

# THE IMPACT OF PRIVATE EQUITY ON ECONOMIC PERFORMANCE AND EMPLOYMENT GROWTH

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## Abstract

This paper analyzes and measures company growth due to private equity investments. Our research aim was to explore in detail whether private equity investments impact performance variables, and enable businesses to grow and become more efficient. For this purpose, a database of unquoted private equity backed companies in Italy was created.

Our analysis suggests that private equity investments have, on average, a positive effect on firm performance and company growth. The performance of private equity backed companies is higher in more cases than that of firms without private equity backing in the second year after the acquisition. Private equity investments lead to growth in EBITDA and in the number of employees, while the effects on ROE are mostly negative. We also found that private equity investments have a positive effect on sales, while the effect on equity is quite neutral. The impact on profit of private equity investments is ambiguous, being negative in some cases and positive in others.

**Keywords:** private equity, employment, company growth, financial performance.

**JEL classification:** G30, G32, G34, L25.

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## 1. Introduction

Private equity (PE) is an asset class that focuses predominantly on actively investing in and supporting businesses with high growth potential. The aim of investors is to help firms grow and create value over several years by providing advice, incentives, networking and knowledge through a range of specific investment structures (Achleitner and Klöckner, 2005).

The PE firm makes investments through a negotiated process with a company (or entrepreneur) in order to achieve growth objectives and returns for investors. The PE investment is made over a limited timeframe to help grow the business or to make it more efficient, thereby furthering its development.

One particularly controversial issue is how PE investors affect employment and economic performance at the companies. However, there are conflicting opinions and heated debate on the effects of PE investments on target companies. PE firms become active investors, assuming a seat on the board of directors, and benefit from detailed pre-purchase due diligence and full, timely information on the current operations of the businesses in which they invest. PE firm expertise in monitoring may enable firms to improve performance through exploiting opportunities for both cost efficiencies and growth. For this reason, PE investments may lead to improvements in performance along a variety of measures, including revenue and employment growth, profitability, operating performance and cash-flow, productivity and innovations. Moreover, PE investors can improve the performance of companies in failure situations. However, active investors need time to successfully restructure and improve the company's performance.

Critics of PE transactions assert that the high leverage typically associated with such deals leads to short term performance horizons, reductions in employment, and increased insolvency risk, particularly in an economic downturn. For instance, the Service Employees International Union (2007), a prominent critic of PE, offers the following assessment: *“Typically it’s easier to decrease costs quickly by cutting heads, which is why buyouts have typically been accompanied by layoffs”*. Overall, evidence suggests that PE target firms become strategically more focused, resulting in job losses where inefficiencies, and at the same time expansion and job creation in

areas of core strength areas. It could be argued that firm-level employment growth should not be a specific goal of for profit-oriented PE companies, given their overriding interest in firm value growth. On the other hand, employment growth is more important for policy makers and PE investors that focus both on financial goals and on supporting the regional economy. One key advantage of employment growth is evident: it allows early diagnosis of firm development while investment is going on. Further, high growth in firm-level employment is directly connected with an increase in firm value in most cases and, hence, represents an appropriate early diagnosis indicator.

Since economists hold a longstanding interest in how ownership changes affect profitability and employment, this paper aims to analyze and measure whether PE investments can foster the growth and the success of enterprises. The key question is whether investments in PE result in efficiency gains and welfare improvements in terms of employment growth and profitability. The structure of the paper is as follows. In Section 2 we discuss the specific literature about the phenomena and develop our hypotheses. Section 3 describes the research method and sample characteristics. The empirical results are presented and discussed in Section 4, while Section 5 concludes.

## **2. Literature review**

There are many studies related to both performance and employment growth in PE backed companies. Kaplan (1989) considered 76 public-to-private leveraged buyouts (LBOs) during the 1980s. He found that the median firm lost 12% of employment on an industry-adjusted basis from the end of the fiscal year prior to the PE transaction to the end of the fiscal year after the transaction. Kaplan's findings also suggest a significant increase in operating returns. He claims that management buyouts generally bring positive improvements to the firm's operations and increase its value.

Smith (1990) found that between 1977 and 1986, the operating returns of 58 public firms significantly increased from the year before completion of buyout to the year after. He also found no employment effects.

