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What am I paying my PE fund manager for?

Empirical evidence from the Italian market

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Abstract

This paper examines how leveraged buyouts with Italy as target country created value for the most recent regional wave started in 2005, by examining the performance and returns to capital for 70 buyouts happened between 2007 and 2013. We observe that the average returns to capital result depressed compared to studies from the 1990s, but consistent if we consider the sub-sample of deals with observable exit price, suggesting an ability of fund managers in achieving greater than average exit multiples. The changes in debt levels are slightly less marked than the previous period in accordance with the credit crunch happened during the examined time frame and the reduced access to credit for small businesses. Operating gains appear modest and unable to explain the significant return to capital achieved by the fund managers, which are shown to be equally reliant on tax benefits from increased debt levels and increasingly on multiples expansion. Cross-sectional regressions with the mentioned value drivers as independent variables are found non-significant, evidencing the complexity of the private equity value creation process and the singularities of successful investments.

Acknowledgement

To my parents, for their tireless support, for believing in me when nobody did and for giving me the opportunity to chase my dreams.

To my beloved partner, Federica, for her precious counsels, for her patience toward my temperament and, more importantly, for giving me the honour of walking our path together.

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1 Introduction

It was November the 30th 1988 when Private Equity firm Kohlberg, Kravis, Roberts & Co (better known nowadays as KKR), after a strenuous battle with the management of gigantic RJR Nabisco, captained by Canadian born CEO F. Ross Johnson, finally took the company private for $24.88bn in which turned out to be the biggest LBO in history. Under the surface of books and movies celebrating the amazing venture lurks a sad truth: in pure investment terms, the RJR Nabisco takeover was a Waterloo; they devoted a massive amount of time, energy and dollars to an investment that preserved investor's equity, but failed to add value. However, if we take into account the nearly $500mn in transaction, advisory and other fees, including 1.5% management fee that netted $279mn over five years, the deal turns into a sweet one for KKR and its executives. Investors in the fund, though not exactly enthralled, were left with no choice, since they couldn't pull out and the PE giant got to control most of their money until at least the end of the decade. KKR fund put $3.1bn into RJR Nabisco at $5.62 per share on a cost-adjusted basis, and six years later unloaded the last of the fund's shares at about $5.73. At the end of the story investors must have thought "What am I paying my fund manager for?".

Private Equity firms made their first appearance during the 1980s and they were acclaimed by many as a superior managerial form that would have enabled to capture the value destroyed by agency problems in public firm. Since then Private Equity funds have grown from a tiny part of the financial market to a global force, representing 25% of global M&A activity as of 2007 (Jensen, 2007). This happened through three major waves: the first wave, as mentioned, began in 1982 and was characterized by huge leveraged buyouts made possible thanks to cheap debt availability provided by the junk-bonds market; second wave, started in 1992 with institutionalized private equity firms, which enjoyed better reputation than their predecessors, was later fuelled by the advent of dot-com companies and finished abruptly in 2001 when the bubble finally burst; finally third wave, which ran from 2003 to 2007, was spurred by decreasing interest rates, relaxed lending standards, tighter regulatory rules for publicly traded firms and new CLO debt instruments, and registered the highest private equity activity to date. Several macroeconomic trends combined with a favourable environment (credit availability thanks to quantitative easing, investors hungry for yield, PE with huge reserves of "dry powder") are suggesting that we are on the edge of a fourth wave (Moszoro & Koscielecka, 2013). This classification, however, cannot be rigidly applied and every country experienced slightly different windows of PE activity. One interesting case is the Italian market, where the number and profile of operators have been historically influenced by the regulatory framework, which disciplined the legal structures allowed to invest in risk capital, and de facto determined the evolution of the sector.

The abrupt growth of the industry spurred prosperous academic research on the value creation tools of PE firms and the performance of targets subject to leveraged transactions and a substantial body of empirical work from the 1980s showed that LBOs actually create value. In light of the renewed interest in the industry and the peak in PE activity that is being registered worldwide, and especially in the Italian market, our main research questions will be to 1) analyse the impact of private equity ownership on the characteristics and performance of target firms; 2) compute the return achieved by the industry and understand how each of the three mentioned value creation drivers (Operational Engineering, Financial Engineering, Multiple Expansion) contribute to the overall performance. The

paper, following an approach similar to the one in "Do Buyouts (Still) Create Value?" (Guo, et al., 2011) on the US market, will try to provide a comprehensive picture and evidence on value creation by PE firms and show how each source impacts on the return on capital invested; the research takes two original angles: first, it will focus on the Italian market, which has been mostly overlooked due to its peculiar characteristics, small dimension, and low-value transactions; secondly, fill the gap with previous research examining the most recent period (2007-2016) upon which there is little (or no) evidence and that coincides with a new wave of PE activity in the country under consideration.
The remainder of this paper is structured as follows. Section 2 elaborates on the actors, mechanisms, fees and legal structures governing the private equity industry. Section 3 offers descriptive statistics on the current Italian private equity market and on its evolution. In Section 4, we provide an outline of previous academic studies and researches carried out on the topic. Section 5 explains the methodology employed in our study. Section 6 deals with data description, examining the sample composition and main operating and financial characteristics. In Section 7 we engage in data analysis, describing the effect of private equity ownership on the portfolio firms and the returns achieved at the outcome date. Section 8 concludes.

