Is the rise of secondary buyouts good news for investors?

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Abstract

Private equity firms increasingly sell their portfolio companies to other private equity firms. We show that these "secondary buyouts" are costly for institutional investors, both because the induced transaction costs are large and because secondary buyouts significantly underperform primary buyouts. Consistent with both the agency conflict view of Axelson, Stromberg and Weisbach (2009) and the fundamental view of Jensen (1989), the underperformance of secondary buyouts is confined to the secondary buyouts made under buying pressure, i.e. towards the end of the fund's investment period.

In the past two decades, leveraged buyout investments by specialized private equity firms have grown from a niche phenomenon to a ubiquitous form of corporate ownership. Stromberg (2008) documents that private equity firm backed leveraged buyout transactions since 2001 totaled over $2 trillion worldwide. Stromberg (2008) also documents an increase in the "staying power" of leveraged buyouts (first investigated by Kaplan, 1991). Firms stay longer under private equity ownership and there is a rise in so-called secondary buyouts – transactions in which a private equity firm sells a company to another private equity firm.

This paper examines secondary buyouts (SBOs) from the point of view of the investors in private equity funds (so-called limited partners). Compared with other investment vehicles such as mutual funds or hedge funds, private equity funds have two distinctive features (Metrick and Yasuda, 2011): they mainly invest in controlling stakes of privately held companies, and they are required to invest (and return) money within a finite period of time. We argue that these two distinctive features of PE funds have an especially negative impact for investor returns when PE funds invest in SBOs.

There are two reasons why SBOs may hurt investor returns compared to primary buyouts (PBOs). First, as portfolio allocations to buyout funds have grown, investors have increased the number of funds they hold. As a result, investors – especially the large ones – are ever more likely to be on both sides of a secondary buyout transaction. We call this phenomenon limited partner overlap ("LP overlap" for short). A limited partner invested in both the buying fund and the selling fund of a secondary buyout pays the transaction fees on each side, but only enjoys a small portfolio rebalancing from the transaction. The combination of high transaction fees (typical of all buyouts) and low

portfolio rebalancing (specific to SBOs) should, ceteris paribus, hurt LP returns in buyout funds.

Second, we argue that secondary buyouts are likely to figure prominently in the agency conflict identified by Axelson, Stromberg and Weisbach (2009): "If the GP [general partner] has not encountered enough good projects and is approaching the end of the investment horizon […] a GP with untapped funds has the incentive to "go for broke" and take bad deals."[1] If a GP wants to burn money, SBOs are a cheaper and safer investment choice than primary buyouts. The reason is that the most important costs for a private equity firm making a buyout investment are search costs and due diligence costs. In the case of a primary buyout, the private equity firm must spend considerable time to identify companies suitable for a buyout, convince the shareholders to sell, and then make sure that the asset is not a lemon (due diligence). By contrast, any company present in the portfolio of another private equity firm is a priori up for sale. As a result, both the lemons and the oranges of a private equity firm are for sale and sourcing a deal is trivial because private equity firms are easy to identify. The due diligence cost remains substantial, but even that, is likely to be less than for a primary buyout.

Empirically, we begin by quantifying the direct cost of LP overlap. Given reasonable assumptions about transaction fees in buyouts, we show that the transaction costs borne by a limited partner in SBOs amounts to a large portion of the limited partner's portfolio rebalancing induced by the transaction. We also document that LP overlap in SBOs occurs frequently for large limited partners.

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[1] Axelson, Stromberg and Weisbach (2009), p. 1551. See also Kandel, Leshchinskii and Yuklea (2011) for a discussion of distortions due to the fixed fund life in venture capital funds.

Our second set of empirical results stems from our analysis of the cross section of buyout returns. Our key finding supports the view that the GPs sometimes "go for broke" towards the end of the investment horizon. Investing in SBOs appears to be one of the manifestations of this "go for broke" behavior. Specifically, we find that (1) SBOs made late in the investment period underperform markedly compared to other SBOs; (2) primary buyouts made late in the investment period do not underperform markedly compared to other PBOs; (3) the average SBO exhibits strong underperformance; and (4) SBO underperformance disappears once we remove late investment SBOs, i.e. those most likely to have been made due to "go-for-broke" incentives.

Our results mean that secondary buyouts are heterogeneous. A sub-set of SBO transactions seem to result from an agency conflict and they underperform. However, some secondary buyouts seem to be done for fundamental reasons and they do not underperform. This fundamental view of secondary buyouts was already expressed in Jensen's (1989) "Eclipse of the public corporation" seminal paper: "The very proliferation of [LBO] transactions has helped create a more efficient infrastructure and liquid market for buying and selling divisions and companies. Thus LBO investors can "cash out" in a secondary LBO or private sale without recourse to a public offering." In this view, the growth of private equity makes it more likely that two private equity firms will transact with each other. Moreover, the increased professionalization of private equity in the past two decades may lead to more value gains: target companies change (private equity) hands because each successive private equity owner has a set of skills uniquely adapted to a specific stage in the life of the company.

A few recent studies have examined secondary buyouts, but unlike this paper, they all focus on the corporate finance side of SBOs. They test the fundamental view of SBOs by looking at the operating performance of the companies going through a secondary buyout. Wang (forthcoming) and Bonini (2012) find little evidence of operating performance gains in secondary buyouts. Jenkinson and Sousa (2012) find that SBOs' operating performance is lower than that of comparable IPOs, and that SBOs compensates for operating underperformance by cutting investments in order to meet their debt payments.[2]

Relative to this existing work, our focus is different in that we examine the investment returns of limited partners, not the operating performance of the company undergoing a secondary buyout. Our results are consistent with existing work as we find that the average SBO does not seem to be "fundamentally" motivated and offers a lower return for investors. However, thanks to the breadth and depth of our data we can precisely quantify the loss for investors, examine a large cross-section of SBOs and thereby isolate a subset of buyouts that are not "fundamentally" motivated. In particular, we show that a non-negligible subset of secondary buyouts perform equally well as similar primary buyouts.

The cross-section of buyout returns come from the Private Placement Memorandums which private equity firms send when raising capital. Our data enables us to observe directly, rather than infer (as in Bonini, 2012), individual private equity deal performance. Our sample contains the performance of 5,308 North American and Western European liquidated buyout investments made between 1986 and 2007. We

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[2] Wang (forthcoming) and Sousa (2011) also find that firms are more likely to exit through SBOs when credit market conditions are favorable, which cannot be explained by the fundamental view.

complemented this data with information from other commercial databases such as Pitchbook, Thomson Banker One and Capital IQ in order to determine the investments' exit route and whether a buyout is a primary or a secondary buyout. 435 of these investments are secondary buyouts and 4873 are primary buyouts.

The rest of the paper is organized as follows. Section 1 analyzes the transaction costs paid by limited partners in secondary buyouts due to limited partner overlap. Section 2 studies the cross-section of secondary buyout returns. Section 3 discusses our results, and section 4 concludes.

1. Limited partner overlap and transaction costs in secondary buyouts

Limited partner overlap ("LP overlap" for short) occurs when the same limited partner is invested in both the buying fund and the selling fund of a secondary buyout. Limited partners that find themselves on both sides of a SBO often bemoan the fees they pay in such transactions. There is a widespread view that LP overlap has increased in recent years.[3] As a result, LP overlap has become one of the most contentious issues surrounding secondary buyouts. In this section, we first analyze the transaction costs paid by limited partners in SBOs, then turn to measuring the extent of LP overlap.

Transaction costs

Transactions costs are substantial in any buyout investment. First, an entire company or division is being bought and thus a large amount of due diligence is required.

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[3] "By 2005 and 2006 [LP overlap] was becoming common practice, even turning into a viral infection." Canderle, Sebastien (2011-12-27). Private Equity's Public Distress (Kindle Locations 2113-2114). Sebastien Canderle. Kindle Edition.

In addition, large amounts are borrowed and investment banks charge hefty fees for providing this capital. From practitioner interviews we conducted, we obtained the following estimates of transaction costs: Financial advisory amounts to about 2-4 million USD flat plus 1% of the enterprise value (i.e. debt value plus equity value) to be paid by both the buyer and the seller. Legal advisory accounts for 1 to 3 million USD also to be paid by both the buyer and the seller. The buyer also needs to carry some additional due diligence, which tends to be a fixed cost of about $1 million. Finally, the buyer needs to arrange loans with a bank (or a consortium of investors) and the cost for this is typically 2% of the amount borrowed.

Thus transaction costs are high in any buyout investment. For a secondary buyout, however, in the presence of LP overlap the *relative* transaction costs can be considerable. For ease of exposition, we will first consider a hypothetical example, followed by a real example. As a hypothetical example, suppose that in 2001 a pension fund invests $10 million with buyout fund A. Fund A has $100 million in capital, so that the pension fund owns 10% of fund A. Fund A spends its capital on only one transaction, Company ABC, which it holds for ten years. Assume that: 1) transaction costs are 5% of enterprise value for the buyer and zero for the seller; 2) $1 is borrowed for each $1 of equity invested, hence the enterprise value is $200 million; 3) return on equity is 0%. The pension fund indirectly pays 10% of the transaction costs, i.e. $10\%*5\%*200 = \$1$ million in 2001 for a ten-year $10 million investment.

