

A COMPARISON OF THE PERFORMANCE OF PRIVATE EQUITY BACKED COMPANIES IN EUROPE

Abstract

This research analyses the performance of private equity backed companies in Europe with the aim to define whether private equity backed companies show a better performance in comparison with non private equity backed companies.

For this purpose we created a database of medium and large sized unlisted companies that have been subject to private equity investments in the period 2003-2009 and a control sample which includes non private equity backed companies located in the same countries.

We concentrated our analysis on the performance of the private equity backed companies in eight European countries - Italy, UK, France, Germany, Spain, Sweden, Netherlands and Czech Republic – and we made a cross-country comparison.

The quantitative analysis was conducted using a OLS regression model and a student t-test. The results prove that private equity backed companies show better performances in comparison to non private equity backed companies. Furthermore there are nearly homogeneous results in all countries probably due to the internationalization process that has induced common practices over time.

Keywords: private equity, company growth, performance, international comparison.

JEL classification: G30, G32, G34, L25.

1. Introduction

In 2010, in Europe investments in private equity (PE) and venture capital were equal to 0.3% of European GDP. This data is growing from 2009, when it was equal to 0.2%.

In Europe there are 1,696 active investors, 709 of which specialized in Venture Capital, 505 in buyout, 74 in growth financing, and the residual 408 generalists, managing around 523 billion capitals from Europe in the PE industry. Furthermore, there are more than 47 institutional investors with offices outside Europe that invest in European enterprises (EVCA, 2011)¹.

Funds raised in 2010 from PE investors were 20 billion euro (18 billion in 2009 and 80 billion in 2008), 2 billion of which were invested by pension funds and funds-of-funds². Investments in the same year were 41 billion euro (23 billion in 2009), higher than the amount raised in the same period, drawing a trend reversal in comparison to the last years with no lack of supply of funds in comparison to the need of investments. On the contrary, the amount of funds raised in a particular year was generally higher than the amount invested in the same period and the funds raised were invested progressively in subsequent years.

The recent innovation in the regulation proposed by the European Union for the creation of a

¹In this paper we define private equity as a short-medium time investment that provides equity capital to enterprises not quoted on a stock market. Venture capital is traditionally defined as seed, start-up, early stage and expansion investing. Private equity includes Venture capital investments, and also later stage buyout and turnaround investments, as well as investments in mezzanine firms that might soon be suitable for listing on a stock exchange. In this paper we study both Venture capital and Private equity investments. However, we use the term private equity as a generic term that encompasses all investments in private firms as mentioned above.

A buyout is PE investment that lead to the purchase of controlling interest in one target company. The transaction is financed by a mix of debt and equity.

LBO is a buyout in which the target company's capital structure incorporates a particularly high level of debt, much of which is normally secured against the company's assets.

Reverse LBOs are PE investments in companies which had been taken private in the past, either in a full LBO or in a divisional buyout, that have gone public again.

Venture capital is an investment in a new business that is perceived to have excellent growth prospects but does not have access to capital markets. Venture capital finance companies in early-stage (seed and start-up) or expansion venture. See EVCA Glossary for a more detailed description of different PE investments.

² PE investment is typically carried out through a limited partnership structure in which the PE firm serves as the general partner (GP). The limited partners (LPs) consist largely of institutional investors and other investors who provide the capital for deals. We refer to each individual limited partnership as a fund. The LPs commit to provide a certain amount of capital to the fund. The GP has an agreed time period - usually five years - in which to invest the committed capital. The GP also has an agreed time period in which to return capital to the LPs - usually on the order of ten to twelve years.

As GPs during the limited partnership select investments, structure deals, monitor investments and design the appropriate exit strategies on behalf of the LPs, we refer to GPs as 'PE investors' (Burgel, 2000).

uniform market of the PE industry has shown some characteristics of the industry. At present, there are natural obstacles resulting from differences of legal and regulatory requirements in addition to differences related to language and culture. The result is that, in general, PE investments tend to be restricted to domestic national markets rather than extending across the larger European and international markets. Currently, the market of PE investments in Europe is highly inefficient and complex and investments can potentially be deterred (EVCA, 2010). The objective of this paper is to understand how the differences between countries can influence the success of the deals and the enterprise growth.

This research analyses PE investments in medium and large size enterprises in eight European countries – Italy, UK, France, Germany, Spain, Sweden, Netherlands and Czech Republic.

The structure of the paper is as follows: in the first section we discuss the specific literature and develop hypotheses; then we describe the research methodologies and unveil the results. Finally, we expose major conclusions and we describe the implications for entrepreneurs, by offering also some tips for further researches.