Muscarella and Vetsuypens (1990) studied 72 reverse LBOs. Ninety-two percent of random samples had a median percentage change in employment larger than that of the reverse LBOs over a similar time period. The low employment growth seen in reverse LBO firms, however, was attributed to divestiture activities after the LBO. Owing to accounting write-ups at the LBO, measures of profitability were likely to be biased against finding evidence of increased efficiency. An analysis of conventional accounting measures of performance revealed that reverse LBOs experienced significant improvements in profitability when compared with random samples of publicly traded firms over similar time periods. These improvements in profitability resulted mainly from sample firms' ability to reduce costs rather than to generate more revenues or to improve asset turnover.

In the early years post buy-out, Wright et al. (1996) identified no significant differences in the Return on Assets ratio (ROA). ROA was on average greater for buy-outs than for non-buy-outs in the first two years, though not significantly so. These findings were consistent with the notion that buy-outs frequently involve underperforming businesses, both in relation to their potential and in relation to their industry sector. A similar pattern was observed in respect of labor productivity as measured by profit to employee figures.

Buttignon et al. (2009) studied a sample of 21 of the 44 family business investor buyouts (FBIBO) carried out in Italy during the 1990s. Their results were ambivalent. Some of the identified variables (such as turnover and EBITDA) were not statistically significant, meaning that performance trends before and after the deal cannot be tracked back to the role of the PE investor. In an attempt to identify some pattern of behaviour, the authors clustered firms on the basis of turnover and EBITDA margin trends (both adjusted by industry sector) and found that generally, PE intervention caused a discontinuity in the life of a firm, generating a shift in performance trends from bad to good and vice versa. Almost a third of firms analyzed achieved very good performances after the PE investment, while another third displayed some signs of failure. In the middle, a number of mixed situations emerged, where growth was achieved at the expense of profitability or where profitability increased as growth diminished.

Badunenko and Baum (2010) analyzed 159,425 firm-years observations, including firms with annual operating revenues in excess of 5,000 Euros. They found that short-term PE investments had, on average, a detrimental effect on firm performance. The performance of PE-backed firms was lower than that of non PE backed firms in the first year of PE investment. Such an effect disappeared if PE investments continued for an uninterrupted six-year term. In the short run, the presence of PE investors among the firm's shareholders had, on average, a negative impact on firm performance, measured in terms of ROA. However, if PE investment time horizon was long enough, its effect on company performance was significantly positive.

Davis et al. (2011) constructed and analyzed a dataset of 3,200 target firms and their 150,000 establishments, covering U.S. PE transactions from 1980 to 2005. The authors compared outcomes to controls that were similar in terms of industry, size, age, and prior growth. Their establishment-level analysis yielded three main findings: first, employment shrank more rapidly, on average, at target establishments than at controls after PE transactions. The average cumulative difference in favor of controls was about 3% of initial employment over two years and 6% over five years. Second, the larger decline in post-transaction employment at target establishments entirely reflected higher rates of job destruction at shrinking and exiting establishments. In fact, post-transaction creation of new jobs at expanding establishments was greater for targets than controls. Third, mean employment growth rates were similar for target and control establishments in the two years before buyout, and targets grew more rapidly in the transaction year.

Wilson et al. (2011) assessed the recent economic and financial performance of U.K. PE backed buyouts. The results reveal that PE backed buyouts achieved superior economic and financial performance in the period before and during the recent global recession, relative to comparable non PE backed buyout firms. The authors' regression results imply positive differentials of 5–15% in productivity and approximately 3–5% in profitability for buyout firms relative to non-buyout firms. Another key finding was that revenue and employment growth for PE backed firms were positive during the sample period.

The vastness of results from the literature invites further investigation of the phenomenon. The key question we investigate here is whether investments in PE result in efficiency gains and welfare improvements in comparison with the pre-investment situation. More specifically, we examine the following research question: *Do PE backed companies outperform non-PE backed companies after the acquisition by the institutional investor in terms of employment growth and profitability?* Another, additional motivation for our research is the lack of studies comparing a sample of PE backed companies with an accurate and appropriate control sample.

