

Explaining Returns in Private Equity Investments

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Abstract

We examine a unique hand-collected database of private equity deals which covers the entire universe of transactions sponsored by Italian private equity investors in Italy in the period 1999-2007. The database offers rare information about the internal rate of return (IRR), covenants, leverage, industry of each deal, as well as information about the changes in governance in receiving firms and characteristics of sponsor funds. We find that most of the PE-backed firms are privately held, established firms searching for an expansion, with only a small minority at an early stage looking for venture capital. We also find that the average investment is smaller and has a shorter duration than the PE deals done in the US or the UK, exits primarily through a trade sale rather than an IPO, and is managed in a large number of cases by banks or financial institutions. We also provide new evidence of previously unexplored relationships between firm, fund, and contract characteristics and the resulting IRR of Continental European PE deals: the IRR is positively related to the initial undervaluation, the risk of the target firm, the experience of the fund manager, the size of the fund, and the existence of puttable securities, lock-up clauses, and exit ratchets. Contrasting with findings in the US, we find evidence for managers' loss of incentives to take risks following previously successful investments (incentive gaming) and of gambling for resurrection at a fund level.

JEL Classification: G11, G23, G24,

Keywords: Private equity, venture capital, internal rate of return, covenants

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1. Introduction

Over the past decade, private equity has played an increasingly important role in the European economy. Investment in private equity funds in Europe has increased more than six times, from €5.5 billion in 1995 to €38 billion in 2007.² This has been reflected in a significantly higher number of European companies receiving funding by this asset class, and in a contribution to employment, innovation, and arguably growth (Achleitner and Klöckner 2005).

Despite the tremendous growth in private equity in Europe and the potential contributions of investments of this asset class for the economy, there have been few academic studies analyzing European private equity investments. In this paper, we start by filling this gap in the literature by studying the characteristics of investments realized in Italy by Italian private equity investors. We argue that our findings are quite representative of the more general Continental European case for several reasons. First of all, private equity investments in Italy account roughly for 15% of all Continental Europe PE deals, a similar percentage as the most important Continental European economies such as Germany (18%) and France (16%); and larger than Spain (12%) and than all the other Eastern European countries. Moreover, the corporate and financial setup of the Italian economy is similar to most other European ones in aspects such as the prevalent role of privately held corporations and the central role played by banks and other financial intermediaries in the structuring and managing of private equity deals. Finally, Italy shares with all other EU countries the same regulatory setup regarding private equity investments, and therefore investments are performed only through closed-end funds managed by Asset Management Companies, instead of through Limited Partnerships as in the US and the UK, and are subject to a closer regulation than in the Anglo-Saxon countries.

For the study, we use unique hand-collected database of 804 private equity deals which covers the entire universe of transactions performed in Italy by Italian

private equity investors during the period 1999-2007. We find that the typical PE investment in Italy is rather conservative, in the sense that is done for an established target firm that is privately owned by individuals and families, and is looking for capital to perform an expansion of its operations (roughly, half of the operations), or a buyout (25% of operations). Contrasting with the US and the UK, there are very few deals involving more risky venture capital investments such as early or turnaround financing.

We also find that the mean private equity investment is relatively small, of only €6.7 million or roughly 5% of the value of the average firm's assets, and is done in exchange for an average 23% of the firm's shares. Consistent with the relatively illiquid public equity markets in Europe, and the strong tradition of family corporations, most of the PE investments are exited in a trade sale (94% of all successfully exited investments), as opposed to an IPO.

We next explore which deal and fund characteristics are best related to the returns earned by the investors, as measured by each investment's IRR. We identify a number of factors that should be related with performance, namely: initial undervaluation, unexpected growth, leverage, market timing by the fund manager, and allocation of cash flow rights between investors and entrepreneurs. Controlling for the underlying firm quality, we do confirm that the firms that initial undervaluation is indeed related to good performance, and that the relationship between leverage and IRR is ambiguous in general but positive within the relatively less risky sample of buyout deals and negative within the relatively more risky sample of early investments, reflecting the fact that leverage also increases risk. Consistent with previous literature, we find that the returns to investors increase with the experience of the fund managers and the size of the fund. However, we do not find evidence for performance persistence, as in Kaplan and Schoar (2005). Instead, we find that there is a negative relationship between previous and current IRR. We interpret these findings as evidence for managers'

² Source: EVCA

loss of incentives to increase risk following previously successful investments (incentive gaming) and of incentives to increase risk following previously unsuccessful investments (gambling for resurrection) by private equity fund managers.

The rest of the paper is organized as follows. In Section 2, we review the related literature. Section 3 describes the general setup of private equity investments in Italy and more generally, in Europe. In Section 4 we describe the data used and perform the first unconditional analyses. In Section 5 we perform multivariate analysis to find relationships between investors' returns, as measured by the IRR, and the factors identified above. We leave conclusions for Section 6.

2. Related literature

There are two main strands of the literature on private equity that are relevant for the present work. On the one hand, there are several studies that focus on the risk and returns of PE investments, providing interesting comparisons with investments in public markets. On the other, there is a large theoretical and empirical literature on the separation of cash-flow and voting rights in PE investments in general and in VC investments in particular. This literature shows that the allocation of cash-flow and voting rights is important for providing incentives to the involved parties.

2.1 Literature on Returns of Private Equity Funds

Kaplan and Schoar (2005) investigate the performance of private equity partnerships using a dataset of individual fund returns collected by Thomson Venture Economics. They find that over the sample period average fund returns net of fees approximately equal the S&P 500 although there is a large degree of heterogeneity among fund returns. Returns persist strongly across funds raised by individual private equity partnerships. The returns also improve with partnership experience. Better performing funds are more likely to raise follow-on funds and raise larger funds than funds that perform poorly. This relationship is concave so

that top performing funds do not grow proportionally as much as the average fund in the market. At the industry level, they find that market entry in the private equity industry is cyclical. Funds (and partnerships) started in boom times are less likely to raise follow-on funds, suggesting that these funds subsequently perform worse. Aggregate industry returns are lower following a boom, but most of this effect is driven by the poor performance of new entrants, while the returns of established funds are much less affected by these industry cycles. Kaplan and Schoar also study the relation of fund performance to capital flows, fund size and overall fund survival. They analyze how a fund's track record affects capital flows into individual partnerships and the industry overall. Fund flows are positively related to past performance. Similarly, new partnerships are more likely to be started in periods after the industry has performed especially well. However, funds that are raised in boom times (and partnerships which are started during booms) are less likely to raise follow-on funds, indicating that these funds are likely to perform poorly. The major fraction of fund flows during these times, therefore, does not appear to go to the top funds, but to funds that have a lower performance and a lower probability of being able to raise a follow-on fund. Finally, the dilution of overall industry performance in periods when many new funds enter is mainly driven by the poor performance of new entrants. The performance of established funds is less affected.

Cummin, Siegel and Wright (2007) provide an overview of the literature on private equity and leveraged buyouts, focusing on global evidence related to both governance and returns to private equity and leveraged buyouts. They distinguish between financial and real returns to this activity, where the latter refers to productivity and broader performance measures.

Lerner, Shoar and Wong (2005) examine investment style and performance of private equity investments across several different classes of LPs and find a great deal of variation. Endowments' average annual returns from private equity funds are nearly 14% greater than the average investor. Funds selected by investment advisors and banks lag sharply. Within the different groups, older LPs tend to have

better performance than LPs that enter the industry at a later time. Differences in returns may be due to different risk profiles, as well as differences in the objectives that LPs have in investing in private equity. For example, as Hellmann, Lindsey, and Puri (2004) suggest, banks as limited partners might diverge from maximizing returns on investments in order to maximize future banking income from the portfolio firms in which they invested.

Cochrane (2005) measures the expected return, standard deviation, alpha, and beta of VC investments and identifies selection bias as the central hurdle in evaluating such investments. The key argument is that we observe valuations only when a firm goes public, receives new financing, or is acquired. These events are more likely when the firm has experienced a good return. To overcome this bias Cochrane uses a maximum-likelihood estimate, identifying and measuring the increasing probability of observing a return as value increases, the parameters of the underlying return distribution, and the point at which firms go out of business. He bases the analysis on measured returns from investment to IPO, acquisition, or additional financing. The central question of the paper is whether VC investments behave the same way as publicly traded securities and whether VC investments yield larger risk-adjusted average returns than traded securities. The average arithmetic return to IPO or acquisition is 698%, with a standard deviation of returns of 3,282%. The distribution is highly skewed; there are a few returns of thousands of percent, many more modest returns of “only” 100% or so, and a surprising number of losses. The skewed distribution is well described by a lognormal, but average log returns to IPO or acquisition still have a large 108% mean and 135% standard deviation. A CAPM estimate gives an arithmetic alpha of 462%; a market model in logs still gives an alpha of 92%. The selection bias correction dramatically lowers these estimates, suggesting that VC investments are much more similar to traded securities than one would otherwise suspect. The estimated average log return is 15% per year, not 108%. A market model in logs gives a slope coefficient of 1.7 and a -7.1%; not +92%, intercept. Mean arithmetic

returns are 59%, not 698%. The arithmetic alpha is 32%, not 462%. The standard deviation of arithmetic returns is 107%, not 3,282%.

Ljungqvist and Richardson (2003b) analyze the investment behavior of private equity fund managers. Based on the theory of Inderst and Mueller (2004), they link the timing of funds' investment and exit decisions, and the subsequent returns they earn on their portfolio companies, to changes in the demand for private equity in a setting where the supply of capital is 'sticky' in the short run. Existing funds accelerate their investment flows and earn higher returns when investment opportunities improve and the demand for capital increases. Increases in supply lead to tougher competition for deal flow, and private equity fund managers respond by cutting their investment spending.

Ljungqvist and Richardson (2003a) analyze the cash flow, return, and risk characteristics of private equity and find that it takes several years for capital to be invested, and over ten years for capital to be returned to generate excess returns. They provide several determining factors for these schedules, including existing investment opportunities and competition amongst private equity funds. In terms of performance, private equity generates excess returns on the order of five to eight percent per annum relative to the aggregate public equity market. Moreover, betas of the private equity funds' portfolios are estimated to be greater than one and on a risk-adjusted basis the excess value of the typical private equity fund is on the order of 24% relative to the present value of the invested capital.