Now assume that in 2006 the pension fund invested $10 million in Fund B, which has capital of $100 million. In 2006 fund B buys company ABC from fund A – a secondary buyout. In this second transaction the pension fund pays an additional $1

million of transaction cost. The transaction, however, has no effect on the portfolio of companies that the pension fund indirectly owns through its holdings in funds A and B: after the SBO, the pension fund still holds 10% of company ABC. The pension fund would have been better off if fund A had kept the company for ten years – all else equal – because it would have saved $1 million (on a $10 million investment).

We now turn to a real example, the Aspen Dental Management SBO transaction between Green Equity Investors V (the buyer) and Ares Corporate Opportunities Fund II (the seller) in October 2010.

From the CalPERS website, we obtained the list of funds of CalPERS's private equity commitments.[4] CalPERS is invested in Green Equity Investors V, which they report as a 2007 vintage fund to which they committed $400 million. CalPERS is also invested in Ares Corporate Opportunities Fund II, a 2006 vintage fund to which they committed $200 million.

Table 1 provides the details of the transaction and of our calculation of the transaction costs paid by CalPERS. Moody's provides the capital structure and shareholder structure for this transaction (Table 1, Panel A).[5] Enterprise value, i.e. asset value, is $547.5 million, split between $200 million of debt and $347.5 million of equity. This leverage ratio is relatively low compared to historical average but is typical of post-crisis deals. Ares II, although selling, kept a large stake in the company.

Table 1, Panel B computes the transaction costs for CalPERS via its holdings in Ares Corporate Opportunities Fund II and in Green Equity Investors V. Given the size of

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these funds – Green Equity Investors V has $5.3 billion of committed capital and Ares Corporate Opportunities Fund II has $2.065 billion of committed capital – CalPERS holds 7.55% of Green Equity Investors V and 9.69% of Ares Corporate Opportunities Fund II.

The amount of equity sold in the SBO was $247.5 million. Through its stake in the selling fund, CalPERS sold $24 million (9.7% of $247.5 million). Through its stake in the buying funds, CalPERS indirectly bought $18.7 million (7.5% of $247.5 million).

CalPERS paid fees on both legs of the transaction. We estimate the total buyer fees in Aspen at $15 million, and the total seller fees at $10 million. Therefore the total fees paid by CalPERS in the Aspen SBO were about $2.1 million (7.5% of $15 million plus 9.7% of $10 million).

Table 1, Panel C shows that that the net effect of the Aspen SBO on CalPERS' portfolio was a reduction of its Aspen equity stake by an amount of $5.3 million ($33.7 million - $18.7 million - $9.7 million). Hence the relative transaction cost paid by CalPERS in the Aspen Dental Management SBO is a staggering 40% ($2.1 million out of $5.3 million) of the amount of CalPERS' equity rebalancing in Aspen.

With the Freedom Of Information Act (FOIA), U.S. pension funds and insurance companies are required to disclose their fund ownership. The Pitchbook database uses FOIA requests to collect this data and obtain data for some additional investors (e.g. some publicly listed funds of funds). Pitchbook lists nine investors (called limited partners) that are on both sides of the Aspen SBO, i.e. they are invested in both the

buying fund, Green Equity Investors V, and the selling fund, Ares Corporate Opportunities Fund II.[6]

Table 2 provides our estimate of the fees paid by each of the nine LPs on both sides of the Aspen SBO. They range from 6% to 66% of equity rebalancing, with a mean of 22%.

In spite of these large transaction costs, it is still possible that the Aspen SBO generated value for the Limited Partners. Perhaps Green V was better positioned than Ares to improve Aspen's value at that stage of the company's development. But these two private equity firms seem very similar—both are U.S.-based mid-market generalist buyout firms, with similar fund sizes and a similar vintage year — casting doubt on the view that the transaction would be value-improving.

Transaction costs are high in all buyout transactions. In a secondary buyout with LP overlap, those limited partners on both sides of the transaction pay fees on each leg, but their portfolio rebalancing is low. Our analysis of the Aspen SBO makes clear that LP overlap generates large relative transaction costs for limited partners.

Measuring the extent of LP overlap

The extent of LP overlap in SBOs is most easily addressed by considering two matrices. Consider m limited partners indexed $i = 1, ..., m$ and n funds indexed $j = 1, ..., n$. We define two matrices, $LPFUND = (l_{ij}), i = 1, ..., m; j = 1, ..., n$ and $ELL = (b_{jk}), j = 1, ..., n; k = 1, ..., n$. $l_{ij} = 1$ if LP_i is invested in $FUND_j$, and $l_{ij} = 0$ otherwise. $b_{jk} = q$ if $FUND_j$ was a buyer in q transactions in which $FUND_k$ was a seller.

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[6] It is possible that more than nine limited partners were on both sides of the Aspen SBO but that incomplete data has not enabled us to detect more LP overlaps.

We are interested in assessing the extent to which LPs are both buyers and sellers in SBO transactions, through the funds in which they are invested. For any limited partner i, we define LP overlap as $\sum_{k=1}^{n}\sum_{j=1}^{n} l_{ij} l_{ik} b_{jk}$. To interpret this measure, note that the expression $l_{ij} l_{ik} b_{jk}$ is different from zero when three conditions are met: (1) LP_i is invested in $FUND_j$; (2) LP_i is invested in $FUND_k$; and $FUND_j$ bought at least once from $FUND_k$. When all three conditions are met $l_{ij} l_{ik} b_{jk}$ measures the number of transactions in which $FUND_j$ was a buyer and $FUND_k$ was a seller. Note that since funds do not buy from themselves, $b_{jk} = 0$ when $j = k$. Summing $l_{ij} l_{ik} b_{jk}$ over all j and k thus gives the total number of transactions in which LP_i was on both sides.[7]

We define the overlap ratio as the LP overlap divided by the number of transactions in which the LP was invested in the selling fund. The overlap ratio measures the probability that the LP was on the buying side of a SBO, given that the LP was on the selling side.

An inspection of the expression $\sum_{k=1}^{n}\sum_{j=1}^{n} l_{ij} l_{ik} b_{jk}$ highlights some properties of our overlap measure. First, the extent of LP overlap is an approximately growing quadratic (hence convex) function of the number of funds that a limited partner is invested in – independently of secondary buyout activity represented by the *BUYSELL* matrix. Second, a limited partner invested in only one fund cannot be on both sides of a SBO, while a limited partner invested in all funds would achieve an overlap ratio of 100%. The rise of LP overlap over time can thus be interpreted as the product of two causes: (1) an increase

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[7] A "transaction" refers to a transfer of portfolio company equity from a selling fund to a buying fund. If there were, say, two buyers and one seller in a secondary buyout, we count two separate transactions.

in SBO activity—leading to a denser *BUYSELL* matrix; and (2) an increased involvement of some limited partners in a large number of funds—leading to a denser *LPFUND* matrix.

Missing data complicates the empirical measurement of LP overlap. If a limited partner has a stake in both the buying fund and the selling fund in a SBO, but we only observe, say, his stake in the selling fund, we will incorrectly code the overlap as zero for this LP and this SBO, creating a bias toward zero in the LP overlap measure. To circumvent this difficulty, we restrict our analysis to those limited partners for which Pitchbook has complete data: U.S. pension funds and insurance companies that were involved at least once in a SBO and for which Pitchbook could identify both the selling fund and the buying fund.

In our sample no limited partner that was invested in four funds or less had any overlap in SBOs. Figure 1 reports the distribution of the overlap ratio for limited partners invested in at least five funds. LP overlap is a frequent phenomenon for these LPs: about 60% of them were on both sides of a SBO at least once.

Figure 2 plots LP overlap as a function of the number of funds that a limited partner is invested in. As expected, LP overlap tends to rise in convex fashion with LP involvement in SBO funds. In order to purge the mechanical effect of the number of funds on LP overlap, Figure 3 plots the overlap ratio as a function of the number of funds that a limited partner is invested in. Most limited partners who invested in 10 buyout funds or less have a LP overlap ratio of zero. For limited partners invested in more than 10 buyout funds, the typical LP overlap ratio is between 10% and 20%, suggesting that

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for a LP on the selling side of a SBO, the probability of being on the buying side as well is quite high.

The ubiquity of private equity ownership has two implications for the extent of LP overlap. First, SBO transactions are mechanically more likely. Second, for any LP the likelihood of LP overlap rises in convex fashion with the number of funds in which the LP has a stake. Combined with our findings showing that relative transaction costs are high in SBOs, our results on the extent of LP overlap suggest that expected relative transaction costs in SBOs are large for limited partners involved in many buyout funds.

From the viewpoint of the LPs, the high transaction costs of SBOs might be justified if SBO buyers are able to generate sufficient returns to cover these transaction costs, and we now turn to the empirical investigation of the returns in SBOs.

2. The cross-section of SBO investment returns

Dataset construction

In order to investigate the cross-section of SBO investment returns we construct a large dataset of SBOs. We make use of both hand-collected information as well as of commercial datasets. Private equity firms that are raising funds send their track records to potential investors. We collect these fund-raising prospectuses (usually referred to as Private Placement Memorandums — PPMs) to create our basic dataset. PPMs contain the performance and characteristics of all prior investments made by the firm.