2 How Does the Private Equity Industry Works?

2.1 The Leveraged Buy-out

Leveraged buyout literally means acquisition throughout debt and consists in the acquisition of a company employing a relatively large portion of debt and a relatively small amount of equity. Sponsors of the initiative can be the managers of the company (management buy-out), the workers of the company (workers buy-out) or the managers of a different firm (management buy-in). However, most commonly, the investment is carried out by specialized investment firms that today refer to themselves (and are usually referred to) as private equity firms. The sponsor's ultimate goal is to realize a return on the equity investment at the time of exit, usually through a sale or a public offer, historically aiming at annualized returns in excess of 20% within an investment horizon of five years. What makes the transaction extremely profitable is the ability to leverage the relatively small equity investment and exploit the additional benefits of tax savings realized due to the tax deductibility of interest expenses. However, the exploitation of the leverage effect and the overall buyout transaction must meet the following feasibility requirements: 1) Financial compatibility: the resulting enterprise after the merger must be able to reimburse the borrowed capital; 2) Economic compatibility: the firm must produce an operating profit (EBIT) sufficient for the payment of the financial interests on the outstanding debt; 3) reasonableness of the buyout project.
A typical leveraged buyout provides for the creation of a special purpose vehicle (*newco*) in which the financial resources of the buyer are contributed in the form of equity (capital) and debt (leverage). In the next phase the newco transfer the assets to the target company receiving in return shares thereof, or, more frequently, merges with the target firm. The debt assumed is then paid off with the cash flows generated by the acquired company or by selling off nonstrategic divisions and assets. The resources employed to finance the buyout project can, more specifically, be divided in equity, senior debt and junior (subordinated) debt. Equity consists of the contribution made by the shareholders of the newco during its capital subscription and it generally represents from 30% to 40% of the total investment needed for the execution the buyout (Rosenbaum & Pearl, 2009). Different categories of investors may

be awarded shares at different prices: managers usually buy stocks at the nominal price, while institutional investors often pay a premium. Debt, instead, has typically comprised 60% to 70% of the financing structure (Rosenbaum & Pearl, 2009). Senior debt is defined as the full set of medium- and long-term financings, usually provided by banks or banking syndicates, characterised by a privileged repayment clause with respect to other debt categories, such as the subordinated one. Junior debt consists of the full set of financings whose repayment is subordinated to the satisfaction of senior debt and privileged with respect to risk capital. This category is generally composed of medium- to long-term borrowing characterised by high-interest remuneration, an example of which are the high-yield bonds. Attractive LBO candidates are characterised by stable and predictable cash flows, as well as substantial assets, thanks to their ability to support larger amounts of debt and offer greater security to lenders. Robust cash-flow generation is required to service periodic interest payments and gradually reduce debt throughout the life of the investment. A consistent asset base increases the amount of bank debt (the cheapest financing mean) available for borrowing by providing higher principal recovery prospects in the event of a bankruptcy. Other features that make a company a strong LBO candidate are: having growth potential, being in a leading and defensible market position, having low CapEx requirements in order to enhance the cash-flows generation and presenting opportunities to improve operational efficiencies and generate cost savings (Rosenbaum & Pearl, 2009).

The LBO in Italy was prohibited until 2004 when the business reform with the art. 2501-bis allowed the leveraged buyout transactions, authorizing a company to raise finances to acquire a target firm with which to merge thereafter. More specifically, the art. 2358 of the Civil Code prohibited an entity to lend money or give guarantees to other subjects for the acquisition of its own shares; the LBO, providing for the transfer of the acquisition debt on the target company, constituted a violation of the regulation. The legislative decree n.142 introduced in 2008, further innovated and simplified the previous rules, allowing financial assistance and repurchase of own shares, under mandatory conditions, and offered more flexibility to M&A actors. The classic LBO scheme pre-reform envisaged the creation of the newco, debt raising through a bridge loan, target firm acquisition, repayment of the bridge loan and debt assumption on the target company. Under the new regime, instead, bridge loans of considerably lower amounts are required and, in some cases, the complete by-pass of this intermediate form of financing has become possible.