Cressy, Malipiero and Munari (2007) examine whether private PE-backed buyouts have higher post-buyout operating profitability than comparable companies as a result of superior governance and whether relative investment specialization by industry or stage provides the PE firm with a competitive advantage over its peers. Using a sample of 122 UK buyouts over the period 1995–2002 and a matched sample of non-PE-backed UK companies, they find that over the first 3 post-buyout years (i) operating profitability of PE-backed companies is greater than those of comparable companies by 4.5%; (ii) industry specialization of PE firms adds 8.5% to this premium; (iii) stage (buyout) specialization does not

impact profitability but may provide a spur to growth. Finally, they observe that initial profitability of the PE-backed company plays a major role in post-buyout profitability.

Cumming and Walz (2004) develop the idea that to obtain more funds from the institutional investors, private equity fund managers may report inflated valuations of private investee companies that are not yet sold. Such overvaluations may result in a reputational cost when those investments are realized. Using evidence from 39 countries, they find that significant systematic biases exist in the reporting of fund performance, and that these biases depend on the degree of accounting conservatism and the strength of the legal environment in a country, and on proxies for the degree of information asymmetry between institutional investors and private equity fund managers.

Groh and Gottshlag (2006) assess the risk-adjusted performance of buyout transactions based on a comparison with public market investments with an equal risk profile, using a unique and proprietary set of data on the IRR, as well as the financial leverage and industry characteristics of 133 US buyouts. They find that, after correcting for sample-selection bias, buyouts outperformed the public market by 12.6% p.a. gross of all fees. The magnitude of the out-performance exceeds the typical level of fees.

Nikoskelainen and Wright (2007), using a dataset of 321 exited buyouts in the UK in the period 1995 to 2004, examine the realized value increase in exited leveraged buyouts. Testing the free cash flow theory, they find that value increase and return characteristics of LBOs are to some extent related to the corporate governance mechanisms resulting from a leveraged buyout, especially managerial equity holdings. They show that return characteristics and the probability of a positive return are mainly related to size of the buyout target and acquisitions carried out during the holding period.

2.2 Literature on Securities, Structuring of Deals, Voting and Cash Flows Allocation in Private Equity

Cumming (2008) uses a sample 223 of European VC investments in the years 1996-2005, that includes 187 actual dispositions (32 IPOs, 74 trade sales, 17 buybacks, and 64 write-offs) and 36 investments that had not exited by December 2005, at the time of his study. The purpose of his work is to relate the characteristics of VC contracts to the means by which a VC exits. The data indicate that ex ante, stronger VC control rights increase the likelihood that an entrepreneurial firm will exit via a trade sale, rather than through a write-off or an IPO. These findings are robust to controls for a variety of factors, including endogeneity and cases in which the VC preplans the exit at the time of contract choice. The key argument of Cumming's paper is that even when an acquisition is financially superior to an IPO, an entrepreneur might prefer the IPO because of the private benefits of being the CEO of a publicly listed firm (Berglof (1994), Black and Gilson (1998), Bascha and Walz (2001) and Hellmann (2006)). Consistently with this theory, if a venture is less promising and/or the likelihood of a conflict in exit choice is high, then in exchange for getting the venture financed, VCs receive more control rights. Strong VC control is associated with a greater probability of an acquisition, than an IPO or a write-off. The author finds that VC board control and the right to replace the founding entrepreneur as CEO are associated with a 30% greater likelihood of an acquisition. VC's use of common equity is associated with weak VC control rights, in contrast to convertible debt or convertible preferred equity. The use of common equity is associated with a 12% greater likelihood of an IPO. Write-offs are approximately 30% less likely when VCs use specific veto and control rights, including the right to replace the founding entrepreneur as CEO.

Gompers (1996) develops and tests the hypothesis that young VC firms take companies public earlier than older VC firms in order to establish a reputation and successfully raise capital for new funds. Evidence from a sample of 433 venture-

backed US IPOs in the years 1978 to 1987 suggests that companies backed by young VC firms are younger and more underpriced at their IPO than those of established VC firms. Moreover, young VC firms have been on the board of directors a shorter period of time at the IPO, hold smaller equity stakes, and time the IPO to precede or coincide with raising money for follow-on funds. The argument of Gompers rests on the idea that reputation and its effect on attracting capital are important in accessing debt and equity markets (Diamond (1989)) and act as a strong indicator of the ability to attract investors (Sirri and Tufano (1993) and Chevalier and Ellison (1995)). As partnerships have finite lifetimes, a venture firm must periodically completely recapitalize itself by raising a new limited partnership. A VC organization would cease operations without raising a new fund. This puts pressure on young VC firms to establish a reputation and raise a new fund within a short, predetermined time. As a result, young VC firms have incentives to grandstand, i.e., they take actions that signal their ability to potential investors. More specifically, young VC firms bring companies public earlier than older VC firms in an effort to establish a reputation and successfully raise capital for new funds.

Hellman (2006) shows that allocating convertible preferred equity with automatic conversion to VCs is optimal, because it restores their incentives to promote IPOs when these are the most wealth increasing exits for the target shareholders.

Ippolito (2007) examines the role of preferred stock and vesting in VC agreements. The idea of the paper is that cash-constrained entrepreneurs seek a VC to finance their firm and costly monitoring is employed by VCs to reduce entrepreneurial moral hazard. When monitoring reveals low effort VCs want to punish the entrepreneur with immediate exit. However, when the interim value of the firm is low, this threat is not credible. To restore credibility, VCs hold preferred stock with a liquidation preference and automatic conversion. If entrepreneurial effort is low VCs have a strong incentive to exit early, because of the liquidation preference. If effort is high, VCs convert and share in the profits as

equityholders. Vesting of the shares held by the entrepreneur further strengthens the credibility of a VC.

In Casamatta (2003) two optimal equilibrium allocations of securities arise depending on the amount invested by the VC. When the amount invested by the VC is low, she receives common stocks, while the entrepreneur is given preferred equity. When the amount invested by the VC is high, she is given convertible bonds or preferred equity. The intuition of this result is that when the investment of one agent is low, she gets a small share of outcome. In order to motivate her, she must be given higher-powered incentives. In the first regime, the VC is given more powerful incentives to exert effort because her investment is low. The second regime corresponds to the symmetric case, where the entrepreneur must be given higher powered incentives, since his investment is lower.

Kaplan and Strömberg (2002) study the actual contracts between VCs and entrepreneurs to compare the characteristics of real world financial contracts to their counterparts in financial contracting theory. They observe that the distinguishing characteristic of VC financings is that they allow VCs to separately allocate cash flow rights, board rights, voting rights, liquidation rights and other control rights. These rights are often contingent on observable measures of financial and non-financial performance. In general, board rights, voting rights, and liquidation rights are allocated such that if the firm performs poorly, the VCs obtain full control. As performance improves, the entrepreneur retains/obtains more control rights. If the firm performs very well, the VCs retain their cash flow rights, but relinquish most of their control and liquidation rights. Kaplan and Strömberg also report that it is common for VCs to include non-compete and vesting provisions that make it more expensive for the entrepreneur to leave the firm, thus mitigating the potential hold-up problem between the entrepreneur and the investor. Finally, the cash flow incentives, control rights and contingencies in these contracts are used more as complements than as substitutes. Ventures in which the VCs have voting and board majorities are also more likely to make the

entrepreneur's equity claim and the release of committed funds contingent on performance milestones.

Kaplan and Strömberg (2004) show that to make investment decisions VCs consider the attractiveness and risks of the business, management, and deal terms as well as expected post-investment monitoring. They find that greater internal and external risks are associated with more VC cash flow rights, VC control rights; greater internal risk, also with more contingencies for the entrepreneur; and greater complexity, with less contingent compensation.

Gompers and Lerner (1996) examine covenants in 140 partnership agreements establishing VC funds. Despite the similar objectives and structures of these funds and the relatively limited number of contracting parties, the agreements are quite heterogeneous in their inclusion of covenants. Covenant use may be determined by the extent of potential agency problems: because covenants are costly to negotiate and monitor, they will be employed only when these problems are severe. Alternatively, covenant use may reflect the supply and demand conditions in the VC industry. The price of VC services may shift if the demand for venture funds changes while the supply of fund managers remains fixed in the short run. The evidence of Gompers and Lerner suggests that both factors are important.

Demiroglu and James (2008) examine whether the reputation of the acquiring private equity group is related to the financing structure, loan contract terms, and valuation of LBOs and find that buyouts sponsored by high reputation funds pay narrower loan spreads, have fewer and less restrictive financial loan covenants, use less traditional bank debt, and borrow more and at a lower cost from institutional loan markets. In addition, reputation is positively related to the amount of leverage used to finance the buyout. They also find that deals sponsored by high reputation groups are less likely to experience financial distress or bankruptcy ex-post. The evidence is consistent with the hypothesis that deals involving reputable groups are perceived as less risky by creditors because reputable groups are more skillful in selecting and monitoring investments or because reputation serves to mitigate the agency costs of debt and thus lowers the need for bank monitoring and control.

3. PE in Europe

One of the main differences between the European and the American and British markets (i.e. the “Anglo-Saxon” financial system) concerning private equity as a business regards regulation. In the European Union, private equity is considered as a financial service, and for this reason it must be supervised by the appropriate local authorities. In addition to strict regulation, European private equity firms should comply with some rules which regulate the entire European financial system. In particular, the usage of an appropriate vehicle to invest becomes a must. In contrast, Anglo-Saxon legislation, which is driven by common law, simply considers private equity as a business activity and therefore it is not supervised as a whole (Walker, 2007)³ The decision to regulate private equity transactions in Europe faces the following tradeoff: On the positive side, because investments in European private equity are more controlled, they are generally considered as safer and more stable. On the negative side, there are high costs associated to the application of several constraints. This difference in the investment environment between the two economies (Anglo-Saxon or European one) might be considered as an advantage for the private equity investors who, having at their availability two different investment vehicles, have the possibility of choosing among the two to invest in private equity.

EU legislation makes it possible to set up an equity investment through one of the following vehicles or players: banks, investment firms, closed-end funds, and local ad-hoc vehicles. Each of these vehicles or players is regulated by the following main acts:

1. Banking Act (1988-1993);
2. Financial Services Act (1996-1998);
3. European Financial Services Regulation (MiFID, 2007)

We must underline the fact that for the time being there is no other EU law regulating the financial system. However, each single country inside the union is characterized by ad hoc rules in place to apply the two acts and different laws for going public, as well.