The latest wave of fund raising was 2005-2007, and therefore our dataset covers most returns up to that date. For each investment, the exit route may be written in the

PPM, or can sometimes be inferred from it (for example, if we see that a company was sold by Bain and reported as bought by KKR at the same date).

In order to identify any missing exits, we complement our dataset with commercial datasets. We hand-match information to our data using Thomson Banker One, Capital IQ, Pitchbook as well as Zephyr. In this way we are able to complement information on seller, buyer, duration as well as the type of deal. If we still lack deal information, we search online.

Appendix 1 provides detailed definitions of all variables. A secondary buyout is classified as a deal in which a PE firm sells the majority of shares to another PE firm. Hence we include tertiary buyouts, fourth buyouts etc. Our definition of SBOs deviates in certain aspects from the definition of commercial databases such as Pitchbook, Thomson Banker One, Zephyr, Capital IQ. We explain our definition of SBOs in detail in Appendix 2.

Table 3 shows our sample composition. We have a sample of 1002 SBOs, of which 435 SBOs have return data, and 6830 PBOs, of which 4873 have return data.

Empirical results

Figure 4 shows the growth of SBOs as a percentage of buyout activity in our sample. The percentage of SBOs among exits of PE investments grows markedly, from single-digits in the early 1990s to well over 30% in the mid-2000s. Our numbers are consistent with Stromberg (2008).

Table 4 reports exit channels and average performance measures for our sample of SBOs versus same-year primary buyouts (PBOs). Several interesting patterns emerge.

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Secondary buyouts are much less likely to be exited through an IPO than non-SBO buyouts (11.1% vs. 22.7%). Secondary buyouts are also much more likely than non-SBO buyouts to be exited through another secondary buyout (38.1% vs. 19.9%). These differences are large and statistically significant, suggesting that once a company enters the SBO route, it is likely to stay there and shun public markets. SBOs are also somewhat more likely to end in bankruptcy, and less likely to be exited through a trade sale, but the differences with benchmarks are not statistically significant.

The average SBO strongly underperforms same-year PBOs. Average cash multiples are markedly lower for the average SBO than for benchmarks, as are other measures such as public market equivalents and internal rates of return. The lower performance of SBOs can be ascribed both to a smaller upside and a larger downside: the percentage of "home runs" (i.e. transactions with a cash multiple greater than 3) is 20.1% for SBOs vs. 32.9% for PBOs; the percentage of losses (transactions with a cash multiple less than 1) is 31.0% for SBO's compared to 21.4% for PBOs.

Secondary buyouts exhibit somewhat less volatile performance, but only because their upside returns are lower. When we compute it in the loss region, the volatility of SBO performance (measured as the standard deviation of the cash multiple) is actually slightly higher for SBOs than for benchmarks.

The average duration of SBOs is longer than that of benchmarks (4.4 vs. 3.2 years). A couple of interpretations are consistent with this finding. On the one hand, it could be that the buyout form is more suited to some companies. Such companies would stay longer with each private equity owner and would tend to be exited to other private equity owners – consistent with our finding that SBOs tend to exit as SBOs. On the other

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hand, the longer duration of SBOs could also be merely a sign of poor performance. Lopez-de-Silanes et al (2011) show that multiples decrease slightly with investment duration. IRR, naturally, goes down dramatically as a function of investment duration. It thus seems that buyout funds hang on to their losing investments.

Table 5 breaks down the performance of secondary buyouts and non-SBOs by exit route and country. Interestingly, buyout investments that are exited via a secondary buyout exhibit strong performance. This is true for both secondary buyouts (Panel A) and for primary buyouts (Panel B). In addition, the returns found for different exit routes are similar. For example, in panel B we see that primary buyouts exited via IPO, trade sale, and SBO have an average IRR of 48%, 47% and 41% respectively. When measuring returns with PME, the dispersion is limited as well (2.21, 1.87 and 1.71, respectively). When using multiples, IPO exits show a high performance (3.48 versus 2.86 and 2.88 for trade sale and SBO respectively) but IPOs are not the only high-performance exit route – the PMEs for trade sale and SBO are 2.86 and 2.88 respectively – perhaps contrary to widespread perception.[8]

We also observe that returns are high overall, both in absolute terms (IRR) and in relative terms (PME). The main reason for this is that our sample includes only liquidated investments and buyout funds tend to hang on to their losers. One should also keep in mind that returns are gross of fees here. For recent and comprehensive evidence on returns to investors, net of fees, in buyout funds see Robinson and Sensoy (2011), Harris et al. (2012), and Phalippou (2013).

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[8] These results contrast with those of venture capital with Facebook, Google and other stellar venture capital returns all being realized via an IPO.

Comparing Panels A and B of Table 5 shows that the underperformance of secondary buyouts relative to benchmarks holds true regardless of the exit route. The effect is strongest with IPO exits and other exits, and much weaker with trade sale and SBO exits.

U.S. secondary buyouts perform particularly poorly compared to the secondary buyouts of other countries. In this first-pass analysis, we cannot determine whether this is due to, say, a different industry mix, or different market conditions, for U.S. SBOs. For example U.S. SBOs might have occurred disproportionately in industries that enjoyed a boom followed by a bust, or might have been fueled by a lax credit market. But note that U.S. primary buyouts have similar returns as those of other countries, so the underperformance of U.S. SBOs is not a pure U.S. effect. The results of Table 5 motivate our use of industry and country fixed effects in the regression analyses that follow.

Table 6 reports the results of a regression analysis of buyout performance on a secondary buyout dummy and control variables. We control for time-fixed effects to capture such important time-dependent drivers of performance as the amount of "money-chasing deals" or credit conditions at the time of investment initiation (Gompers and Lerner 2000; Ljungqvist *et al*. 2007; Axelson, Jenkinson, Stromberg and Weisbach 2010; Robinson and Sensoy, 2011). We also control for investment location and industry fixed effects to capture risk differences. Controlling for country fixed effects should capture an important variation in cost of capital across companies as shown by Doidge, Karolyi and

Stulz (2007). Standard errors are obtained by inception year clustering to account for the dependence in residuals within a given year (performance is very cyclical in PE).[9]

The results of Table 6 broadly confirm the findings shown in the previous tables. Secondary buyouts exhibit economically large and statistically significant underperformance compared to benchmarks. SBO underperformance holds irrespective of control variables, including when we introduce year, country, and industry fixed effects (models 3-5). Thus SBO underperformance is not just a consequence of credit market booms, industry shocks or country effects. The regressions put equal weight on each transaction, unlike in Tables 4 and 5. The regression estimates of SBO underperformance in Table 6 are smaller than the measures in Tables 4 and 5: for example, in Table 6, Panel A, model 1 estimates an equally-weighted Cash Multiple spread of 0.338 compared to 0.63 (2.61-1.98) estimated in Table 4 (which uses value weights and adjusts for year effects) and to 0.64 (2.56-1.92) when only value-weighting is employed (Table 5).

In model 5 we introduce three additional explanatory variables related to the buying fund. First, Buyer Assets Under Management proxies for the size of the buyer. To the extent that due diligence activities and buyout company management are subject to diseconomies of scale, we might expect larger buyers to perform worse (Lopez de Silanes et al. 2012). We find support for this idea – the coefficient on Buyer assets under management is negative for all three performance measures, and statistically significant for two out of three.

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[9] See Kaplan and Schoar (2005) and Robinson and Sensoy (2011).

Second, Buyer Experience is defined as the number of deals that the private equity firm has done minus the average number of deals done by or other private equity firms that year. One might think that greater buyer experience could translate into superior investment performance, but this is not the case. The coefficient on Buyer Experience is positive but not statistically significant.

Finally, a more focused buyer might be better able to generate value – the coefficient on Buyer Portfolio Concentration has the expected positive sign, but it is not statistically significant (Lerner, Kovner and Scharfstein, 2011).

Table 6, Panels B and C show the same regression results but change the return metric to PME (Panel B) and IRR (Panel C). Results are similar. Overall, Table 6 suggests that SBO underperformance is a robust phenomenon.

Table 7 tests the predictions of the agency view. The agency view of Axelson, Stromberg and Weisbach (2009) predicts that deals made in the second half of the investment period of the fund are likely to reflect "go for broke" incentives – funds are eager to spend capital. In principle this logic could apply equally to primary buyouts. If SBOs made in the second half of a fund's investment period underperform, but primary buyouts do not, then we can conclude that SBOs are a key channel through which funds under buying pressure direct their excess liquidity.

To test this we need to restrict the sample to deals made by funds for which we know all the other investments and by funds that have limited life (i.e. non ever-green funds).

Consistent with the agency view, Table 7 strongly suggests that SBOs made late in the investment period of a fund tend to underperform. We regress performance

measures (Cash Multiple, PME and IRR) on a set of dummy variables and control variables. The dummy variables capture whether the transaction is a secondary buyout; whether it was made in the second half of the fund's investment period; whether it was made when "dry powder" (the fund's unspent capital as a share of committed capital) exceeded 50% (i.e. when less than 50% of the fund's money has been invested at the investment inception date); and an interaction of late investment and high dry powder. We include year, country and industry fixed effects, as well as the same set of control variables as in Table 6, model 5 (Investment Size, Stock-Market Return, Buyer Asset Under Management, Buyer Experience, Buyer Portfolio Concentration).