2. Literature review

There are many studies about different aspects of PE industry. In particular, since 1990 the growing market of PE is accompanied by a very wide literature. In the 1990s, most of studies were focused either on aggregate trends in PE or on the relation between institutional investors and entrepreneurs. This restriction was mainly due to the difficulty of obtaining information on individual fund performance. For example, Kaplan and Schoar (2005) investigated the performance and capital inflows of PE partnerships. They found average fund returns (net of fees) approximately equal the S&P 500 although substantial heterogeneity across funds existed. Afterwards many studies related to the latter work were developed in order to explain the performance of PE funds (e.g. Phalippou and Gottschalg, 2009; Diller and Kaserer, 2008).

There is also an extensive literature, both theoretical and empirical, that examines the features of contracts between PE investors and portfolio companies (e.g., Sahlman, 1990; Metrick and Yasuda, 2010).

Some recent studies have also criticised the instrument of PE and argue the failure of the PE industry (e.g. Davidoff, 2009; Cheffins and Armour, 2007). Surely the market for PE investments is far from perfect. First, not all investors have the same information at the same

point in time. Usually target companies have mostly little pressure to divulge information, no financial analysts monitoring them and potential investors know considerably less about them than about publicly quoted companies (Manigart et al., 2002). On the other hand, institutional investors are more actively involved in the company than passive investors on the stock market (Sapienza et al., 1996).

Once the investment is realized, monitoring and value adding is likely to lead to a more thorough understanding of the business to PE investors than outside analysts would normally acquire. Moreover, it is more difficult to fully diversify a portfolio of unquoted investments than one of quoted investments. In particular, PE investments are highly illiquid as they cannot be sold easily at any point in time. The existence of huge market imperfections implies that idiosyncratic investment risk and other investment characteristics may be as important as market risk in determining the required return (Manigart et al., 2000).

Moreover it has been highlighted that PE investors seem to be mainly concerned with minimising investment risk, by selecting firms that already have positive performance and professional management, rather than pursue turnaround situations which greatly increase risk, even though this limits the potential for achieving high returns (Dawson, 2006). The contrary is possible if the PE investor take decisions for a large portfolio - which allows it to spread risk across a larger number of investments - or if it takes a majority stake - which makes it more likely to be able to control the future strategy of the investee firm.

Furthermore, it is much more difficult to collect and evaluate data about PE target companies, meaning that it is difficult to assess the overall impact of PE actions (Nielsen, 2008). In general, PE investments are hindered as they are characterized by informational opacity (Schmid, 2001). Internal information tends to be kept private due to the joint presence of three main conditions featuring the ordinary business operations of enterprises:

1. they lack of publicly visible contracts with all of their stakeholders;
2. they do not issue securities that are traded on public markets;
3. they have unaudited financial statements.

In order to overcome informational opacity investors must draw complex contracts. In these operations, financial intermediaries play a critical role as information producers who can assess business quality and address information problems through the activities of screening, contracting, and monitoring (Baldi and Zazzara, 2006).

[Insert table 1 about here]

In more recent years a wide literature about cross-country differences in PE investments is emerging. Most of studies focus on a particular aspect of the phenomenon and investigate only a few countries. Our work is related to the literature on international and comparative studies. This international setting allows us to examine the breadth of applicability of results and to examine differences between countries, an issue of increasing importance for the growth of the economies.

There are important between-country differences with respect to the valuation approaches of PE investments and the relative importance upon accounting and financial information in this process. In this case, the analyses are mainly based on an important assumption: if a country has a larger amount of PE inflows over time, it is a sign of positive performance for PE investments. The idea is based on the following reasoning: if a fund is successful in its investments, it will be able to raise additional funds. In the aggregate, a country in which the initial inflow of PE performs positively is more likely to attract additional investments from PE funds, as a positive track record is created for the market (Charvel, 2009).

Spatial variations in PE activity result from numerous factors. Partly, they can be explained by a built-in bias mechanism. The whole investment process from institutional investor to the finally-backed company is geographically biased. The institutional investors allocate their capital via chains of agents and networks in certain regions, and among countries. General partners prefer spatial proximity in their investments to facilitate the transaction processes, monitoring and involvement. It is popular also for general partners to focus on a particular region or just a single country. Hence, the geographical source of PE is generally not very distant from the demand (Groh et al., 2008). Moreover, particular regions become attractive to institutional investors only when the expected number of transactions is large and their volumes and payoff exceed certain thresholds to cover the management fees.

Investors in PE funds can benefit from an awareness of the heterogeneity of the PE community across different countries. On the other hand, entrepreneurs need to be aware of the factors influencing the decisions of investors, so that they can anticipate their needs and be better prepared for the investment negotiations (Manigart et al., 2002).

In each country, PE has its own unique characteristics. Differences may also be present in the approaches to the evaluation of projects. Given that capital markets are more mature and dominant in Anglo-American countries, it may be expected that therein the valuation process is both more developed and more likely to rely on standard corporate finance theory developed in an advanced capital market context (Manigart et al., 1997). In countries where

holding and networking structures predominate, such as France and the Netherlands (Moerland, 1995), long term relationships are important, and frequent, detailed valuation of companies may be less important. Furthermore, the priority of economic return to investors versus regional development, job creation, and the like may vary by country.