Banks and investment firms are mainly regulated by Banking Act because their core activity is related to credit intermediation, meaning that the investment in equity is one of the activities these institutions are able to undertake. Closed-end funds are regulated by Financial Services Act and they are characterized by the fact that the investment in equity is not carried out for the interest of the fund itself, but for the interest of fund's investors. Regarding local ad-hoc vehicles, it is possible to find a considerable number of specific domestic laws throughout Europe. However, all of investment firms, closed end funds and ad hoc vehicles show an organizational rationale which is quite similar to the mechanism of Anglo-Saxon Limited Partnership, which is the leading vehicle to manage private equity in US and UK.

In 2007, the EU real GDP growth was strong at 2.9%. In this context, and despite the global financial crisis that started in the second half of the year, EU private equity remained strong as reflected by the new records of investment and the funds raised (EVCA, 2008). As a global picture, the main drivers behind the robustness of private equity are: the capability of three big countries (UK, France and Germany) to generate fund raising and investment; the capability of EU vehicles to attract capital from outside Europe; and a good balance between mega deals and small caps/mid corporate deals. Those drivers enhanced private equity system also in 2008 whereas the rise of GDP was not the same like 2007 and the level of uncertainty through the financial markets was impressive, mostly for the credit crunch that stopped many mega deals.

³ Of course, some features and players of private equity vehicles are regulated even in Anglo-Saxon countries, following general rules coming from financial market regulation (for example, General Partners are FSA regulated in the UK market).

If we consider the EU market, UK covers more or less the 50% of volume in term of investment and fund raising. The UK market, both for the size and the regulator framework is considered quite closed to US market and not comparable with the other EU countries. For these reasons, it's quite common to analyze statistics through EU without UK to make them more homogeneous. Without UK, considering official statistics coming from EVCA, in 2007 the total amount of investments in EU was 39,564 million euro, of which 31% was done in France, 18% in Germany and 15% in Italy. In terms of fund raising, the total EU amount without UK was 37,959 million euro in 2007, where 20% was raised in France, 18% in Germany and 16% in Italy. By type of investor, the traditional investor type continued to lead the ranking: pension funds, banks and insurance companies. Similar to 2000-2006, also in 2007 and 2008, pension funds were the number one source of funding, mainly due to UK pension funds activism across the world. All those data are impressive using a historical perspective: the industry of private equity was born in Continental Europe with the introduction of the Financial Services Act in 1996 and the amount of investment move from 5,000 million euro in 1996 to the above mentioned 37,959 million euro in 2007.

In 2007, the average fund size for private equity funds that reached final closing in EU was 112.8 million euro, whereas for the buyout cluster only the average fund size was 928.7 million euro. Data are not so different without UK sample. While most of the funds did not have a specific focus on a particular industrial sector, there were eleven funds focusing on ICT reaching final closing in 2007, with an average fund size of 140.2 million euro, six life sciences focused funds with an average fund size of 132.1 million euro. and five energy & environment focused funds with an average fund size of 111,18 million euro. The ICT focused funds were managed primarily from Poland, UK and France, with the life sciences funds raised driven mainly by UK and the Netherlands, and the energy & environment funds mainly managed in UK and France.

If we consider the stage distribution by percentage of amount in 2003-2007, 60% was made by turnaround and buyouts, 30% by expansion, and 10% for early

financing, of which 1% corresponds to seed and 9% to start up. Percentages change dramatically if we consider the distribution by percentage of number of investments, whereas 33% is covered by expansion, 30% by start up and 24% only by turnaround and buyouts.

4. Data description and descriptive statistics

We construct a unique database of private equity deals which covers the entire universe of transactions that have been sponsored by Italian private equity investors in Italy in the period 1999-2007. More precisely, the data consist of all exited private equity deals financed in Italy from January 1999 to December 2005. The data are hand collected from copies of the contractual agreements of the deals, obtained from the Italian Private Equity and Venture Capital Association (AIFI) and the European Venture Capital Association (EVCA). We then merge these records with public files from Bank of Italy, to obtain information regarding the Asset Management Company that managed each deal, and from the Italian Securities and Exchange Commission (Consob), for information about the funds' governance.

For each deal, we have information about the type of investment (early stage, expansion capital, buy-out or turnover finance), the exit strategy (trade sale, IPO, write-off), the start and end dates, the internal rate of return, the size of the investment, the deal covenants, the leverage used, the percentage of shares of the target firm held by the private equity fund, the target's sector and organizational form, and governance characteristics of the management company and of the private equity fund.

The sample contains solely deals that have been officially liquidated. To the extent that fund managers are reluctant to write off underperforming deals and carry on with "living dead" investments, this restriction potentially causes an

upward bias to our measure of performance due to sample selection.⁴ On the other hand, this restriction enables us to calculate performance from realized cash flows rather than on subjective estimates of value given by fund managers.

The sample is composed of 804 investments, which also corresponds to the number of target firms that received financing. Financing was provided by 87 private equity funds, respectively owned by 58 management companies. We report descriptive statistics in the following order: for firms, investments, funds, management companies.

Tables 1-4 contain information about target firms, which are all located in Italy and can be either privately held or publicly traded. Table 1 gives an illustration of the distribution of target firms by sector. Most of the firms financed are in the consumer goods sector (34%), followed by the general industrial sector (25%), and the services sector (20%).

Table 2 contains balance sheet and income statement information. Following standard practice in private equity, we identify EBITDA as the most relevant variable for gross profitability. EBITDA is commonly employed by practitioners because it is unaffected by depreciation and amortization policies, which presumably will be modified after the private equity fund takes control of the firm. Furthermore, EBITDA gives a gross measure of the ability of the firm to generate cash to pay off interest charges. Having a measure of interest coverage is particularly important when firm leverage increases significantly after the deal, as it commonly happens in leveraged buyouts. There is great variation among target firms in terms of EBITDA, with an average of 15.95, a standard deviation of 19.09 million euro).

As a measure of size, we use both yearly sales and book value of assets as reported in the latest financial statement before the investment. Both measures are highly correlated. Lacking market value data, however, we believe that sales are a

⁴ Indeed, Phalippou and Gottschlag (2007) document, in a sample of US and non-US private equity deals, that roughly half of the active investments that have reached maturity correspond to 'living dead' investments that have not been written off, despite poor performance.

more precise and up-to-date measure of size than assets. The average firm on our sample had pre-investment sales of 128 million euro, with standard deviation of 131.3 millions. The smallest firm in the sample had yearly pre-investment sales of only 6.3 million euro, and the largest one 500 million euro. We also report data on the value of debt and equity pre investment, and find that the average leverage expressed as D/E at book value before the investment is 3.92 (3.92 median).

Table 3 reports information on the form of incorporation. Almost the entirety of the sample (798 deals out of 804, corresponding to 99.25%) is composed of Società per Azioni (SPA), i.e. joint stock companies. The residual four companies are either Società in Accomandita per Azioni or Società a Responsabilità Limitata, both of which are forms of limited liability companies. Therefore, all target firms are limited liability companies of one form or another. The ownership of these firms is reported in Table 4 which shows that the majority of firms are privately owned by individuals and families, as one would expect given the historical evolution of the Italian corporate sector.

Investments are classified in terms of their characteristics as early stage, expansion, buyouts and turnaround. Early stage financing is an investment concerning the development of a potential business idea (i.e., seed financing) or the start-up of a company. Expansion financing provides capital to the company to facilitate its growth (i.e., in order to develop additional production capacity, product diversification, market expansion, or to provide working capital). Both early stage and expansion are usually investments in small, private firms with high growth opportunities. Buyout financing provides capital to a potential buyer for the purchase of a company or a controlling interest of a corporation's shares. Buyouts include both leveraged and non leveraged acquisitions in which the private equity fund aims at transferring control from the original shareholder to itself (management buy-in) or to the managers of the company (management buy-out). Finally, turnaround financing provides capital to the company to avoid the risk of failure and to launch a process of restructuring. Turnarounds are investments in non-profitable firms and more generally troubled firms. Buyouts and turnarounds

can be of both private and public firms. Table 5 reports statistics for the four types of investment, showing that the majority of our deals are expansions (51.87%), followed by buyouts (26.24%), early stage (16.29%) and turnarounds (5.60%).

Table 6 shows that investments have an average size of €6.71 million (median of €4.10 million), with the largest deal of €30.40 million. Early-stage and expansion deals are much smaller than buyouts and turnarounds, as they generally involve target firms of smaller size (1.03 and 3.9 versus 15.5 and 8.1 million euro on average, respectively). Among buyouts we have the largest deals of our sample (the largest buyout for €30 million), which however can be regarded as small by international standards, particularly with respect to some of the mega buyouts that we have seen in the US and UK in recent years.

In the whole sample, private equity funds never acquire a majority stake in the firm and there are only two cases (which correspond to buyouts) in which the private equity fund takes a stake of 50%. In all other cases, the fund takes an average minority stake of 22.63% (25.00% median), so that it has enough power to influence the board – and some time to exercise effective control – while leaving the majority stake to insiders. Control is often exercised by private equity investors by subscribing shares with preferential voting rights. These voting rights are not necessarily correlated to the percentage of shares held by the fund or to the number of members of the fund that sit in the board of the target firm. In practice funds tend to have only one board member (in 782 out of 804 cases), only rarely they have two or three members, but never more than three, and the number of board members is not correlated to the percentage of shares held in the firm, nor to the overall number of members sitting in the board (which average 6 with a maximum of 13).

Investments are also classified according to the form of exit, which gives us three groups: initial public offering (IPO), trade and write-off. A trade exit refers to the sale of the firm to a well identified third party, such as another private equity fund or a corporation. Table 7 reports statistics for each type of exit, for the whole sample and for each type of investment. We find that the large majority of

investments are exited via a trade sale (87.69%), while IPOs (5.85%) and write-offs (6.47%) are much less common. As shown below, IPOs are generally the most lucrative form of exit, which then applies only to top performing firms. As can be expected, IPOs represent a relatively larger percentage for buyouts and expansions than for early stage and turnarounds. The relatively higher risk of turnarounds is such that these deals have the highest unconditional probability of ending in a write-off. The percentage of write-offs could be under-estimated due to the selection bias discussed above.

