103]	[7.040]	[4.336]
Venture deal	0.12	0.11	-52.44*	-27.03*
	[0.182]	[0.181]	[21.608]	[12.101]
Investor fixed effects	Yes	Yes	Yes	Yes
Observations	333	333	327	327
R-squared	0.022	0.022	0.026	0.026

Table 11

Factors influencing the performance differences: Distance to the target and transaction type

Each observation in the sample used for the analysis is a direct investment. The dependent variable is the deal performance minus the corresponding benchmark; these are performance measures *net* of benchmark. Each investment is matched to a benchmark based on the type of the investment. The benchmark is lagged by one year ("Lag 1" in the previous tables); i.e., a direct investment in year *T* is compared to performance of a fund closed in year *T-1*. All measures are net of fees. "Net-net" returns are, in addition, net of in-house investment cost. (See Figure 4 for definitions.) *Distance* is the distance between the headquarters of the institutional investor and that of the portfolio company, in hundreds of kilometers. *Venture deal* is a dummy indicating whether the deal is a venture deal (as opposed to a buyout investment). Industry fixed effects correspond to Fama and French (1997) 48-industry portfolios. Standard errors are clustered by the investor from which we obtained the data. ***, **, and * indicates statistical significance at the 1%, 5%, and 10% level, respectively.

	PME (Benchmark: Harris, et al., (2013); weighted average)				IRR (Benchmark: Preqin; matched on investment type)			
Return type:	Net	"Net-net"	Net	"Net-net"	Net	"Net-net"	Net	"Net-net"
Solo direct investments	0.95	0.93	-0.75	-0.70	18.49***	17.78***	14.91***	15.28**
	[1.245]	[1.196]	[3.467]	[3.354]	[2.743]	[3.317]	[1.834]	[4.455]
Solo DI*Distance	-0.09**	-0.09**	-0.12**	-0.11**	-0.29	-0.26	-0.09	-0.09
	[0.029]	[0.028]	[0.034]	[0.033]	[0.191]	[0.188]	[0.272]	[0.264]
Distance ('00 km)	-0.04	-0.04	-0.05	-0.05	0.17	0.12	0.07	0.05
	[0.046]	[0.044]	[0.053]	[0.051]	[0.132]	[0.100]	[0.172]	[0.147]
Venture deal	-0.11	-0.11	0.58	0.56	-45.57*	-19.38*	-44.89***	-22.98***
	[0.542]	[0.524]	[0.715]	[0.691]	[19.101]	[9.398]	[7.160]	[4.858]
Investor fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry fixed effects	--	--	Yes	Yes	--	--	Yes	Yes
Observations	328	328	328	328	322	322	322	322
R-squared	0.029	0.028	0.156	0.155	0.023	0.025	0.144	0.163

Table 12

Factors influencing the performance differences: Economic cycles and transaction type

Each observation in the sample used for the analysis is a direct investment. The dependent variable is the deal performance minus the corresponding benchmark; these are performance measures *net* of benchmark. Each investment is matched to a benchmark based on the type of the investment. The benchmark is lagged by one year ("Lag 1" in the previous tables); i.e., a direct investment in year *T* is compared to performance of a fund closed in year *T-1*. *Recession* is a dummy variable equal to 1 if the investment was made in an economic recession year and 0 otherwise. (According to the National Bureau of Economic Research, the recession years in our sample are 1991, 2001, and 2007 through 2009.) *Venture deal* is a dummy indicating whether the deal is a venture deal (as opposed to a buyout investment). Industry fixed effects correspond to Fama and French (1997) 48-industry portfolios. Standard errors are clustered by investor from which we obtained the data. ***, **, and * indicates statistical significance at the 1%, 5%, and 10% level, respectively.

	PME (Benchmark: Harris, et al., (2013); weighted average)				IRR (Benchmark: Preqin; matched on investment type)			
Return type:	Net	"Net-net"	Net	"Net-net"	Net	"Net-net"	Net	"Net-net"
Solo direct investments	0.95***	0.93***	1.47	1.44	19.62***	20.39**	22.21***	22.86***
	[0.232]	[0.225]	[0.855]	[0.829]	[3.579]	[5.500]	[3.506]	[5.394]
Solo DI*Recession	-4.80***	-4.65***	-19.68	-19.04	-37.02***	-34.19***	-44.67***	-41.62***
	[1.095]	[1.061]	[15.554]	[15.043]	[5.655]	[4.458]	[8.377]	[7.618]
Recession	-0.97	-0.94	-1.64	-1.58	-15.22**	-11.51**	-13.01	-8.44**
	[1.129]	[1.089]	[2.024]	[1.953]	[5.980]	[4.072]	[8.058]	[3.275]
Venture deal	-0.32	-0.31	-0.02	-0.02	-57.88*	-31.77*	-53.76***	-31.74***
	[0.322]	[0.316]	[0.504]	[0.488]	[23.766]	[13.931]	[5.973]	[3.447]
Investor fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry fixed effects	--	--	Yes	Yes	--	--	Yes	Yes
Observations	333	333	333	333	327	327	327	327
R-squared	0.025	0.024	0.170	0.169	0.043	0.043	0.162	0.176