2.2 Private Equity Firms

A typical private equity company is organized as a limited partnership or a limited liability corporation. In the 1980s they used to be decentralised and extremely nimble organizations with relatively few investment professionals and employees. The exponential growth of the sector, which is still ongoing nowadays, led to a substantial increase in the size of these organizations, with mega-funds now counting thousands of employees and hundreds of investment professionals[1]. The Italian private equity sector had, instead, a rather different evolution. In the early years of the sector development, local operators, organized in holdings and investment companies, accounted for virtually all the active players in the market. Later on, in the 1980s, the market saw the progressive increasing presence of pan-European and global operators, together with bank-owned investment vehicles, which represented initially 50% of

[1] Among the biggest PE firms the 2017 PEI300, the list, redacted by Private Equity International, of the biggest private equity funds on the market, reports: Blackstone (2,200 employees and 250 investment professionals) KKR (1,250 employees and 370 investment professionals) and The Carlyle Group (1,555 employees and 625 investment professional).

the total number of operators. In the mid-1990s, the first SGR (closed-end equity funds) began to operate, instituted by the Law n. 344 of 14th August 1993. These firms, which initially represented only 1% of the market, progressively consolidated their presence (accounting for 30% of all the operators in 2007) and counterbalanced the decline of banks' direct involvement in LBO transactions, which broadly stabilised around 10%. Financial institutions, however, continue to play a major role in the Italian private equity industry as investors in private equity funds (Bentivogli, et al., 2009).

2.3 Private Equity Funds

A private equity firm raises equity capital through a private equity fund. These funds are "closed-end" investment vehicles in which investors commit to provide an agreed amount of money to pay for investments in target companies and remunerate the private equity firm with management fees[2]. As mentioned, legally, private equity funds are generally organized as limited partnerships (eg. Blackstone Capital Partners VII, L.P.), which offers two advantages: first and foremost, investors are exposed to limited liability and should anything go wrong in the investment process (bankruptcy, lawsuits etc.), the investors risk only the committed capital; secondly, a limited partnership is a pass-through entity for income tax purposes and helps to solve the problem of duplicating tax charges. To raise and operate a private equity fund two main actors are required: a financial sponsor and a group of investors. The sponsor is the team of professionals who identify, execute and manage investments in privately-held operating businesses and is generally comprised of a Manager (or Management Company) and a General Partner (GP). The Manager is the firm that structures the partnership, employs the investment professionals and is ultimately responsible for managing the fund being raised (eg. Blackstone Capital Partners, LLC). The General Partner of a fund is organized as a limited partnership controlled by the fund Manager and is the entity with legal authority to make all investment decisions for the fund and that assumes legal liability. The GP has a fiduciary responsibility to act for the benefit of the investors and is fully liable for its actions. It is customary for the general partner to provide at least 1% of the total capital (Bratton & McCahery, 2015). Because the funds, as discussed, are usually organized as limited partnerships, the investors are referred to as limited partners (LPs). The limited partners, who typically include institutional investors (such as corporate and public pension funds, endowments and insurance companies) as well as wealthy individuals, provide the equity capital to execute the investments; they have limited liability and usually priority over GPs upon liquidation of the partnership, but they have no control over the daily management of the fund (Fenn, et al., 1995).
In some instances, the amount of capital required to make an investment may be larger than a fund is comfortable committing to a single investment. In these cases, LPs are often utilized as potential co-investors, investing side-by-side with the fund in a deal. The co-investment doesn't count toward the committed capital and increasingly more LPs are attracted by the prospect of higher returns and lower fees and carried interest charges (Preqin, 2015).
The total amount that each investor commit to a fund over the life of the fund and that is at financial sponsor's disposal is called committed capital. It is not paid by the LPs all at once when the fund is created but rather drawn over time on an as-needed basis (to make investments, pay management fees etc.). More specifically, when an investment is made, the GP makes a capital call to its investors in order to receive the capital required to perform the

[2] In a "closed-end" fund, investors can't withdraw their money until the fund is terminated. This contrast with mutual funds, where, for example, investors are free to withdraw their investments at any time.

transaction. Capital calls are made as a percentage of total committed capital (i.e. a fund may call 10% of total committed capital from all LPs) and investors are usually given at least ten business days' notice prior to a drawdown. The fund typically has a fixed life of ten years, but can generally extend for an additional three years. The financial sponsors, therefore, have around five years to deploy the committed capital and the remaining five to eight years to return money to the LPs. After committing their capital, the LPs have little say on how the general partners deploy the investment funds. Some restrictions, however, could span from the covenants included in the Limited Partnership Agreement (LPA). Common covenants include restraints on how much fund capital can be invested in a single company, on the types and sectors of securities a fund can invest in, and on debt at the fund level. Evidence suggests that contractual pressure of covenants usually lead to identifying better deals and that good quality PE firms tend to have covenants-rich contracts, being less concerned by their constraints (Casellia, et al., 2013).