Table 7 shows that other things equal, a secondary buyout made late in the investment period is associated with about one less unit of cash multiple (panel A), 0.57 to 0.69 less units of public market equipment, (panel B), and a 23 to 29 percentage point lower internal rate of return (panel C), depending on the specification. Interestingly, the negative impact of a late investment only applies to secondary buyouts, not other buyouts. Our results strongly suggest that the completion of a secondary buyout late in the investment period of the fund reflects money burning behavior, consistent with the "go for broke" incentives of Axelson, Stromberg and Weisbach (2009).

These magnitudes are large. They imply that a $100 investment in a buyout investment made in the second half of the investment period of a fund, and which would return an average of $250 gross of fees, would return only about $140 [=250-(1.003+0.102)*100 based on model 2 of Table 7)] if it is a SBO (made in the second half of the investment period of a fund).

We do not detect any associations between high dry powder and poor future investment returns. This is not really surprising, as high dry powder typically coincides with the early part of the fund's investment period. When we interact SBOs made in the 2nd part of the investment period with dry powder of above 50%, the coefficient is negative and statistically significant for two performance measures out of three. But high dry powder is a rare occurrence in the second half of a fund's investment period, causing the statistical power of our test to be low. Similarly in model 3, the high dry powder variable has a large economic magnitude but no statistical significance.

Table 8 focuses on seller characteristics, and therefore restricts the analysis to the cross-section of SBOs, hence excluding PBOs. We require transactions to contain data on both the primary deal and the secondary deal. As a result, the number of observations falls substantially, to about 150 (out of 435 SBOs for which we have investment returns data).

We first examine the impact of two potential determinants of secondary buyout investment performance. First, we might expect the investment performance of a secondary buyout to be lower when the first deal was more successful. We have already shown that, on average, performance is high for SBO sellers and low for SBO buyers. If the high returns of the sellers are due to the buyer paying too much, then we should see a negative relationship between the successive returns.

In fact, we find that the previous transaction performance is positively associated with SBO investment performance: the high average returns generated by sellers in SBOs are not at the expense of the buyers – consistent with the fundamental view of SBOs and with the notion that some firms are well-suited to buyout ownership, and that new private

equity owners can bring additional value gains, even if the first private equity owner has already generated value.

Second, we may expect a more experienced seller to sell at a premium due to his experience at selling companies. Moreover if a buyer wants to 'burn money', it is probably safest to do so by buying SBOs from a more experienced firm: a more experienced firm has more companies in its portfolio, making it easier and quicker to purchase a company. In addition, if the investment SBO investment ends up performing poorly, the SBO buyer is better able to defend its reputation if it can say 'I bought this SBO from KKR' rather than 'I bought this SBO from a small PE firm in Romania' –the equivalent of the saying 'you do not get fired for investing in IBM'.

We further examine the implications of this intuition by looking at SBO returns when the seller is experienced and the buyer is not. This situation should exacerbate the experience effect we have just described. Inexperienced buyers may be especially tempted to protect their reputation by buying from a "star" fund; their bargaining skills may also be much less honed than those of an experienced seller. Whatever the reason, we find that SBOs in which the seller is experienced but the buyer is not, exhibit much lower returns – suggesting that the transaction price was too high.

Finally, we test whether some SBOs are fundamentally motivated. This view implies that we should not expect any underperformance of SBOs if it is going from one specialized firm to the other. Consistent with this view we find that specialized-to-specialized SBOs have higher returns.

3. Discussion

Our results suggest that for limited partners, diversification across many private equity funds carries a potential cost in the form of LP overlap in SBOs. The benefits of diversification across asset managers are well known and advertised, and investment officers often argue for diversification across asset managers as well as across assets. Cases such as Madoff illustrate the importance of not entrusting everything to one manager. Another argument relates to the unobservability of skills: if the average manager is skilled, but skill is unobservable, then it makes sense to diversify across managers.

The costs of diversification across asset managers are often deemed to arise merely from administration and communication. Our findings on the high LP overlap costs in secondary buyouts illustrate a new cost of diversification. While SBOs offer a striking illustration of this cost of LP overlap, they are by no means the only area in which such costs arise. For example, assume that a private equity fund buys a department store, sells the walls to a real estate fund, leases them back, and borrows money from a mezzanine fund. A well-diversified investor may very well hold in its portfolio the private equity fund, the real estate fund and the mezzanine fund. The investor thinks his portfolio is well diversified. In fact, after the transactions have taken place, the investor is still just holding the department store (the business including the walls and little debt). Yet the investor will pay a large transaction cost for the slicing and dicing of the company and the diversification benefits of investing across asset classes would be minimal at best.

Our findings also suggest that the "go for broke" incentives that emerge from the finite life of PE funds can end up hurting investor returns, raising two questions. First,

LPs could theoretically protect themselves by contractually capping the percentage of a fund that a GP may invest in SBOs – and if LPs do not avail themselves of such protection, why not? We have heard many complaints from LPs about SBOs, and some even claim to include reviews of whether GPs have resorted to SBOs in the past in their due diligence when considering new private equity commitments. We are yet to hear of contracts capping SBO investments by the GP, as nothing rules out such a clause in principle. Such contractual limitations would also provide a screening advantage, at least until they become standard: the high-quality GPs – those confident enough that they can invest most of the fund in primary buyouts – would be more likely to accept them.

However, it not obvious that such contractual limitations would provide much help to LPs. At the end of the investment period, "go for broker" incentives would remain. GPs in need of burning money would look for other targets – possibly riskier than SBOs.

The second question raised by our results, then, is why PE funds are structured as finite life entities. Historically, the first private equity funds were organized as closed end funds. This structure was largely abandoned in favor of limited partnerships in the 1970s (Lerner and Schoar 2004). Axelson, Stromberg and Weisbach (2009) conjecture that the finite life of PE funds helps solve an agency problem between LPs and GPs, as it forces GPs to produce tangible results within a fixed time frame. The tradeoff between the benefits of the finite life of PE funds vs. its costs – SBO underperformance – is an interesting topic for future research.

4. Conclusion

Private equity firms are increasingly selling their portfolio companies to other private equity firms. This exit channel – called secondary buyout – is now more prominent than IPOs and even trade sales. As institutional investors may have a stake in both the buying and the selling fund, each transaction carries a significant cost for them while the corresponding rebalancing of their portfolio is minimal. For the subset of investors for which information on their private equity fund portfolio is publicly available, we provide an estimate of the frequency at which they are on both sides of the transaction and estimate the related cost. In addition, we assemble a comprehensive and unique sample of secondary buyouts, for which we have information on performance. We find that the seller obtains returns as high as those obtained with public listings. The buyer, however, obtains returns that are lower than the average. Consistent with both the agency conflict view of Axelson, Stromberg and Weisbach (2009) and the fundamental view of Jensen (1989), the underperformance of secondary buyouts is confined to transactions made under "go for broke" incentives, i.e. towards the end of the fund's investment period.

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Appendix 1: Variable Description

PE firm:
A private equity firm (PE firm) is an organization that undertakes buyout investments. Since the focus of the paper is on the PE industry, we exclude from the sample firms specifically raising money for venture capital or other alternative investments such as timber, infrastructure, land, real estate, or mezzanine. These asset classes are sometimes also referred to as private equity.

PE fund:
A private equity fund (PE fund) is a buyout investment fund that is managed by a PE firm. A PE firm may have several funds running at the same time. The typical PE firm launches a new fund every two to four years. Funds have a finite life lasting ten to fourteen years.

Investment:
An investment is a private equity transaction realized by a PE firm. PE firms report their investments per company. So we follow this practice considering one company as a single investment including all "add-on" acquisitions and divestments made by the company as part of the same investments. We exclude debt and public equity investments.

Multiple:
The multiple of the investment is the ratio of total cash received from the investment plus its current valuation (if not fully liquidated) to the total cash invested. The measure is gross of fees. Different PPM use different currencies to report performance: 57% of PPM use US dollars, 29% use euros, 9% use GBP, and 5% use other currencies such as yen and Canadian dollars.

Duration:
The length in years between the investment initiation date and the investment exit date. The source of the year of investment initiation is the PPM in 100% of the cases.

IRR:
The internal rate of return, gross of fees, of the investment.

PME:
The public market equivalent (PME) is the ratio of the present value of dividends to the present value of the amount invested. To calculate this measure, we assume that the full amount of the investment is made at the investment initiation date, and that all distributions take place at the exit date. To discount the cash flows, we use CRSP value-

weighted return series. The measure is gross of fees and is computed in the currency originally used in
the PPM to report performance.

Secondary Buyout:
Variable taking the value Secondary if majority of shares are sold by a PE company directly to another PE company.

Log investment size:
The natural logarithm of the total amount of equity paid by the PE firm for the investment. Total equity is also called investment size and is used to weight investment performance within a fund or a block.

Home run:
We classify investments as "home runs" if their Multiple is above 3.

Losses:
We define Losses as investments with a multiple below one.

Fund Age:
The difference between the year of investment and the vintage year of the fund.

Stock-Market Return:
The equally-weighted arithmetic average return of the CRSP index during the investment life.

PE Firm Assets under Management:
Assets under management of the PE Firm in million USD as reported by Galante's Venture Capital & Private Equity Directory (alternatively Thomson Banker One if the variable is missing).