Much attention has been devoted in recent literature to the claim that a country's 'legal origin' may make a difference to its pattern of financial development and more generally to its economic growth path. Bottazzi, Da Rin and Hellmann (2005) present questionnaire evidence that across Europe better legal systems - measured by legal origin or rule of law - are associated with more investor involvement, more downside protection for the investors, and more corporate governance involvement of investors. Cumming and Walz (2009) show that the legal framework in the different countries significantly contributes to the performance of the investment: the more sound the legal conditions, the higher the IRRs. A similar result is presented by Lerner and Schoar (2005) based on a PE dataset of 210 investments.

Other factors in each country are likely to influence PE investors' return rates. Risk and return perceptions and preferences are also likely to be influenced by "constant" factors, such as the corporate governance, national culture, institutional environment and individual characteristics of the managers (Manigart et al., 2002). For example, Sapienza, Manigart and Vermeir (1996) examine the impact of the venture capital governance structure in different countries. On the other hand, Baughn and Neupert (2003) argue that national cultures shape both individual orientation and environmental conditions, which lead to different levels of entrepreneurial activity in particular countries.

Da Rin, Nicodano and Sembenelli (2006) study the evolution of PE investments in fourteen European countries as a function of policy measures and find a significant impact of the creation of stock markets geared to entrepreneurial firms and of capital gains taxations.

The numerous contributions emphasize the difficulty of identifying appropriate criteria to establish a PE attractiveness index.

Taking into consideration these results, our research has some features in common with the papers of Groh et al. (2010) and Baldi and Zazzara (2006) but differs from these, by using a more international data set as well as defining original research questions.

3. Research hypotheses

PE investors are typically considered to be specialized intermediaries who invest in illiquid

assets, i.e. their investee firms, and aim to achieve a return for the duration of their investment. In this research, we investigate if there is a better company performance in PE backed companies and the differences in various European countries. In other words, the research question is: ‘what is the value added in the target company by PE investments in different countries?’_In particular, we want to measure the positive effects of PE investments for the target company, both in terms of size growth and performance.

Since this study involves several European Union countries, we want to check how the company results are influenced by variables that affect the features of PE investments in different countries.

Once we have determined if the investments in PE added value in the enterprise, we verify the related causes with the subsequent assumptions.

First, we want to verify the performance of the PE backed companies that are currently invested. We suppose that the company still invested by a PE investor should exhibit a growth in the EBITDA margin because this variable is one of the most important index for institutional investors, as calculation on the value of the firms are based on this variable. There should also be a positive effect on long-term debt because institutional investors allow better chance of borrowing, through the use of mixed capital and debt instruments, and through the use of privileged channels with banks and other lenders. In the same way we expect a decreasing effect on the financial costs. The effect on intangibles is supposed to be positive, as PE investors implement innovation policies, increase R&D expenditure and develop the brand. Profitability - measured with ROA and ROE - is supposed to be negatively affected by the fact of being currently invested. In fact, the most recent deals are more likely to be still invested, deals in which the effects of the crisis emerge - is also expected a significant value of the variable year. Moreover, are more likely to be still invested the interventions that have not yet achieved sufficient profitability for sale.

H₁: companies currently owned by PE investors should exhibit a growth in EBITDA margin, long-term debt, intangibles and a fall in financial costs, ROA and ROE.

Companies invested by PE firms should show higher financial costs than banks. For these investors, unlike banks and pension funds, following their PE investments is their core business, so they should be able to achieve higher performance - higher EBITDA margin, ROA and ROE. They should also lead to a growth in the intangibles of the PE backed

companies. PE firms should allow an increase in the long-term debt, as they should provide to the invested companies more channels for the supply of the debt by providing debt by their own or by giving new network for financing.

H₂: to be invested by a PE house should lead to a growth in financial expense, intangibles, long-term debt, EBITDA margin, ROA and ROE.

We expect that the percentage of the company held by the institutional shareholders should conduce to an increase in the profitability of the company – growth in ROA, ROE and EBITDA margin – because of a higher percentage of the company involves a greater commitment for the institutional investor and a higher amount invested. We suppose a growth in the cash flow-to-operating income ratio, liquidity ratio and current ratio because of a greater attention for this ratio shown by the investor. We also expect an increase in the intangible assets and in the total assets.

H₃: the percentage of the company held by the shareholders in the target company should conduce to higher EBITDA margin, ROA, ROE, cash flow-to-operating revenue ratio, liquidity ratio, current ratio, intangibles, total assets.

Companies actually seeking new investments should exhibit higher profitability and higher values of intangibles. We suppose that there is no significance for the other variables.

