

# **Corporate Governance and Value Creation: Evidence from Private Equity<sup>1</sup>**

by

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## **Corporate Governance and Value Creation: Evidence from Private Equity**

### **Abstract**

We examine deal-level data from 110 private equity transactions in Western Europe initiated by mature private equity houses during the period 1995 to 2005. We un-lever the deal-level equity return and adjust for un-levered return to quoted peers to extract a measure of abnormal performance of the deal. The abnormal performance is significantly positive on average. In the cross-section of deals, higher abnormal performance is related to greater improvement in EBITDA to sales ratio (margin) and greater growth in EBITDA multiple during the private phase, relative to those of quoted peers. In particular, “organic” deals that focus exclusively on internal value creation programs improve margins; while “inorganic” deals with an M&A focus grow EBITDA multiples more substantially. We show that general partners with an operational background (ex-consultants or ex-industry-managers) generate significantly higher outperformance in organic deals. In contrast, general partners with a background in finance (ex-bankers or ex-accountants) generate higher outperformance in deals with M&A events. We interpret these findings as evidence of positive on average, but heterogeneous, skills at deal partner level in private equity transactions.

JEL: G31, G32, G34, G23, G24.

Keywords: leveraged buyouts (LBO), management buyouts (MBO), active ownership, activism

## 1. Introduction

In a seminal piece on private equity, Jensen (1989) argued that leveraged buyouts (LBOs) create value through high leverage and powerful incentives. He proposed that public corporations are often characterized by entrenched management that is prone to cash-flow diversion and averse to taking on efficient levels of risk. Consistent with Jensen's view, Kaplan (1989), Smith (1990), Lichtenberg and Siegel (1990), and others provide evidence that LBOs create value by significantly improving the operating performance of acquired companies and by distributing cash in the form of high debt payments.

By contrast, the recent literature has focused on the returns that private equity (PE) funds – which usually initiate the LBO and own (or more precisely manage) at least a majority of the resulting private entity – generate for their end investors such as pension funds. In particular, Kaplan and Schoar (2005) studied internal rates of return (IRRs) *net of* management fees for 746 funds during 1985-2001 and found that the median fund generated only 80% of S&P500 return and the mean was only slightly higher, at around 90%.<sup>2</sup> However, the evidence is better for the largest and most mature houses (those that have been around for at least 5 years). Kaplan and Schoar document that for funds in this sub-set of PE houses, the median performance is 150% of S&P500 return and the mean is even higher at 170%. Furthermore, this performance is persistent, a characteristic that is generally associated with potential existence of “skill” in a fund manager. It is interesting to note that such persistence has rarely been found in mutual funds, and when found has generally been in the worst performers (Carhart, 1997).

Our paper is an attempt to bridge these two strands of literature concerning PE, the first of which analyses the operating performance of acquired companies, and the second that analyzes fund IRRs. In addition, we investigate how human capital factors are associated with

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<sup>2</sup> This evidence has been replicated by studies in Europe (Phalippou and Gottschalg, 2007, Phalippou, 2007), though they raise the issue of certain survivorship biases in data employed which might imply no median outperformance relative to the market even for large and mature PE houses. This by itself does not necessarily refute Jensen's original claim; it could simply be that PE funds keep the value they create through fees. The puzzle that the evidence on median return of PE funds raises is thus more

value creation in PE deals. We focus on the following questions: (1) Are the returns to large, mature PE houses simply due to financial leverage over and above comparable quoted sector, or do these returns represent the value created in enterprises they engage with, over and above the value created by the quoted sector peers? (2) What is the effect of ownership by large, mature PE houses on the operating performance of portfolio companies relative to that of quoted peers, and how does this performance relate to the financial value created (if any) by these houses? (3) Are there any distinguishing characteristics of PE houses or partners involved in a deal that are best associated with value creation?

To answer the first question, we develop a methodology to break-down the deal-level equity return earned by a PE house, measured by the IRR, into two components: the un-levered return and amplification of this un-levered return by deal leverage. Next, we subtract from the un-levered deal return the un-levered return that the quoted peers of the deal generated over the life of the deal. The difference between these two un-levered returns is what we call “abnormal performance,” a measure of *enterprise-level* outperformance of the deal relative to its quoted peers after purging the effects of financial leverage. We hypothesize, and later show, that the abnormal performance of a deal captures the return associated with changes in operating performance and human capital factors such as skills at a deal partner level.

We apply this methodology to 110 large deals (greater than ~€50mln in enterprise value) in Western Europe from 14 mature PE houses initiated over the period 1995 to 2005.<sup>3</sup> We find that, on average, about 22% (8.4 out of 38.6%) of average deal IRR comes from abnormal performance, another 56% (21.7 out of 38.6%) is due to higher financial leverage, and the remaining portion is due to exposure to the quoted sector. Although abnormal performance has substantial variation across deals, it is on average positive and statistically significant, consistent with the view that large, mature PE houses generate higher (enterprise-

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about why their investors (the limited partners) choose to invest in this asset class as a whole, an issue investigated by Lerner and Schoar (2004) and Lerner, Schoar and Wong (2007).

level) returns compared to benchmarks. In the cross-section of deals, abnormal performance has a positive correlation, even if imperfect, to IRR and to the “public-market equivalent” (PME) measures employed by Kaplan and Schoar (2005).

We find a positive impact of ownership by large, mature PE houses on the operating performance of portfolio companies relative to that of the sector. In particular, during PE ownership the deal margin (EBITDA/Sales) increases by around 2 percentage points (ppt.) above the sector; for deals with M&A events during the private phase we find a multiple increase (EBITDA/Enterprise Value) of 18%. We interpret the findings as causal PE impact, since we find no evidence for a violation of the strict exogeneity assumption. For example, could it be that what we are calling “operational improvements” represents simply a reversion of acquired deals to the mean? Although the sample size of deals with more than 2 years of pre-acquisition data is small, we document evidence *against* the mean-reversion argument: PE deals show no difference to their respective sector companies in performance trends pre-acquisition. Both targeted and sector companies show nearly the same increase in nominal sales and constant profitability.<sup>4</sup>

We also provide evidence that higher abnormal performance is associated with a stronger operating improvement relative to quoted peers. We find margin improvements as an important explanatory factor for abnormal performance, especially for deals without M&A events during PE ownership. For deals with M&A events during the PE phase, we find the increase in EBITDA multiple as one of the most prominent explanatory variables for

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<sup>3</sup> We believe this time period is particularly well-suited for studying value creation through operational engineering. Kaplan and Stromberg (2008) note that operational engineering became a key private equity input to portfolio companies primarily in the last decade.

<sup>4</sup> Yet, PE might still be able to identify companies which will be subject to a positive future shock. This is something we can not rule out. However, a systematic relationship between PE-ownership and anticipated future performance shocks can induce abnormal performance in PE deals. To financially exploit individual shocks on a company, a PE house must have a systematic informational advantage in forecasting the future in comparison to the seller and other bidding PE houses. This systematic informational advantage appears questionable in a competitive buyout market, such as that for the large sized firms in Western Europe.

abnormal performance. Interestingly, exactly those explanatory variables show up as important for abnormal performance, which PE improves on average during PE ownership.<sup>5</sup>

Overall, this evidence is consistent with top, mature PE houses creating financial value through operational improvements. Such improvements require skills and the return to such skills may explain the persistent returns generated by these funds for their investors (Kaplan and Schoar, 2005). We therefore study whether (time-invariant) deal partner characteristics affect the performance of PE deals. We employ deal partner background as human capital or skill factor that may be relevant for deal success. The econometric advantage of using deal partner background is that it is a fixed characteristic and thus exogenous except for the matching of deal partners to specific deals.

We find evidence that there are combinations of value creation strategies and partner skills that correlate with deal-level abnormal performance. Deal partners with a strong operational background, e.g., ex-consultants or ex-industry-managers, generate significantly higher outperformance in “organic” deals. In other words, partners who worked as managers in the industry or as management consultants before joining a PE house seem to have gathered skills to improve a company internally, for example, through cost-cutting, expansion to new customers and new geographies. In contrast, partners with a background in finance, e.g., ex-bankers or ex-accountants, more frequently and successfully follow an M&A strategy or the so-called “inorganic” strategy. Using data based on private interviews we carried out with deal partners for a sub-sample of our deals, we show that active governance initiatives (such as replacement of top-management, high intensity of interaction between deal partner and CEO, overall high PE time commitment and revising management plans) are undertaken more often in organic deals, especially those featuring partners with operational background.

One could argue that we only studied deals from the funds we sampled, which might have been cherry-picked by the PE fund. We show that this is not the case. While we have a bias in our sample for large PE funds, this is by design given that we wished to understand

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<sup>5</sup> These results are robust to controlling for deal duration and dummies for various acquisition time sub-periods (that control for trends in stock-market valuations).

drivers of their persistent out-performance. However, within the funds we sampled for our deals, we find no statistically significant difference between a fund's publicly reported net IRR and the average net IRRs of the deals from that fund in our sample. Moreover in contrast to the extant literature which mainly focuses on public-to-private deals, our data set covers also deals where only part of a company is acquired (e.g., carve-out deals), and private-to-private deals, where a non-listed business is acquired. Using carve-out and private-to-private deals is important, because they comprise 74% of PE deals in Western Europe over the last decade, and they are different in size (enterprise value) and profitability (EBITDA margin) from public-to-private deals.

In Section 2, we review the related literature. In Section 3, we provide a description of the data we collected and some summary statistics. In Section 4, we describe the methodology for calculating abnormal performance. In Section 5, we discuss operating performance. In Section 6, we link abnormal performance and operating performance. Section 7 discusses the role of deal partner background and PE governance practices (based on the interview data) in the financial outperformance. Section 8 concludes.

## **2. Related literature**

Following the seminal work of Jensen (1989) on LBOs, the early empirical contributions verified the impact of PE ownership on firms (Kaplan, 1989, Smith, 1990, Lichtenberg and Siegel, 1990).<sup>6</sup> The most recent wave of PE transactions (2001-2006) has, however, prompted researchers to re-examine whether buyouts are still creating value in this new era. Guo, Hotchkiss and Song (2009) answer this question with a sample of 94 US public-to-private transactions between 1990 and 2006. They find that gains in operating performance are not statistically different from those observed for benchmark firms. Also Leslie and Oyer (2008) find weak or generally no evidence of greater profitability or operating efficiency of LBOs in the US between 1996 and 2004, relative to public companies.

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<sup>6</sup> Note that Kaplan (1989), Smith (1990), and Lichtenberg and Siegel (1990) also investigate whether LBOs improved operating performance at the expense of workers. They find that the wealth gains from LBOs were not a result of significant employee layoffs or wage reductions (see Palepu (1990) for a detailed survey of these papers and Kaplan and Stromberg, 2008 also for a comprehensive survey).

However, Lerner, Sorensen and Stromberg (2008) provide evidence with a sample of 495 buyouts that in contrast to the often-cited claim that PE has short-term incentives, buyout deals in fact lead to significant increases in long-term innovation. They find that patents applied for by firms in PE transactions are more frequently cited (a proxy for economic importance), show no significant shifts in the fundamental nature of the research, and are more concentrated in the most important and prominent areas of companies' innovative portfolios.

This literature has focused mainly on the data from the US whereas our data are based on PE deals in the UK and the Europe. Several studies have examined PE investment in the UK, which also experienced a tremendous increase in buyout activity prior to the crisis of 2007-09. Nikoskelainen and Wright (2005) study 321 exited buyouts in the UK in the period 1995 to 2004. On average, these deals generated a 22% return to enterprise value and 71% return to equity, after adjusting for market return. In a related paper, Renneboog, Simons, and Wright (2007) examine the magnitude and the sources of the expected shareholder gains in UK public-to-private transactions from 1997 to 2003. They find that pre-transaction shareholders receive a premium of 40%. They also find that the main sources of the shareholder wealth gains are undervaluation of the pre-transaction target firm, increased interest tax shields, and incentive realignment. Harris, Siegel, and Wright (2005) study the productivity of management buyouts (MBO) plants in the UK. MBO plants experienced substantial increases in productivity after an MBO, whose magnitudes are substantially higher than those reported in the US, for example, by Lichtenberg and Siegel (1990).

In limited evidence on human capital or skill factor in PE investments, Kaplan et al. (2008) analyze the relationship between portfolio company managers (CEOs) and the success of buyouts. They find that execution skills appear to be more strongly related to success than interpersonal skills. Other than this study, to our knowledge there has been no systematic analysis of the link between financial returns of LBOs and human capital factors. As Cumming et al. (2007) state "... there is a need to understand the human capital expertise that successful PE firms require. There appears to be a need to broaden the traditional financial

skills base of private equity executives to include more product and operations expertise.” Our evidence on the relevance of deal partner background (operational or financial) fills this important gap in the literature. We conjecture that skill attributable to deal partner background is one significant part of the persistent abnormal financial return generated by large, mature PE houses for their investors (Kaplan and Schoar, 2007).<sup>7</sup>

### **3. Data and sample selection**

The sample represents relatively large deals, all greater than roughly €50 million in enterprise value, all acquired by fourteen large and mature PE houses between 1995 and 2005. We collected the data in the following way: 1) We developed a list of 40 well-established European multi-fund PE houses. We sought out large houses, either in “mid-cap” or “large-cap” market. Next, we approached the senior partners at these houses to seek their cooperation. We assured them the information collected would remain confidential, as data would be aggregated and not attributable to any single deal or PE house. 14 PE houses (35%) agreed. 2) From those PE houses who agreed, we requested information on as many deals as possible, but made sure (as we explain in 3.) that it was representative of overall fund performance and not skewed. After that, we followed up with a data request template and worked with their accounting department to obtain data. 3) We made sure that the IRRs of deals of a given fund for which data was received were in fact representative of that fund’s publicly reported IRR – and pushed back on a small selection of deals to meet this condition. 4) We also rigorously checked data, looking for discrepancies (e.g., in currencies, sales, cash flows, etc.) and followed up with PE houses when necessary. 5) We collected data from Datastream for roughly 7,000 PLCs in Europe to construct sector indices, based on ICB level 3 classification; We ensured EBITDA(E) data was used rather than EBITDA data to remove effects of exceptional items.

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<sup>7</sup> We note that our paper is silent about the conflicts of interest between private equity houses and their investors. Axelson et al. (2009), Ljunqvist et al. (2007) and Metrick and Yasuda (2007) provide good coverage of theoretical as well as empirical issues on this front.

Our final data-set comprises 110 deals, of which 102 were exited during 2000 to 2007. Out of the 102 exited deals, there were 5 bankruptcies.<sup>8</sup> For each deal, we have the exact structure of cash inflows and outflows from the standpoint of the PE house involved in the deal, detailed data on financial and operating performance, and ownership and board structure. We *do not* have all enterprise level cash flows, which would include for example also taxes or interest and principal paid on debt.<sup>9</sup> The softer information on governance affected by the PE house was collected via interviews with one of the general partners (GP) from the PE house involved in the deal. We describe the interview-based data fields later in the paper.