PE Firm Experience:
The number of deals made previously by the PE firm. To capture the relative experience we subtract the average number of deals made by PE firms which made a deal this year. (With a lower boundary of 1 as a firm cannot have negative experience).We then take the logarithm.

Industry fixed effects:
Fixed effects based on the industry of the investment. The industries are manually assigned to one of the forty-eight Fama-French industry classification using their SIC

codes or their would-be SIC codes (based on the information in siccode.com). We classify as "machinery" the industry of 112 investments for which the PPM reported "manufacturing" as the sector and we could not find further details in other databases. The information sources for the industry of the investments are the PPM (60%), the websites of PE firms (16%), the Thomson database (20%) and the Capital IQ database (4%).

Time fixed effects:
Fixed effects based on the year of investment initiation

Country fixed effects:
Fixed effects based on the country of investment location. The information sources for the country of the investment are the PPM (34%), the websites of PE firms (30%), the Thomson database (33%), and the Capital IQ database (3%).

Log fund size:
The natural logarithm of the capital committed to the PE fund in million of US dollars. The information sources for the variable are the PPM (72%), the websites of PE firms (12%), and the Thomson database (16%)

Dry Powder:
Dry powder is one minus sum invested up to the focal investment divided by total invested by the fund.

The 2nd part of investment period:
Dummy variable equalling one if the investment has been undertaken 2.5 years after the date of a fund's first investment. We chose the 2.5 cut-off point as 90% of investment periods are 5 years long.

Previous transaction duration:
Variable exists only for SBOs. Holding period of company of previous PE owner of given portfolio company in a SBO transaction.

Previous transaction performance:
Variable exists only for SBOs. Performance of seller of the given portfolio company in multiple in a SBO transaction.

Appendix 2: Our SBO definition, special cases, and differences with commercial databases

We define a secondary buyout (SBO) as a transaction in which a private equity firm sells the majority of the shares of a company to another private equity firm. Our definition leads us to exclude certain transactions that commercial databases list as SBOs.

Trade sale to PE-owned company: The portfolio company was bought by a portfolio company of a PE owned company (thus not directly by a PE company as in a standard SBO)**.** We label such deals as mergers. In Pitchbook, such deals are alternatively labeled SBOs or Trade sales. For example, KPS bought Attends PaperPAkm in 2007, which was at that time owned by the 3i Group. Another example is Case Logic, which Caterton sold to Thule, a company owned by Nordic Capital. FLA Orthopedics was sold in 2007 by Riverside to BSN Medical, which itself was backed by Montagu from 2006 to 2012.

IPO then Secondary: The portfolio is first brought public in an IPO and the owning PE firm retains a majority stake. The PE firm exits subsequently by selling directly its shares directly to another PE company. For example, JL Partners took Builder First Source public in June 2005. Pitchbook states that the Builder First Source was not PE backed after the IPO. However, JL Partners kept a 52% majority stake, which they sold in February 2006 to Warburg Pincus Equity.

Secondary block: this is a transaction in which only a *minority* of shares of a portfolio company was bought by a PE company from the PE owner. For example Triton sold a block of 20% of Tetra GmbH to AXA Private Equity. We label this transaction "Secondary Block", rather than SBO.

Table 1: Transaction costs paid by CalPERS
in the Aspen Dental Management SBO

We use data from Pitchbook and Moody's, except italicized numbers which we obtained from Capital IQ or assumed based on conversations with practitioners. Bold numbers are derived from data and assumptions. Numbers are in millions of US$ unless indicated otherwise.

Panel A: Capital structure and shareholders

Capital structure of company post-SBO	
Assets	547.5
Debt	200
Equity	**347.5**
Shareholders (post-SBO)	
Green Equity Investors V	**247.5**
Ares Corporate Opportunities Fund II	*100*
Shareholders (pre-SBO)	
Green Equity Investors V	0
Ares Corporate Opportunities Fund II	*347.5*

Panel B: Buying and selling funds

	Green Equity Investors V	Ares Corporate Opportunities Fund II
Role in SBO	Buyer	Seller
Fund size	5300	2065
Calpers' fund commitment	400	200
Calpers' fund percentage stakes	**7.5%**	**9.7%**
Equity values		
Funds' pre-SBO equity stake in Aspen	0.0	**347.5**
Calpers' pre-SBO equity stake in Aspen	0.0	**33.7**
Funds' post-SBO equity stake in Aspen	**247.5**	**100.0**
Calpers' post-SBO equity stake in Aspen	**18.7**	**9.7**
Transaction costs (fees)		
Financial advisor	*8.0*	*8.0*
Legal advisor	*2.0*	*2.0*
Various due diligence reports	*1.0*	**0.0**
Loan fees	*4.0*	0.0
Total transaction costs	**15.0**	**10.0**
Transaction costs (indirectly) paid by Calpers	**1.1**	**1.0**

Panel C: CalPERS portfolio rebalancing and transaction costs

Rebalancing (change in equity value through SBO)	**9.7-33.7+18.7= -5.3**
Total transaction costs (indirectly) paid	**2.1**
Total transaction costs paid as a fraction of rebalancing	**2.1/5.3 = 40%**

Table 2: Transaction costs paid by investors in the Aspen Dental Management SBO

Table 2 reports the breakdown of the transaction costs in the Aspen Dental Management SBO in October 2010. Nine investors (limited partners) are invested both in the buying fund (out of 40 LPs in total) and in the selling fund (out of 22 LP in total) according to Pitchbook. We compute their estimated share of transaction fees using the same methodology as in Table 1.

	Transaction cost paid ($ million)	Rebalancing amount ($ million)	Relative transaction cost
	(1)	(2)	(1)/(2)
U.S. Pension funds			
CalPERS	2.1	5.3	40%
State of Wisconsin Investment Board	0.5	1.3	40%
New York State Teachers' Retirement System	0.5	4.3	12%
New York State Common Retirement Fund	0.7	8.5	8%
State Teachers Retirement System of Ohio	0.7	12.0	6%
U.S. Insurance companies			
Variable Annuity Life Insurance Company	0.1	1.0	10%
Western National Life Insurance Company	0.1	1.0	10%
Michigan Department of Treasury	1.3	2.0	66%
Fund-of-funds			
Princess Private Equity	0.1	1.9	7%
Mean			22%
Total	6.1	37.3	

Table 3: Descriptive statistics per investment inception year

This table shows our sample of buyout investments by inception year. Results are shown separately for the sub-sample of Secondary Buyouts (SBOs) in Panel A and for the sub-sample of Primary Buyouts (PBOs; i.e. non-SBOs) in Panel B. An investment is classified as Secondary Buyout if the company was owned in majority by buyout funds right before the focal transaction. All the transactions are made by buyout funds; they can be ever-green or with a fixed duration. The classification as "buyout funds" is self-declared by the fund. Four time-series are displayed. The first column shows the total number of investments; the second column shows the number of investments for which we have information on exit status (e.g. IPO, trade sale, still not exited); the third column shows the number of liquidated investments (we may or may not know their exit route); the fourth column shows the number of investments that are liquidated and for which we know performance (we may or may not know their exit route).

Panel A: Secondary buyouts

Inception year	Number of SBOs in our sample by inception year			
	All SBOs	SBOs with information on exit route	SBOs that are liquidated	SBOs with performance information
1986	1	1	1	1
1987	5	5	5	4
1988	2	2	2	2
1989	3	3	3	2
1990	1	1	1	1
1991	3	3	3	3
1992	7	7	7	6
1993	4	4	3	2
1994	1	1	1	1
1995	6	6	6	6
1996	17	16	17	14
1997	45	39	41	37
1998	37	37	36	27
1999	45	42	43	29
2000	66	64	59	41
2001	33	31	28	17
2002	55	50	47	31
2003	72	65	65	41
2004	150	141	119	58
2005	146	138	106	56
2006	165	158	82	32
2007	138	128	52	24
Total	1002	942	727	435

Panel B: Primary buyouts

Inception year	Number of Primary Buyouts in our sample by inception year			
	All	With information on exit route	Liquidated	With performance information
1986	67	44	67	66
1987	61	36	61	60
1988	120	78	120	119
1989	114	81	114	113
1990	147	112	146	146
1991	144	115	141	141
1992	212	154	206	206
1993	200	149	199	199
1994	297	222	290	287
1995	336	251	328	322
1996	413	324	381	368
1997	533	402	461	439
1998	544	407	448	414
1999	712	499	540	495
2000	666	469	500	452
2001	354	286	288	250
2002	330	277	263	220
2003	351	298	270	223
2004	384	293	244	178
2005	367	269	188	126
2006	338	197	57	38
2007	140	135	17	11
Total	6830	5098	5329	4873

Table 4: Characteristics of Secondary versus Primary Buyouts

This table compares the characteristics of the sample of Secondary Buyouts (SBOs) to that of the sample of Primary Buyouts (PBOs). All the buyouts are liquidated and the underlying company is headquartered in either North America or Western Europe (including UK & Scandinavia). For each year, we compute statistics for investments that were started that year; we do this separately for the sample of SBOs and PBOs. The yearly statistics are aggregated across years by the number of SBOs made that year. These aggregated statistics are computed for the three sets of investment characteristics and are displayed in the table. The first set of investment characteristics contains the percentage of investments (size-weighted) that are exited via IPO, trade sale, secondary, bankruptcy, other (e.g. sale to management), and the percentage of not-exited deals. Investments that are exited but for which we do not know the exit channel are excluded from this computation. The second set of investment characteristics contains the (size-weighted) average Multiple (total amount received by the fund divided by total amount invested by the fund), the median and standard deviation of the Multiple, the fraction (size-weighted) of Multiples that are above three and below one respectively, and the standard deviation computed among money-losing investments (i.e. Multiple is below one). The third set of investment characteristics contains the size-weighted average of the Public Market Equivalent (PME), Internal Rate of Return (IRR), Duration, Fund age at the time of the investment, investment size, average return of the CRSP equally-weighted index during investment's life, the private equity firm assets under management at the time of investment inception (minus the average across other private equity firms that year), the number of investments made by the private equity firm up until that investment (minus the average across firms that year), the Herfindhal index of the industries in which the private equity firm has invested in until that investment. An investment is classified as Secondary Buyout (SBO) if the company was owned in majority by buyout funds right before the focal transaction. Investment size is in 1980 U.S. dollars. More details on the variable construction are provided in Appendix table A.1.