Table 8 reports the distribution of investments across time, reporting both the entry and exit year. All investments were financed between 1999 and 2005, with 2000, 2001 and 2004 being peak years. The distribution of exits centers on the years 2002-2006. Figure 1 reports volumes and illustrates the distribution of deals across type, distinguishing by type of deal. From Table 6, we find that for the whole sample the typical holding period for investments is almost three years from entry to exit (average of 34.19 months, median of 33) with a minimum of 6 and a maximum of 66, with longer periods corresponding to early investments (42 months on average) and shorter ones for buyouts (30 months), consistent with the different investment philosophies of these investment types. The average holding period for trade sales is 34.42 months, for IPOs is 31.34 months and for write-offs is 33.71. As there is hardly any difference between the holding period of write-offs and the other two forms of exit, we observe that at least unconditionally, the holding period is not artificially prolonged by fund managers when an investment performs poorly, so to delay a possible write-off. We return to this point when we discuss the results of our regressions.

Table 10 reports information on returns, in terms of internal rate of return (IRR) of the investment. Gross IRR is calculated by taking the difference between the exit and entry value of the investment and dividing by the entry value. This is a gross measure of returns because it does not take into account the length of the investment. For this reason we calculate the yearly IRR of the investment. Returns over the whole sample have been generally very satisfactory with an average gross

IRR of 33.17% and a yearly IRR of 10.66%. In a few cases we observe write-offs of the whole investment, whence returns equal -100%. As we expected, the lowest, and most left-skewed IRRs are observed for early investments (average yearly IRR of 1.71 and median of 9.17%). Turnaround finance is the one that presents the highest variance, with an average yearly IRR of 3.34%, a median of 12.81%, and a standard deviation of 40.55. The performance of private equity fund is startling in comparison to the returns of the Italian equity market over the same period. To see this for each investment we have calculated the returns of the Italian market index (S&P MIB) over the same period of the investment and we have then annualized these returns. The simple difference between the yearly IRR of the private equity investment and the yearly returns of the index average 17.95%, with a minimum of -131.38% and a maximum of 163.43%. While the Italian stock index performed poorly during the first two years after 2001, private equity investments remained relatively unaffected by the recession. We have also calculated the difference between the yearly IRR of the investment and the average annualized rate of return of Italian government bonds with duration of 2 years, matching the investment period. We find that this difference has an average 8%, thus suggesting that it is the poor performance of the stock market to drive the difference in results between the stock index and the IRR of the funds.

Table 10 gives an overview of the use of leverage by private equity funds. Debt is employed to finance a deal only in conjunction with a SPV (Newco). SPVs are very rarely used in early stage financing (6.10%), but are rather common (approx. a third of the cases) in the other three types of investments, being particularly popular for expansion and buyouts. The average leverage employed is 3.48, thus meaning that the equity component of the average deal that employs an SPV is 22.32%, while debt represents 77.67% of financing. By comparing our results with Axelson et al. (2008), we find that the equity component in our sample of deals is small by international standards, as they report it to be around 30% in Europe and between 30% and 40% in the US. We do not have detailed information on the debt instruments that have been employed to finance the SPV. However, we

expect these to be primarily bank loans rather than bonds.

Table 11 provides the distribution of funds across time, identifying 1997 as the most popular *vintage* year, with a total number of 87 funds across all years. Table 12 reports that the average size of funds is €62.05 million. Funds specializing in early stage and expansion financing are the smaller ones (average size of 40.53 and 57.2 million euro, respectively), and buyouts take the biggest sizes (average 96.9 million euro).⁵ Only one fund is 100% specialized in one form of investment (expansion); the average fund diversifies across investment types, performing the majority of its investments in expansions (53.29%) and to a lesser extent in buyouts (24.85%) and early stage (16.85%). In particular, from the table it emerges that turnarounds are a residual form of investment for private equity funds (only 5% on average).

All funds are relatively diversified holding an average portfolio of 9.24 investments. This squares well with the minimum and maximum values of the IRR, which are less extreme than the analogous values for investments, as reported in Table 9. We find a similar pattern when we look at exits. While some funds succeed in selling all their investments via a trade sale, none of them is actually able to do the same with IPOs, which would be the way to achieve maximum returns.

Finally, Table 13 reports data on the 58 management companies (MCOs) of our sample, which have an average size of €3.07 million and 1.5 funds each under management. The effect of diversification is very clear for MCOs, all of which have managed to generate positive returns in terms of gross IRR. Table 13 also gives information about the ownership of MCOs, reporting that the majority of these are owned by banks and other financial institutions, with much fewer under the control of industrial and service companies and individuals.

⁵ We define a fund to be specialized respectively in each of early, expansion, buyout, or turnaround financing if the majority of the investments are done in each of these investment types. Most of the funds (67 out of 87) are specialized in expansion financing, only one in early financing, and 9 in buyouts. 7 funds are specialized simultaneously in expansion and buyout financing, 3 in early and expansion financing, and no single fund specializes in turnaround finance.

5. Hypotheses

We identify five main factors that affect the IRR of a private equity investment: 1) initial under-valuation, 2) higher-than-expected fundamental growth, 3) leverage, 4) duration of the investment and finally, 5) covenants.

Differently from public markets, private equity markets are often affected by severe liquidity and information problems, which result in a smaller degree of market efficiency. In this context, professional investors such as PE funds are often well placed to use information and imperfect competition to their advantage, so to extract most of the surplus generated in a deal. We envisage that sometimes PE investors may succeed in under-valuing equity when they buy shares in a firm. This would allow them to reap a profit that stems uniquely from bargaining power and superior information. We expect the initial under-valuation effect to be stronger for smaller firms receiving early-stage and expansion financing, as well as in turnarounds. More generally, we expect undervaluation to be more pronounced for firms with negative earnings.

The second key component of returns is generated by above-expectations growth in profitability. To the extent that the firm grows more than originally anticipated, its market value increases after the investment, thus generating returns for all equity holders and for PE funds in particular. When leverage is employed (factor 3), the returns to the fund are more than proportional to the increase in the value of equity.

In practice, due to the inefficiency of PE markets, it is difficult to estimate un-expected growth separately from initial undervaluation. With efficient markets this distinction is clear: as prices reflect all available information, a change in the value of equity can be uniquely due to unexpected growth. However, with inefficient markets, a change in value may be due either to (correct) pricing, to unexpected growth or a mix of the two.

The third explanatory factor is duration of the investment. Depending on the characteristics of the investment and of the market, investors may shorten or

lengthen the duration of the investment to maximize returns at the time of exit. Duration tends to be longer if market conditions and firm profitability are expected to increase, and shorter otherwise. The effect of duration on returns is generally ambiguous and can be only determined with certainty once we control for a relevant set of investment and market variables.

Duration is endogenously determined by returns: as investors update their expectations on returns during the life of the investment, they also revise the time of exit. This suggests that we need to find an instrument that explains duration, while not affecting returns other than via duration. One possible instrument is the performance of a fund's previous investments. While previous performance is generally uncorrelated to current performance, it does however affect duration due to the so called "home run effect". Ljungqvist and Richardson (2003b) show that PE managers care about the performance of each single investment, but also of the fund as a whole, and may then sacrifice one investment for the benefit of this higher objective. Under certain circumstances PE funds exit early to cut their losses on under-performing investments, particularly if they have achieved a good return in previous investments. Other times, funds hold on to under-performing investments hoping for a lucky resurrection, particularly if their previous investments have also underperformed.

The last explanatory factor is covenants. As shown by Kaplan and Stromberg (2003), PE financing agreements almost always make use of state-contingent clauses, such as covenants, that affect the distribution of returns between investors and original owners. Covenants also act as signaling devices for outside investors, thus reducing potential adverse selection and moral hazard problems. In our dataset we identify the following covenants: lock-up restrictions, permitted-transfer restrictions, callability, puttability, tag-along rights, drag-along rights, rights of first refusal, exit ratchets and debt covenants.

Table 14 reports the distribution by type of investment. Tag-long rights are the most common form of covenant, being employed in 87.81% of the deals, followed in popularity by permitted transfer clauses, puttability of securities and

drag-along rights. There is relatively little variation in the use of covenants between early stage, expansion and buyout financing, with the exception of covenants on debt which are much more common for expansion and buyouts than for early-stage investments. This is due to the fact that covenants on debt are employed only when there is an SPV and the deal is leveraged, neither of which is likely to occur in early-stage financing. On rather different terms, covenants are used in turnaround financing. The use of callable securities is much more common for turnarounds than for other types of investments. This is probably because private equity funds hope that insiders will buy back the stake owned by the fund if the turnaround is successful, thus the callability feature acts as an incentive for insiders. On the contrary, the right-of-first-refusal covenant is rare in turnarounds because funds want to retain the option of exiting the investment and cut their losses when performance turns for the worse.

A lock-up clause prohibits insiders from selling shares of stock for a specified period of time. As such, it acts as a commitment device to alleviate the moral hazard of insiders and as a signal of quality for the firm (Brav and Gompers (2003)). A lock-up clause affects the returns of a fund in two opposite directions. On the one hand, the fund is worse off with a lock-up clause because it faces trade restrictions that limit the ability to do market timing. On the other, the fund benefits from the signaling effect of the clause, facilitating an IPO or a trade sale. We envisage this second effect to dominate market timing and expect an overall positive effect associated with lock-up clauses.

Permitted-transfer clauses are similar to lock-up clauses in that they limit the tradability of shares of insiders, the only difference being that these clauses apply also to the sale of minority stakes outside an IPO and do not generally apply to shares held by the funds. Permitted-transfer clauses are imposed by a fund to incumbent owners with the aim of aligning incentives, thus reducing moral hazard and improving returns. However, we expect a fund to impose a permitted-transfer clause only if the firm is particularly risky. The clause acts as a flag of low firm quality.

With a callable security, the entrepreneur has the option of buying back his shares at a given price. Entrepreneur will only exercise the option when the value of the target is higher than the strike; in other words, the maximum return to investors is capped by the strike price, and the entrepreneur reaps all of the profits if the investment goes very well. The existence of a callability feature is a signal that either the fund has a great interest to invest in the firm, even at the cost of getting a less than proportional share of the profits, or that the fund does not expect a spectacular growth. In any case, the interest of the fund to invest in the target must be due to reputation or any other reason beyond returns. Hence we do not expect any effect of this on investor returns.