Data on the performance of PE investments can be gathered either at company-level, or at fund level. While fund-level data have the advantage of being net of fund fees and carry, aggregation at fund level also implies loss of leveraged recapitalization. In contrast, company-level data allow researchers to more explicitly control for selection bias arising from lack of observations for final outcomes of unsuccessful investments. Studies using company-level data are often restricted (due to data limitations) to firms that underwent IPOs and/or buyout firms publicly traded prior to transactions, a small and select subset of all PE target firms. These studies also rely on surveys with incomplete and perhaps selective responses, raising doubts as to whether data accurately reflect the experiences of employees acquired by PE firms. Furthermore, the underlying data offer little scope to control for employment changes at comparable firms. For example, Achleitner and Klöckner (2005) compared percentage employment growth of European PE backed firms with total employment growth in Europe. This comparison was not significant since it compared companies differing in terms of size and industry sector. On the contrary, measurement of the growth of PE backed companies must be based on comparison of similar businesses. Even if our work is strictly related to existing literature, it differs by using a more appropriate data set for the control sample and by defining an original research question.

### **3. Data**

In this paper we define PE as a short-medium time investment that provides equity capital to enterprises not quoted on a stock market. Venture Capital (VC) is

traditionally defined as seed, start-up, early stage and expansion investing. PE includes VC investments, and also later stage buyout and turnaround investments. In this paper we study both VC and PE investments. However, we use the term PE as a generic term encompassing all investments in private firms as mentioned above (Cumming et al., 2009).

To analyze investments we constructed a sample of PE backed companies in the period 1997-2008. We used direct financial statement analysis (with AIDA software) to understand the key characteristics of PE investments. The initial dataset consisted of 32 PE backed companies located in Vicenza, from which we eliminated eight firms with missing data in the two years before and after the investment year. The final sample consisted of 24 firms as follows.

**Table 1**

Year	Number of deals	%
1997	1	4.2%
1998	-	-
1999	1	4.2%
2000	2	8.3%
2001	1	4.2%
2002	2	8.3%
2003	2	8.3%
2004	1	4.2%
2005	3	12.5%
2006	5	20.8%
2007	4	16.7%
2008	2	8.3%
<b>Total</b>	<b>24</b>	<b>100.0%</b>

The impact of PE on firm performance was directly analyzed by comparing firms with and without PE shareholders. As a basis for comparison, we computed the same accounting measures of performance for a control sample of companies (sample NPE) randomly drawn from the AIDA annual industrial tape. For each PE company N, we generated 3 draws of N firms from AIDA. Each randomly selected firm was "matched" to a sample firm in the sense that we measured the variables over the same calendar period as the PE company. We drew the firms from AIDA with the following characteristics:

- Two-digit ATECO 2007 code;
- Number of employees in the year of the deal;
- Registered office in the Veneto Region. In three cases no enterprises in the region corresponded to the first two parameters, so we selected other companies by giving preference to territory proximity.

Table 2 shows the ATECO code, the number of employees and the deal year for each company in the PE sample.

**Table 2**

Year	ATECO 2007 code	Number of employees
1997	93 - Sport clubs	41
1999	14 - Manufacture of clothing	113
2000	23 - Manufacture of other non-metallic mineral processing	2,132
2000	10 - Food	12
2001	24 - Metallurgy	141
2002	28 - Manufacture of machinery and equipment	149
2002	26 - Manufacture of computer, electronic and optical products	42
2003	14 - Manufacture of clothing	240
2003	26 - Manufacture of computer, electronic and optical products	27
2004	24 - Metallurgy	1,101
2005	17 - Manufacture of paper and paper products	44
2005	27 - Manufacture of electrical and non-electric domestic appliances	60

2005	31 - Manufacture of furniture	40
2006	31 - Manufacture of furniture	38
2006	46 - Wholesale	21
2006	42 - Civil Engineering	337
2006	10 - Food	152
2006	23 - Manufacture of other non-metallic mineral processing	134
2007	23 - Manufacture of other non-metallic mineral processing	110
2007	62 - Production of software, consultancy and related activities	n.a.
2007	26 - Manufacture of computer, electronic and optical products	31
2007	23 - Manufacture of other non-metallic mineral processing	138
2008	14 - Manufacture of clothing	63
2008	24 - Metallurgy	125

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From the results of our search on the AIDA database, we chose to include in the NPE sample the first three companies in alphabetical order. In this manner we did not influence in any way the construction of the control sample.