Table 1, Panel A shows that our deals are well spread-out over time (within our sample period) although there is some concentration in 2002-2003 in terms of acquisitions. The fall in deal number and flow during 2001 is due to the global recession and tightening of credit. Table 1, Panel B provides additional summary statistics for the deals. Deals in our sample have high mean IRR (38.6%) and cash multiples (2.9), with significant outliers on either side. A high value for average IRR is to be expected from a sample of deals from mature PE houses (Kaplan and Schoar, 2005).

We also report the duration for all deals and the time until first major M&A or divestment events during PE ownership. M&A and divestment events seem to be mutually exclusive, since no deal shows both during deal life. M&A seem to be a common PE strategy: 34% (37 out of 110) of our deals show an M&A event (or so-called “inorganic” strategy) during PE ownership and 50% (47 out of 94) of the deals in the sample of Guo et al. (2009).<sup>10</sup>

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<sup>8</sup> The proportion of bankruptcies – 5 out of 102 – is typical of buyout data. Kaplan and Stromberg (2008) report an average of 6% of bankrupt deals in a large sample of buyouts since 1980.

<sup>9</sup> We also do not have all cash flows for the 8 un-exited deals because there is no exit cash flow from sale, nor can it be deemed to be zero as in the case of bankruptcies. Therefore, the end enterprise-value cash flow was simulated using the EV / EBITDA multiple at the start of the deal and applying that number to 2006 or 2007 year-end EBITDA. Our results are robust to alternative assumptions, including one assumption that they produced no terminal cash flow whatsoever. However, we have verified that such a pessimistic scenario is unlikely to be appropriate for these deals.

<sup>10</sup> We use M&A or divestment events during PE ownership as reported by the PE house or as mentioned in the press, Capital IQ database, or PE house website. M&A event are major if they altered sales or enterprise value of the deal by more than 20%.

It is important to note that on average first acquisition events happen earlier in the private phase (after one year) than first divestment events (after two years).

In the second half of Table 1, Panel B we compare financial ratios at the entry and exit date. The mean entry EV/EBITDA multiple is 8.9, whereas the corresponding exit multiple is 11.1, which indicates that on average our deals improved their market valuations (consistent with the findings of Kaplan, 1989). The median debt to equity ratio at entry is 2.0, which is in line with the usual LBO capital structure, believed to be 70% debt and 30% equity (Axelson et al., 2008). However, the median debt to equity ratio at exit is much smaller (0.9). The debt to EBITDA ratio does not fall as much as the debt to equity ratio (it goes from a median entry value of 5.6 to an exit value of 4.7). Therefore, it appears that the debt to equity ratio falls for PE deals during their life only partly due to improvements in coverage ratio (Debt/EBITDA), and mainly due to improvements in equity value over deal life.

Next, we come to the important sample-selection issues. Table 2, Panel A-D provides several relevant comparisons between our sample and the PE universe. Overall, we conclude that our sample covers mainly large deals but seems to be representative in terms of the performance of large PE houses, and includes all different vendor types, that is, not just public-to-private deals but also the frequent private-to-private deals.

First, Table 2, Panel A presents the comparison of the average performance of our deals per fund (in terms of net IRR) to the performance of the 32 specific PE funds (based on Prequin figures), from which our deals were financed. We show that PE funds do not seem to have cherry-picked the deals that they reported. The difference between the average publicly reported fund net IRR of 24.1% and the average net IRR of our deals per fund of 26.2% is in fact not statistically significant ( $t=0.52$ ). This illustrates that we have in terms of performance, an unbiased representation of deals within the funds we sampled. For the comparison, we had to convert our gross deal-level IRRs (before fees charged by PE houses to fund investors) to net IRRs (after fees, or in other words, IRRs from the viewpoint of fund investors). This is because the public data we have on the overall universe of PE funds is

primarily in the form of net IRRs.<sup>11</sup> We deduct from the gross IRR a 2% annual fee and 20% carry for IRR above (the typical) benchmark (the market return of 8%).<sup>12</sup>

Table 2, Panel B shows that the sampled funds are a good representation of similar-sized funds, once we take into account the fact that we are focusing on funds whose sizes are above €500 million. All 229 funds in Western Europe with the vintage year in 1993-2003 as our sample have a simple average net IRR of 16.3% (based on Thomson Financial Venture Expert figures), which is lower than the net IRR of our funds ( $t=-2.29$ ). Yet large funds have higher returns. Specifically, the 53 funds above €500 million, like the participating funds in our sample, show a net IRR of 22.0%, which is again not statistically significantly different from the 24.1% net IRR average of our 32 participating funds ( $t=-0.50$ ). In row (0) we also report the net IRR of the previous funds of our participating funds, to show that the higher performance of our funds seems to be persistent and not a flash in the pan.

Table 2, Panel C shows that the number of deals in our sample is significantly smaller than that of all Western European deals over the sample period. Our sample only represents 110 out of 5,384 deals, for which data was available. However, in value terms we cover 13.7% of “large” and “very large” deals – €100 to €500 Mio and greater than €500 Mio, respectively. Ultimately, because we are studying the performance of large, mature PE houses, we have a sample with a large-size bias. However, it should be noted that most of the literature has an implicit large-size bias, too, due to the focus a) on public-to-private deals, which are mostly large deals or b) on deals with public debt financing, which are typically larger as well. Further, the large-size bias makes our sample more comparable to the

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<sup>11</sup> To perform this conversion, we also construct an artificial fund of our sample deals and calculate its IRR. The pseudo-fund starts in 1995 and lasts for 13 years, until 2007. Investments or cash inflows take place in years 1-9 (with small investments in years 10 and 11 as well). The bulk of the investments occur in years 3-9. Cash payouts start in year 5; in the last 3 years, the fund only has cash payouts. Using this pattern of cash inflows and outflows, we calculate the gross IRR of the pseudo-fund. This pooled net IRR for our deals is 23.9%, which is close to the average net deal IRR of 26.2%.

<sup>12</sup> More specifically, if a) gross IRR $\leq$ 10%, then LPs keep all return except 2% fees, so that net IRR = gross IRR - 2% fees; b) 10% $<$ gross IRR $<$ 12.5%, then LPs keep all return up to 10% except for 2% fees and GPs keep all return from 10% to 12.5%, so that net IRR = gross IRR - 2% fees - (Gross IRR - 10%) = 8%; and c) gross IRR $\geq$ 12.5%, then LPs and GPs share in 80:20 ratio the return exceeding 12.5%, so that net IRR = gross IRR - 2% fees - 2.5% - 20%\*(gross IRR - 12.5%).

benchmark group we employ, which consists of publicly quoted peers. The size of these is generally larger than a typical PE deal in the entire universe of such deals.

Table 2, Panel D shows another advantage of our data set. As previously mentioned, our sample includes all types of deals, which is important to get a full perspective on PE ownership's effects. The extant literature mainly focuses on public-to-private transactions, which represent by volume only 4% of the total buyout activity in Western Europe. By contrast, the majority of deals are carve-out where only part of a company is acquired, or private-to-private deals, where PE acquires a non-listed business. For example in Western Europe, carve-out and private-to-private comprise 74% of all PE deals (between 1995 and 2005) and are smaller in size and different in profitability (EBITDA margin) from public-to-private deals in the Western European universe (according to untabulated results).

#### **4. A measure of abnormal financial performance**

##### **4.1 Methodology**

One of the key questions we want to answer in this study is how much of the excess return generated by PE firms, relative to quoted peers, comes from pure financial leverage, and how much comes from genuine operational improvements. To disentangle the effect of leverage from that of operational improvements, we first calculate the IRR of the deal – its levered return – using the entire time pattern of cash inflows and outflows for the deal, as experienced by the PE house (before fees). Then we un-lever this IRR. Next, we benchmark this un-levered return to (similarly un-levered) return for the quoted peers of the deal. The resulting residual un-levered return is what we call the “abnormal performance” of the deal.

Formally, to un-lever the levered return of deal  $i$ ,  $R_{L,i}$ , we use the un-levering formula:

$$R_{U,i} = \frac{R_{L,i} + R_{D,i}(1-t)(D/E_i)}{(1 + D/E_i)} \quad (1)$$

The un-levered IRR,  $R_{U,i}$ , corresponds to the return generated at the enterprise level. Since the PE houses in our sample did not report  $R_{D,i}$ , which is the average cost of debt, we

use the base rate and interest margin spread reported in Dealogic for each deal.<sup>13</sup> The leverage ratio  $D/E_i$  of the deal is the average of the entry and exit debt to equity ratio of the deal. Since the starting  $D/E$  is higher than exit  $D/E$  for most deals, the average pattern of leverage is one of decline over the life of the deal. Hence, we employ the average of the two. Finally, we use for tax rate  $t$  the average corporate tax rate during the holding period from the country in which the portfolio companies' headquarter is located.

We also apply (1) to un-lever sector IRRs. In this case, a sector is defined as containing all quoted European “peer” companies sharing the deal’s 3-digit ICB code in Datastream. In particular, we calculate the median annualized total return to shareholders (TRS) over the life of each deal of these quoted peers of the deal, denoted as  $R_{S,i}$ .<sup>14</sup> The median return of these peers represents the benchmark levered sector return, which we un-lever using (1) and the median  $D/E$  for the sector over a three-year average from the deal’s entry date onwards. We further assume the same tax rate and cost of debt for the sector as for the deal. Note that higher values of  $R_{D,i}$  result in greater un-levered return for the same levered return. Since the  $R_{D,i}$  for the less levered sector companies is potentially lower than for the deals, we overestimate the un-levered sector returns and are therefore conservative in attributing positive abnormal performance to PE deals.

After obtaining the un-levered returns,  $R_{U,i}$ , and  $R_{SU,i}$ , which are purged of the effect of financial leverage, the next key step is to measure the portion of PE excess return that is brought about by genuine operational improvements. For this purpose, we define the abnormal performance of the deal,  $\alpha_i$ , as:

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<sup>13</sup> Dealogic provides information on the base rate and the interest margin spread for only 67 deals (out of 110) in our sample. For 19 deals we can find only the base rate (Libor vs. Euribor) and for the remaining 24 deals we find no information. If the margin spread is unknown, we use the median spread of all PE deals in Western Europe in the same year. If the base rate is unknown, we use LIBOR for the UK deals and Euribor for all other deals.

We made sure that the assumption on the spread does not have a large impact on our results. First, the spread does not vary much in the cross-section. In our sample period and for all deals covered in Dealogic, the standard deviation of the weighted (by risk tranches) average spread is 1.1%, with an average (median) spread of 2.6 (2.3) % (n=984). Second, the sensitivity of the abnormal performance of a deal (alpha) to different interest rate assumptions is less than 1. It varies according the un-levering formula by  $(D/E)/(1+D/E) * \Delta i$ . For example, with a D/E ratio of 2, a  $\Delta i$  of 1 bp increase of the interest rate only changes the abnormal performance by 2/3 bp.

$$\alpha_i = R_{U,i} - R_{SU,i} \quad (2)$$

In essence, applying (1) and (2) allows us to make the following decomposition or performance attribution of each deal IRR:

- (i) Deal-level abnormal performance:  $\alpha_i$
- (ii) Unlevered sector performance:  $R_{SU,i}$
- (ii) Total leverage effect:  $R_{L,i} - R_{U,i}$

The leverage effect ( $R_{L,i} - R_{U,i}$ ) measures the total effect of leverage on deal return. More often, however, we are interested in measuring the effect of the additional leverage that firms take on after they are purchased by PE. To get at the incremental effect of increased leverage, we re-write (2) in terms of  $R_{L,i}$  as follows, where  $D/E_i$  and  $D/E_{S,i}$  denote the deal and sector debt to equity ratios respectively:

$$R_{L,i} = R_{U,i}(1 + D/E_i) - R_{D,i}(1-t)(D/E_i)$$

whereby

$$\begin{aligned} R_{L,i} &= \alpha_i(1 + D/E_i) + R_{SU,i}(1 + D/E_i) - R_{D,i}(1-t)(D/E_i) \\ &= \alpha_i + [R_{SU,i}(1 + D/E_{S,i}) - R_{D,i}(1-t)(D/E_{S,i})] \\ &\quad + [(R_{SU,i} - R_{D,i}(1-t))(D/E_i - D/E_{S,i}) + \alpha_i(D/E_i)] \end{aligned}$$

This equation provides an alternative decomposition of each deal IRR:

- (i) *Deal-level abnormal performance*:  $\alpha_i$  measures the excess asset return generated at the enterprise level of the portfolio company for PE investors, and it is purged of the effect of leverage financing that the firm takes on.
- (ii) *Levered sector return*:  $R_{SU,i}(1 + D/E_{S,i}) - R_{D,i}(1-t)(D/E_{S,i})$  measures the effect of contemporaneous sector returns, including the effect of sector-level leverages.
- (iii) *Return from incremental leverage*:  $(R_{SU,i} - R_{D,i}(1-t))(D/E_i - D/E_{S,i}) + \alpha_i(D/E_i)$  captures the amplification effect that a) the incremental deal leverage beyond the sector

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<sup>14</sup> Using an equally weighted average of the annualized TRS of these quoted peers does not qualitatively alter our results.

leverage,  $(D/E_i - D/E_{s,i})$ , has on the sector returns and b) the total leverage has on enterprise-level abnormal performance.

The purpose of performing such a decomposition or return attribution is three-fold. First, it is to see if the sample deals from mature PE houses generated a significantly positive abnormal performance on average or not. Second, if we believe that the abnormal performance is attributable to operating strategies and changes attempted by the PE houses, then what is the cross-sectional distribution of this abnormal performance? And, third and perhaps most importantly, is there evidence at the individual deal level that abnormal performance is related to actual measures of operational improvements and to the characteristics of PE houses or their general partners?

Before we proceed to discussing our results, it is useful to note some of the limitations of our methodology. First, it treats leverage as having a purely financial effect rather than having some incentive effect. Second, our methodology is subject to the usual problems associated with IRRs, that they are a way of describing cash flows rather than being actual realized returns, and that they translate into returns only under extreme assumptions of constant and common discount rates and reinvestment rates. To address the second issue, another approach we adopted was to calculate a public market equivalent (PME) for each deal. As a benchmark, we used the sector return to discount all cash flows and then calculated the ratio of discounted cash flows to the largest cash inflow for the deal (in the spirit of Kaplan and Schoar, 2005). We discuss the relationship between our measure of abnormal performance, IRR and PME in the next section. Finally, since we do not have the exact cash payouts on debt, we are unable to employ the methodology of Kaplan (1989), which is to simulate the enterprise-level (not equity) cash flows that would be obtained by investing these cash inflows in the quoted sector and examining the cash outflows thus generated. We chose to use IRR, given its simplicity and also because it is easily broken down into abnormal performance and related components.

#### **4.2. Average abnormal performance and its characteristics**

Table 3, Panel A summarizes the results from employing the decomposition method of Section 4.1. It presents results for (1) the overall sample of 110 deals; (2) the sample of 102 deals which excludes the 8 un-exited deals; and (3) the set of 67 deals where Dealogic provided the exact cost of debt for the deals. The key findings are as follows:

(1) Out of the average IRR of 38.6% for all 110 deals, sector risk and leverage amplification on its account for a total of 8.5%. In other words, less than one third of the total return is attributable to sector-picking ability of PE houses or simply to pure luck. Interestingly, since quoted sectors have little leverage on average, most of the incremental leverage effect of 21.7% is due to deal leverage, above and beyond the sector. The average abnormal performance of 8.4% is statistically significant (significant at a 1% level), confirming that large, mature PE houses do generate higher (enterprise-level) returns compared to benchmarks and not all of these returns are attributable to sector exposure and financial leverage. The medians tell a similar story.