H₄: to be actually seeking new investments should conduce to a growth in EBITDA margin, ROA, ROE and intangibles.

The number of funds invested in the PE backed companies should have a positive effect on the same companies. In general a greater number of funds means a greater amount of money invested in the company. We suppose that the number of funds conduce to high values for ROE, ROA, EBITDA margin, and also an improvement in the liquidity and current ratio.

H₅: the number of funds is positively related with ROA, ROE, EBITDA margin, liquidity ratio and current ratio.

For generalist investments, we expect an improvement of the ratios (solvency ratio, liquidity ratio and current ratio), a decrease in the financial costs, an enhancement of the measures of profitability (increase in EBITDA margin, ROE, ROA), a growth in total assets and intangible assets, a rise in long-term debt and increase in the cash flow-to-operating revenue ratio.

H₆: generalist investments should show higher solvency ratio, liquidity ratio, current ratio, cash flow-to-operating revenue ratio, EBITDA margin, ROA, ROE, total assets, intangible assets, long-term debt and a decrease in financial costs.

As for the generalist investments, also for venture capital investment we expect an improvement of the ratios (solvency ratio, liquidity ratio and current ratio), a decrease in the financial costs, enhancement of the measures of profitability (increase in EBITDA margin, ROE, ROA), a growth in total assets and intangible assets, a rise in long-term debt and increase in the cash flow-to-operating revenue ratio.

H₇: venture capital backed companies are expected to show an increase in solvency ratio, liquidity ratio, current ratio, cash flow-to-operating revenue ratio, EBITDA margin, ROA, ROE, total assets, intangible assets, long-term debt and a decrease in financial costs.

Also for buyouts, we hypothesize an increase in EBITDA margin, cash flow-to-operating revenue ratio, ROE, ROA, solvency ratio, liquidity ratio, current ratio, long-term debt, total assets and intangible assets and a decrease in the financial costs.

H₈: buyouts should show an increase in solvency ratio, liquidity ratio, current ratio, cash flow-to-operating revenue ratio, EBITDA margin, ROA, ROE, total assets, intangible assets, long-term debt and a decrease in financial costs.

Because the turnaround investments depart from a failure situation, we expect a decrease in the solvency ratio, liquidity ratio and current ratio. We hypothesize a decrease also in EBITDA margin, ROE, ROA and the cash flow-to-operating revenue ratio. However we expect a decrease in the financial costs, a growth in total assets and intangible assets and a rise in long-term debt.

H₉: turnaround investments should exhibit an increase in total assets, intangibles and long-term debt, and a decrease in the solvency ratio, liquidity ratio, current ratio, cash flow-to-operating revenue ratio, EBITDA margin, ROE, ROA and financial costs.

In mezzanine investments we expect an improvement of the ratios (solvency ratio, liquidity ratio and current ratio), a decrease in the financial costs, enhancement of the measures of profitability (increase in EBITDA margin, ROE, ROA), a growth in total assets and intangible assets, a rise in long-term debt and increase in the cash flow-to-operating revenue ratio.

H₁₀: mezzanine investments should show a decrease in the financial costs, and an increase in all the other variables.

We expect that the age of the companies at the deal year has no effect on the variables analyzed. This is because institutional investors create a break in the life of the PE backed company. They do not introduce only new capital but they introduce new operations, they provides the target company with advice, incentives, networking and knowledge through a range of new specific structures.

H₁₁: the age of a company has no statistical significance

Finally, we expect that control variables are not statistically significant.

H₁₁: control variables have no statistical significance

4. Research method and sample description

A. Data sources

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.

Our data sources and sample selection scheme are detailed in this section.

In this research, we analyze countries showing the highest amount of PE investments in local target companies between 2003 and 2009. These countries are the following: United Kingdom, France, Germany, Italy, Czech Republic, Spain, Sweden, Netherlands and, which together account for 70% of the total investments in Europe and 59% of investments from outside the country.

[Insert table 2 about here]

[Insert table 3 about here]

We only analyze investments in unlisted medium, large and very large PE backed companies³. Only initial rounds of investments undertaken by non State-related PE investors were considered. Moreover, we only consider investments in companies which are post the start-up phase. Hence, our study excludes the following types of deals:

- Seed and start-up deals;
- Second-round financing deals.

In order to analyze these investments, we constructed a sample of PE backed companies invested in the period 2003/2009, comprising 2,429 enterprises in total. We extracted data from the Thomson Reuters Thomson ONE database⁴ and we crossed data from the Bureau van Dijk AMADEUS Medium, Large, and Very Large Companies database⁵.

The final sample consisted of 2,429 firms as follows:

[Insert table 4 about here]

The impact of PE on target firm performance was directly analyzed by comparing firms with

³We define Medium, Large and Very large companies with operating revenue greater than €1 million, total assets greater than €2 million and more than 10 employees.