	Entry channel			
	Secondary buyouts	Primary buyouts	Difference	*t*-stat
Exit channels				
IPO	11.1%	22.7%	-11.6%	*-2.36*
Trade sale	20.9%	28.2%	-7.4%	*-1.58*
Bankruptcy	16.0%	10.7%	5.2%	*0.78*
Secondary buyout	38.1%	19.9%	18.3%	*3.64*
Other exit route	1.6%	2.5%	-0.9%	*-0.84*
Not exited	12.4%	16.0%	-3.6%	*-1.97*
Cash Multiples				
Mean	1.98	2.61	-0.63	*-2.07*
Median	2.05	2.23	-0.18	
St. Deviation	1.78	2.09	-0.31	
Home run (M > 3)	20.1%	32.9%	-12.8%	*-2.82*
Losses (M < 1)	31.0%	21.4%	9.6%	*1.37*
St. Deviation among losses	0.33	0.28	0.05	
Other performance measures				
Mean PME	1.32	1.83	-0.51	*-2.08*
Mean IRR	7.0%	39.3%	-32.4%	*-3.09*
Other characteristics (Mean)				
Duration	4.43	3.26	1.17	*4.00*
Fund age	1.91	1.98	-0.06	*-0.18*
Investment Size	12.40	12.23	0.17	*0.19*
Stock-Market Return	0.14	0.15	-0.01	*-1.35*
PE Firm Asset Under Management	7.71	7.72	-0.01	*-1.90*
PE Firm Experience	6.67	6.62	0.05	*1.70*
PE Firm Portfolio Concentration	0.17	0.19	-0.02	*-1.26*

Table 5: Descriptive statistics per exit route and country

This table shows the performance of investments per exit route and per country in which the investment is located. Results are shown separately for the sub-sample of Secondary Buyouts (SBOs) in Panel A and for the sub-sample of Primary Buyouts (PBOs) in Panel B. An investment is classified as Secondary buyout if the company was owned in majority by buyout funds right before the focal transaction. All the transactions are made by buyout funds; they can be ever-green or with a fixed duration. The classification as buyout is self-declared by the fund. Average performance is weighted by investment size. Investment size is the amount invested by the focal fund in the focal investment (not the transaction value). The unit of observation is a fund-investment. Three performance measures are used: Multiple, Public market Equivalent (PME) and Internal Rate of Return (IRR). Multiple is the ratio of the total amount distributed divided by the total amount invested. PME is the ratio of the total amount distributed discounted from the exit date back to the inception date of the investment and the total amount invested. Investments with unknown exit routes are added to the "other exited deal" category.

Panel A: Secondary buyouts

	Number of observations	Mean (VW) Multiple	Mean (VW) PME	Mean (VW) IRR
Exit routes				
IPO	32	2.74	1.95	0.39
Trade sale	109	2.54	1.83	0.32
Bankruptcy	76	0.17	0.14	-0.79
Secondary buyout	172	2.59	1.74	0.35
Other exited deals	46	1.37	0.95	0.07
All exited deals	435	1.92	1.33	0.06
Countries				
U.S.A	154	1.40	0.83	-0.24
U.K.	135	2.10	1.46	0.18
France	68	2.12	1.55	0.28
Other countries	78	2.33	1.80	0.22
All countries	435	1.92	1.33	0.06

Panel B: Primary buyouts

	Number of observations	Mean (VW) Multiple	Mean (VW) PME	Mean (VW) IRR
Exit routes				
IPO	858	3.48	2.21	0.48
Trade sale	1511	2.86	1.87	0.47
Bankruptcy	717	0.30	0.19	-0.78
Secondary buyout	718	2.88	1.71	0.41
Other exited deals	1069	2.38	1.41	0.28
All exited deals	4873	2.56	1.60	0.25
Countries				
U.S.A	2258	2.55	1.61	0.20
U.K.	1129	2.31	1.47	0.27
France	282	2.73	1.62	0.38
Other countries	1155	2.79	1.71	0.35
All countries	4873	2.56	1.60	0.25

Table 6: Performance of Secondary buyouts – Base analysis

This table reports cross-sectional regressions to explain the performance of buyout investments. We use three different performance measurements as dependent variable: Panel A shows results with Cash Multiple, Panel B shows results with Public Market Equivalent (PME), Panel C shows results with Internal Rate of Return (IRR). Cash Multiple is the ratio of the total amount distributed divided by the total amount invested. PME is the ratio of the total amount distributed discounted from the exit date back to the inception date of the investment and the total amount invested. The sample consists of the secondary buyouts for which we know the performance and the buyer's characteristics. In particular, we need to have the full investment history of the buyer up to that point in order to compute experience, asset under management and portfolio concentration. Secondary Buyout (1/0) is a dummy variable that equals one if the buyout is a secondary transaction, i.e. the seller was a private equity fund, and is zero otherwise. All the control variables are defined in details in appendix table 1. *t*-statistics are reported in italics below each coefficient; they are based on standard errors clustered by both investment inception year and private equity firms.

Panel A: Dependent variable is the Buyer's Cash Multiple

	Spec 1	Spec 2	Spec 3	Spec 4	Spec 5
Secondary Buyout (1/0)	-0.338	-0.279	-0.440	-0.374	-0.361
	-3.220	*-2.681*	*-3.977*	*-3.310*	*-2.789*
Investment Size		-0.003	-0.003	-0.003	0.000
		-1.271	*-1.388*	*-1.302*	*0.061*
Stock-market Return		1.548	1.190	0.986	0.847
		4.265	*3.217*	*2.678*	*2.051*
Buyer Assets Under Management					0.000
					-1.848
Buyer Experience					0.052
					0.183
Buyer Portfolio Concentration					0.000
					0.320
Year Fixed Effects	No	No	Yes	Yes	Yes
Country Fixed Effects	No	No	No	Yes	Yes
Industry Fixed Effects	No	No	No	Yes	Yes
Adjusted R-square	0.002	0.006	0.044	0.062	0.068
Number of observations	5308	5308	5308	5308	4793

Panel B: Dependent variable is the Buyer's Public Market Equivalent

	Spec 1	Spec 2	Spec 3	Spec 4	Spec 5
Secondary Buyout (1/0)	-0.146	-0.174	-0.428	-0.360	-0.333
	-1.750	*-2.088*	*-4.781*	*-3.963*	*-3.238*
Investment Size		-0.004	-0.006	-0.006	-0.002
		-2.282	*-3.248*	*-3.229*	*-1.052*
Stock-market Return		-1.614	-1.190	-1.341	-1.640
		-5.363	*-3.685*	*-4.101*	*-4.830*
Buyer Asset Under Management					-0.001
					-5.006
Buyer Experience					0.130
					0.557
Buyer Portfolio Concentration					0.001
					3.320
Year Fixed Effects	No	No	Yes	Yes	Yes
Country Fixed Effects	No	No	No	Yes	Yes
Industry Fixed Effects	No	No	No	Yes	Yes
Adjusted R-square	0.000	0.008	0.055	0.069	0.073
Number of observations	5308	5308	5308	5308	4793

Panel C: Dependent variable is the Buyer's Internal Rate of Return

	Spec 1	Spec 2	Spec 3	Spec 4	Spec 5
Secondary Buyout (1/0)	-0.127	-0.096	-0.218	-0.209	-0.174
	-3.681	*-2.849*	*-5.978*	*-5.740*	*-4.343*
Investment Size		-0.001	-0.001	-0.001	0.001
		-0.661	*-1.802*	*-1.391*	*1.397*
Stock-market Return		0.973	0.997	0.942	0.778
		6.916	*6.076*	*5.710*	*4.311*
Buyer Asset Under Management					0.000
					-4.355
Buyer Experience					0.226
					2.305
Buyer Portfolio Concentration					0.000
					1.745
Year Fixed Effects	No	No	Yes	Yes	Yes
Country Fixed Effects	No	No	No	Yes	Yes
Industry Fixed Effects	No	No	No	Yes	Yes
Adjusted R-square	0.002	0.017	0.075	0.085	0.093
Number of observations	5308	5308	5308	5308	4793