(2) When we only include deals in the analysis that were exited by 2008, the results do not vary much, confirming that our simulation for the “exit” of 8 un-exited deals is conservative and has nearly no impact on the average level of abnormal performance. In fact, the abnormal performance estimate is hardly affected when we include deals with simulated exits. Therefore, we keep the un-exited deals in our data set for the following analyses.

(3) The abnormal performance is also statistically significantly positive when we only look at the 67 deals for which data on the cost of debt was available in Dealogic, even though the abnormal performance of 6.5% is lower than the abnormal performance of 8.4% of all deals. This is partly explained by the fact that the deals with an entry year early in our sample period perform better but it is less likely that we find information on the cost of debt for those deals in Dealogic.<sup>15</sup>

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<sup>15</sup> To elaborate, in comparison to the deals with an entry in 2003 or 2004, the deals in 1996-2000 and 2001-02 were doing substantially better. This might correspond to availability of cheap debt financing, a phenomenon believed to be at work especially for PE deals struck during 2003 to mid-2007 and likely responsible for the somewhat high valuation multiples paid by PE houses during 2003-07 (Acharya, Franks and Servaes, 2007; and Kaplan and Stromberg, 2008).

Overall the evidence points to outperformance of PE deals in our sample in a manner that is robust to alternative measures. In Table 3, Panels B we provide alternative financial performance measures IRR and PME. Consistent with the results on positive abnormal performance, PE also generates high IRRs and returns above the sector and the market: For instance, the average sector PME is 116.4%. Interestingly, in Table 3, Panel C, abnormal performance positively relates in the cross-section of deals to the alternative measures but the association is not perfect, as revealed by correlation coefficients of 0.77 (with IRR) and 0.58 (with sector PME).

## **5. Operating performance**

### **5.1. Operating measures**

The next step in our analysis is to see if abnormal performance is related to operating abnormal performance at the enterprise level. Operating abnormal performance can be captured in two ways, first, as a larger increase in EBITDA of the portfolio company *during* PE ownership than pre-acquisition or, second, as a larger increase in the EBITDA *after* PE ownership than the sector. To disentangle the PE impact on EBITDA *during* PE ownership, we focus on the effects on (1) sales and (2) profitability (margin=EBITDA/Sales). We capture the impact on the company *after* the PE ownership period by analyzing (3) the EBITDA multiple (Enterprise Value/EBITDA). Here, we have to rely on the assumption that market expectations are rational at exit, since we do not have operational figures after the PE phase for many of the deals (trade sales, for example).

The three measures we analyze in detail are:<sup>16</sup>

- (1) *Sales*, equal to operating revenues earned in the course of ordinary operating activities.
- (2) *Margin* (EBITDA/Sales). EBITDA (Earnings before Interest, Taxes, Depreciation and Amortization) is equal to Operating revenues - COGS (cost of goods sold) - SG&A (selling, general and administrative expenses) - Other (e.g., R&D) = Operating income. Note that EBITDA is commonly used as it shows a company's fundamental operational earnings

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<sup>16</sup> Since we work with operational numbers in €, we convert all figures into € at the exchange rate applicable in that year.

potential. However, EBITDA is not a defined measure according to Generally Accepted Accounting Principles (GAAP) or IFRS/IAS. In the present paper, we define EBITDA *excluding* “Non-operating income.”<sup>17</sup> Often this measure is more precisely referred to as EBITDAE (Earnings Before Interest, Taxes, Depreciation, Amortization and Exceptionals).

(3) *EBITDA multiple* (Enterprise Value/EBITDA). In our data, enterprise values are available only at acquisition and at exit. For these dates, the PE house also reported the total debt and total equity of the company. For the 5 bankrupt deals, the equity value is assumed to be 0 at the time of bankruptcy (exit).

Note that to identify the PE impact on operating performance between pre-acquisition and during PE ownership, it is crucial to have access to a consistent dataset for both periods. Probably the only data source without a structural inconsistency is the data PE houses collect themselves in the due diligence process and through monitoring efforts during their ownership. This is the data we collected from PE houses and use in the present paper.

## 5.2. PE impact on operating performance

Table 4 reports for the three operating measures ( $x$ ) the difference ( $\Delta x_i = x_{iT} - x_{it}$ ) from the last pre-acquisition year ( $t$ ) to last PE-ownership year ( $T$ ) and therefore captures the total change during PE ownership.<sup>18</sup> The difference in log sales we further divide by the number of PE ownership years ( $T-t$ ) to get annual nominal sales growth. In the first set of columns, we report the changes for all deals with sufficient operational data available ( $n=85$ ). In the second and third column, we separate deals with organic strategies ( $n=55$ ) from deals that had major M&A events during the private phase ( $n=30$ ), so that we can analyze the operating performance difference by strategy. We also report these figures for the corresponding sector

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<sup>17</sup> The reason for the exclusion of “Non-operating income” is that this measure contains income derived from a source other than a company's regular activities and is by definition nonrecurring. For example, a company may record as non-operating income the profit gained from the sale of an asset other than inventory (which can be large in relation to the operating income). From a practitioner's perspective, an EBITDA multiple including “Non-operating income”, would not be a helpful measure to understand the price paid in relation to the current performance capability. From our perspective, the operational performance indicator EBITDA would then be subject to a measurement error.

<sup>18</sup> The differences in sales and margin between entry and exit date are calculated without including changes in years with M&A or divestment events. This is because the numbers might get artificially inflated or deflated in the presence of acquisition or divestment activity. However, our findings stay qualitatively unchanged when we include changes in years with M&A or divestment events.

companies ( $\Delta x_s = x_{sT} - x_{st}$ ) and use median sector changes, given that there are mostly less than 100 companies in each three digit sector. Finally, we test if the changes are different from zero and, in the spirit of a difference-in-difference (DiD), also test for differences between deal and median sector changes.

Overall, PE ownership tends to have a positive impact on the operating performance in our sample. As shown in Table 4, column (1) all deals show on average a margin improvement of 2.1 percentage points (ppt.) and a multiple improvement of 1.9 during PE ownership. Both changes are above sector changes. Interestingly, the margin improvements of the deals in our sample are roughly in line with the 1.4 - 3.8 ppt. reported in Kaplan (1989). Only for sales growth we find that deals underperform the sector, although PE deals grow annually in sales during PE ownership by 5.6%.<sup>19</sup>

Another important result of Table 4 is that the operating improvements differ by deal strategy. Organic deals in particular seem to improve profitability (EBITDA margin) by about 2 ppt. above sector as shown in Table 4, column (2).<sup>20</sup> In contrast, only inorganic deals seem to increase the EBITDA multiple (enterprise value/EBITDA) statistically significantly by 2.1 during PE ownership, which is a multiple increase of 18% above sector, as reported in Table 4, column (3).<sup>21</sup>

## 6. Abnormal performance and operating performance

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<sup>19</sup> This finding is likely caused by the fact that the sector companies are smaller than our deals and smaller companies show a higher growth as discussed in Acharya, Hahn and Kehoe (2009) who use (propensity score) matched peers as benchmark instead of the broad sector, since PE does not randomly pick targeted companies. All the results shown in this paper are qualitatively robust to using matched peers, except the finding on sales growth.

<sup>20</sup> In a robustness check, we also include 4 deals with M&A events after 2 years of PE ownership in the organic deal set and find our results qualitatively unchanged. We include those 4 deals, since late M&A events might be endogenously determined by the observed performance of the deal. M&A events in the first 2 years can be treated as “exogenous”, if we assume that it takes at least one year to find out that a deal is underperforming and at least another year to identify and buy another company.

<sup>21</sup> As described in Kaplan (1989) and also according to our data, PE does not seem to pick companies that were exposed to a negative idiosyncratic shock, which in better times would revert to the mean and the target potentially be sold with an upside. In a robustness check (Table R1 available upon request), we provide a snapshot of the operating performance change for the deals in our sample prior to acquisition. Targeted companies show a robust pre-acquisition increase in nominal sales but a constant profitability. Importantly, in terms of performance trends, PE owned companies do not differ statistically significantly from their sector peers in the pre-acquisition phase.

Having separately identified financial and operating abnormal performance of PE deals relative to quoted peers, in Table 5, Panel A we investigate the relationship between the two measures. Specifically, we regress abnormal performance on the increase in EBITDA margin, growth in sales and change in EBITDA multiple. Columns (1) and (2) present results for the whole sample but once more we distinguish between organic (Columns 3 and 4) and inorganic deals (Columns 5 and 6). As additional controls, we include duration and dummies for the entry time.<sup>22</sup> Another potential driver of abnormal performance is that PE houses may have been lucky on some deals simply because they bought them at the right time when the margins or multiples in the sector were growing. We therefore include the sector change for all three operating measures too.

Coming to our main results, out of the three measures of operating performance, the two which we have identified as being improved during PE ownership, also show up as significant determinants of abnormal performance: Both EBITDA margin and multiple changes have a positive and economically meaningful impact on abnormal performance (Columns 1 and 2). Other columns illustrate that EBITDA margin improvements seem to be more important for organic deals while EBITDA multiple improvements are more important for inorganic deals. First, according to regression (4), 1 ppt. improvement in EBITDA margin, controlling for sector EBITDA margin improvements, increases abnormal performance by roughly 1.1 ppt. for organic deals. Second, a growth of the multiple from entry to exit by 10% increases abnormal performance by roughly 3.4 ppt. in regression (6) for inorganic deals. Third, changes in margins do not seem to relate to abnormal performance in inorganic deals, as shown in regression (6). And conversely, multiple improvements do not seem to explain abnormal performance in organic deals, as shown in regression (4).

The economic contribution of these operating performance changes is substantial in explaining abnormal performance. In the previous sections we identified a typical abnormal

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<sup>22</sup> However, in unreported results, we find that the significance and size of the estimates on operating improvements is minimally affected by omitting time dummies for entry years. We do not include dummies for the size of the deals since size does not show up as significant and does not increase the

performance of 8.4%, a typical EBITDA margin increase of roughly 2.6 ppt. for organic deals and a multiple increase of roughly 17.8% for inorganic deals. Based on the estimated coefficients in regression (4) and (6), operational performance changes explain nearly one to two thirds of the abnormal performance, depending on the deal strategy.

Our findings are also robust to alternative financial performance measures. In Panel B, we simply replace the dependent variable abnormal performance with either IRR or PME based on sector. For example in regression (4), with PME based on sector, margin improvement is significant ( $t = 3.95$ ), and has a positive effect on abnormal performance in organic deals: A 1 ppt. margin increase alters PME by roughly 7%, given an average PME based on sector of 116.4%. Also the effect of the log EBITDA multiple stays significant for inorganic strategies.

We conclude that it is the improvement in margins for organic deals and multiples for inorganic deals that distinguishes good deals from others in terms of financial value creation. This is a potentially important result: it provides insight into the operating strategies that might be at play in different PE deals, as we explore below.

## **7. Human capital factors of deal partners**

### **7.1. Financial performance and deal partner background**

We now show that the “fit” between a deal partner’s background (finance vs. operations) and deal strategy (organic vs. inorganic) correlates with deal’s performance. This could be considered as evidence that skills or human capital of the PE houses is relevant for deal performance. In particular, we hypothesize that deal partners with financial background have skills at investment banking type activities and those with operational background have skills at revenue growth and cost-cutting activities. Further, if this is true then more partners with financial background should be matched to deals with M&A and then partners with operational background to organic deals, assuming that the PE houses engage in matching of skills to deal requirements.

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explanatory power. This is potentially due to a lack of variation in size in our sample that consists

We base our analysis on additional deal-level information, collected through interviews with general partners (GPs). The interview data is an important novelty in this context, since it allows us to identify the professional background of the deal partner. We simply use the most recent profession of the interviewee before he or she joined the PE industry as an indicator for background. For 102 out of 110 deals we know the background of the leading deal partner. First, we have 72 interviews with (GPs) involved in our deals.<sup>23</sup> Second, for 30 deals where no interview was available, we identified the single leading deal partner and the background from the Capital IQ database, the PE house website, or press articles.

Table 6 gives an overview of the partners' background and their performance by strategy followed by the deal. Given the small sample size, we cluster the partners by background into two groups, either Finance Partners (FPs) or Operation Partners (OPs). We define FPs as partners who before working for PE worked for a bank, as an accountant, or have a background in law. In contrast, we define OPs as partners who had worked as management consultants or as managers in the industry.<sup>24</sup> In our sample the majority of deals have FPs rather than OPs (75 out of 102 deals). Interestingly, FPs almost always manage deals with an inorganic strategy (FPs led 30 out of 35 inorganic deals). Second, inorganic deals appear to outperform organic deals in terms of raw averages. The 67 deals in our sample with an organic strategy have a median un-levered return of 8.2% above the sector and the 35 inorganic deals of 11.5%. Third, OPs in general, with a median abnormal performance of 11.5%, seem to outperform FPs, with an abnormal performance of 8.2%. The same holds true for PME or IRR.

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solely of large deals.

<sup>23</sup> We verified if the interviewee was indeed the single leading partner for the deal with information from the Capital IQ database, the PE house website, or press articles. We had to change the background for only a few deals, since another single leading deal partner with a different background from the interviewee was mentioned.

<sup>24</sup> Only one deal partner went to the PE house immediately after graduating college and is not included in the sample.

To examine the deal partner impact per deal strategy more generally, we estimate the following specification:

$$Y_i = \phi + x_i' \beta + \theta_1 FP_i + \theta_2 inorganic_i + \theta_3 FP_i * inorganic_i + \varepsilon_i \quad (3)$$

in which  $Y_i$  is an outperformance measure (abnormal performance, IRR or PME) of deal  $i$ . The vector  $x$  represents a set of control variables that include observed deal characteristics, for instance, holding length in years and a dummy for non-exited deals and entry period dummies, since we want to control for time based variations in financial returns. We capture the performance differences of the deal partner, depending on the strategy, with three dummy variables. First,  $FP_i$  is a dummy equal to 1 for deals with FPs in the lead (and 0 for OPs in the lead). Second,  $inorganic_i$  is a dummy that equals 1 for deals with major M&A events during PE ownership (and 0 otherwise). Third,  $FP_i * inorganic_i$  is the interaction term of both. Thus the base group are deals with OPs in organic strategies ( $n=22$ ). All effects are measured relative to the performance of this group. Lastly,  $\phi$ ,  $\beta$ ,  $\theta_1$ ,  $\theta_2$ , and  $\theta_3$  are coefficients to be estimated and  $\varepsilon_i$  is the regression error. The coefficients are estimated by cross-sectional variation, since we have only one observation on  $Y$  per deal.