With a puttable security, investors are protecting themselves against bad investments. To write the put contract, entrepreneurs must be sure that their investment is good. Investors will try to put this covenant when they are not sure about the real quality of the investment (therefore we expect this covenant to be present where information asymmetry is higher – smaller targets, early investments, etc). Entrepreneurs will only accept if they are sure about the quality (therefore this covenant is a signal of good quality). To the extent that entrepreneur's expectations are correct, we expect this covenant to be positively correlated with IRR.

Drag-along rights enable a fund to force other shareholders to join in the sale of a company. In general, the fund doing the dragging must give other investors the same price, terms, and conditions as any other seller. Drag-along rights significantly enhance the flexibility of an exit, by reducing the bargaining power of other investors and thus favouring market timing.

Tag-along rights represent a contractual obligation used to protect the investment of the fund. If other shareholders sell their stake, the fund has the right to join the transaction and sell its stake in the company at the same terms.

A right of first refusal gives the option to existing shareholders to buy the shares sold by the fund. At the time of sale, the right has no effect on the selling price. However, it acts as a signal of quality at the time of the investment and

therefore we expect only profitable firms to carry such right.

An exit ratchet agreement provides existing entrepreneurs and other incumbent shareholders with more than proportional cash flow rights in case of a sale of the firm. The ratchet is generally triggered only if returns exceed a certain predetermined value and it acts as an incentive mechanism for entrepreneurs, as well as a deal sweetener. We expect exit ratchets to be associated with outperformers. The fact that fund is willing to give more than proportional cash flow rights signals a great interest of the fund to invest for profitability reasons.

Finally, with the term debt covenants we refer to the covenants carried either by the debt of a newco or the previous existing debt. These covenants include restrictions on the quantity, seniority and collateral of newly issued debt by the target firm, upper limits to the ratio of debt to profitability indicators (EBIT, EBITDA), restrictions on dividends, repayment schedules, restrictions on the sale of assets, as well as a number of other specific impositions. These covenants should only affect (positively) existing debtholders, but should have no effect on IRR due to the option-like feature of equity vis-à-vis debt. Once we control for the effect of leverage, the effect of debt covenants on returns is negative.

Table 15 summarizes the above hypotheses.

6. Analysis of IRR determinants

This section examines the conditional relationship between the internal rate of return and the five factors that we have identified before. To analyze the effects of initial undervaluation and unexpected growth on the returns to investors, we would ideally like to run a regression of the realized internal rate of return on measures of initial undervaluation, final overpricing, and a measure of unexpected growth – for example, the difference between the expected and the realized growth. In practice, we cannot observe the true value of the investments, nor the expectations about the investments' growth. We propose to use Tobin's q and a measure of realized growth (sales growth) to capture these effects. The former

should capture the valuation of the investment by private equity funds; to the extent that investors' expectations are correct, this variable should measure initial overvaluation and hence we envisage a negative relationship with performance. The latter is a proxy for the realized growth of the investment as well as for the quality of the investment; therefore we expect it to be positively correlated with internal rate of return.

We include the leverage of the private equity operation to control for the third factor. All else equal, a higher leverage increases the return to investors if things go well. Moreover, highly leveraged operations substantially increase risk; hence we expect investors to require higher return, and this variable should be positively related to the internal rate of return.

For the fourth factor, we include the average performance of all previously exited investments, as well as a measure of the duration of each investment. If fund managers lose the incentive to take risks (“incentive gaming”) following previously successful investments, we expect subsequent investments to have lower risk and hence lower internal rate of return. We also expect that fund managers write off underperforming investments relatively quickly following a period of successful investments. Hence there should be a negative relationship between the duration of the current investment and previous performance. Similarly, if fund managers tend to “gamble for resurrection” following previous unsuccessful investments, then the subsequent increase in risk should lead investors to require higher returns. In the latter case, we also expect underperforming investments to have longer durations, as fund managers extend the holding periods of the investments in the hope of being able to resurrect the ‘living dead’ investment. Both when risk aversion increases and when managers gamble for resurrection, we expect a negative relationship between previous and current performance. We also expect in both cases a negative relationship between average previous performance and the duration of the investment.

Finally, we include dummies containing a one if the contract between the fund and the target firm has one of the nine covenants, to control for the last

factor. To the extent that the expectations about the target’s quality are correct, we expect higher internal rates of returns for funds with puttable securities, drag along rights, right of first refusal, exit ratchet, and lock up clauses.

The basic empirical specification is the following:

$$IRR = \alpha + \beta_1 Q + \beta_2 GROWTH + \beta_3 LEV + \beta_4 PERF + \sum_{i=5}^K \beta_i COV_{i-4} + CONTROLS \quad (1)$$

where *IRR* is the yearly internal rate of return of the investment, *Q* is Tobin’s *q*, *GROWTH* refers to the fundamental growth of the target firm, proxied by the yearly increase in sales, *LEV* is the leverage of the operation, *PERF* refers to the average past performance of the fund, and *COV_i* are dummy variables containing a one for the following covenants: lock-up clause, permitted transfer, puttable security, callable security, right of first refusal, drag-along right, tag-along right, and covenants on debt.

We control for risk and other factors related to the quality of each investment, by adding firm size (which is also a proxy for asymmetric information), fund experience (age of fund) and dummies for the type of investment (early, expansion, turnaround or buyout), for the industry of the target, and for the vintage year of each investment.

Due to the limited liability feature of investor returns, the correct specification for the regressions of Equation (1) is a Tobit limited dependent variable model with censoring at -1. Moreover, to control for within-group correlation for investments made by funds in the same management company, we calculate standard errors with clustering by management company. We also run, but do not report, standard OLS regressions with and without correction for the standard errors. These coefficients are qualitatively equal to the reported Tobit specifications.

The results of several different specifications of Model (1) are summarized in Tables 16 to 20. Table 16 contains the estimated coefficients for Equation (1) on the complete sample, while Tables 17-20 respectively contain the coefficients for the subsamples of buyouts, expansions, early and turnarounds. From Table 16, we

observe that there is a negative, though not significant, relationship between Tobin's q and performance. We also find that leverage is positively, but not significantly, related with performance. We do find the results to be significantly different from zero on the subsample of buyouts and turnaround finance; however, for early investments the relationship between leverage and performance is reversed. A possible explanation for this reversal is the accentuated information asymmetry that characterizes early finance deals, together with their higher risk. While it is true that investors expect higher rewards for riskier deals, the actual realization of the returns can be very different to the expected return when investors are poorly informed and risk is high.

Our sample also presents evidence for "incentive gaming" and "gambling for resurrection". Conditional on firm quality (as proxied by realized fundamental growth), the relationship between previous and current performance is negative, reflecting the possibility that funds with a successful track record will feel less urged to obtain an above-average current performance. This relationship disappears when we do not condition on firm quality; in this case the holding period becomes negatively significant.

We explore whether this negative and significant coefficient could be due to the endogenous relationship between the holding period and performance inherent in the incentive gaming and gambling for resurrection hypothesis with an instrumental variable regression (Column 3). As instruments for the holding period, we use the average previous fund performance. Indeed, if fund managers perform incentive gaming and/or gambling for resurrection, then any relationship between the length of the investment and investment performance should be solely due to a previous fund underperformance. The first stage regression (not reported) shows a clear negative and significant relationship between previous fund performance and the length of the holding period. However, once we control for this endogenous relationship, the inverse relationship between holding period and performance disappears and even becomes (weakly) positive in some specifications.

The results in the previous paragraph are robust to several specifications and

contrast sharply with the findings of Kaplan and Schoar (2005), who found a positive relationship between performance and previous performance. Moreover, these results, as for the case with leverage and Tobin's q , appear in the whole sample and in the different subsamples, with the exception of early investments. In this case we find a positive relationship between the length of the investment and performance, but no relationship between previous and current performance, conditional on investment quality.

Regarding the covenants, we consistently find evidence for a positive relationship between performance and puttable securities, lock-up clauses, and exit ratchets. However, the positive relationship between performance and exit ratchet is not robust to controlling for realized growth. We have identified the existence of each of these three covenants as a signal of firm quality, therefore the positive relationship between them and performance does not come at a surprise. However, we do find it interesting that exit ratchet loses all significance only when we explicitly control for realized growth, an explicit measure of quality. One explanation is that these covenants are measuring something else apart from quality. Puttable securities, for example, protect investors from a decrease in value by giving them full cash flow rights when exercising their option. This covenant therefore is also a measure of the bargaining power of the investor, and as such it is not surprising that the relationship with IRR is positive even after conditioning by quality. The lock up clause, on the other hand, gives the investors the right incentives to do their job. Hence, all else equal a fund subject to a lockup clause is more committed to exert effort and will be at the end more profitable.

The regressions in Tables 16-20 also show, consistently with previous literature (Kaplan and Schoar 2005), that returns improve with fund experience, and with the size of the target firm, although this relation is not monotonic nor statistically significant throughout specifications.

7. Conclusions

In this paper we provide fresh evidence about private equity investments in Europe, in particular focusing on a sample of 804 exited private equity investments realized by Italian investors during 1999-2007. We find that most of the PE-backed firms are privately held, established firms searching for an expansion, with only a small minority at an early stage looking for venture capital or a turnaround financing. We also find that the average investment is smaller and has a shorter duration than the PE deals done in the US or the UK, exits primarily through a trade sale rather than an IPO, and is managed in a large number of cases by banks or financial institutions.

We also study previously unexplored relationships between IRR of European PE investments and the characteristics of the receiving firms, giving funds, and the deal contracts. We find that the IRR of the funds is positively related to the initial undervaluation and the risk of the target firm. As previous studies for the US have found, we observe that the experience of the fund manager and the size of the fund are also correlated with the performance of the investment. We also find new evidence consistent with a positive relationship between IRR and the existence of puttable securities, lock-up clauses, and exit ratchets. Finally, contrasting with findings in the US, we do not find that funds' returns are persistent. Instead, we find evidence for incentive gaming and gambling for resurrection at a fund level.