It should be noted that operating in this way and searching for control sample companies in the database AIDA introduced bias: failed companies are deleted from the database, while the PE sample included two failed companies. For this reason, we expected firms in the control sample to show better performance. In addition, PE undertakings would be expected to show some minor profit performance, related to higher post-merger annual depreciation or goodwill amortization and impairment tests. Nevertheless, our analysis does not demonstrate this superiority, making the results even stronger.

Table 3 summarizes the characteristics of the two samples by indicating mean, standard deviation, truncated mean (at 5% level), maximum value and minimum value for each variable analyzed.

**Table 3**

Sample P E						
	Mean	Standard deviation	Median	Truncated mean	Min	Max
<i>Sales</i>	36,706,238	61,371,333	12,879,966	36,706,238	1,210,019	286,644,150
<i>EBITDA</i>	64,536,475	296,571,200	2,011,994	64,536,475	-3,969,357	1,456,515,354
<i>Profit</i>	570,234	2,924,097	351,122	570,234	-9,369,912	9,041,611
<i>Equity</i>	12,677,817	30,374,455	3,398,728	12,677,817	100,928	140,479,118
<i>Employment</i>	137	171	80	137	8	713
Sample NPE						
	Mean	Standard deviation	Median	Truncated mean	Min	Max
<i>Sales</i>	27,390,492	36,898,241	12,583,649	25,215,496	132,425	206,898,259
<i>EBITDA</i>	3,458,749	11,361,190	887,802	2,226,406	-1,673,170	94,854,678
<i>Profit</i>	630,915	4,586,263	80,216	455,173	-17,909,074	31,472,866
<i>Equity</i>	11,648,972	41,111,823	3,146,773	7,041,227	-192,852	346,032,977
<i>Employment</i>	120	175	66	106	2	1,213

In order to estimate how target firm performance was affected by the PE activity, we analyzed the following variables: earnings before interest taxes depreciation and amortization (EBITDA), return on equity (ROE), profit, sales, equity and employees. Through financial statement analysis we aimed to answer the main research question by measuring the positive effect of PE investment, both in terms of size growth and performance. The first four variables - changes in EBITDA, ROE, profit and sales - were designed to measure company performance, while the latter two variables - changes in equity and number of employees - were used to measure company growth.

We departed from a linear regression model to explain the relationship between the probability of a company being subject to PE investment and the variables analyzed in year T+2.

We analyzed the following linear regression (Probit model):

$$\text{PROB\_PE} = \beta_1 + \beta_2\text{T+2\_ROE} + \beta_3\text{T+2\_EBITDA} + \beta_4\text{T+2\_EMPLOYMENT} + \beta_5\text{T+2\_PROFIT} + \beta_6\text{T+2\_EQUITY} + \beta_7\text{YEAR} + u \quad (1)$$

where:

PROB\_PE is a dummy variable which explains the membership of the PE sample (1 for PE backed companies, 0 otherwise)

T+2\_ROE explains the value of Return on Equity in year T+2

T+2\_EBITDA explains the value of EBITDA in year T+2

T+2\_EMPLOYMENT explains the number of employees in year T+2

T+2\_PROFIT explains the value of profit in year T+2

T+2\_EQUITY explains the value of total equity in year T+2

YEAR explains the deal year (T)

Statistical results are summarized in Table 4<sup>1</sup>.

**Table 4:** OLS model, using observations 1-96. Dependent variable: PROB\_PE

	<i>Expected sign</i>	<i>Coefficient</i>	<i>p-value</i>		<i>Std. Error</i>	<i>t-ratio</i>
T+2_ROE	-	-0.0660676	0.03277	**	0.030459	-2.1691
T+2_EBITDA	+	8.00482e-011	0.04639	**	3.962e-011	2.0204
T+2_EMPLOYMENT	+	0.000401327	0.06817	*	0.0002173	1.8466
T+2_PROFIT	+/-	8.61274e-09	0.29031		8.095e-09	1.0638
T+2_EQUITY	+/-	-1.1909e-09	0.23800		1.002e-09	-1.1881
YEAR	+	0.00745639	0.61786		0.0148929	0.5007
const		-14.7653	1036.48.00		29.8501	-0.4946

  