In Table 7 we provide evidence that the success of OPs or FPs depends on the deal strategy. OPs outperform in organic strategies, whereas FPs outperform in inorganic strategies. This finding is qualitatively robust to alternative specifications, in particular to alternative outperformance measures, for example, IRR or PME returns. We start in Table 7, regression (1)-(4), with abnormal performance as the dependent variable; then provide in regression (5)-(8) the same for IRR and in regression (9)-(12) for PME as the dependent variable.

First, in regression (1), (5) and (9), when we only add  $FP_i$ , it is not clear if FPs in general under- or out-perform relative to OPs. In regression (1) and (9), with abnormal performance or PME as dependent variable, we find no statistically significant underperformance of FPs. Only in regression (5), when using IRR as a dependent variable, do

we find a weak result that FPs underperform relative to OPs. Second, in regression (2), (6) and (10) we also include  $inorganic_i$ , to see if the weak result that FPs underperform interferes with potentially lower returns for inorganic deals, which FPs most frequently lead. The three regressions show mixed results: Only in regression (2) and (6) the coefficient for  $FP_i$  is weakly significant. Finally, when we add an interaction term  $FP_i * inorganic_i$  in order to control for partner background effects that are strategy specific, we get similar results in sign and significance across regressions for all the three dependent variables. The interaction term in regression (3), (7) and (11), is throughout positive and statistically significant. In contrast the coefficient  $FP_i$  is negative and statistically significant in all three regressions. We conclude that FPs underperform the base group in organic strategies, but outperform in inorganic strategies. For example, in regression (3) OPs with organic strategies outperform relatively by 12%, whereas FPs with inorganic strategies, outperform by 18%. In addition, in regression (4), (8) and (12) we also include a dummy for deals that were not exited by 2008 and find that our results are qualitatively unchanged.

## **7.2. Endogeneity issues of partner background, deal strategy and performance**

In this section we discuss the following endogeneity issues, which could potentially cause the results on deal partner background we discovered in Table 7: (1) Do FPs or OPs follow an M&A strategy when underperforming? (2) Are PE houses a selection of partners with the same background and do PE houses focus on a specific strategy? (3) Do FPs or OPs have sector-picking abilities? We are not able to rule out these concerns entirely, but provide sufficient evidence against each of them.

(1) Since the deal partners in some deals decide to follow an inorganic strategy late during PE ownership, our observed findings are potentially subject to a reverse causality. For example, OPs could follow an inorganic strategy if the deal shows underperformance in an organic strategy in the first years of PE ownership. That is, OPs do not follow inorganic strategy initially but may execute M&A eventually in order to blur underperformance, if necessary. Therefore, it is not necessarily a lack of skill of OPs at inorganic strategies that

causes their relative underperformance at inorganic strategies. Rather it is the underperformance that causes the inorganic strategy decision for OPs.

Given the small sample size, we only have 5 inorganic deals with OPs in our sample, and so we cannot rule out or validate this argument entirely. However, in order to address the reverse causality concern, we define the inorganic strategy more narrowly in a robustness check (Table R2 available upon request) as one that shows the first M&A events by the end of the second PE ownership year. This *early* inorganic strategy is somewhat more exogenous to deal performance, if we are willing to assume that it takes at least one year to find out that a deal is underperforming and another year to identify and buy another company. This reduces the number of early inorganic deals with OPs to 3 deals and with FPs to 25. Given these sample sizes, we focus on FPs. Our findings stay qualitatively unchanged. FPs still underperform in organic deals and outperform in inorganic deals.

(2) Another concern is that PE house fixed effects instead of the partner background are causing outperformance and we are identifying a spurious correlation if some successful PE houses are a selection of people with the same background and have a focus on a specific strategy. Therefore, in another robustness check (Table R3 available upon request), we provide an overview of returns, deal partner background, and deal strategy ranked by PE house returns (measured in terms of abnormal performance). First, since we do not have many observations per PE house, we are not able to analyze statistically if PE house effects are at play. But for 3 PE houses, which provided more than 10 deals, there seems no specific focus on OPs/organic or FPs/inorganic match.<sup>25</sup>

(3) We also confirm that the outperformance of FPs or OPs does not seem to be caused by sector-picking abilities (Table R4 available upon request). When we use as a dependent variable levered sector returns instead of deal abnormal performance and the same independent variables as in equation (3), we do not find any statistically significant

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<sup>25</sup> In Table R3 (available upon request) we also report the leverage per PE house. There also seems to be no leverage story at play across PE houses. The D/E ratios in all deals are high and only two PE

relationship. While we already control for leverage and sector returns in abnormal performance measure, this serves as a more direct test ruling out the contribution of sector-picking ability to our results linking deal partner background to deal performance.

### **7.3. PE governance**

In this section we describe governance practices, which PE funds deploy to shape actively the performance of a portfolio company. Since information on such practices is soft and not hard-coded in PE funds' documents, we conducted interviews with general partners (GPs) involved in 72 of our 110 deals.<sup>26</sup> Each interview lasted for 45-60 minutes and was structured around a questionnaire, which consists of a) general information on the PE firm strategy and organization and also b) deal specific questions on deal sourcing/structuring, value creation drivers, changes to management, key initiatives launched, use of external advisors, value creation plan and use of key performance indicators (KPIs), role of PE staff, deal exit, board structure, and incentives.

Importantly, the interview data covers PE governance practices just before the PE acquisition and during PE ownership. In our analysis, we use only PE actions from the first 100 days phase, which means in the first 3 months after the PE house bought the company. This early phase constitutes the most active phase of engagement by GPs involved with their portfolio companies. It also ensures that the activity of a deal partner we study is not an endogenous reaction to the performance of the company during PE ownership, since it is reasonable to assume that in the first 100 days the deal partner does not yet resolve full uncertainty about the deal performance. However, we cannot rule out that, intentionally or unintentionally, partners in successful or unsuccessful deals overplayed or underplayed their role in the interview according to the performance of a deal. We therefore interpret the findings on interview dimensions, which were subject to the personal judgment of the

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houses show statistically significant (at a 1% level) different leverage ratios from other houses. But those two PE houses do not show a particularly high abnormal performance.

<sup>26</sup> In some cases, we have more data points than interviews because we have information, e.g., on the management equity share, from the hard-coded PE fund documents we received. In other cases, the full questionnaire was not covered, due to time constraints of the interviewed deal partner.

interviewee such as PE time commitment, as descriptive, or at best suggestive, rather than causal.<sup>27</sup>

To relate qualitative interview information to deal performance quantitatively, we code the interview answers into “active governance scores” and replace yes answers with 1, and no answers with a 0. Hence, if a question has a governance score of 0.38, it means that 38% of the interviewed partners in that group have answered the question with yes, implying that in 38% of the deals PE houses were indeed “active” on the corresponding dimension. Also, we cluster the deals in our sample into two performance groups: We rank the deals by abnormal performance in order to create a group of deals, which are top tercile performers, and a group, which are non-top tercile performers. Finally, given the large amount of interview data collected we had to focus our analysis. Therefore, we concentrate our attention on 6 PE governance topics, which we found most important. We cover these topics with 16 interview questions, all listed in detail in Table 8. For 4 PE governance topics we use the governance score of 3 interview questions and for 2 topics the score of 2 questions.<sup>28</sup> In the following, we summarize the governance topics and the general insights gathered from the interviews and conversations with the PE funds. Then, we link these to deal abnormal performance.

(1) **Management turnover:** *PE makes early management changes in order to replace ineffective management and bring in others who can execute the value-creation plan efficiently.* In Table 9, Panel A, column (1), 38% (36%) of our deals have CEO (CFO) replacements already in the first 100 days.<sup>29</sup>

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<sup>27</sup> In addition, the fact that we only have 72 interviews limits our analyses in the following way: We are not able to identify differences in governance pattern for deals with an inorganic strategy, since only one-third of the deals are inorganic. Further, in contrast to the financial performance analyses with multivariate regressions, we are only able to test for differences non-parametrically with bivariate tests. Finally, we can not control for that governance practices might be determined by the PE house rather than by partner background.

<sup>28</sup> We fill data holes for deriving subtotals for each topic with the average score of the questions answered per deal. However, when employing each question individually we did not fill the blanks.

<sup>29</sup> Also Guo et al. (2009) report that the CEOs were changed in 37% of their deals.

(2) **Management incentives:** *PE provides substantial, but focused incentives, using significant equity and options-based stakes for top management, requiring co-investment from top management.*<sup>30</sup> This incentive provision is high-powered: Based on unreported figures, the PE house(s) own over 70% of deal's ordinary equity on average, with 14.3% of the remaining ordinary equity being employed for incentive purposes. On average the top management get a cash multiple of 13.5 on their cash investment in the deal (almost always, there is co-investment) upon hitting the base case of performance laid out in the value-creation plan. The high-powered nature of incentives often even includes other employees: more than the half (57%) of the 1<sup>st</sup> and 2<sup>nd</sup> management line have equity shares, as shown in Table 9, Panel A, column (1).

(3) **Control:** *General Partners (GPs) invest significant time upfront, both in due diligence as well as in the first 100 days, and interact with the CEO and CFO, often multiple times a week through formal as well as informal channels.* In most (53%) of the cases (see Table 9, Panel B, column 1) the GPs have regular, informal interactions with the CEO in the first 100 days at a weekly or better frequency. The time commitment by the PE funds is high relative to the involvement of a typical non-executive director in a public firm. According to unreported results the total PE house time committed is 1.21 (measured in employees per day) during the first 100 days (GPs committed 0.96), suggesting that on average 1 PE house employee (GP) per day is involved with new deals.

(4) **Support:** *Often PE funds employ external support where required to strengthen the company's weak spots in operations, and to implement required changes.* External support is usually brought about to cut costs and improve process efficiency and are often not the focus of non-PE firms. In the majority of deals (78%) external support/expertise is employed during the due diligence and in one-third (34%) during the first 100 days, as shown in Table 9, Panel B, column (1).

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<sup>30</sup> This is in line with Leslie and Oyer (2009), who report that the highest manager (CEO) of a PE owned company has an on average 68% more equity ownership as a comparable public company manager.

(5) **Interventions:** *PE funds draft value-creation (“100-day”) plans that serve as the initial blue-print of a company’s strategic and operational agenda for its life in private ownership. During the life of the deal, the top management team is monitored on a regular basis in terms of their performance, and plan deviations are reacted to immediately.* Table 9, Panel C, column (1) provides evidence that 68% of the deals involve a change of the management plan, in more than half (56%) of the deals PE funds identified deviations from the management plan and acted within a month. In 73% of the deals new key performance indicators (KPIs) were introduced.

(6) **Initiatives:** *PE funds frequently introduce value creation initiatives.* The majority of deals start a productivity (55%) and/or organic growth initiative (64%) already in the first 100 days as shown in Table 9, Panel C, column (1).

#### **7.4. PE governance and abnormal performance**

In this section, we are interested in knowing if abnormal performance achieved in PE deals correlates with governance activities of PE funds and GPs involved with these deals.

**Management turnover and incentives:** Guo et al. (2009) show that improvements are greater at PE owned companies, when the CEO is replaced at the time of the buyout. We find in Table 9, Panel A, column (2) that CEO replacement relates to high abnormal performance, in particular in organic deals: 67% of the top tercile organic deals replace the management, in contrast to 32% of the non-top tercile organic deals (difference has a t-statistics of  $t=2.15$ , question 1.1). Interestingly, there is an inverse pattern between top abnormal performance deals and the practice of giving high cash-multiples to the management: 9% of the top tercile deals give higher incentives than the average, compared to 40% of the non-top tercile deals ( $t=-1.86$ , question 2.2). This finding seems to be

directionally consistent with Leslie and Oyer (2009), who do not find that higher incentives relate to value creation.<sup>31</sup>

**Control and Support:** It seems that PE governance of management employs external support and intense monitoring: Top tercile deals show in Table 9, Panel B, column (2) higher scores for management support and external support. In particular the weekly interactions with the CEO happen more frequently for those deals than on average ( $t=2.55$ , question 3.1). Furthermore, these deals employ extensively more external support within the first 100 days ( $t=2.83$ , question 4.2).

**Interventions and initiatives:** We find in Table 9, Panel C that only organic growth initiatives seem to relate positively to abnormal performance ( $t= 2.75$ , question 6.2), even though PE funds are generally very active in plan adjustments (interventions) and initiatives. One possibility is that the general high activity level across deals implies that there is not much variation left, which one could relate to performance.

## **7.5. PE governance and deal partner background**

Finally, we ask whether OPs or FPs manage PE engagements differently, depending on the deal strategy? In column (3) of Table 9, Panel A-C, we analyze the same interview topics as in the previous section, but show that there are differences in governance practices by deal partner background. Since we found that some of the governance practices relate to a higher abnormal performance, the differences in these practices might explain in part the performance differences by partner background identified in the regressions in Table 7.

**Management turnover and incentives:** Early (first 100 days) management changes happen more frequently in the top performing organic strategies, but FPs engage less actively in early management changes in organic deals. In Table 9, Panel A, column (3) OPs

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<sup>31</sup> There are two possible interpretations: (i) strengthening of the management team through appropriate replacements in the early phase delivers performance, but providing them with strong equity-based incentives and requiring them to co-invest does not; or, (ii) strong incentives are provided because weaker incentives would result in even lower performance. That is, the worst deals are so risky that strong incentive provision required to attract good managers and improve performance fails to improve these deals substantially enough to push their performance above that of other deals.

change management in total 52% of the organic deals, whereas FPs do so only in 33% of the cases ( $t=1.54$ , question 1.4). This finding comes mainly from the differences in the replacement of management other than CEO or CFO ( $t= -2.15$ , question 1.3). In contrast, there is an inverse pattern between performance and giving high cash-multiples to the management, but FPs seem to give higher incentives to management ( $t=1.78$ , question 2.2).

**Control and Support:** While most OPs (77%) engage in multiple CEO interactions in organic deals, FPs only do so 36% of the times in Table 9, Panel B, column (3) ( $t=-2.65$ , question 3.1). Thus yet again, OPs execute more frequently those PE governance practices that are more important in terms of outperformance in organic strategies. On the other hand, the usage of external support in the first 100 days, although highly positively correlated with abnormal performance, seems to be similar for FPs and OPs (questions 4.1-4.2).

**Interventions & initiatives:** In Table 9, Panel C, column (3), we find that FPs engage less in revising management plans in organic strategies than OPs. 85% of OPs revise management plans in organic deals, in contrast to only 58% of FPs ( $t=-1.71$ , question 5.1). On the other hand, OPs devise new Key Performance Indicators (KPIs) less often in organic deals: OPs devise new KPIs in 46%, but FPs in 75% of their organic deals ( $t=1.89$ , question 5.2). Interestingly, OPs start in general more productivity initiatives than FPs ( $t=-2.02$ , question 6.1). But this result is not statistically significant for organic deals only ( $t=-0.78$ ).

While these findings do not necessarily imply that management change and support and efforts in monitoring the management of the PE house automatically lead to value creation, it is suggestive of the critical agency problem that may be unlocked by successful PE houses for value creation, in particular in deals with organic strategy: changing or challenging entrenched management in PLCs; taking private and monitoring the inefficiently managed subsidiaries of conglomerates; professionalization of small family-owned businesses by bringing in expertise from the deal partners. And it seems that partners with an operational background have the best skills to do so in deals that attempt to create value through internal (or organic) changes.