⁴Thomson ONE provides market news and quotes, plus comprehensive reference data. Designed for private equity & venture capital practitioners, lawyers and consultants within the deal-making community, it's the ideal way to get an overview of a company, its peers or the market as a whole.

⁵ Amadeus is a comprehensive database of 14 million companies across Europe. It combines data from over 35 sources with software for searching and analysis. The financial information is in a standardized format so cross-border searching and analysis is possible.

and without PE shareholders. For each combination country-industry in the PE sample, from the Bureau Van Dijk AMADEUS database we generated 50 draws of firms and we computed the mean of the variables in each year. The sample of the country-industry combination consist in 358 combination, for a total of 2,506 country-industry-year observation as follows:

[Insert table 5 about here]

We direct budget analysis in order to understand the key characteristics of the investments. We analyze the percentage variation of the following indexes: Cash flow-to-operating revenues ratio, EBITDA margin, Financial expenses, Solvency ratio, Intangibles, Long term debt, ROA, ROE, Total assets, Liquidity ratio and Current ratio. Through the budget analysis we want to answer the main research question, that is we want to measure the positive effect of investment, both in terms of size growth and performance.

B. Methodology

In this sub-section, we report descriptive statistics on the performance of the 2,429 PE backed companies and the 2,506 non-PE backed observations, we describe the methodology applied and we debate about the variables chosen to analyzed the companies.

We decided to use financial statement analysis to explain the key characteristics of PE investments. This is due to our willingness to adopt data available for all companies and not to investigate the investments using surveys.

In order to test for the performance of PE backed companies we need to define the variables to analyze and the OLS model. In particular, we analyzed the following OLS model:

$$Y = \beta_0 + \beta_1 IN + \beta_2 FU + \beta_3 SE + \beta_4 PEF + \beta_5 AGE + \beta_6 SH + \beta_7 GN + \beta_8 BO + \beta_9 ME + \beta_{10} TU + \beta_{11} T + \beta_{12} CR + \beta_{13} GE + \beta_{14} SW + \beta_{15} IT + \beta_{16} FR + \beta_{17} SP + \beta_{18} UK \quad (1)$$

where⁶:

- IN: the company is currently invested
- FU: number of funds investing in the company
- SE: the company is actively seeking new investments

⁶ Definitions can be find in Appendix (table A)

- PEF: the company is invested by a PE investor
- AGE: age of the company at the deal year
- SH: percentage amount of the company held by the institutional investor
- GN: generalist investor
- BO: buyout investment
- ME: mezzanine investment
- TU: turnaround investment
- T: deal year
- CR: the company is located in Czech Republic
- GE: the company is located in Germany
- SW: the company is located in Sweden
- IT: the company is located in Italy
- FR: the company is located in France
- SP: the company is located in Spain
- UK: the company is located in United Kingdom

The first ten variables (IN, FU, SE, PEF, AGE, SH, GN, BO, ME and TU) are effect variables, while the last seven variables (T, CR, GE, SW, IT, FR, SP and UK) are control variables.

We run the regression for the percentage variation of 11 indexes as dependent variable, namely: cash flow-to-operating revenue ratio, EBITDA margin, financial expense, intangible assets, solvency ratio, long term debt, return on assets (ROA), return on equity (ROE), total assets, liquidity ratio and current ratio.

The financial variables employed in this study are selected in order to reflect the traditional dimensions of performance evaluation within the constraints of data availability⁷. The precise constructs are detailed in Appendix (Table A).

⁷These variables have already been employed in the literature for the analyses of PE investments. For example see Ang and Sorensen (2012) for solvency ratio, Agarwal et al. (2004) for liquidity ratio, Chamberlain and Tennyson (1998) for both solvency and liquidity ratios. Current ratio have been studied by Agarwal et al. (2004) and Chesbrough and Tucci (2004). Intangibles have been studied by Audretsch and Lehmann, 2004, Bargerion et al. (2008) and Badertscher et al. (2010). Long term debt has been studied by Fenn and Liang (1998), Hovakimian et al. (2001), Carpenter and Petersen (2002). Desbrières and Schatt (2002) analyzed liquidity ratio, current ratio, ROE, and cash flow. Cash flow was already analyzed by Jensen (1986) and Katz (2009). Total assets and ROA has been studied by Katz (2009) and Badertscher et al. (2010), while Nielsen (2008) and Bruton et al. (2010) analyzed ROA. Weir et al. (2007) and Badertscher et al. (2011) adopted the EBITDA margin in their analyses.

The ratio between cash flow and operating revenues gives investors an idea of the company's ability to turn sales into cash. It would be worrisome to see company's revenues grow without a parallel growth in cash flow. Positive and negative changes in a company's terms of operating revenues and/or the collection experience of its accounts receivable will show up in this indicator.