Table 7: Performance of Secondary Buyouts and Buyer Fund Characteristics

This table reports cross-sectional regressions to explain the performance of buyout investments. We use three different performance measurements as dependent variable: Panel A shows results with Cash Multiple, Panel B shows results with Public Market Equivalent (PME), Panel C shows results with Internal Rate of Return (IRR). Cash Multiple is the ratio of the total amount distributed divided by the total amount invested. PME is the ratio of the total amount distributed discounted from the exit date back to the inception date of the investment and the total amount invested. The control variables that are displayed are all dummy variables. The first control variable equals one if the buyout is a secondary transaction, i.e. the seller was a private equity fund, and the investment is made when the fund is older than 2.5 years (investment period lasts for 5 years). The second control variable equals one if the buyout is a secondary transaction and the (buying) fund had spent less than half of its capital at the time of the transaction. The third control variable is the multiplication of the two first control variables. The fourth control variable equals one if the buyout is a secondary transaction. The fifth, sixth and seventh control variables are the same as the first three control variables but do not have the 'secondary buyout' restriction. The sample is restricted to transactions for which we know all the other transactions made by the fund and only fixed-life funds are included (i.e. ever-green funds are excluded). All the control variables are defined in details in appendix table 1. *t*-statistics are reported in italics below each coefficient; they are based on standard errors clustered by both investment inception year and private equity firms.

Panel A: Dependent variable is the Buyer's Cash Multiple

	Spec 1	Spec 2	Spec 3	Spec 4	Spec 5
SBO made in 2nd part of investment period		-1.003			-0.986
		-3.856			*-2.849*
SBO made when dry powder is above 50%			0.223		-0.138
			0.858		*-0.416*
SBO made in 2nd part of investment period And when dry powder is above 50%				-1.383	-0.612
				-3.544	*-1.123*
Secondary Buyout (1/0)	-0.410	-0.102	-0.518	-0.351	-0.014
	-2.748	*-0.578*	*-2.781*	*-2.303*	*-0.053*
Buyout made in 2nd part of investment period	0.071	0.141			0.152
	0.647	*1.586*			*1.323*
Buyout made when dry powder is above 50%	0.013		-0.034		0.035
	0.141		*-0.435*		*0.357*
Buyout made in 2nd part of investment period and when dry powder is above 50%	0.026			0.205	0.082
	0.126			*1.102*	*0.381*
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes
Country Fixed Effects	Yes	Yes	Yes	Yes	Yes
Industry Fixed Effects	Yes	Yes	Yes	Yes	Yes
Other control variables	Yes	Yes	Yes	Yes	Yes
Adjusted R-square	0.078	0.081	0.078	0.079	0.080
Number of observations	3507	3507	3507	3507	3507

Panel B: Dependent variable is the Buyer's Public Market Equivalent

	Spec 1	Spec 2	Spec 3	Spec 4	Spec 5
SBO made in 2nd part of investment period		-0.688			-0.566
		-3.165			*-2.071*
SBO made when dry powder is above 50%			0.267		0.082
			1.282		*0.329*
SBO made in 2nd part of investment period And when dry powder is above 50%				-0.927	-0.574
				-2.985	*-1.310*
Secondary Buyout	-0.360	-0.150	-0.490	-0.321	-0.199
	-3.028	*-1.099*	*-3.341*	*-2.634*	*-1.058*
Buyout made in 2nd part of investment period	0.076	0.111			0.122
	0.884	*1.535*			*1.335*
Buyout made when dry powder is above 50%	0.010		-0.049		0.011
	0.144		*-0.802*		*0.150*
Buyout made in 2nd part of investment period and when dry powder is above 50%	-0.077			0.064	-0.027
	-0.469			*0.420*	*-0.152*
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes
Country Fixed Effects	Yes	Yes	Yes	Yes	Yes
Industry Fixed Effects	Yes	Yes	Yes	Yes	Yes
Other control variables	Yes	Yes	Yes	Yes	Yes
Adjusted R-square	0.078	0.081	0.079	0.079	0.080
Number of observations	3507	3507	3507	3507	3507

Panel C: Dependent variable is the Buyer's Internal Rate of Return

	Spec 1	Spec 2	Spec 3	Spec 4	Spec 5
SBO made in 2nd part of investment period		-0.230			-0.287
		-2.720			*-2.525*
SBO made when dry powder is above 50%			-0.002		-0.123
			-0.026		*-1.172*
SBO made in 2nd part of investment period				-0.305	-0.035
And when dry powder is above 50%				*-1.967*	*-0.171*
Secondary Buyout	-0.175	-0.105	-0.175	-0.163	-0.027
	-3.781	*-1.986*	*-2.778*	*-3.413*	*-0.320*
Buyout made in 2nd part of investment period	0.029	0.042			0.054
	0.813	*1.519*			*1.428*
Buyout made when dry powder is above 50%	0.014		0.003		0.026
	0.459		*0.101*		*0.806*
Buyout made in 2nd part of investment period	0.030			0.085	0.035
and when dry powder is above 50%	*0.472*			*1.483*	*0.510*
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes
Country Fixed Effects	Yes	Yes	Yes	Yes	Yes
Industry Fixed Effects	Yes	Yes	Yes	Yes	Yes
Other control variables	Yes	Yes	Yes	Yes	Yes
Adjusted R-square	0.107	0.108	0.107	0.107	0.108
Number of observations	3507	3507	3507	3507	3507

Table 8: Performance of Secondary Buyouts and Seller Characteristics

This table reports cross-sectional regressions to explain the performance of *secondary* buyout investments. We use three different performance measurements as dependent variable: Panel A shows results with Cash Multiple, Panel B shows results with Public Market Equivalent (PME), Panel C shows results with Internal Rate of Return (IRR). Cash Multiple is the ratio of the total amount distributed divided by the total amount invested. PME is the ratio of the total amount distributed discounted from the exit date back to the inception date of the investment and the total amount invested. The sample consists of the secondary buyouts for which we know the investment's performance and for which we know both the seller's and the buyer's characteristics. In particular, we need to have the full investment history of the seller up to that point in order to compute experience or portfolio concentration. Control variables include the performance realized by the seller on its investment in that portfolio company, the seller's experience and the seller's portfolio concentration. The next two control variables are dummy variables. The first one equals one if the experience of the seller is above median while the experience of the buyer is below median; and is zero otherwise. The second one equals one if the country Herfindhal index (i.e. portfolio concentration) of the seller is above median and the country Herfindhal index of the buyer is also above median; and is zero otherwise. All the control variables are defined in details in appendix table 1. Robust White *t*-statistics are reported in italics below each coefficient.

Panel A: Dependent variable is the Buyer's Cash Multiple

	Spec 1	Spec 2	Spec 3	Spec 4
Previous transaction performance	0.185			
	2.916			
Seller experience		-0.001		
		-1.243		
Experienced Seller & Inexperienced Buyer			-1.024	
			-2.625	
Specialized Seller & Specialized Buyer				0.821
				1.882
Year Fixed Effects	Yes	Yes	Yes	Yes
Country Fixed Effects	Yes	Yes	Yes	Yes
Industry Fixed Effects	Yes	Yes	Yes	Yes
Other control variables	Yes	Yes	Yes	Yes
Adjusted R-square	0.160	0.085	0.122	0.099
Number of observations	164	141	141	141

Panel B: Dependent variable is the Buyer's Public Market Equivalent

	Spec 1	Spec 2	Spec 3	Spec 4
Previous transaction performance	0.209			
	2.198			
Seller experience		-0.001		
		-1.272		
Experienced Seller & Inexperienced Buyer			-0.800	
			-2.147	
Specialized Seller & Specialized Buyer				1.183
				2.819
Year Fixed Effects	Yes	Yes	Yes	Yes
Country Fixed Effects	Yes	Yes	Yes	Yes
Industry Fixed Effects	Yes	Yes	Yes	Yes
Other control variables	Yes	Yes	Yes	Yes
Adjusted R-square	0.130	0.109	0.131	0.152
Number of observations	164	141	141	141

Panel C: Dependent variable is the Buyer's Internal Rate of Return

	Spec 1	Spec 2	Spec 3	Spec 4
Previous transaction performance	0.173			
	1.636			
Seller experience		-0.001		
		-2.380		
Experienced Seller & Inexperienced Buyer			-0.361	
			-2.227	
Specialized Seller & Specialized Buyer				0.376
				2.597
Year Fixed Effects	Yes	Yes	Yes	Yes
Country Fixed Effects	Yes	Yes	Yes	Yes
Industry Fixed Effects	Yes	Yes	Yes	Yes
Other control variables	Yes	Yes	Yes	Yes
Adjusted R-square	0.094	0.121	0.131	0.124
Number of observations	164	141	141	141