## 8. Concluding remarks

The surge in PE funding during 2003 through the middle of 2007, and the aftermath of the sub-prime crisis since then, has caused research on PE to confront similar issues as those after the boom and bust cycles of late 80s and early 90s. Significant policy interest has also been expressed in understanding and quantifying the long-run impact of PE in terms of value creation at the enterprise level, and in the attribution of this value creation to financial engineering, systematic risk and operational engineering.<sup>32</sup>

This paper is best viewed as an attempt to get at some of these issues with three significant contributions. First, we provided a simple methodology that relies only on returns and leverage information at the level of deal's equity, and the returns and leverage of quoted peer firms, in order to extract a measure of abnormal performance of the deal at enterprise-level. The methodology also quantifies the sector and leverage contributions to deal return. Second, by using this abnormal performance measure we showed that for deals of large, mature PE houses in Western Europe, there is evidence consistent with value creation on average for portfolio companies. Furthermore, deal-level abnormal performance correlates well with operating outperformance of deals measured as improvement in margins and multiples relative to the quoted sector. Third, we provided evidence based on interviews with GPs involved in PE deals that the abnormally positive performance of these PE houses is at least partly due to differences in human capital factors. In particular, the match between the deal strategy – inorganic (M&A based) or organic – and deal partner background – financial/accounting or operating/consulting is correlated with deal performance.

Overall, our results can be interpreted as providing a microscopic view on expertise in operational engineering employed by large, mature PE houses in improving companies they acquire. Returns to this expertise are likely the reason behind persistent and significant out-performance of funds run by these houses.

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<sup>32</sup> Indeed, in some cases such as in the UK, policymakers have undertaken independent recommendations based on interactions with the PE industry to improve disclosure on such value attribution. See the House of Commons Treasury Committee's Tenth Report in the UK of Session 2006-07 and Sir David Walker Report on "Disclosure and Transparency in Private Equity" (2007).

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**Table 1 – Panel A: Distribution of deals by entry and exit years**

The table shows the years in which the PE houses bought (entry) or sold (exit) the portfolio companies (deals) in our sample.

Years	1995	96	97	98	99	2000	01	02	03	04	05	06	07	sum
Entry	1	5	8	12	14	11	10	17	17	13	2			110
Exit					2	2	7	6	10	22	18	19	24 <sup>1</sup>	110

1 Including eight deals for which exit is simulated

**Table 1 – Panel B: Summary statistics**

The table shows various financial measures for the deals in our sample.

The first part reports the financial performance and the duration. We calculate the deal IRRs (internal rate of return) using the entire time pattern of cash inflows and outflows for each deal (portfolio company), as experienced by the PE house (before fees). The cash in/cash out multiple measures the absolute value of all positive cash flows divided by all negative cash flows minus 1. The duration captures the length of the deals in years, using the entry and exit months and years as reported by the PE house. The time until first M&A event reports the duration in years between entry data and first M&A event of a deal; the time until first divestment reports the same for divestment events.

The second part of the table compares the enterprise value (deal size) and several financial ratios between entry and exit date. The number of observations is smaller than in the first part, since we only include deals that the PE funds sold by end of 2007, and assume an equity value of zero for bankrupt deals. In addition, information on EBITDA at entry and exit is not available for all deals.

In the last column we test for differences between entry and exit values.

Variable	n	mean (median)	std. dev.	min	Max	t-stat of diff. exit and entry
Deal IRR (gross) %	110	38.6 (36.0)	40.5	-87.8	123.4	
Cash in/cash out multiple		2.9 (2.8)	1.8	0.0	10.3	
Duration (years) <sup>1</sup>	102	3.9 (3.6)	1.5	1.4	9.0	
Time until first M&A event	37	1.2 (0.9)	1.3	-0.2	4.3	
Time until first divestment	15	2.5 (2.2)	1.8	0.4	7.3	
Deal size (Entry) <sup>1</sup>	102	650.2 (397.6)	694.6	42.7	3,154.9	6.50***
Deal size (Exit) <sup>1</sup>		1,062.3 (592.2)	1,160.5	64.1	4,970.0	
Debt/equity (Entry) <sup>2</sup>	97	2.0 (1.9)	1.1	0.1	8.7	-9.97***
Debt/equity (Exit) <sup>2</sup>		0.9 (0.6)	0.8	0.0	4.5	
Deal size/EBITDA (Entry) <sup>3</sup>	73	8.9 (7.9)	7.0	-13.7	38.7	1.92*
Deal size/EBITDA (Exit) <sup>3</sup>		11.1 (9.5)	7.5	2.4	56.3	
Debt/EBITDA (Entry) <sup>3</sup>	73	5.6 (5.1)	4.5	-5.5	32.4	-1.33
Debt/EBITDA (Exit) <sup>3</sup>		4.7 (3.6)	4.4	0.0	33.6	

Note: In Mio, EUR; significance level \* p<0.1, \*\* p<0.05, \*\*\* p<0.01

1 Only exited deals

2 Only exited deals, excluding 5 bankruptcies (since we assume zero equity for bankruptcies)

3 Only exited deals and if EBITDA for exit and entry date is available, including 5 bankruptcies

**Table 2 – Panel A: Benchmarking of our deals vs. our funds by net IRR comparison**

This table compares the deals with the funds in our sample by net IRRs. Row (1) provides the net IRR for 32 out of 36 funds that participate in our sample and for which Prequin reports the net IRRs by end of 2007. We weight the 32 fund returns by the number of participating deals per fund. In row (2) we show the simple average net IRRs of all deals in our sample for which we have publicly available fund return data (for 93 out of 110 deals). In row (3) we pool these deals artificially in one pseudo fund. Since the data on the European universe is primarily in the form of net IRRs, we convert our gross deal-level IRRs (before fees charged by PE houses to fund investors) to net IRRs (after fees, or in other words, IRRs from the viewpoint of fund investors). In the last column we test if the PE houses cherry-picked the deals out of their funds in terms of performance.

	<b>n</b>	<b>mean (median) net IRR<sup>1</sup></b>	<b>t-stat of diff. to our funds</b>
(1) Our funds <sup>2,3</sup>	32	24.1 <sup>4</sup> (26.4)%	
(2) Our deals	93	26.2 <sup>5</sup> (25.0)%	0.52 <sup>6</sup>
(3) Our deals pooled in 1 pseudo fund <sup>7</sup>	1	23.9%	

**Note:** Vintage year 1993-2003, significance level \* p<0.1, \*\* p<0.05, \*\*\* p<0.01

1 Net IRR, estimated for our deals in the following way: If a) gross IRR<=10%, then LPs keep all return except 2% fees, so that net IRR = gross IRR - 2% fees; b) 10%<gross IRR<12.5%, then LPs keep all return up to 10% except for 2% fees and GPs keep all return from 10% to 12.5%, so that net IRR = gross IRR - 2% fees - (gross IRR - 10)% = 8%; and c) gross IRR>=12.5%, then LPs and GPs share in 80:20 ratio the return exceeding 12.5%, so that net IRR = gross IRR - 2% fees - 2.5% - 20%\*(gross IRR - 12.5%)

2 In 5 cases, more than one fund of a PE house is involved; in these cases we take the simple average fund net IRR of the funds involved and treat the funds as one fund. For 1 deal the fund names is unknown, for 3 funds we cannot find fund returns

3 As reported in Prequin

4 Weighted averages by number of participating deals per fund

5 Simple average

6 We use Welch's t-test of difference between (1) and (2) assuming unequal variance for (1) and (2)

7 Pooled by calendar period using quarterly cash flows.

**Table 2 – Panel B: Benchmarking of our funds vs. PE universe by net IRR comparison**

This table compares the returns of the funds in our sample with fund returns of the EU universe. First, row (1) provides the net IRR for 32 out of 36 funds which participate in our sample and for which Prequin reports the net IRRs. Second, row (2) provides the net IRRs for all funds in Western Europe and (3) for very large funds only, as reported in Thomson Financial Venture Expert.

In addition, in row (0) we report the performance of previous funds, e.g., of fund “Europe I” for fund “Europe II.” However, we only find net IRRs for 25 funds (out of the 32 funds), since 5 funds did not have a previous fund in Western Europe, and for two previous funds there is no net IRR available. In the last column we test if the PE funds in our sample are different in terms of net IRR from (0) the previous funds, (2) the Western European universe and (3) the universe with the same fund size.

	<b>n</b>	<b>mean (median) net IRR<sup>1</sup></b>	<b>fund size (in Mio EUR)</b>	<b>t-stat of diff. to our funds</b>
(0) Previous funds of our funds <sup>2</sup>	25	24.2 <sup>3</sup> (22.1)%	500-5000	0.03 <sup>4</sup>
(1) Our funds <sup>2,5</sup>	32	24.1 <sup>3</sup> (26.4)%	500-5000	
(2) All funds in Western Europe <sup>6</sup>	229	16.3 (9.8)%	0-1000+	-2.29*** <sup>7</sup>
(3) All large funds in Western Europe <sup>6</sup>	53	22.0 (18.9)%	500-1000+	-0.50 <sup>8</sup>

**Note:** Vintage year 1993-2003, significance level \* p<0.1, \*\* p<0.05, \*\*\* p<0.01

1 Net IRR, estimated for our deals in the following way: If a) gross IRR<=10%, then LPs keep all return except 2% fees, so that net IRR = gross IRR - 2% fees; b) 10%<gross IRR<12.5%, then LPs keep all return up to 10% except for 2% fees and GPs keep all return from 10% to 12.5%, so that net IRR = gross IRR - 2% fees - (gross IRR - 10)% = 8%; and c) gross IRR>=12.5%, then LPs and GPs share in 80:20 ratio the return exceeding 12.5%, so that net IRR = gross IRR - 2% fees - 2.5% - 20%\*(gross IRR - 12.5%)

2 As reported in Prequin

3 Weighted averages by number of participating deals per fund

4 We test for the difference between (0) and (1) assuming equal variance for (0) and (1) and use for (1) only the 25 funds, for which previous fund net IRR was available (net IRR 24.2%)

5 In 5 cases more than one fund of a PE house is involved; in these cases we take the simple average of the funds involved and treat the funds as one fund

6 According to Thomson Financial Venture Expert

7 We test for the difference between (2) and (1) assuming equal variance for (2) and (1)

8 We test for difference between (3) and (1) assuming equal variance for (3) and (1). Unequal variance assumption leads to t= -0.58.

**Table 2 – Panel C: Benchmarking of sample by distribution of deal size**

The table classifies the deals by the price paid for the acquired company (deal size). The first part of the table shows the distribution by size for the deals in our sample and the second part for the European universe. The last column shows the share of our sample on all large and very large buyouts.

	deal size (in Mio EUR)				Total	sample coverage of large & very large deals
	small (0-50)	medium (50-100)	large (100-500)	very large (>500)		
Our sample by number	1.8%	7.3%	44.5%	46.4%	110	
Our sample by value	0.1%	0.8%	15.4%	83.7%	73,487	
EU universe by number	67.3%	11.9%	15.2%	5.5%	5,384	8.9%
EU universe by value	9.4%	7.1%	26.9%	56.5%	636,604 <sup>1</sup>	13.7%

**Source:** EU universe data from Private Equity Insight, covering all deals acquired from 1995 to 2005 in Western Europe for which information on deal value or deal size category was available

<sup>1</sup> For 22.8% of all deals in EU universe, only deal size category was available. For those deal we estimated the deal size with the mean deal size per category. Mean deal size per category calculated with 77.2% of all deals for which exact deal size was available (total deal size = mean deal size per category \* number of deals).

**Table 2 – Panel D: Benchmarking of sample by vendor type**

The table classifies the deals by vendor types (previous owner) into five different categories. Category (1) shows public-to-private deals in which PE acquired a whole public company and (2) carve-out deals in which PE acquired only a part of a company. Category (3) reports PE acquisitions of former family or private companies, (4) of companies which were owned by institutional investors, e.g., other PE funds, and (5) of former state or government owned companies. The left part of the table reports the categories for the deals in our sample, the right part for the PE universe in Western Europe.

Vendor type	our sample		EU universe	
	n	split by n (by value)	n	split by n (by value)
(1) Public-to-Private	12	10.9 (12.3)%	249	4.6 (17.3)%
(2) Carve-out	43	39.1 (38.1)%	2,066	38.4 (44.7)%
(3) Family/Private	35	31.8 (27.5)%	1,937	36.0 (13.2)%
(4) Institutional Investor	18	16.4 (20.9)%	749	13.9 (19.3)%
(5) State	2	1.8 (1.1)%	74	1.4 (2.6)%
(6) Not Disclosed <sup>1</sup>			309	5.7 (2.9)%
Total	110	100.0%	5,384	100.0%

**Source:** Private Equity Insight, all deals acquired from 1995 to 2005 in Western Europe with deal size or size category available

<sup>1</sup> Including “In Receivership.”

**Table 3 – Panel A: IRR decomposition**

The table provides simple averages of three gross IRR components:

(i) Deal-level abnormal performance (alpha):  $\alpha_i$  measures the excess asset return generated at the enterprise level of the portfolio company for PE investors. It is purged of the effect of leverage financing the firm takes on, since  $\alpha_i = R_{Ui} - R_{SU_i}$ . Whereby  $R_{Ui}$  is the un-levered return of the deal  $i$  and  $R_{SU_i}$  the un-levered return of the sector  $i$ , using the standard un-levering formula.

(ii) Return from incremental leverage:  $(R_{SU_i} - R_{Di} (1-t))(D/E_i - D/E_{Si}) + \alpha_i (D/E_i)$  captures the amplification effect that a) the incremental deal leverage beyond the sector leverage,  $(D/E_i - D/E_{Si})$  has on the sector returns and b) the total leverage has on enterprise-level out-performance.

(iii) Levered sector return:  $R_{SU_i} (1 + D/E_{Si}) - R_{Di} (1-t)(D/E_{Si})$  measures the effect of contemporaneous sector returns, including the effect of sector-level leverage.

For the sector, we use the median IRR in each deal corresponding sector.<sup>1</sup>

We report the IRR decomposition for different scenarios: (1) We break down the returns for all deals, (2) only for the deals exited by 2008, and (3) only for deals for which the cost of debt was available.

Scenario	n	(i) deal-level abnormal performance	(ii) return from incremental leverage	(iii) levered sector return	total IRR
(1) All deals	110	8.41 (10.49) ***	21.65 (18.81) ***	8.53 (7.07) ***	38.59***
(2) Exited deals	102	9.83 (10.73) ***	22.95 (19.40) ***	8.15 (6.75) ***	40.93***
(3) Deals with cost of debt information	67	6.46 (4.31) ***	23.22 (18.38) ***	10.65 (10.50) ***	40.33***

**Note:** All values in percent, simple averages, medians in parentheses, significance level of difference to zero \* p<0.1, \*\* p<0.05, \*\*\* p<0.01

<sup>1</sup> We further use the average  $D/E$  ratio during deal life for the deals, a median  $D/E$  ratio over 3 year for the sector and  $\beta=1$ . We further assume the same cost of debt and corporate tax rate for the sector as for the deal. For 67 deals we find the cost of debt (based rate and margin spread) in Dealogic; for 19 we only find the base rate (Libor vs. Euribor); and for 24 deals we find no information. If the margin spread is unknown for a deal we use the median spread of PE deals in Western Europe in the same year. If the base rate is unknown we use Libor for UK deals and Euribor for all other deals.