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Tables

Descriptive Tables for Target Firms

Table 1: Distribution of firms by sector

<i>Sector</i>	<i>Number of Firms</i>	<i>%</i>
Resources (mining, oil, gas)	17	2.11
Basic (chemicals, construction, forestry, steel, other metals)	67	8.33
General (aerospace and defense, diversified industries, electronic equipment, engineering and machinery)	198	24.63
Cyclical Consumer Goods (automobiles and parts, household goods and textiles)	160	19.90
Non Cyclical Consumer Goods (beverages, food, health, personal care, pharmaceuticals and biotech, tobacco)	115	14.30
Cyclical Services (retailers, leisure, media, entertainment, transportation)	111	13.81
Non Cyclical Services (food and drug retailers, telecommunication services)	51	6.34
Utility (electricity and other)	26	3.23
Finance (banks, insurance, investment companies, real estate, other)	16	1.99
IT (hardware, software and computer services)	43	5.35

Table 2: Summary statistics for target firms

All figures are in €Million	Mean	Median	SD	Min	Max	#Obs.
Sales₀	128.01	81.60	131.28	6.31	499.10	802
EBITDA₀	15.95	9.29	19.09	-4.17	109.41	804
(pre) BV₀ Assets	124.81	70.25	132.57	3.72	984.56	804
(pre) BV₀ Equity	25.36	14.30	26.47	0.68	175.50	804
(pre) BV₀ Debt	99.45	56.15	106.70	3.04	809.06	804
Investment Size	6.71	4.10	6.06	0.25	30.40	804
Yearly Sales growth (%)						
Whole Sample	6.92	3.95	10.57	-31.86	79.73	804
Early	2.84	2.36	4.27	-31.87	13.60	131
Expansion	7.15	4.00	10.39	-13.93	75.63	417
Buyout	9.13	5.32	12.85	-12.75	78.67	211
Turnaround	7.68	4.24	12.62	-5.30	59.31	45
Yearly ROA growth (%)						
Whole Sample	6.30	3.25	10.74	-26.97	105.16	804
Early	8.63	7.26	7.71	-21.46	34.56	131
Expansion	13.01	10.18	12.30	-21.01	92.33	417
Buyout	14.81	11.66	14.86	-19.62	129.12	211
Turnaround	12.47	10.43	14.04	-15.23	63.61	45
Yearly ROE growth (%)						
Whole Sample	18.77	8.13	42.55	-66.53	503.00	804
Early	26.94	21.36	29.08	-56.02	142.03	131
Expansion	40.00	24.90	43.79	-54.21	352.93	417
Buyout	43.40	28.20	69.06	-72.98	697.26	211
Turnaround	41.99	26.32	51.05	-52.38	205.95	45

Table 3: Form of incorporation of target firms

	<i>SPA</i>	<i>SAPA</i>	<i>SRL</i>
Number of firms	798	2	4
%	99.25	0.25	0.50

Table 4: Ownership of target firm before investment

	Bank	Other PE	Manager	Individuals
Ownership	15	137	95	557
%	1.87	17.04	11.82	69.28

Descriptive Tables for Investments

Table 5: Summary statistics for investments by type

	Early	Expansion	Buyout	Turnaround
Type	131	417	211	45
%	16.29	51.87	26.24	5.60

Table 6: Summary statistics for investments

	Mean	Median	SD	Min	Max	#Obs.
Investment Size (€Million)						
Whole Sample	6.71	4.10	6.06	0.25	30.40	804
Early	1.03	1.00	0.54	0.25	6.15	131
Expansion	3.88	3.75	1.51	0.50	15.00	417
Buyout	15.52	15.50	4.33	1.10	30.40	211
Turnaround	8.10	8.25	3.45	1.80	25.00	45
Shares owned in firm (%)						
Whole Sample	22.63	25.00	6.77	2.00	50.00	804
Early	24.16	25.00	7.50	5.00	40.00	131
Expansion	22.48	25.00	6.59	2.00	50.00	417
Buyout	23.16	25.00	6.24	10.00	40.00	211
Turnaround	17.00	15.00	5.78	5.00	30.00	45
Holding period (months)						
Whole Sample	34.20	33.00	13.58	6.00	66.00	804
Early	41.92	43.00	13.30	8.00	66.00	131
Expansion	33.83	34.00	12.90	6.00	66.00	417
Buyout	30.42	29.00	12.97	6.00	64.00	211
Turnaround	32.80	31.00	14.83	8.00	62.00	45

Table 7: Summary statistics for investments by type and exit

Exit strategy	# IPO (%)	# Trade (%)	# Write-off (%)	Total
Whole Sample	47 (5.85)	705 (87.69)	52 (6.47)	804 (100%)
Early	5 (3.82)	112 (85.50)	14 (10.69)	131 (100%)
Expansion	23 (5.52)	376 (90.17)	18 (4.32)	417 (100%)
Buyout	17 (8.06)	182 (86.26)	12 (5.69)	211 (100%)
Turnaround	2 (4.44)	35 (77.78)	8 (17.78)	45 (100%)

Table 8: Distribution of investments by year

<i>Year</i>	<i># Entry</i>	<i># Exit</i>
1999	65	1
2000	252	10
2001	214	33
2002	54	107
2003	59	158
2004	114	169
2005	46	93
2006	0	143
2007	0	82
2008	0	8
Total	804	804

Figure 1: Distribution of investments by year

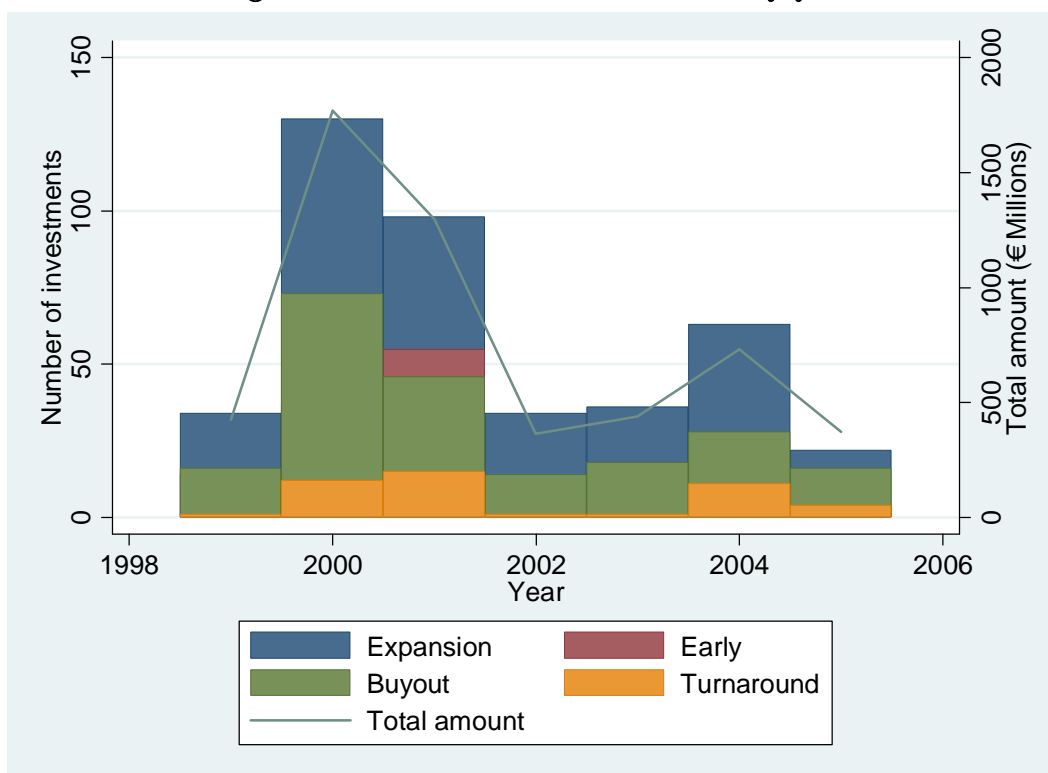


Table 9: Summary statistics for returns on the investments

	Mean	Median	SD	Min	Max	#Obs.
Total IRR (%)						
Whole Sample	33.17	36.50	34.45	-100.00	203.00	804
Early	26.16	36.00	42.54	-100.00	124.00	131
Expansion	34.30	35.00	29.55	-100.00	153.00	417
Buyout	37.19	38.00	32.91	-100.00	203.00	211
Turnaround	24.22	40.00	50.76	-100.00	115.00	45
Yearly IRR (%)						
Whole Sample	10.66	11.05	23.88	-100.00	93.34	804
Early	1.71	9.17	28.51	-100.00	33.57	131
Expansion	12.08	10.98	19.73	-100.00	77.85	417
Buyout	14.99	13.26	21.84	-100.00	96.34	211
Turnaround	3.34	12.81	40.55	-100.00	71.28	45

Table 10: Summary statistics for use and leverage of SPVs in investments

Presence of SPV	Freq.	%					# Obs.
Whole Sample	251	31.21					804
Early	8	6.10					131
Expansion	153	36.69					417
Buyout	76	36.01					211
Turnaround	14	31.11					45
	Mean	Med	SD	Min	Max	#Obs.	
Leverage if SPV (D/E)	3.48	3.00	0.055	2.00	5.00	251	

Descriptive Tables for Funds

Table 11: Distribution of funds by start year

<i>Year</i>	<i>Number</i>	<i>%</i>
1995	8	9.20
1996	19	21.84
1997	23	26.44
1998	21	24.14
1999	16	18.39
Total	87	100.00

Table 12: Summary statistics for private equity funds

	<i>Mean</i>	<i>Median</i>	<i>SD</i>	<i>Min</i>	<i>Max</i>	<i># Obs.</i>
Fund size (Million €)	62.05	56.80	35.07	8.4	182.2	87
Number of investments	9.24	9.00	3.20	3.00	19.00	87
Fund investment by type (%)^a						
Early	16.85	16.66	12.64	0.00	60.00	87
Expansion	53.29	54.54	16.09	11.76	100.0	87
Buyout	24.85	25.00	15.21	0.00	63.63	87
Turnaround	5.00	0.00	6.79	0.00	22.22	87
Weighted average total IRR per fund (%)	33.20	34.86	18.31	-65.22	90.71	87
Weighted average yearly IRR per fund (%)	11.33	11.73	13.67	-72.14	49.34	87
Exit (%)						
IPO	6.32	0.00	8.27	0.00	40.00	87
Trade	87.28	88.88	11.00	60.00	100.0	87
Write-off	6.38	0.00	7.76	0.00	33.33	87

NOTE: a) Percentage of the total deals performed by the fund on each of the investment types.