Management and investors can use ratios to evaluate a company's performance over time and against the industry. The cash flow-to-operating revenue ratio indicates management's ability to turn revenue into profits and net cash flow. The higher the percentage, the more cash available from sales. If a company is generating a negative cash flow, which would show up as a negative number in the numerator in the cash flow margin equation, then even as it is generating operating revenues, it is losing money. The company will have to borrow money or raise money through investors in order to keep on operating.

EBITDA margin is a measure of profitability that is obtained from the ratio of EBITDA and operating revenues. EBITDA is widely used as a measure of profitability by PE investors who needed to analyze the financial statements of target enterprises that were considered to be in need of financial restructuring. As target companies are often distressed enterprises that are not making a profit, PE investors need a variable to measure the potential ability of the target company. Using the EBITDA gives some ideas of the availability of cash to deal with the repayment terms of debt, ignoring the current financing structure of the target enterprise. EBITDA gives an opportunity for comparison of companies with a different financing structure by looking at the profit before interest and concentrating on the cash generated in the company. EBITDA is not distorted by expenses outside of a company's business (interest and taxes) and non-cash charges due to allocation of historical cost of an asset (depreciation and amortization). The result given by EBITDA, although not the same as a cash flow forecast, give an indication of the value of the target company and its suitability as a target for a PE investor.

Financial expenses include interest, income taxes, and other such expenditure incurred in owning or renting an asset or property. It is a company's interest expense on long-term debt. It includes interest and related charges; foreign exchange losses on debt; net expense on the disposal of marketable securities; amortization of bond redemption premiums; additions to provisions for financial liabilities and charges and impairment losses on investments.

The solvency ratio which is the ratio between equity and total assets is one of the most

important ratios used to measure a company's ability to meet long-term obligations. The solvency ratio measures the size of a company's after-tax income, excluding non-cash depreciation expenses, as compared to the firm's total debt obligations. It provides a measurement of how likely a company will be to continue meeting its debt obligations. In other words, the solvency ratio has to prove that business firms can service their debt or pay the interest on their debt as well as pay the principal when the debt matures. The solvency ratio helps the business owner keep an eye on possible bankruptcy. While liquidity is a measure of the firm's ability to pay short-term debt, solvency is a measure of the firm's ability to pay all debt, particularly long-term debt and is a measure of the firm's long-term survival. Intangible assets can prove very valuable for a firm and can be critical to its long-term success or failure although they don't have the obvious physical value of a factory or equipment. For example brand recognition is not a physical asset, but its positive effects on bottom-line profits can prove extremely valuable to firms whose brand strength drives global sales year after year.

Long term debt includes any financing or leasing obligations that are to come due in a greater than 12-month period. Such obligations would include company bond issues or long-term leases that have been capitalized on a firm's balance sheet. It could be in the form of a bank loan, mortgage bonds, debenture, or other obligations not due for one year.

Return on assets (ROA) is the ratio, which is expressed as a percentage, between net income and total assets. It is an indicator of how profitable a company is relative to its total assets. The assets of the company are comprised of both debt and equity. Both of these types of financing are used to fund the operations of the company. The ROA figure gives investors an idea of how effectively the company is converting the money it has to invest into net income. Furthermore ROA gives an idea as to how efficient management is at using its assets to generate earnings. The higher the ROA, the better, because the company is earning more money on less investment.

ROE is profit after tax less exceptional items deflated by shareholders' equity. ROE, which is displayed as percentage, represents the situation after tax and interest payments and indicates the profit available to shareholders. It is therefore more important to PE providers than other measures such as ROCE, that can be affected by asset valuation.

The sum of current and long-term assets owned by company is the value of the total assets.

The liquidity ratio is a financial metric used to determine a company's ability to pay off its short-term debts obligations. The higher the value of the ratio, the larger the margin of safety

that the company possesses to cover short-term debts. The liquidity ratio measures a company's ability to pay its bills. The denominator of a liquidity ratio is the company's current liabilities, while the numerator is part of current assets (current assets - stocks). Because current assets are expected to be converted to cash within one year, this liquidity ratio includes assets and liabilities of equal longevity. The liquidity ratio is sometimes requested by banks when they are evaluating a loan application - the lender may require to maintain a certain minimum liquidity ratio, as part of the loan agreement. For that reason, steps to improve your liquidity ratios are sometimes necessary.

The current ratio is the ratio between the current assets and the current liabilities. This is a way of testing liquidity by deriving the proportion of assets available to cover current liabilities. The current ratio is widely discussed in the financial world; however, it can be misleading because the chances of a company ever needing to liquidate all its assets to meet liabilities are very slim indeed. It is often more useful to consider a company as a going concern, in which case you need to understand the time it takes to convert assets into cash, as well as the current ratio. The current ratio should be at least between 1.5 and 2. A ratio of less than 1 - that is where the current liabilities exceed the current assets - could mean that the business is unable to meet debts. A high current ratio could indicate that too much money is tied up in current assets.