**Table 3 – Panel B: Abnormal Performance vs. PME**

The table reports summary statistics on the abnormal performance, as reported in the previous table under scenario 1, IRR and the public market equivalent (PME) for each deal in the spirit of Kaplan and Schoar 2005. In the PME calculation, we discount all cash flows with the total sector return and then calculate the ratio of discounted cash flows to the largest cash inflow for the deal.

<b>Performance measure</b>	<b>n</b>	<b>mean (median)</b>	<b>std. dev.</b>
Abnormal performance (scenario 1)	110	8.41 (10.49)	19.79
IRR gross	110	38.59 (36.00)	40.45
PME Sector	110	116.35 (105.05)	142.81

**Note:** All values in percent

**Table 3 – Panel C: Correlation matrix: Abnormal Performance, IRR and PME**

The table shows the correlation between abnormal performance (scenario 1), IRR and the public market equivalent (PME) for all deals in our sample (n=110).

	<b>IRR gross</b>	<b>PME Sector</b>
<b>Abnormal performance</b>	0.77***	0.58***
<b>PME Sector</b>	0.50***	1

**Note:** All values in percent, significance level (of the pairwise correlation coefficient) \* p<0.1, \*\* p<0.05, \*\*\* p<0.01

**Table 4: Operating performance change during PE ownership**

The table reports for various operating measures ( $x$ ) the difference ( $\Delta x_i = x_{iT} - x_{it}$ ) from the last pre-acquisition year ( $t=0$ ) to last PE-ownership year ( $T$ ). First, we report the changes for all deals. Second, we show changes only for deals, which had no M&A event (organic deals) during PE ownership. Third, we report changes only for deals that had M&A events (inorganic deals). We also report the same for deal corresponding sector companies ( $\Delta x_s = x_{sT} - x_{st}$ ). We divide the difference for log sales between  $t$  and  $T$  by the number of PE ownership years ( $T-t$ ) to get annual nominal sales growth. We use median sector changes, given that there are mostly less than 100 companies in each three digit sector. In the last column we test if the changes are different from zero and also for differences between deal and median sector changes, in the spirit of a difference-in-difference (DiD). We calculate the differences without including changes in years with M&A or divestment events. Since the numbers might get artificially in- or deflated in the presence of acquisition or divestment activity.<sup>1</sup>

Variable	(1) all deals (n=85)			(2) organic deals (n=55) <sup>2</sup>			(3) inorganic deals (n=30) <sup>3</sup>		
	mean (median)	t-stat of diff. with		mean (median)	t-stat of diff. with		mean (median)	t-stat of diff. with	
		zero	sector		zero	Sector		zero	sector
$\Delta x_i$ deal log sales <sup>4</sup>	5.58 (4.60)	4.32***	-1.76*	4.60 (4.11)	2.57**	-1.56	7.36 (5.41)	4.65***	-0.81
$\Delta x_s$ sector log sales <sup>5</sup>	7.95 (6.37)	12.23***		7.50 (6.08)	9.01***		8.68 (7.81)	8.52***	
$\Delta x_i$ deal margin <sup>4</sup>	2.13 (0.91)	2.74***	2.51**	2.60 (0.71)	2.29**	2.07**	1.28 (1.44)	1.75*	1.62
$\Delta x_s$ sector margin <sup>5</sup>	0.18 (0.12)	1.37		0.28 (0.27)	1.70*		0.00 (-0.04)	0	
$\Delta x_i$ deal multiple <sup>4,6</sup>	2.23 (1.37)	1.92*	1.71*	2.28 (1.35)	1.41	1.21	2.12 (1.66)	2.18**	2.28**
$\Delta x_s$ sector multiple <sup>5</sup>	0.22 (0.33)	3.21***		0.30 (0.35)	4.27***		0.04 (0.07)	0.26	
$\Delta x_i$ deal log multiple <sup>4,6,7</sup>	14.29 (16.84)	2.08**	1.66	12.74 (16.84)	1.42*	0.93	17.76 (21.48)	1.79*	2.01*
$\Delta x_s$ sector log multiple <sup>5,7</sup>	2.68 (4.50)	2.62**		4.21 (4.88)	3.93***		-0.72 (-0.35)	-0.33	

**Note:** All values in percent, except change in multiples, significance level \* p<0.1, \*\* p<0.05, \*\*\* p<0.01

1 We use M&A or divestment events during PE ownership as reported by the PE house or as mentioned in the press, Capital IQ database, or PE house website. M&A event are major if they altered sales or enterprise value of the deal by more than 20%

2 Deals without major M&A activity during PE ownership

3 Deals with major M&A activity during PE ownership

4 Exited deals only, including bankruptcies

5 Median sector changes

6 Including deals only with entry and exit EBITDA multiple available

7 Excluding observations with negative EBITDA

**Table 5 – Panel A: Abnormal performance and operating performance changes**

The table relates cross-sectional financial performance to changes in operating measures with OLS regressions.

For the operational changes we calculate the average difference ( $\Delta x_i = x_{iT} - x_{i0}$ ) from the last pre-acquisition year ( $t=0$ ) to last PE-ownership year ( $T$ ) for EBITDA margin, log sales and log EBITDA multiple.<sup>1</sup> We divide the difference for log sales by the number of PE ownership years ( $T-t$ ) to get annual nominal sales growth. In the same way we add to the regressions median changes in the deal corresponding sector companies ( $\Delta x_s = x_{sT} - x_{s0}$ ).

First, in regression (1) – (2) we use all deals. Second, in regression (3) and (4) we show regressions for only organic deals and in the regression (5) and (6) for only inorganic deals. In the lower part of the table we control for deal duration and different entry time periods.

Independent variables	Dependent variable: abnormal performance in %					
	(1) all deals		(2) organic deals <sup>2</sup>		(3) inorganic deals <sup>3</sup>	
	(1)	(2)	(3)	(4)	(5)	(6)
$\Delta x_i$ log sales	-0.04 (-0.29)	0.08 (0.44)	-0.05 (-0.35)	0.03 (0.15)	-0.22 (-0.38)	0.34 (1.04)
$\Delta x_s$ sector log sales	-0.03 (-0.11)	-0.60** (-2.35)	-0.10 (-0.42)	-0.55* (-1.91)	0.04 (0.08)	-0.33 (-0.43)
$\Delta x_i$ margin	0.60** (2.38)	1.07*** (3.06)	0.61** (2.34)	1.08*** (2.82)	1.24* (1.95)	2.09 (1.56)
$\Delta x_s$ sector margin	1.40 (1.15)	1.53 (0.91)	1.96 (1.41)	1.35 (0.81)	1.10 (0.49)	0.26 (0.06)
$\Delta x_i$ log multiple		0.09* (1.97)		0.07 (-1.54)		0.34*** (3.32)
$\Delta x_s$ sector log multiple		-0.42** (-2.15)		-0.25 (-0.92)		-1.01** (-2.94)
PE duration (exit – entry year)	-4.89*** (-4.36)	-5.33*** (-3.31)	-6.60*** (-4.32)	-7.02*** (-3.68)	-2.93* (-2.04)	2.69 (1.05)
Entry dummy 95-00	Yes	Yes	Yes	Yes	Yes	Yes
Entry dummy 01-02	Yes	Yes	Yes	Yes	Yes	Yes
Intercept	Yes	Yes	Yes	Yes	Yes	Yes
Number of deals	85 <sup>4</sup>	70 <sup>4,5</sup>	55 <sup>4</sup>	48 <sup>4,5</sup>	30 <sup>4</sup>	22 <sup>4,5</sup>
R <sup>2</sup> adjusted	0.23	0.32	0.31	0.39	0.02	0.28

**Note:** OLS regressions, t-stats in parentheses with robust standard errors, significance level \* p<0.1, \*\* p<0.05, \*\*\* p<0.01

1 Without years with major M&A or divestment events during PE ownership as mentioned by the PE house or in the press, Capital IQ database, or PE house website. M&A events are major if they altered sales or enterprise value by more than 20%

2 Deals without major M&A activity during PE ownership

3 Deals with major M&A activity during PE ownership

4 Exited deals only, including bankruptcies

5 Including deals with entry and exit EBITDA multiple available only, excluding observations with negative EBITDA.

**Table 5 – Panel B: IRR, PME and operating performance changes**

The table relates IRR (in %) and public market equivalent (PME) to operational changes ( $\Delta x_i$  and  $\Delta x_s$ ) with OLS regressions. We calculate the PME in the spirit of Kaplan and Schoar (2005).

For the operational changes we calculate the average difference ( $\Delta x_i = x_{iT} - x_{i0}$ ) from the last pre-acquisition year ( $t=0$ ) to last PE-ownership year ( $T$ ) for EBITDA margin, log sales and log EBITDA multiple.<sup>1</sup> We divide the difference for log sales by the number of PE ownership years ( $T-t$ ) to get annual nominal sales growth. In the same way we add to the regressions median changes in the deal corresponding sector companies ( $\Delta x_s = x_{sT} - x_{s0}$ ).

First, in regression (1) – (2) we use all deals. Second, in regression (3) and (4) we show regressions for only organic deals and in the regression (5) and (6) for only inorganic deals. In the lower part of the table we control for deal duration and different entry time periods.

Dependent variable	(1) all deals		(2) organic deals <sup>2</sup>		(3) inorganic deals <sup>3</sup>	
	IRR	PME	IRR	PME	IRR	PME
Independent variables	(1)	(2)	(3)	(4)	(5)	(6)
$\Delta x_i$ log sales	0.41 (1.14)	0.01 (1.01)	0.46 (1.24)	0.01 (1.06)	0.71** (2.25)	0.01 (0.11)
$\Delta x_s$ sector log sales	-1.07* (-1.77)	-0.01 (-0.48)	-0.78 (-1.05)	-0.02 (-0.98)	-1.43 (-1.68)	0.04 (0.32)
$\Delta x_i$ margin	2.30*** (2.70)	0.11** (2.57)	1.96* (1.96)	0.08*** (3.95)	5.46*** (4.32)	0.41 (1.56)
$\Delta x_s$ sector margin	4.05 (1.43)	0.12 (0.86)	6.26* (1.91)	0.24* (1.87)	-2.76 (-0.71)	-0.09 (-0.19)
$\Delta x_i$ log multiple	0.21** (2.12)	0.01** (2.04)	0.15 (1.58)	0.00 (1.60)	0.79*** (5.74)	0.02* (2.15)
$\Delta x_s$ sector log multiple	0.13 (0.34)	0.00 (0.03)	0.20 (0.25)	-0.02 (-1.18)	-1.22** (-2.66)	0.01 (0.12)
PE duration (exit year – entry year)	10.89*** (-3.53)	-0.18 (-1.60)	-11.74*** (-3.00)	-0.28** (-2.66)	-0.87 (-0.34)	0.46 (0.91)
Entry dummy 95-00	Yes	Yes	Yes	Yes	Yes	Yes
Entry dummy 01-02	Yes	Yes	Yes	Yes	Yes	Yes
Intercept	Yes	Yes	Yes	Yes	Yes	Yes
Number of deals	70 <sup>4</sup>	70 <sup>4</sup>	48 <sup>4</sup>	48 <sup>4</sup>	22 <sup>4</sup>	22 <sup>4</sup>
R <sup>2</sup> adjusted	0.42	0.16	0.38	0.39	0.84	0.04

**Note:** OLS regressions, t-stats in parentheses with robust standard errors, significance level \* p<0.1, \*\* p<0.05, \*\*\* p<0.01

1 Without years with major M&A or divestment events during PE ownership as mentioned by the PE house or in the press, Capital IQ database, or PE house website. Events are major if they altered sales or enterprise value by more than 20%

2 Deals without major M&A activity during PE ownership

3 Deals with major M&A activity during PE ownership as reported by the PE house or as mentioned in the press, Capital IQ database, or PE house website (if M&A altered sales or enterprise value of the deal by more than 20%)

4 Exited deals and deals with entry and exit EBITDA multiple available only, including bankruptcies, but excluding observations with negative EBITDA.

**Table 6: Outperformance by deal partner background PE strategy**

The table gives an overview of the background of the partners who led the deals in our sample, for all deals and by deal strategy (organic vs. inorganic strategy).<sup>1</sup>

We cluster the partners into 4 categories. We call partners in the first two categories Finance Partners (partners with a background in banking or accounting), and in the second two categories Operations Partners (partners with a background in consulting or industry).

For each category, we report summary statistics on (1) abnormal performance, (2) IRR and (3) PME.

<b>Strategy</b>	<b>leading partner background</b> <sup>2</sup>	<b>n</b>	<b>(1) abnormal performance</b>	<b>(2) IRR</b>	<b>(3) PME</b>
<b>All deals</b>	Banking	33	7.8 (14.0)	34.9 (34.0)	1.6 (1.4)
	Accounting <sup>3</sup>	42	4.9 (3.1)	31.04 (30.5)	0.8 (0.7)
	Subtotal (FPs)	75	6.2 (8.2)	32.74 (33.8)	1.1 (1.0)
	Consulting	15	16.4 (11.5)	67.88 (63.3)	1.5 (1.3)
	Industry Manager	12	11.6 (11.9)	44.4 (41.5)	1.2 (1.3)
	Subtotal (OPs)	27	14.3 (11.5)	57.45 (56.3)	1.4 (1.3)
	<b>Total</b>	<b>102</b>	<b>8.3 (10.5)</b>	<b>39.28 (36.3)</b>	<b>1.2 (1.1)</b>
<b>Organic deals</b> <sup>4</sup>	Banking	14	-2.0 (5.0)	22.8 (24.1)	0.8 (1.0)
	Accounting <sup>3</sup>	31	3.3 (1.8)	31.03 (32.9)	0.8 (0.7)
	Subtotal (FPs)	45	1.6 (1.8)	28.47 (28.2)	0.8 (0.7)
	Consulting	14	17.3 (12.1)	67.68 (63.2)	1.6 (1.4)
	Industry Manager	8	13.8 (14.6)	53.55 (62.5)	1.4 (1.9)
	Subtotal (OPs)	22	16.0 (12.1)	62.54 (63.2)	1.5 (1.4)
	<b>Total</b>	<b>67</b>	<b>6.4 (8.2)</b>	<b>39.66 (36.5)</b>	<b>1.0 (0.1)</b>
<b>Inorganic deals</b> <sup>5</sup>	Banking	19	15.0 (14.2)	43.81 (36.1)	2.2 (1.8)
	Accounting <sup>3</sup>	11	9.4 (4.5)	31.07 (27.1)	0.7 (0.5)
	Subtotal (FPs)	30	13.0 (13.5)	39.14 (35.7)	1.6 (1.2)
	Consulting	1	4.1 (4.1)	70.8 (70.8)	0.6 (0.6)
	Industry Manager	4	7.1 (3.8)	26.09 (26.0)	0.9 (0.6)
	Subtotal (OPs)	5	6.5 (4.1)	35.03 (39.6)	0.9 (0.6)
	<b>Total</b>	<b>35</b>	<b>12.1 (13.2)</b>	<b>38.55 (36.1)</b>	<b>1.5 (1.1)</b>

**Note:** Simple averages, medians in parentheses, abnormal performance and IRR in percent

<sup>1</sup> Including bankruptcies and non-exited deals

<sup>2</sup> Professional background of the partner interviewed if not mentioned otherwise in Capital IQ database, PE house website, or press articles. For deals without an interview available or if the interviewed partner is not the leading deal partner, we use the professional background of the leading deal partner if mentioned in Capital IQ database, PE house website, or press articles

<sup>3</sup> Including deal partners with background in law

<sup>4</sup> Deals without major M&A activity during PE ownership

<sup>5</sup> Deals with major M&A activity during PE ownership as reported by the PE house or as mentioned in the press, Capital IQ database, or PE house website (if M&A altered sales or enterprise value of the deal by more than 20%).