Descriptive Tables for Management Companies (MCO)

Table 13: Summary statistics for MCOs

	<i>Mean</i>	<i>Median</i>	<i>SD</i>	<i>Min</i>	<i>Max</i>	<i># Obs.</i>
MCO size (Million €)	93.07	62.10	79.60	10.5	445.05	58
Number of funds	1.50	1.00	0.88	1.00	5.00	58
Weighted average gross IRR per MCO (%)	36.81	34.04	12.31	17.08	90.71	58
Weighted average yearly IRR per MCO (%)	13.75	12.72	8.62	-6.20	49.34	58
Ownership of MCO (%)						
Banks and fin. inst.	51.38	55.00	40.37	0.00	100.00	58
Private investors	10.34	0.00	21.96	0.00	100.00	58
Ind. and Serv. Comp.	21.63	0.00	31.55	0.00	100.00	58
Public institutions	9.82	0.00	21.06	0.00	80.00	58
Other subjects	6.72	0.00	12.16	0.00	50.00	58

Other Tables

Table 14: Distribution of Covenants by Type of Investment

<i>Covenant</i>	<i># firms</i>	<i>% firms</i>	<i>Early (%)</i>	<i>Expansion (%)</i>	<i>Buyout (%)</i>	<i>Turnaround (%)</i>
Lock-up	50	6.22	6.11	5.52	8.06	4.44
Permitted transfer	145	18.03	13.74	18.94	18.96	17.78
Callable security	67	8.33	4.58	7.67	9.95	17.78
Puttable security	139	17.28	12.21	16.31	22.27	17.78
Tag-along right	706	87.81	86.26	88.49	86.63	91.11
Drag-along right	147	18.28	15.27	20.38	15.64	20.00
Right of first refusal	58	7.21	6.11	6.95	9.48	2.22
Exit ratchet	64	7.96	4.58	6.95	11.85	8.89
Covenants on debt	341	42.41	20.61	46.52	48.34	40.00

Table 15: Summary of Hypotheses on Determinants of IRR

<i>Variable</i>	<i>Effect</i>	<i>Other</i>
Initial Under-Valuation	Positive	More in small firms and firms with low/negative earnings
Un-Expected Growth	Positive	More if leveraged
Leverage of Investment	Ambiguous	
Duration of Investment	Ambiguous	Endogenous: instrumented with returns of previous investments
Covenants:		
• Lock-up	Positive	
• Permitted-Transfer Restrictions	Ambiguous	
• Callability	Neutral	
• Puttability	Positive	
• Drag-Along Rights	Positive	
• Tag-Along Rights	Positive	
• Rights of First Refusal	Neutral/Pos.	
• Exit Ratchet	Positive	
• Debt Covenants	Neutral/Neg.	Only applicable if leveraged newco is present

Table 16: Determinants of IRR (Whole sample)

The basic empirical specification is the following:

$$IRR = \alpha + \beta_1 Q + \beta_2 GROWTH + \beta_3 LEV + \beta_4 PERF + \sum_{i=5}^K \beta_i COV_{i-4} + CONTROLS'$$

where *IRR* is the yearly internal rate of return of the investment, *Q* is Tobin's q, *GROWTH* refers to the fundamental growth of the target firm, proxied by the yearly increase in sales, *LEV* is the leverage of the operation, *PERF* refers to the average past performance of the fund, and *COV_i* are dummy variables containing a one for the following covenants: lock-up clause, permitted transfer, puttable security, callable security, right of first refusal, drag-along right, tag-along right, and covenants on debt. We control for risk and other factors related to the quality of each investment, by adding investment size, fund experience (age of fund) and dummies for the type of investment (early, expansion, turnaround or buyout), for the industry of the target, and for the vintage year of each investment. Estimated coefficients for Equation (1) are on the complete sample. * significant at 10%; ** significant at 5%; *** significant at 1%. Robust standard errors are in brackets.

	1	2	3	4	5	6	7
	tobit	tobit	iv	tobit	tobit	tobit	tobit
Sales growth	1.401*** [0.224]		2.791** [1.194]	1.369*** [0.194]		1.361*** [0.195]	
Tobins q	-0.002 [0.019]	-0.014 [0.021]	0.014 [0.030]	-0.004 [0.020]	-0.015 [0.023]	-0.026 [0.020]	-0.029 [0.025]
Holding period	0 [0.001]	-0.005*** [0.001]	0.019 [0.013]				
Avg. prev. IRR	-0.102** [0.041]	0.026 [0.067]		-0.104*** [0.039]	0.068 [0.070]	-0.145*** [0.051]	0.077 [0.080]
Operation leverage (l	0 [0.024]	0.017 [0.027]	-0.013 [0.039]	0.002 [0.026]	0.022 [0.030]	0.03 [0.026]	0.032 [0.032]
Ln(assets)		0.081 [0.081]					-0.015 [0.139]
Ln(assets)^2		-0.008 [0.009]					0.003 [0.015]
LN 1+age at starting date of investment							-0.001 [0.022]
Puttable security				0.035** [0.017]	0.025 [0.023]	0.026 [0.017]	0.036* [0.019]
Callable security				-0.025 [0.037]	0.017 [0.042]	-0.014 [0.035]	0.01 [0.041]
Lock up				0.068*** [0.021]	0.138*** [0.027]	0.099*** [0.023]	0.149*** [0.032]
Exit ratchet				0.012 [0.051]	0.233*** [0.054]	0.009 [0.051]	0.215*** [0.048]
Permitted tranfer				0.012 [0.018]	0.016 [0.020]	0.004 [0.019]	0.017 [0.021]
Tag along right				0.018 [0.026]	0.016 [0.033]	0.009 [0.026]	0.018 [0.034]
Drag along right				0.02 [0.021]	-0.005 [0.022]	0.009 [0.020]	0.003 [0.019]
Right of first refusal				0.041 [0.025]	-0.007 [0.027]	0.027 [0.025]	-0.007 [0.023]
Covenants on debt				0.007 [0.021]	0.003 [0.025]	0.005 [0.020]	0.011 [0.026]
Buyout						0.057** [0.028]	0.063 [0.067]
Turnaround						-0.056 [0.061]	-0.066 [0.096]
Expansion						0.056** [0.025]	0.067 [0.063]
Y-IRR MKT						-0.082 [0.136]	-0.124 [0.167]
FREE						-7.074** [2.815]	-10.733*** [3.280]
Inv_vintage Dummy						Yes	Yes
Industry Dummy						Yes	Yes
Constant	0.019 [0.062]	0.097 [0.194]	-0.773 [0.567]	-0.007 [0.040]	0.055 [0.047]	0.202* [0.106]	0.287 [0.285]
Observations	717	717	717	717	717	717	717
F-stat	19.52	8.29		20.43	14.75	22.8	18.9
Prob>F	0	0		0	0	0	0

Table 17: Determinants of IRR (Buyouts)

The basic empirical specification is the following:

$$IRR = \alpha + \beta_1 Q + \beta_2 GROWTH + \beta_3 LEV + \beta_4 PERF + \sum_{i=5}^K \beta_i COV_{i-4} + CONTROLS'$$

where *IRR* is the yearly internal rate of return of the investment, *Q* is Tobin's q, *GROWTH* refers to the fundamental growth of the target firm, proxied by the yearly increase in sales, *LEV* is the leverage of the operation, *PERF* refers to the average past performance of the fund, and *COV_i* are dummy variables containing a one for the following covenants: lock-up clause, permitted transfer, puttable security, callable security, right of first refusal, drag-along right, tag-along right, and covenants on debt. We control for risk and other factors related to the quality of each investment, by adding investment size, fund experience (age of fund) and dummies for the type of investment (early, expansion, turnaround or buyout), for the industry of the target, and for the vintage year of each investment. The estimated coefficients for Equation (1) are on the sub sample of buyouts. * significant at 10%; ** significant at 5%; *** significant at 1%. Robust standard errors are in brackets.

	1	2	3	4	5	6	7
	tobit	tobit	iv	tobit	tobit	tobit	tobit
Sales growth	1.047*** [0.229]		1.699* [0.993]	0.975*** [0.204]		0.937*** [0.198]	
Tobins q	-0.022 [0.034]	-0.106* [0.056]	-0.029 [0.037]	-0.043 [0.040]	-0.094** [0.045]	-0.062 [0.037]	-0.118** [0.056]
Holding period	-0.002 [0.001]	-0.007*** [0.001]	0.01 [0.013]				
Avg. prev. IRR	-0.091 [0.069]	0.078 [0.087]		-0.062 [0.062]	0.118 [0.079]	-0.048 [0.088]	0.157 [0.101]
First investment							
Operation leverage (t	0.021 [0.042]	0.125* [0.066]	0.031 [0.048]	0.047 [0.049]	0.121** [0.055]	0.073 [0.047]	0.146** [0.069]
Ln(assets)		-0.526* [0.310]					-0.132 [0.279]
Puttable security				0.057** [0.023]	0.046 [0.030]	0.073*** [0.026]	0.072*** [0.028]
Callable security				0 [0.034]	0.07 [0.042]	0.015 [0.034]	0.076 [0.051]
Lock up				0.094** [0.036]	0.140*** [0.042]	0.092*** [0.033]	0.107** [0.041]
Exit ratchet				0.085 [0.054]	0.282*** [0.057]	0.051 [0.053]	0.237*** [0.048]
Permitted tranfer				0.024 [0.027]	0.03 [0.033]	-0.006 [0.026]	0.007 [0.033]
Tag along right				-0.065* [0.034]	-0.064* [0.039]	-0.064** [0.029]	-0.054* [0.032]
Drag along right				0.01 [0.041]	-0.007 [0.047]	0.013 [0.043]	0.014 [0.050]
Right of first refusal				0.035 [0.034]	-0.001 [0.044]	0.056* [0.034]	0.016 [0.045]
Covenants on debt				0.014 [0.021]	-0.011 [0.030]	0.014 [0.025]	0.001 [0.030]
Y-IRR MKT						0.273* [0.145]	0.172 [0.153]
FREE						2.449 [3.385]	0.612 [4.136]
Ln(assets)^2		0.044 [0.028]					0.009 [0.025]
LN 1+age at starting date of investment							0.008 [0.034]
Inv_vintage Dummy						Yes	Yes
Industry Dummy						Yes	Yes
Constant	0.153* [0.085]	2.054** [0.936]	-0.267 [0.489]	0.144** [0.068]	0.255*** [0.072]	0.046 [0.128]	0.571 [0.858]
Observations	177	177	177	177	177	177	177
F-stat	22.04	14.15		10.03	11.85	187.52	171.64

Table 18: Determinants of IRR (Expansion)

The basic empirical specification is the following:

$$IRR = \alpha + \beta_1 Q + \beta_2 GROWTH + \beta_3 LEV + \beta_4 PERF + \sum_{i=5}^K \beta_i COV_{i-4} + CONTROLS'$$

where *IRR* is the yearly internal rate of return of the investment, *Q* is Tobin's q, *GROWTH* refers to the fundamental growth of the target firm, proxied by the yearly increase in sales, *LEV* is the leverage of the operation, *PERF* refers to the average past performance of the fund, and *COV_i* are dummy variables containing a one for the following covenants: lock-up clause, permitted transfer, puttable security, callable security, right of first refusal, drag-along right, tag-along right, and covenants on debt. We control for risk and other factors related to the quality of each investment, by adding investment size, fund experience (age of fund) and dummies for the type of investment (early, expansion, turnaround or buyout), for the industry of the target, and for the vintage year of each investment. Estimated coefficients for Equation (1) are on the sub sample of expansion. * significant at 10%; ** significant at 5%; *** significant at 1%. Robust standard errors are in brackets.