Table 6 summarize the descriptive statistics of the two samples by indicating mean and median value for each variable analysed.

[Insert table 6 about here]

We analysed the percentage change of the variables from the year of the deal to two years after the investments because if we would use a longer time period we should have cancelled the last deals – data three year after the deal are not available for acquisition made after 2009.

As we can see, the mean values in the PE sample are higher than the values in the NPE sample for all variables, with the exception of ROA and ROE. However, the median values of the two samples are more similar. We can deduct that there are some companies over-performing in the PE sample that conduce to higher mean values, although median values are similar.

Statistical results of the regressions are summarized in Table 7 (first five variables) and 8 (last six variables).

[Insert table 7 about here]

[Insert table 8 about here]

We continued the analysis by using a t-test. The logical scheme adopted in our analyses is explained in Figure 1.

[Insert figure1 about here]

We wanted to see if there were statistically significant differences between firms that were the object of PE and country-industry-year observations of firms not subject to PE.

Some variables analysed were statistically significant. We departed further analyses using the significant variables by splitting the sample of PE backed companies by country and we conducted a t-test to see if there were differences between each country and the other countries surveyed. In this way we wanted to see if between the variables for which there is a significant difference between the PE sample and the NPE sample exists a significant difference also between countries. In six variables, some significant differences were detected. On these variables we conducted another t-test to check whether or not the differences between the countries also exist among the firms in the NPE sample. In three cases the difference was still found to be significant- the difference between the countries is present both between PE backed companies and between non-PE backed companies-while in the other three cases the difference was significant only for firms subject to PE. It follows that there are countries in which the PE investment involves a performance in some variables statistically different compared to other countries. Results are summarized in Table 9 and Table 10.

[Insert table 9 about here]

[Insert table 10 about here]

5 Results

We run the regression for the percentage variation from year T+2 to T for the following independent variables: EBITDA margin, Cash flow / operating revenues, Financial expenses, Solvency ratio, Intangible assets, Long term debt, ROA, ROE, Total assets, Liquidity ratio, Current ratio (see Appendix for definitions).

Our analyses partially confirmed our assumptions.

The effects of being currently PE backed hypothesized (H_1) on the dependent variables analyzed in different OLS regressions were fully confirmed. The percentage change in the EBITDA margin on these companies was positive. In fact, institutional investors control the level of EBITDA margin of companies invested in because the EBITDA multiples are used to evaluate the value of the firms. Often in the case of repurchase of the company by the last entrepreneur, a selling price calculated as a multiple of EBITDA is usually stated in the contract. We also confirmed the hypothesis about the positive effects in these companies on long-term debt and intangibles. It was verified that these companies shown a lower profitability (ROA and ROE) than firms not currently invested. Assumptions on the decline of the financial costs have also been met.

Companies owned by PE investors showed major financial costs than firms not invested by PE investors, confirming our assumptions (H_2). We also confirmed the hypothesis on the growth of intangibles and long-term debt. Nevertheless, the hypothesis of an increased performance of businesses acquired by PE Firms were only partially confirmed. While ROE was positive and significant, ROA was not significant, while the EBITDA margin was statistically significant but with sign minus. It follows that companies invested by such institutional investors have a negative change in EBITDA margin. In addition, the value of the solvency ratio was statistically significant with minus sign.

The hypotheses on the effects of the percentage of capital held by institutional investors (H_3) have also been only partially fulfilled. The regressions showed a plus sign in the cash flow-to-operating revenue ratio, financial costs and ROA. The value of the variable was not significant in the regressions with ROE and EBITDA margin as dependent variables. Contrary to our hypothesis, the positive sign has also appeared for the liquidity ratio and current ratio.

The hypothesis H_4 was only partially verified. Companies seeking new investments actually show an increase of intangibles - as assumed - and a positive performance measured by EBITDA margin and cash flow / operating revenue. However, the value of ROA was negative: firms seeking new investments are actually conscious of EBITDA margin and cash

flow but have profitability problems - problems that may impede new investments.

The hypothesis on the number of invested funds was fulfilled. Significant variables (ROE, liquidity ratio and current ratio) have complied with the requirement of a positive sign hypothesized in H₅.

The hypotheses H₆, H₇, H₈, H₉ and H₁₀, respectively on generalist, venture capital, buyout, turnaround and mezzanine investments were confirmed in part by OLS regressions. The minus sign in the regression with the financial cost as dependent variable has been verified by all variables - with the exception of mezzanine investments that are not statistically significant. The improvements assumed in the ratios were statistically confirmed: the equation of the solvency ratio showed positive coefficients for the variables generalist, venture capital and buyout - but not turnaround investments that involves a failure initial situation difficult to subvert - and the equation of the liquidity ratio of the current ratio was positive and significant values for venture capital investments. The growth in total assets and intangibles was verified in generalist investment; it was not significant in the other cases

The assumptions on the profitability have not been confirmed. The regression of the EBITDA margin has negative signs for the variables generalist, venture capital and buyouts. The equation of the cash flow-to-operating revenue ratio shows negative signs for the same variables. The regression of ROA has the significant variable with the minus sign for the variable venture capitalist, while the regression of ROE shows significant minus sign in the generalist type of investment. Although the assumptions on the growth of long-term debt have been disproved: negative and statistically significant coefficients were found for generalist, venture capital and buyout acquisitions.