**Table 7: Abnormal performance, IRR and PME by deal partner background and PE strategy**

The table reports multivariate regression results of financial performance on the background of the deal partner who initiated the deals in our sample.<sup>1</sup> In regression (1) – (4) we run the regression with abnormal performance as dependent variable in (5) – (6) with IRR and (9) – (12) with PME. We cluster the partner into two categories. We call partners with a background in banking or accounting as “FPs” and with a background in consulting or industry as “OPs.”

Independent variables	(1) Abnormal performance in %				(2) IRR in %				(3) PME			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
FPs <sup>2</sup>	-6.29 (-1.56)	-7.81* (-1.88)	-11.77** (-2.44)	-11.54** (-2.39)	-13.45* (-1.70)	-14.99* (-1.83)	-22.10** (-2.27)	-21.27** (-2.19)	-0.33 (-1.00)	-0.42 (-1.29)	-0.71* (-1.92)	-0.69* (-1.84)
Inorganic <sup>3</sup>		8.93** (2.60)	-5.62 (-1.19)	-6.37 (-1.27)		9.09 (1.40)	-16.97* (-1.82)	-19.66** (-2.10)		0.55* (1.70)	-0.53 (-1.26)	-0.60 (-1.35)
FPs x inorganic			17.87*** (2.96)	19.02*** (2.85)			32.01*** (2.69)	36.11*** (2.96)			1.32** (2.33)	1.42** (2.40)
No exit <sup>4</sup>				-9.07 (-0.68)				-32.38 (-1.45)				-0.81** (-2.01)
Holding length (in years)	-6.02*** (-4.93)	-6.22*** (-5.32)	-5.91*** (-5.19)	-5.39*** (-4.24)	-12.8*** (-5.40)	-13.1*** (-5.59)	-12.5*** (-5.44)	-10.7*** (-4.33)	-0.21** (-2.21)	-0.22** (-2.32)	-0.20** (-2.05)	-0.15 (-1.42)
Entry period <sup>5</sup>	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Intercept	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
No. of deals	102	102	102	102	102	102	102	102	102	102	102	102
R <sup>2</sup> adjusted	0.21	0.24	0.25	0.25	0.29	0.30	0.31	0.34	0.02	0.04	0.06	0.07

**Note:** OLS regressions, t-stat in parenthesis with robust standard errors, significance level \* p<0.1, \*\* p<0.05, \*\*\* p<0.01

<sup>1</sup> Including bankruptcies and not exited deals

<sup>2</sup> Dummy equals 1 (and 0 otherwise) for deals with leading deal partners who have a background in banking, accounting or law (in contrast to consulting or industry). Professional background of the partner interviewed if not mentioned otherwise in Capital IQ database, PE house website, or press articles. For deals without an interview available or if the interviewed partner is not the leading deal partner, we use the professional background of the leading deal partner if mentioned in Capital IQ database, PE house website, or press articles

<sup>3</sup> Dummy equals 1 (and 0 otherwise) for deals with major M&A activity during PE ownership as reported by the PE house or as mentioned in the press, Capital IQ database, or PE house website (if M&A altered sales or enterprise value of the deal by more than 20%)

<sup>4</sup> Dummy equals 1 (and 0 otherwise) for deals, which were not yet exited

<sup>5</sup> Dummies for entry period 1998 – 2000, 2001 – 2002 and 2003 – 2007.

**Table 8: Interview questions**

<b>Topic</b>	<b>interview question</b>	<b>set of answers</b>	<b>additional remarks</b>
(1.1-1.3) 1st 100 days management changes	“What management changes, if any, did you make and when?”	<ul style="list-style-type: none"> <li>• CEO</li> <li>• CFO</li> <li>• Sales &amp; Marketing Director</li> <li>• COO/OPs. Director</li> <li>• Chairman</li> <li>• Other (specify)</li> </ul>	Answer subdivided into <ul style="list-style-type: none"> <li>• Pre-completion</li> <li>• First 3 months</li> <li>• 3-12 months</li> <li>• Year 2 or later</li> </ul>
(2.1) Mgmt. with high equity share	“For those that did invest... what % equity did they own?”	Open-ended	Answer subdivided into <ul style="list-style-type: none"> <li>• CEO</li> <li>• First line</li> <li>• Second line</li> <li>• Others</li> </ul>
(2.2) CEO with high cash-multiple	“What return did they expect, as a multiple of their original investment (base case)?”	Open-ended	Answer subdivided into <ul style="list-style-type: none"> <li>• CEO</li> <li>• First line</li> <li>• Second line</li> <li>• Others</li> </ul>
(2.3) 1st & 2nd mgmt. line with equity	“For those that did invest... what % equity did they own? ”	Open-ended	Answer subdivided into <ul style="list-style-type: none"> <li>• CEO</li> <li>• First line</li> <li>• Second line</li> <li>• Others</li> </ul>
(3.1) Multiple CEO interactions per week	“How frequently did the deal partner(s) interact with the CEO? (Choose 1 answer per stage)”	<ul style="list-style-type: none"> <li>• Multiple times/week</li> <li>• Once/week</li> <li>• 2-3 times/month</li> <li>• Less than 2 or 3 times/month</li> </ul>	Answer subdivided into <ul style="list-style-type: none"> <li>• Pre-completion</li> <li>• First 3 months</li> <li>• 3-12 months</li> <li>• Year 2 or later</li> </ul>
(3.2) Frequent CFO interactions	“Did the deal partner(s) interact on a regular basis with anyone else? (Choose all applicable)”	<ul style="list-style-type: none"> <li>• CFO</li> <li>• Operations director</li> <li>• Sales or marketing director</li> <li>• Other (specify)</li> </ul>	Answer subdivided into <ul style="list-style-type: none"> <li>• Pre-completion</li> <li>• First 3 months</li> <li>• 3-12 months</li> <li>• Year 2 or later</li> </ul>
(3.3) High PE partner time commitment	“Roughly what share of their time did they spend during the deal? (FTE per stage)”	Open-ended	Answer subdivided into <ul style="list-style-type: none"> <li>• Pre-completion</li> <li>• First 3 months</li> <li>• 3-12 months</li> <li>• Year 2 or later</li> </ul>

**Table 8: Interview questions (continued)**

<b>Topic</b>	<b>interview question</b>	<b>set of answers</b>	<b>additional remarks</b>
(4.1-4.2) External support	“Did you/the consortium use external advisors during the deal (please disregard Legal; Accounting; and Finance)? If so, whom and when?”	<ul style="list-style-type: none"> <li>No (only used legal; accounting; finance)</li> <li>Market/commercial due diligence</li> <li>Strategy/Operations</li> <li>HR – Management assessment</li> <li>HR – Other (e.g. pensions)</li> <li>Other (please specify)</li> </ul>	<p>Answer subdivided into</p> <ul style="list-style-type: none"> <li>Pre-completion</li> <li>First 3 months</li> <li>3-12 months</li> <li>Year 2 or later</li> </ul>
(5.1) Revised management plan	“Did you/the consortium make any adjustments to management’s plan? (1 answer per stage)”	<ul style="list-style-type: none"> <li>Yes</li> <li>None</li> </ul>	<p>Answer subdivided into</p> <ul style="list-style-type: none"> <li>Pre-completion</li> <li>First 3 months</li> <li>3-12 months</li> <li>Year 2 or later</li> </ul>
(5.2) New Key Performance Indicators	“Did you devise new KPIs (Key Performance Indicators)? If so, when? (Choose 1 answer)”	<ul style="list-style-type: none"> <li>Devised</li> <li>Not devised</li> </ul>	<p>Answer subdivided into</p> <ul style="list-style-type: none"> <li>First 3 months</li> <li>3-12 months</li> <li>Year 2 or later</li> </ul>
(5.3) Acted on deviations	“Were there any deviations from the plan and if so how soon did you take action? (One answer per deviation)”	<ul style="list-style-type: none"> <li>No deviations</li> <li>Deviation and took action: <ul style="list-style-type: none"> <li>Immediately</li> <li>Within 1 month</li> <li>In 1 to 3 months</li> <li>In 3 to 6 months</li> <li>Later</li> </ul> </li> <li>Deviation, but no action taken</li> </ul>	<p>Answer subdivided into</p> <ul style="list-style-type: none"> <li>Pre-completion</li> <li>First 3 months</li> <li>3-12 months</li> <li>Year 2 or later</li> </ul>
(6.1) At least one productivity initiative	“What initiatives did you/the consortium launch, that made a significant impact on value? When were they launched? (Please choose up to 3 answers for each section; please rank if possible 1=highest)”	<ul style="list-style-type: none"> <li>Purchasing (e.g. supplier consolidation)</li> <li>Process efficiency (e.g. supply chain)</li> <li>Overhead reduction (e.g. SG&amp;A)</li> <li>Other cost reduction (e.g. R&amp;D)</li> </ul>	<p>Answer subdivided into</p> <ul style="list-style-type: none"> <li>First 3 months</li> <li>3-12 months</li> <li>Year 2 or later</li> </ul>
(6.2) At least one organic growth initiative	“What initiatives did you/the consortium launch, that made a significant impact on value? When were they launched? (Please choose up to 3 answers for each section; please rank if possible 1=highest)”	<ul style="list-style-type: none"> <li>Review of pricing</li> <li>New channels</li> <li>New products</li> <li>New geographies</li> <li>Existing geographies <ul style="list-style-type: none"> <li>Develop new customers</li> <li>Develop existing customers</li> </ul> </li> <li>Other (please specify)</li> </ul>	<p>Answer subdivided into</p> <ul style="list-style-type: none"> <li>First 3 months</li> <li>3-12 months</li> <li>Year 2 or later</li> </ul>

**Table 9 – Panel A: Management turnover and incentives**

The Table reports first the mean active governance score for (1) all deals. In column (2) we rank the deals by abnormal performance and show the mean score for the top performance tercile and remaining (non-top) terciles. In column (3) we show the mean scores for partners with backgrounds in finance and in operations separately. We further provide the mean scores for all deals and organic deals separately. All questions contain governance actions in the 1<sup>st</sup> 100 days or before.

The sample size varies per answer. In some cases, we have more answers than interviews, since we have also information from PE fund documents. In other cases, the full questionnaire was not covered, due to time constraints of the interviewee.

	(1) Total	(2) by abn. performance			(3) by partner background <sup>1</sup>		
		top tercile	non-top terciles	t-test <sup>2</sup>	FPs <sup>3</sup>	OPs <sup>4</sup>	t-test <sup>2</sup>
<b>All deals (n)</b>	72	20	52		56	16	
(1.1) CEO replacement	0.38	0.45	0.35	0.81	0.34	0.50	-1.17
(1.2) CFO replacement	0.36	0.45	0.33	0.97	0.36	0.38	-0.13
(1.3) Other replacement	0.39	0.50	0.35	1.19	0.32	0.63	-2.24**
(1.4) Total management change <sup>6</sup>	0.38	0.47	0.34	1.28	0.34	0.50	-1.51
<b>Organic deals (n) <sup>5</sup></b>	49	12	37		37	12	
(1.1) CEO replacement	0.41	0.67	0.32	2.15**	0.35	0.58	-1.42
(1.2) CFO replacement	0.37	0.50	0.32	1.09	0.35	0.42	-0.4
(1.3) Other replacement	0.41	0.58	0.35	1.42	0.32	0.67	-2.15**
(1.4) Total management change <sup>6</sup>	0.39	0.58	0.33	1.96*	0.34	0.56	-1.65*
<b>All deals (n)</b>	75	26	49		54	21	
(2.1) Mgmt. with high equity share <sup>7</sup>	0.41	0.42	0.41	0.12	0.43	0.38	0.35
(2.2) Mgmt. with high cash-multiple <sup>7</sup>	0.29	0.09	0.40	-1.86*	0.36	0.00	1.78*
(2.3) 1st & 2nd mgmt. line with equity	0.57	0.65	0.54	0.83	0.62	0.41	1.53
(2.4) Total incentives <sup>6</sup>	0.48	0.47	0.48	-0.17	0.51	0.39	1.32
<b>Organic deals (n) <sup>5</sup></b>	50	17	33		32	18	
(2.1) Mgmt. with high equity share <sup>7</sup>	0.42	0.47	0.39	0.51	0.44	0.39	0.33
(2.2) Mgmt. with high cash-multiple <sup>7</sup>	0.25	0.00	0.38	-1.98*	0.31	0.00	1.28
(2.3) 1st & 2nd mgmt. line with equity	0.53	0.62	0.50	0.7	0.56	0.46	0.59
(2.4) Total incentives <sup>6</sup>	0.45	0.48	0.43	0.48	0.46	0.42	0.45

**Note:** significance level \* p<0.1, \*\* p<0.05, \*\*\* p<0.01

1 Professional background of partner interviewed if not mentioned otherwise in Capital IQ database, PE house website, or press articles. For deals without an interview available or if the interviewed partner is not the leading deal partner, we use the professional background of the leading deal partner from Capital IQ database, PE house website, or press articles

2 t-test of difference

3 Partner with a background in banking, accounting, or law

4 Partner with a background in consulting or industry

5 Deals without major M&A events during PE ownership as reported by the PE house or as mentioned as a major strategy in the press. We classify M&A events as major if they alter sales or enterprise value by more than 20%

6 We fill data holes for deriving subtotals with the average score of the subquestions answered per deal

7 Above cross-sectional average.

**Table 9 – Panel B: Control and support**

The Table reports first the mean active governance score for (1) all deals. In column (2) we rank the deals by abnormal performance and show the mean score for the top performance tercile and remaining (non-top) terciles. In column (3) we show the mean scores for partners with backgrounds in finance and in operations separately.

We further provide the mean scores for all deals and organic deals separately. All questions contain governance actions in the 1<sup>st</sup> 100 days or before.

The sample size varies per answer. In some cases, we have more answers than interviews, since we have also information from PE fund documents. In other cases, the full questionnaire was not covered, due to time constraints of the interviewee.