	1	2	3	4	5	6	7
	tobit	tobit	iv	tobit	tobit	tobit	tobit
Sales growth	6.713*** [1.273]		5.854 [10.239]	4.650*** [0.936]		6.526*** [1.151]	
Tobins q	0.23 [0.172]	0.296 [0.187]	0.667 [2.369]	0.164 [0.165]	0.252 [0.187]	0.398** [0.188]	0.309 [0.247]
Holding period	0.009*** [0.003]	0.001 [0.002]	0.035 [0.149]				
Avg. prev. IRR	-0.015 [0.146]	-0.211 [0.245]		-0.161 [0.179]	-0.293 [0.260]	-0.194 [0.156]	-0.22 [0.205]
First investment							
Operation leverage (t	-0.368 [0.247]	-0.458* [0.273]	-1.019 [3.522]	-0.28 [0.237]	-0.413 [0.271]	-0.579** [0.271]	-0.509 [0.351]
Ln(assets)		0.258 [0.615]					-0.055 [0.519]
Puttable security				0.129*** [0.046]	0.056 [0.039]	0.073 [0.060]	0.072 [0.068]
Callable security				0.012 [0.065]	0.110* [0.057]	0.036 [0.069]	0.089* [0.052]
Lock up				0.028 [0.046]	0.134* [0.072]	0.058 [0.051]	0.08 [0.084]
Exit ratchet				-0.21 [0.185]	-0.193 [0.254]	-0.315* [0.185]	-0.233 [0.249]
Permitted tranfer				0.012 [0.056]	-0.007 [0.086]	0.003 [0.077]	-0.015 [0.111]
Tag along right				-0.068 [0.046]	-0.083 [0.060]	-0.032 [0.044]	-0.007 [0.073]
Drag along right				0.096** [0.046]	0.105** [0.043]	0.056 [0.043]	0.072* [0.041]
Right of first refusal				-0.027 [0.065]	0.065 [0.055]	-0.086 [0.066]	0.062 [0.069]
Covenants on debt				0.063 [0.051]	0.033 [0.049]	0.055 [0.049]	0.019 [0.047]
Y-IRR MKT						-0.28 [0.550]	-0.665 [0.748]
FREE						-4.438 [12.744]	-22.1 [17.481]
Ln(assets)^2		-0.043 [0.101]					0.005 [0.086]
LN 1+age at starting date of investment							0.032 [0.069]
Inv_vintage Dummy						Yes	Yes
Industry Dummy						Yes	Yes
Constant	-0.785*** [0.246]	-0.66 [0.998]	-2.286 [9.018]	-0.242 [0.178]	-0.169 [0.196]	-0.313 [0.385]	0.542 [1.184]
Observations	119	119	119	119	119	119	119
F-stat	7.44	0.65		4.46	1.42	7.35	20.68

Table 19: Determinants of IRR (Early)

The basic empirical specification is the following:

$$IRR = \alpha + \beta_1 Q + \beta_2 GROWTH + \beta_3 LEV + \beta_4 PERF + \sum_{i=5}^K \beta_i COV_{i-4} + CONTROLS'$$

where *IRR* is the yearly internal rate of return of the investment, *Q* is Tobin's q, *GROWTH* refers to the fundamental growth of the target firm, proxied by the yearly increase in sales, *LEV* is the leverage of the operation, *PERF* refers to the average past performance of the fund, and *COV*_{*i*-4} are dummy variables containing a one for the following covenants: lock-up clause, permitted transfer, puttable security, callable security, right of first refusal, drag-along right, tag-along right, and covenants on debt. We control for risk and other factors related to the quality of each investment, by adding investment size, fund experience (age of fund) and dummies for the type of investment (early, expansion, turnaround or buyout), for the industry of the target, and for the vintage year of each investment. Estimated coefficients for Equation (1) are on the sub samples of early investments. * significant at 10%; ** significant at 5%; *** significant at 1%. Robust standard errors are in brackets.

	1	2	3	4	5	6	7
	tobit	tobit	iv	tobit	tobit	tobit	tobit
Sales growth	1.256*** [0.266]		1.611** [0.801]	1.185*** [0.196]		1.175*** [0.194]	
Tobins q	-0.006 [0.018]	-0.014 [0.026]	-0.007 [0.019]	0.005 [0.017]	-0.005 [0.021]	-0.004 [0.016]	0.008 [0.026]
Holding period	0.001 [0.001]	-0.005*** [0.001]	0.005 [0.008]				
Avg. prev. IRR	-0.027 [0.035]	0.107* [0.064]		-0.035 [0.031]	0.158* [0.086]	-0.021 [0.037]	0.215** [0.098]
First investment							
Operation leverage (l	0.01 [0.024]	0.022 [0.032]	0.013 [0.026]	-0.007 [0.023]	0.005 [0.027]	0.007 [0.021]	-0.018 [0.035]
Ln(assets)		-0.177 [0.120]					-0.313** [0.141]
Puttable security				0.005 [0.029]	-0.016 [0.038]	0.002 [0.028]	0.003 [0.034]
Callable security				0.009 [0.037]	0.025 [0.042]	0.003 [0.037]	0.001 [0.043]
Lock up				0.057* [0.029]	0.102*** [0.037]	0.084*** [0.031]	0.101** [0.050]
Exit ratchet				0.061 [0.048]	0.198*** [0.051]	0.07 [0.048]	0.216*** [0.049]
Permitted tranfer				0.026* [0.014]	0.030* [0.017]	0.019 [0.013]	0.033 [0.020]
Tag along right				0.090** [0.041]	0.073 [0.052]	0.085** [0.041]	0.092* [0.051]
Drag along right				-0.003 [0.018]	-0.026 [0.023]	-0.002 [0.016]	-0.011 [0.020]
Right of first refusal				0 [0.042]	-0.053 [0.042]	-0.011 [0.043]	-0.048 [0.044]
Covenants on debt				0.009 [0.017]	0.033 [0.020]	0.003 [0.018]	0.031 [0.022]
Y-IRRMKT						0.025 [0.098]	0.108 [0.122]
FREE						-7.422** [3.150]	-9.333** [3.986]
Ln(assets)^2		0.021 [0.013]					0.039** [0.016]
LN 1+age at starting date of investment							0.051 [0.034]
Inv_vintage Dummy						Yes	Yes
Industry Dummy						Yes	Yes
Constant	0.017 [0.071]	0.633** [0.302]	-0.17 [0.341]	-0.062 [0.048]	0.004 [0.059]	0.232** [0.105]	0.839*** [0.322]
Observations	380	380	380	380	380	380	380
F-stat	16.68	9.93		15.6	11.15	30.65	10.34

Table 20: Determinants of IRR (Turnaround)

The basic empirical specification is the following:

$$IRR = \alpha + \beta_1 Q + \beta_2 GROWTH + \beta_3 LEV + \beta_4 PERF + \sum_{i=5}^K \beta_i COV_{i-4} + CONTROLS'$$

where *IRR* is the yearly internal rate of return of the investment, *Q* is Tobin's q, *GROWTH* refers to the fundamental growth of the target firm, proxied by the yearly increase in sales, *LEV* is the leverage of the operation, *PERF* refers to the average past performance of the fund, and *COV_i* are dummy variables containing a one for the following covenants: lock-up clause, permitted transfer, puttable security, callable security, right of first refusal, drag-along right, tag-along right, and covenants on debt. We control for risk and other factors related to the quality of each investment, by adding investment size, fund experience (age of fund) and dummies for the type of investment (early, expansion, turnaround or buyout), for the industry of the target, and for the vintage year of each investment. Estimated coefficients for Equation (1) are on the sub sample of turnaround finance. * significant at 10%; ** significant at 5%; *** significant at 1%. Robust standard errors are in brackets.

	1	2	3	4	5	6	7
	tobit	tobit	iv	tobit	tobit	tobit	tobit
Sales growth	2.579*** [0.889]		2.895 [7.445]	1.701 [1.361]			
Tobins q	-0.410*** [0.131]	-0.132 [0.274]	-0.403 [0.792]	-0.400** [0.157]	-0.373** [0.152]		
Holding period	0 [0.006]	-0.006 [0.005]	0.007 [0.096]				
Avg. prev. IRR	0.042 [0.292]	-0.567* [0.313]		0.281 [0.356]	0.214 [0.347]		
Operation leverage (L)	0.545*** [0.177]	0.178 [0.329]	0.531 [0.988]	0.687*** [0.229]	0.697*** [0.228]		
Ln(assets)		1.451 [1.083]					
Puttable security				0.196 [0.177]	0.322* [0.163]		
Callable security				-0.383 [0.232]	-0.498** [0.223]		
Lock up				0.442 [0.410]	0.575 [0.405]		
Exit ratchet				0.137 [0.456]	0.607*** [0.192]		
Permitted tranfer				-0.021 [0.160]	-0.019 [0.177]		
Tag along right				0.275 [0.273]	0.361 [0.281]		
Drag along right				-0.02 [0.140]	-0.009 [0.142]		
Right of first refusal				0.430* [0.249]	0.460* [0.233]		
Covenants on debt				-0.536 [0.390]	-0.713** [0.330]		
Constant	0.213 [0.271]	-3.427 [3.267]	-0.007 [2.938]	0.03 [0.227]	0.019 [0.211]		
Ln(assets)^2		-0.137 [0.098]					
Observations	42	42	42	42	42		