As assumed in H₁₁ the age of a company had no statistical significance.

In H₁₁ we expected thus that control variables were not statistically significant. We only found that the year of the deal was statistically significant for ROA and EBITDA margin. However we did not find country variables to be statistically significant. We found homogenous results in all countries. In fact, it is possible that the internationalization of the PE sector has induced common practices over time.

Afterwards we run a student t-test for seven variables – cash flow / operating revenue, cost of employees / operating revenue, sales, long term debt, current ratio, liquidity ratio and shareholders' funds - in order to check the difference between the sample of PE backed companies and the control sample. All the variables are statistically significant, meaning that there are statistical differences on these variables.

The first three variables - cash flow-to-operating revenue ratio, cost of employees-to-operating revenue ratio, sales - are significant at 1% confidence level, long term debt and current ratio are significant at 5% confidence level, while liquidity ratio and shareholders' funds are significant at 10% confidence level.

We departed further analyses by splitting the sample of PE backed companies by country and we conducted a t-test on the same variables to check if there are country differences in the PE sample. Some significant differences were detected: Swedish companies show differences in the values of cash flow / operating revenue (1% confidence level), cost of employees / operating revenue (1%) and long term debt (5%); French companies are different for current ratio (5%) and liquidity ratio (5%), while UK companies show differences for shareholders' funds (10%). On these variables we conducted another t-test to check whether or not the differences between these countries also exist among the firms in the NPE sample. In three cases - cost of employees / operating revenue, long term debt and liquidity ratio - the differences were still found to be significant; in particular, the difference between the countries is present both between PE backed companies and between non-PE backed companies. However, in the other three cases the difference was significant only for firms subject to PE. It follows that there are countries in which the PE investment involves a performance in some variable statistically different compared to other countries. These combinations country-variable are Sweden-cash flow / operating revenue, France-current ratio and UK-shareholders' funds. These combinations are significant respectively for 1%, 5% and 10% confidence level.

Conclusions

We run the regression for the percentage variation from year T+2 to T for the following independent variables: EBITDA margin, Cash flow / operating revenues, Financial expenses, Solvency ratio, Intangible assets, Long term debt, ROA, ROE, Total assets, Liquidity ratio, Current ratio (see Appendix for definitions).

To be currently invested by a PE investor has a negative impact on most of variables: cash flow / operating revenue, financial expenses, ROA, ROE, total assets. However there is a positive impact on EBITDA margin and intangibles.

To be invested by a PE firm – and not by a bank or an insurance company or a pension fund – involves a inferior value for the EBITDA margin, solvency ratio but a superior amount for

financial expenses, intangibles, long term debt and ROE.

The percentage of the company held by the institutional investors has a positive effect on cash flow / operating revenue, financial expenses, ROA. It has a negative impact on intangibles, liquidity ratio and current ratio.

If the company is actually seeking new investments it should have a higher value for EBITDA margin, cash flow / operating revenue and intangibles, besides a smaller ROA.

The number of funds invested has a positive impact on ROE, liquidity ratio and current ratio.

The generalist type of investment has a negative effect on EBITDA margin, cash flow / operating revenue, financial expenses, long term debt, total assets and ROE. It has a positive effect on solvency ratio and intangibles.

Company invested by a venture capitalist show a slower amount of EBITDA margin, cash flow / operating revenue, financial expenses, long term debt and ROA. It has a positive effect on solvency ratio, liquidity ratio and current ratio.

Buyouts conduce to slower EBITDA margin, cash flow / operating revenue, financial expenses and long term debt. It has a positive impact on solvency ratio.

The turnaround investment conduce to lower financial expenses and solvency ratio, while the mezzanine investment has a detrimental impact on cash flow / operating revenue.

The age of the company at the deal year has no effect on the variables analyzed.

We expected that control variables were not statistically significant. From the control variables inserted in the regression, only the year of the deal was statistically significant for two dependent variables – EBITDA margin and ROA. However we did not find country variables to be statistically significant. We found homogenous results in all countries. In fact, it is possible that the internationalization of the PE sector has induced common practices over time. This result was partially confirmed with the t-tests. Only in three cases we found that there are countries in which the PE investment involves a performance in some variable statistically different compared to other countries. These combinations country-variable are Sweden-cash flow / operating revenue, France-current ratio and UK-shareholders' funds. These combinations are significant respectively for 1%, 5% and 10% confidence level.

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