	(1) Total	(2) by abn. performance			(3) by partner background <sup>1</sup>		
		top tercile	non-top terciles	t-test <sup>2</sup>	FPs <sup>3</sup>	OPs <sup>4</sup>	t-test <sup>2</sup>
<b>All deals (n)</b>	73	21	52		56	17	
(3.1) Multiple CEO interactions	0.53	0.76	0.44	2.55**	0.52	0.59	-0.5
(3.2) Frequent CFO interactions	0.97	0.95	0.98	-0.66	0.96	1.00	-0.84
(3.3) High PE time commitment <sup>7</sup>	0.52	0.50	0.53	-0.18	0.45	0.67	-1.36
(3.4) Total PE support <sup>6</sup>	0.67	0.78	0.63	1.83*	0.65	0.75	-1.22
<b>Organic deals (n) <sup>5</sup></b>	49	13	36		36	13	
(3.1) Multiple CEO interactions	0.47	0.77	0.36	2.65**	0.36	0.77	-2.65**
(3.2) Frequent CFO interactions	0.98	1.00	0.97	0.63	0.97	1.00	-0.63
(3.3) High PE time commitment <sup>7</sup>	0.59	0.56	0.60	-0.23	0.48	0.82	-1.93*
(3.4) Total PE support <sup>6</sup>	0.64	0.79	0.58	2.08**	0.56	0.86	-3.08***
<b>All deals (n)</b>	68	21	47		53	15	
(4.1) Used in acquisition phase	0.78	0.81	0.77	0.39	0.74	0.93	-1.64
(4.2) Used in 1st 100 days	0.34	0.57	0.23	2.83***	0.32	0.40	-0.57
(4.3) Total external support <sup>6</sup>	0.56	0.69	0.50	2.12**	0.53	0.67	-1.36
<b>Organic deals (n) <sup>5</sup></b>	46	13	33		34	12	
(4.1) Used in acquisition phase	0.80	0.85	0.79	0.44	0.76	0.92	-1.13
(4.2) Used in 1st 100 days	0.33	0.69	0.18	3.73***	0.29	0.42	-0.77
(4.3) Total external support <sup>6</sup>	0.57	0.77	0.48	2.56**	0.53	0.67	-1.14

**Note:** significance level \* p<0.1, \*\* p<0.05, \*\*\* p<0.01

1 Professional background of partner interviewed if not mentioned otherwise in Capital IQ database, PE house website, or press articles. For deals without an interview available or if the interviewed partner is not the leading deal partner, we use the professional background of the leading deal partner from Capital IQ database, PE house website, or press articles

2 t-test of difference

3 Partner with a background in banking, accounting, or law

4 Partner with a background in consulting or industry

5 Deals without major M&A events during PE ownership as reported by the PE house or as mentioned as a major strategy in the press. We classify M&A events as major if they alter sales or enterprise value by more than 20%

6 We fill data holes for deriving subtotals with the average score of the subquestions answered per deal

7 Above cross-sectional average.

**Table 9 – Panel C: Interventions and initiatives**

The Table reports first the mean active governance score for (1) all deals. In column (2) we rank the deals by abnormal performance and show the mean score for the top performance tercile and remaining (non-top) terciles. In column (3) we show the mean scores for partners with backgrounds in finance and in operations separately. We further provide the mean scores for all deals and organic deals separately. All questions contain governance actions in the 1<sup>st</sup> 100 days or before.

The sample size varies per answer. In some cases, we have more answers than interviews, since we have also information from PE fund documents. In other cases, the full questionnaire was not covered, due to time constraints of the interviewee.

	(1) Total	(2) by abn. performance			(3) by partner background <sup>1</sup>		
		top tercile	non-top terciles	t-test <sup>2</sup>	FPs <sup>3</sup>	OPs <sup>4</sup>	t-test <sup>2</sup>
<b>All deals (n)</b>	68	21	47		51	17	
(5.1) Revised management plan	0.68	0.76	0.64	1	0.63	0.82	-1.5
(5.2) New Key Performance Indicators	0.73	0.77	0.70	0.58	0.80	0.53	2.17**
(5.3) Acted on deviations	0.56	0.50	0.59	-1.34	0.56	0.57	-0.2
(5.4) Total plan adjustments <sup>6</sup>	0.64	0.67	0.63	0.47	0.65	0.63	0.23
<b>Organic deals (n) <sup>5</sup></b>	44	13	31		31	13	
(5.1) Revised management plan	0.66	0.77	0.61	0.99	0.58	0.85	-1.71*
(5.2) New Key Performance Indicators	0.67	0.71	0.65	0.45	0.75	0.46	1.89*
(5.3) Acted on deviations	0.59	0.50	0.62	-1.55	0.60	0.55	0.73
(5.4) Total plan adjustments <sup>6</sup>	0.63	0.66	0.62	0.44	0.63	0.62	0.19
<b>All deals (n)</b>	74	23	51		57	17	
(6.1) At least one productivity initiative	0.55	0.43	0.61	-1.02	0.49	0.76	-2.02**
(6.2) At least one organic growth init.	0.64	0.87	0.53	2.75***	0.67	0.53	1.03
(6.3) Total initiatives <sup>6</sup>	0.59	0.65	0.57	1.13	0.58	0.65	-0.73
<b>Organic deals (n) <sup>5</sup></b>	53	16	37		37	13	
(6.1) At least one productivity initiative	0.60	0.63	0.59	0.2	0.57	0.69	-0.78
(6.2) At least one organic growth init.	0.62	0.81	0.54	1.9*	0.68	0.54	0.88
(6.3) Total initiatives <sup>6</sup>	0.61	0.72	0.57	1.53	0.62	0.62	0.06

**Note:** significance level \* p<0.1, \*\* p<0.05, \*\*\* p<0.01

1 Professional background of partner interviewed if not mentioned otherwise in Capital IQ database, PE house website, or press articles. For deals without an interview available or if the interviewed partner is not the leading deal partner, we use the professional background of the leading deal partner from Capital IQ database, PE house website, or press articles

2 t-test of difference

3 Partner with a background in banking, accounting, or law

4 Partner with a background in consulting or industry

5 Deals without major M&A events during PE ownership as reported by the PE house or as mentioned as a major strategy in the press. We classify M&A events as major if they alter sales or enterprise value by more than 20%

6 We fill data holes for deriving subtotals with the average score of the subquestions answered per deal.

## APPENDIX: ROBUSTNESS CHECKS

**Table R1: Operating performance trends PRE PE ownership**

The table provides performance trends in the last year PRE PE ownership ( $t=0$ ) for all deals in our sample, for which we have at least two years of PRE PE ownership data ( $n=69$ ). More specifically, the table reports change in EBITDA margin ( $ebitda\ margin_t - ebitda\ margin_{t-1}$ ) in percentage points and the growth in sales ( $logsales_t - logsales_{t-1}$ ) in percent for the deals. In addition, we provide also sector median changes and test for differences between deal and sector in the last column.

Variables	mean	median	std. dev.	min	max	t-stat of diff. with	
						zero	deal
deal sales growth	5.87	7.18	14.79	-59.03	58.11	3.29***	
sector median sales growth	6.54	5.52	8.08	-8.81	23.02	6.71***	0.65
deal margin change	0.08	0.60	3.66	-19.97	10.94	0.17	
sector margin median change	0.23	0.17	1.11	-1.56	8.11	1.72*	-0.34

**Note:** All values in percent

**Table R2: Abnormal performance, IRR and PME by deal partner background and early PE strategy**

The table reports multivariate regression results of financial performance on the background of the deal partner who led the deals in our sample.<sup>1</sup> We cluster the partner into two categories. We call partners with a background in banking or accounting as “FPs” and with a background in consulting or industry as “OPs.” In regression (1) – (4) we run the regression with abnormal performance as dependent variable in (5) – (6) with IRR and (9) – (12) with PME. The regressions are the same as in Table 7; however we use as M&A dummy variable early M&A events (early inorganic) only. We therefore assign a 1 for deals only with M&A in the first 2 years of PE ownership, since late M&A events might be endogenously determined by the performance of the deal.

Independent variables	(1) Dependent variable abnormal perf. in %				(2) Dependent variable IRR in %				(3) Dependent variable PME			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
FPs <sup>2</sup>	-6.29 (-1.56)	-8.35** (-2.04)	-10.04** (-2.20)	-9.70** (-2.14)	-13.45* (-1.70)	-15.08* (-1.79)	-19.91** (-2.18)	-18.61** (-2.04)	-0.33 (-1.00)	-0.45 (-1.41)	-0.60* (-1.74)	-0.57 (-1.63)
Early inorganic <sup>3</sup>		8.90** (2.48)	-1.67 (-0.33)	-1.90 (-0.35)		7.05 (1.00)	-23.14** (-2.50)	-24.01*** (-2.66)		0.54 (1.44)	-0.39 (-0.77)	-0.41 (-0.77)
FPs x early inorganic			12.36* (1.89)	12.87* (1.86)			35.30*** (3.00)	37.24*** (3.17)			1.09* (1.70)	1.14* (1.70)
No exit <sup>4</sup>				-8.03 (-0.60)				-30.49 (-1.36)				-0.73* (-1.91)
Holding length (in years)	-6.02*** (-4.93)	-5.54*** (-4.80)	-5.41*** (-4.71)	-4.95*** (-3.68)	-12.8*** (-5.40)	-12.5*** (-5.18)	-12.1*** (-5.16)	-10.34*** (-3.99)	-0.21** (-2.21)	-0.18* (-1.76)	-0.17 (-1.62)	-0.13 (-1.09)
Entry period <sup>5</sup>	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Intercept	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
No. of obs.	102	102	102	102	102	102	102	102	102	102	102	102
R <sup>2</sup> adjusted	0.21	0.23	0.23	0.23	0.29	0.29	0.29	0.32	0.02	0.03	0.04	0.05

**Note:** OLS regression, t-stat in parenthesis with robust standard errors, significance level \* p<0.1, \*\* p<0.05, \*\*\* p<0.01

1 Including bankruptcies and not exited deals

2 Dummy equals 1 (and 0 otherwise) for deals with leading deal partners, which have a background in banking, accounting or law (in contrast to Consulting or Industry). Professional background of the partner interviewed if not mentioned otherwise in Capital IQ database, PE house website, or press articles. For deals without an interview available or if the interviewed partner is not the leading deal partner, we use the professional background of the leading deal partner if mentioned in Capital IQ database, PE house website, or press articles.

3 Dummy equals 1 (and 0 otherwise) for deals with major M&A activity during PE ownership in the first 2 years of PE ownership as reported by the PE house or as mentioned in the press, Capital IQ database or PE house website (if M&A altered sales or enterprise value of the deal by more than 20%)

4 Dummy equals 1 (and 0 otherwise) for deals, which were not yet exited yet

5 Dummies for entry period 1998 – 2000, 2001 – 2002 and 2003 – 2007

**Table R3: Performance and PE house characteristics**

The table reports various measures by the 14 PE houses participating in our sample. We rank the PE houses by simple average abnormal performance and report for each PE house the share of Finance Partners/inorganic and Operation Partners/organic deals. We also test for difference in the D/E ratio by PE house.

PE house	no. of deals	financial performance in %			share of deals with FPs and inorganic strategy	share of deals with OPs and organic strategy	leverage mean (median)
		mean (median) abnormal performance	mean IRR	mean PME			
(1)	3	19.59 (14.63)	37.79	4.59	0.67	0.00	1.93
(2)	4	17.53 (15.75)	42.97	2.27	0.75	0.25	2.46
(3)	8	14.43 (19.76)	79.58	1.40	0.00	0.75	2.13
(4)	1	14.19 (14.19)	44.19	4.82	1.00	0.00	2.21
(5)	1	14 (14)	84.96	1.01	0.00	0.00	2.26
(6)	11	13.8 (18.45)	35.13	1.50	0.18	0.27	1.13***
(7)	21	10.32 (10.79)	31.78	0.94	0.24	0.10	1.96
(8)	7	10.26 (4.75)	28.53	0.68	0.57	0.14	3.28***
(9)	9	7.14 (4.47)	42.62	1.21	0.33	0.11	1.70
(10)	8	7.12 (7.54)	36.68	1.26	0.38	0.25	1.93
(11)	2	6.18 (6.18)	83.37	1.49	1.00	0.00	2.38
(12)	8	3.01 (3.51)	55.30	0.68	0.00	0.63	2.34
(13)	15	0.49 (-4.44)	25.96	0.55	0.27	0.07	1.46*
(14)	4	-7.42 (-5.03)	6.56	0.63	0.25	0.00	2.06
Total	102	8.32 (10.49)	39.28	1.19	0.29	0.22	1.94

**Note:** significance level \* p<0.1, \*\* p<0.05, \*\*\* p<0.01

**Table R4: Sector returns by deal partner background and PE strategy <sup>1</sup>**

The table reports multivariate regression results of levered sector return on the background of the deal partner who led the deals in our sample. <sup>1</sup>

We cluster the partner into two categories. We call partners with a background in banking or accounting as “FPs” and with a background in consulting or industry as “OPs.”

Independent variables	Levered sector return			
	(1)	(2)	(3)	(4)
FPs <sup>2</sup>	1.77 (0.80)	2.39 (1.04)	2.57 (1.11)	2.65 (1.13)
Inorganic <sup>3</sup>		-3.62* (-1.78)	-2.96 (-0.49)	-3.21 (-0.53)
FPs x inorganic			-0.82 (-0.13)	-0.44 (-0.07)
No exit <sup>4</sup>				-2.97 (-0.85)
Holding_ length (in years)	0.23 (0.34)	0.31 (0.45)	0.29 (0.43)	0.46 (0.63)
d_98_00	-4.80** (-2.11)	-4.64** (-2.07)	-4.65** (-2.07)	-4.48* (-1.95)
d_01_02	0.05 (0.02)	-0.24 (-0.08)	-0.31 (-0.10)	0.04 (0.01)
d_03_07	14.84*** (4.83)	14.69*** (4.94)	*14.64*** (4.88)	15.59*** (4.48)
Intercept	4.05 (1.01)	4.59 (1.16)	4.56 (1.15)	3.58 (0.82)
No. of obs.	102	102	102	102
R <sup>2</sup> adjusted	0.43	0.44	0.44	0.43

**Note:** OLS regression, t-stat in parenthesis with robust standard errors, significance level \* p<0.1, \*\* p<0.05, \*\*\* p<0.01

1 Including bankruptcies and not exited deals

2 Dummy equals 1 (and 0 otherwise) for deals with leading deal partners who have a background in banking, accounting or law (in contrast to Consulting or Industry). Professional background of the partner interviewed if not mentioned otherwise in Capital IQ database, PE house website, or press articles. For deals without an interview available or if the interviewed partner is not the leading deal partner, we use the professional background of the leading deal partner if mentioned in Capital IQ database, PE house website, or press articles

3 Dummy equals 1 (and 0 otherwise) for deals with major M&A activity during PE ownership as reported by the PE house or as mentioned in the press, Capital IQ database, or PE house website (if M&A altered sales or enterprise value of the deal by more than 20%)

4 Dummy equals 1 (and 0 otherwise) for deals which were not yet exited.