Mean dependent var	0.242105	S.D. dependent var	623.34.00
Sum squared resid	15.20448	S.E. of regression	0.415666
R-squared	0.127762	Adjusted R-squared	0.068292
F(6, 88)	2.148323	P-value(F)	0.055656
Log-likelihood	-47.76554	Akaike criterion	109.5311
Schwarz criterion	127.4082	Hannan-Quinn	116.7548

We went on to analyze performance changes before and after the deal year. For both the PE sample and the control sample we calculated the value of each performance variable two years before the investment year (T-2), in the year of the investment (T) and two years later (T+2). We calculated the performance change in the pre-deal period (from T-2 to T) and in the post-deal period (from T to T+2) (Table 5).

<sup>1</sup> We did not include the variable sales in our regression as it is strongly correlated with the variable EBITDA.

**Table 5**

	From T-2 to T		From T to T+2	
	PE Sample	NPE Sample	PE Sample	NPE Sample
<i>SALES</i>				
% companies with $\Delta > 0$	75.0%	72.2%	54.2%	47.2%
% companies with $\Delta = 0$	0.0%	0.0%	0.0%	0.0%
% companies with $\Delta < 0$	25.0%	27.8%	45.8%	52.8%
<i>Total</i>	<i>100.0%</i>	<i>100.00%</i>	<i>100.0%</i>	<i>100.0%</i>
<i>EBITDA</i>				
% companies with $\Delta > 0$	66.7%	65.3%	50.0%	43.1%
% companies with $\Delta = 0$	0.0%	0.0%	0.0%	0.0%
% companies with $\Delta < 0$	33.3%	34.7%	50.0%	56.9%
<i>Total</i>	<i>100.0%</i>	<i>100.00%</i>	<i>100.0%</i>	<i>100.0%</i>
<i>PROFIT</i>				
% companies with $\Delta > 0$	45.9%	59.7%	41.7%	48.6%
% companies with $\Delta = 0$	0.0%	1.4%	0.0%	1.4%
% companies with $\Delta < 0$	54.1%	38.9%	58.3%	50.0%
<i>Total</i>	<i>100.0%</i>	<i>100.0%</i>	<i>100.0%</i>	<i>100.0%</i>
<i>EQUITY</i>				
% companies with $\Delta > 0$	75.0%	80.6%	66.7%	65.3%
% companies with $\Delta = 0$	0.0%	0.0%	0.0%	0.0%
% companies with $\Delta < 0$	25.0%	19.4%	33.3%	34.7%
<i>Total</i>	<i>100.0%</i>	<i>100.0%</i>	<i>100.0%</i>	<i>100.0%</i>
<i>EMPLOYEMENT</i>				
% companies with $\Delta > 0$	58.3%	51.4%	41.7%	41.7%
% companies with $\Delta = 0$	4.2%	8.3%	8.3%	4.1%
% companies with $\Delta < 0$	37.5%	40.3%	50.0%	54.2%
<i>Total</i>	<i>100.0%</i>	<i>100.0%</i>	<i>100.0%</i>	<i>100.0%</i>

We analyzed the timing of changes in performance trends , by comparing the two samples. Our aim was to analyze whether a detrimental (positive) change in

performance before the deal year – negative (positive) change in the performance from year T-2 to year T - corresponded to an improvement (deterioration) in performance after the deal year – positive (negative) change in the performance from year T to year T+2) in the two samples. Table 6 shows the number of companies with a negative change in the first period, and how many of these progressed to an increase in the post-deal period – both in number and in percentage. Table 7 shows instead the number of companies with a positive change in the first period and how many recorded a decrease in the post-deal period.

**Table 6**

	PE			NPE		
	$\Delta > 0$ pre-deal	$\Delta < 0$ post-deal	$\Delta > 0$ post-deal	$\Delta > 0$ pre-deal	$\Delta < 0$ post-deal	$\Delta > 0$ post-deal
<i>SALES</i>	18	9	9	52	26	26
		50.0%	50.0%		50.0%	50.0%
<i>EBITDA</i>	16	9	7	47	28	19
		56.3%	43.8%		59.6%	40.4%
<i>PROFIT</i>	11	9	2	43	22	21
		81.8%	18.2%		51.2%	48.8%
<i>ROE</i>	9	8	1	37	22	15
		88.9%	11.1%		59.5%	40.5%
<i>EQUITY</i>	18	6	12	58	18	40
		33.3%	66.7%		31.0%	69.0%
<i>EMPLOYMENT</i>	14	8	6	37	22	15
		57.1%	42.9%		59.5%	40.5%