Figure 1: Distribution of overlap ratio for LPs invested in at least five funds

The overlap ratio is defined as the number of SBOs in which the investor (i.e. limited partner; LP) was invested in both the buying fund and the selling fund, divided by the number of SBOs in which the LP was invested in the selling fund. The LPs are all U.S. pension funds and insurance companies listed by Pitchbook as having been involved at least once in a SBO, and for which Pitchbook could identify the selling fund and the buying fund. The exact values of the overlap ratio are shown on the horizontal axis as vertical bars.
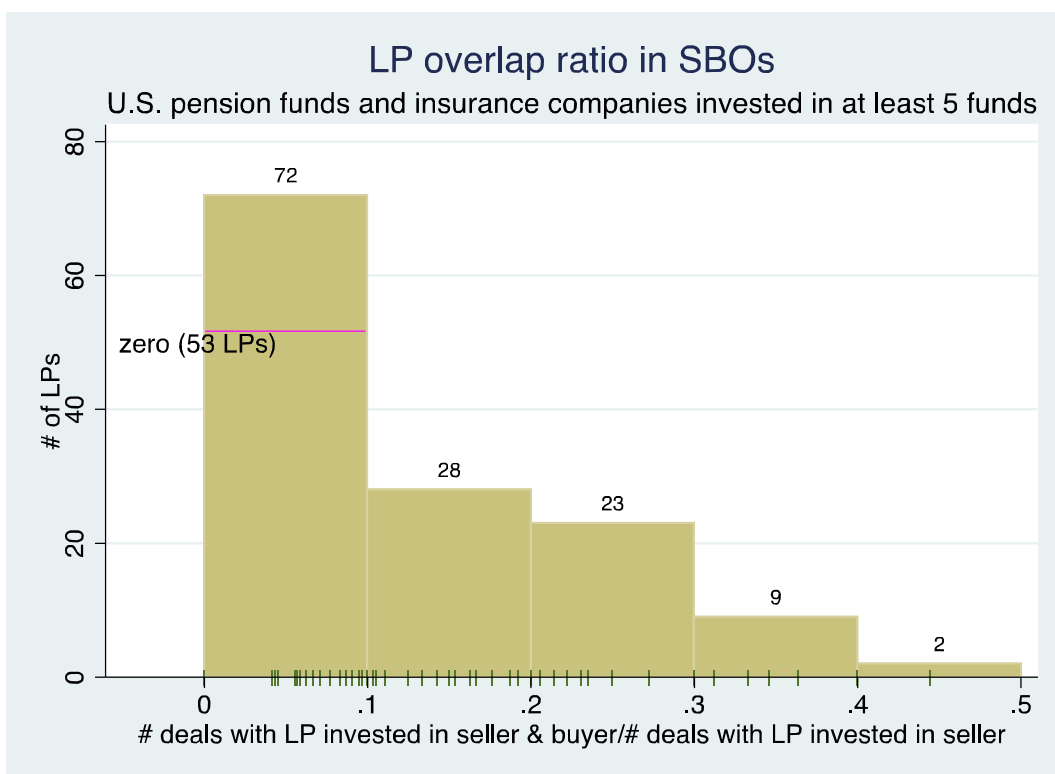
Figure 2: LP overlap vs. LP involvement in private equity funds

LP overlap is defined as the number of SBOs in which the investor (i.e. limited partner; LP) was invested in both the buying fund and the selling fund. The LPs are all U.S. pension funds and insurance companies listed by Pitchbook as having been involved at least once in a SBO for which Pitchbook could identify the selling fund and the buying fund.
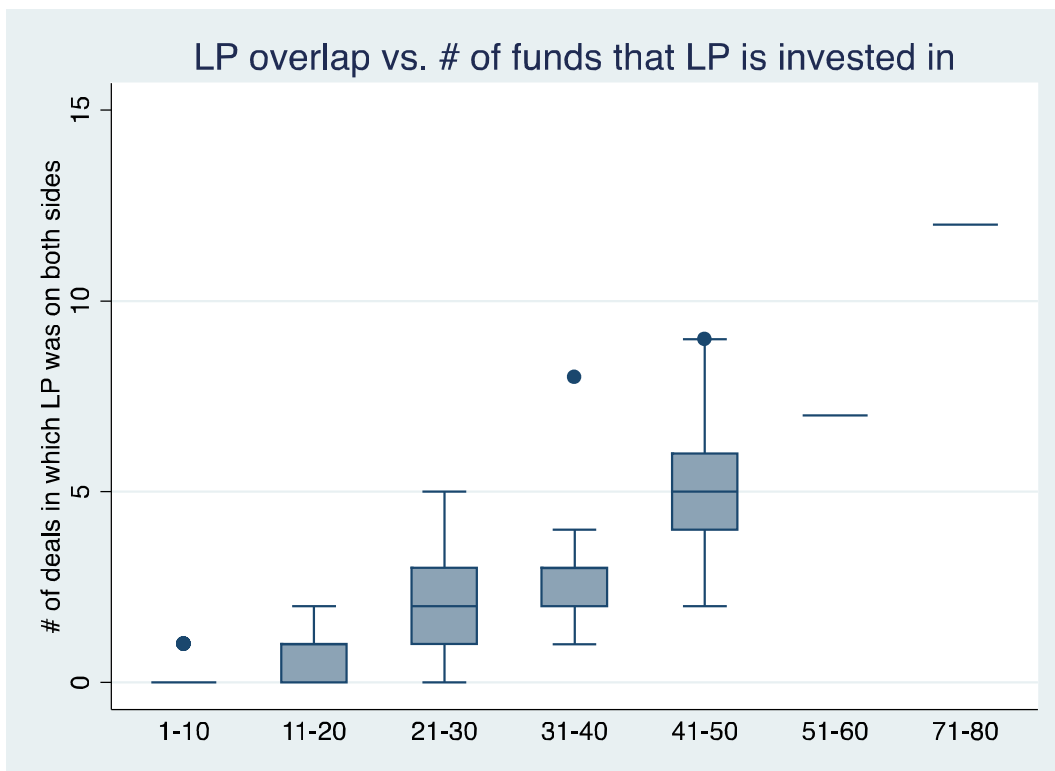

LP overlap vs. # of funds that LP is invested in

Figure 3: LP overlap ratio vs. LP involvement in private equity funds

The overlap ratio is defined as the number of SBOs in which the investor (i.e. limited partner; LP) was invested in both the buying fund and the selling fund, divided by the number of SBOs in which the LP was invested in the selling fund. The LPs are all U.S. pension funds and insurance companies listed by Pitchbook as having been involved at least once in a SBO, and for which Pitchbook could identify the selling fund and the buying fund.
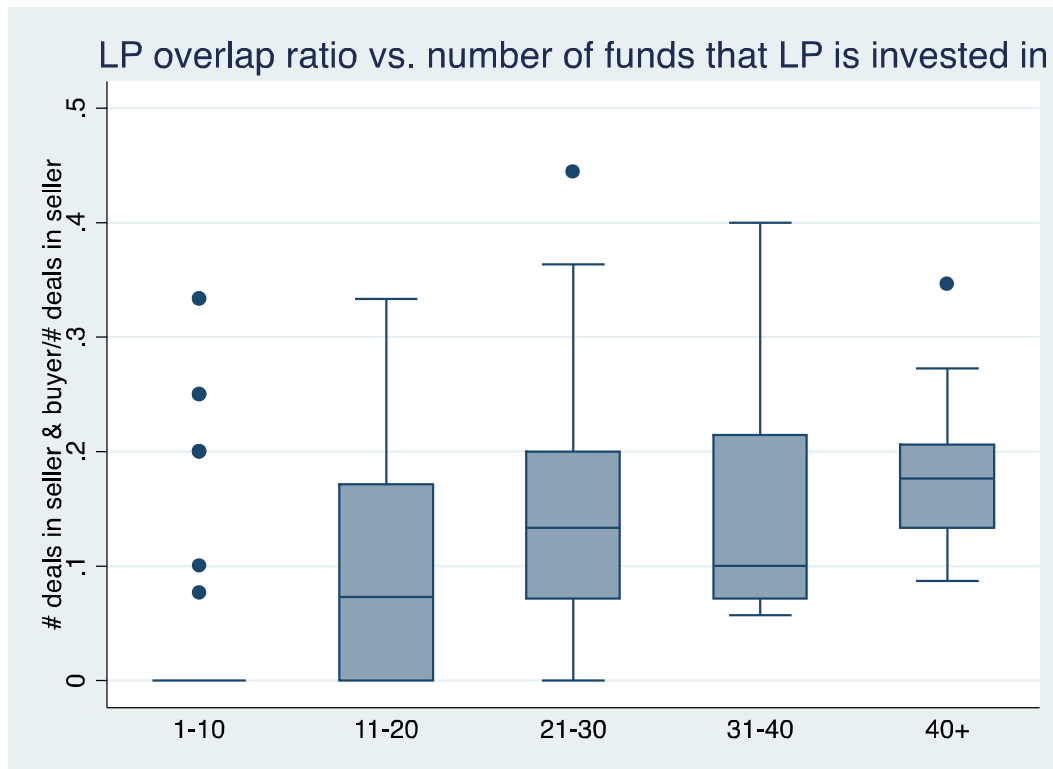
Figure 4: Percentage of SBOs among exits per year

This figure shows the percentage of PE investments via SBOs in relation to the sum of all deals with exit routes other than a SBO per year of investment of our sample. An investment is classified as Secondary Buyout (SBO) if the company was owned in majority by buyout funds right before the focal transaction. Other exits routes are IPO, trade sale, SBO, bankruptcy, other (e.g. MBO), and not-exited deals. The percentage of the exit route is computed for every investment (inception) year.