**Table 7**

	PE			NPE		
	$\Delta < 0$ pre-deal	$\Delta > 0$ post-deal	$\Delta < 0$ post-deal	$\Delta < 0$ pre-deal	$\Delta > 0$ post-deal	$\Delta < 0$ post-deal
<i>SALES</i>	6	4	2	20	8	12
		66.7%	33.3%		40.0%	60.0%
<i>EBITDA</i>	8	6	2	25	12	13
		75.0%	25.0%		48.0%	52.0%
<i>PROFIT</i>	13	7	6	28	13	15
		53.8%	46.2%		46.4%	53.6%
<i>ROE</i>	15	8	7	32	15	17
		53.3%	46.7%		46.9%	53.1%
<i>EQUITY</i>	6	4	2	14	7	7
		66.7%	33.3%		50.0%	50.0%
<i>EMPLOYMENT</i>	9	5	4	29	12	17
		55.6%	44.4%		41.4%	58.6%

## 5. Results

From the regression (1) it can be seen that three variables had a statistically significant impact. These variables were ROE, EBITDA and the number of employees.

The relationship between the probability of having a PE investment and ROE was negative - PE investments brought about a decrease in ROE two years after the deal. In fact, profits should decline as the result of an increase in depreciation and amortization, while equity capital should increase, the combined effect being a decrease in ROE.

The effect on EBITDA and number of employees of PE investment was positive. The positive relation between EBITDA and PE investments means that if a company is acquired by an institutional investor, that company should record an increase in its EBITDA two years after the deal. In the same way, private equity investments should lead to an increase in the number of employees.

The relation between PE investment and profit was not statistically significant. This is because there are many aspects that can affect – in a positive or negative way - the post-deal profit value.. Similarly, the relation between PE investment and equity was

not statistically significant.

As Table 5 shows, the number of firms with a positive variation in the variables analyzed was lower in the second period than the first period for both samples. This was due to phenomena such as outsourcing and off-shoring, erosion of market share from Asian competitors and, for the most recent deals, the economic crisis. However, the percentage of firms with positive changes in the second period was higher in the PE sample than the control sample for four variables analyzed. Moreover, comparing these values with those of the first period, we observe that PE backed firms showed better overall results, succeeding in more cases in maintaining good performance.

Table 6 shows the number of companies with a decrease in performance in the second period. Profit and ROE performance in PE backed companies was poor.

As can be seen in Table 7, PE backed companies that had a negative change in performance in the first period, in more than 50% of cases showed a positive change in performance in the second period. In the control sample, the performance indicators analyzed improved only for a smaller number of firms. It follows that already two years after the deal, PE investments bring about improvements in business performance in firms with an initial deficit situation - improvements that would not be achieved without PE backing.

The change in sales in the pre-deal period was positive for 75% of companies in the PE sample and for 54% of companies in the control sample. In the post-deal period companies with positive change in sales were fewer for both samples. In particular, for the PE sample positive change in sales was observed for 54% of firms, and only 47% of firms in the control sample. The decline in the number of firms with a positive changes in sales was greatest for the control sample.

As table 6 highlights, by analyzing PE backed companies with an increase in sales in the pre-deal period, we found that only 50% of firms continued to record sales growth in the second period, while the remaining 50% recorded a decrease in sales. However, sales variability for firms in the control sample remained constant in both periods. By analyzing companies with a decrease in sales in the pre-deal period, it can be observed that there was a reversal trend in 66% of PE backed firms,

compared to 40% of the control sample.

In the pre-deal period, the change in EBITDA was positive for about 66% of the PE backed firms, and 65% of non PE backed companies. However, in the post-deal period 50% of PE backed firms showed a positive change in EBITDA, versus 43% of the control sample. Furthermore, 56% of companies in PE sample with a pre-deal increase in EBITDA showed a drop in this index in the latter period. The corresponding percentage in the NPE sample was not much different (59%).

EBITDA variations became positive in 75% of PE backed companies with a decrease in the index in the pre-deal period, compared to 48% in the NPE sample.

In pre-deal period only 45% of PE backed companies showed a positive value for profit (compared to 59% of companies in the control sample). In fact, institutional investors tend to invest not only in growing businesses with good performance indicators but also in difficult situations (turn-around) or in business failures, to achieve higher profitability due to the higher level of risk.. In the post-deal period, the purely accounting effects of PE investment (e.g. goodwill and merger revaluation that lead to higher depreciation and amortization in balance sheet) should result in a decrease in financial statement profits. Nevertheless, in comparison with the pre-deal situation, the fall in the percentage of firms with reduced profit in the post-deal period was higher in the control sample.

PE backed companies with a pre-deal rise in profit in 81% of cases showed a negative post-deal performance. This outcome may seem very negative when compared with control sample data (51%). However, note that the accounting implications of PE investment result in an increase in depreciation and a consequent reduction in profit.

Profit growth in the second period was seen for 53% of PE backed companies with a negative pre-deal change in profit, and for 46% of companies in the control sample.

In terms of profit, ROE also declined in the post-deal period: 88% of PE backed companies with increases in ROE in the first period show a decrease in ROE in the second period (59% in the control sample).

PE backed companies with a decrease in ROE in the first period in 53% of cases

recorded an increase in the same index in the latter period, compared to 46% of firms in the control sample.

The effects on equity were neutral. In fact, many PE investments (e.g. buyouts) do not lead to an increase in the value of equity, but rather a change in the shareholders. Companies with an increase in total equity accounted for approximately the same percentage in both samples.. Even in the second period, in which a smaller number of firms in both samples recorded an increase in equity, percentage values were similar for the two samples. PE backed firms with an increase in equity in the first period in 33% of cases showed a subsequent decrease in the second period, compared to 31% of firms in the control sample.

PE backed firms with a decrease in equity in the pre-deal period in 66% of cases showed a subsequent increase in the second period, compared to 50% of firms in the control sample.

In the pre-deal period 58% of companies in the PE sample recorded an increase in the number of employees, against 51% in the control sample. In general, in the post-deal period, a decrease in the number of employees was seen. In the pre-deal period 57% of PE backed companies with a pre-deal rise in the number of employees showed a negative post-deal change compared to 59% in the control sample.

A positive variation in the number of employees was seen in 55% of PE backed companies that recorded a decrease in the pre-deal period, compared to a figure of 41% for the NPE sample. So in general, an increase in employment was seen in more companies in the PE sample than the control sample.

## **Conclusions**

To analyze the effects of PE investments, we first constituted a sample of 24 PE backed companies in the period 1997-2008. The impact of PE investments on firm performance was directly analyzed by comparing firms with and without PE shareholders. We set up a control sample of 3 companies for each PE backed company with the same two-digit ATECO 2007 code, number of employees in the year of the deal and territory proximity.

We departed from a linear regression model to explain the relationship between the probability of a firm receiving a PE investment and five variables analyzed in year T+2 (EBITDA, employment, ROE, profit and equity). Then we calculated performance changes in the pre-deal period (from T-2 to T) and the post-deal period (from T to T+2).

From the results of the regression, three variables emerged as statistically significant: ROE, EBITDA and the number of employees.

The relationship between the probability of having a PE investment and ROE was negative and the impact on EBITDA and number of employees of PE investment was positive. This means that PE backed companies should record an increase in EBITDA and the number of employees and a decrease in ROE after two years.

The findings of our further analysis on EBITDA confirmed the regression results. In general, PE investments led to growth in EBITDA. Even the number of companies with an increase in employment was higher in the PE sample than the control sample.

The effects on ROE were mostly negative. We also found that PE investments had a positive effect on sales, while the impact on equity was fairly neutral.

The effects on profit were ambiguous: in some cases we found a negative effect of PE investments, while in other cases we found a positive effect. Indeed, the positive impact of PE on sales and EBITDA should lead to positive effects on profit. However, in most cases the higher investment costs had a greater impact that resulted in a decrease in profit.

Our analysis suggests that PE investments have, on average, a positive effect on firm performance and company growth. In the second year after the deal, the performance of a PE backed company is higher in more cases than that of a firm without PE investments. An appropriate next step would be to consider the impact of PE investments in subsequent years.

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