Historically, many private equity houses have had very limited contacts with their investors when they were not fundraising. Today, with increasing competition and sophistication in the sector, GPs have responded by developing investor relation strategies that are far more comprehensive than they used to be. Based on the terms of a legal contract between investors and the GP, there is an obligation for very basic details on a fund status and performance, but in reality the LPs expects and receive considerably more. The most important part of LP reporting is fund reports, which are typically provided on a quarterly basis (although some funds still report on a semi-annual basis). A report generally includes portfolio companies' information and valuation, fund level information and market monitoring. Also annual general meetings (AGMs) are widely regarded as an opportunity to receive up to date information, and meet executives and other investors in an informal setting. The rigour of going through the executed investments, analyse performances, together with multiple Q&A sessions, strengthen and bring to life the GP-LP relationship and provides useful insights to investors and inputs to investment executives. Among other widely employed communication channels, we report ad-hoc and face to face contacts, which are effective ways for LPs to monitor the portfolio and for GPs to incorporate feedback, hospitality, advisory committees, intranet and marketing (Moon, 2006).

2.4 Fee Structure

The private equity firm is remunerated primarily in two ways: Management Fees and Incentive Fees. Management fees are fees intended to compensate a fund manager for its day to day work of investing, whether or not the investments prove to be profitable. Almost all money managers, such as mutual funds and asset managers, charge management fees. Management fees are usually expressed as the product of a Calculation Rate and a Calculation Base. For Private Equity investors, the calculation rate is a percentage stated in the GP's marketing material and the fund's offering documents (private placement memorandum [PPM] and limited partnership agreement [LPA]). The market rate for management fees is approximately 1.5%-2% (Jacobides & Saavedra, 2015). The calculation base is the fund's aggregate capital commitment during the fund's investment period, which corresponds to the first three to five years during which a fund is allowed to invest in portfolio companies. Often, after the end of the fund's investment period, the management fee is reduced to a percentage of actual invested capital or a reduced percentage of the overall original committed capital. Management fees often deviate from the market rate of 1.5%-2% of the funds capital commitments: for example, larger funds or funds with less oversight and monitoring requirements

typically charge lower rates while smaller or first-time funds may have management fees around 2.5%; for real estate funds, instead, management fees are often based on the amounts invested in properties. Fees' rates vary also based on the investor type, with different LPs charged different management fees at times. In fact, large investors may require reduced management fees while affiliates or other employees of the GP who invest in the fund are often totally exempted from management fees (Steinman, 2014).

Incentive fees, known as "carried interest", are intended to compensate GPs for investing profitably and are computed as a percentage of profits generated by the private equity firm. The amount of the carried interest and the way in which it is distributed is set out in the distribution waterfall of the fund's partnership or operating agreement. 20% of the profits is the most typical rate. Distributions of carried interest are typically subordinated to the return of capital contributions and the preferred return of funds' investors, which generally range from 6% to 8%. Despite these figures have been industry practice since the 1990s we are witnessing growing pressure form GPs to revise the numbers, reflecting the current and persistent low interest rate environment (Jacobides & Saavedra, 2015). The timing of the payment of carried interest is unpredictable and depends on the profitability of the funds. Carried interest is generally taxed as capital gain to the general partners of the fund. Private equity funds usually also include provisions that enable the general partner to charge ancillary fees for services provided to portfolio companies. These fees are generally charged to portfolio companies directly, rather than to LPs, but they have a similar effect in reducing the value allocable to investors in the fund. They may include fees for arranging acquisitions or divestitures of assets, monitoring portfolio companies and attending board meetings, arranging financing and much more. Interestingly, the share of transaction fees that PE funds charge to investors rose from 63% in 2006 to 81% in 2013. This trend only covers disclosed transaction fees but in the US a SEC investigation on 400 private equity sponsors found that half of the funds collected fees not disclosed to the investors. This recently raised significant suspects of "double dipping" practice: GPs charging portfolio companies, jeopardizing their financial position, to pay investment professionals, whose salary should be already covered by the management fees. The scope and amounts of these fees are often (intentionally) very broadly defined. However, such fees may be sometimes partially or totally offset by reductions in the management fee payable by LPs. This reduces the likelihood that the GP will engage in opportunistic behaviours (for example making portfolio companies engage in acquisitions at inflated prices) in order to generate additional fees (Jacobides & Saavedra, 2015).

Despite we now covered the main fees and expenses that private equity investors may expect to encounter and that accrue to fund managers, there are still other ways in which projected returns can leak out LPs pockets into those of other parties. Two of the most common leakages are placement fees and related-party transaction fees and expenses. Placement fees are fees paid to intermediaries and marketers for introducing investors to a private equity fund; 2% to 4% of the committed capital are typical placement fees. Such fees are usually charged as an access price to smaller investors, while investors who can make large commitments are rarely charged placement fees. Related-party fees and expenses arise when entities related or affiliated to, but distinct from, the general partner provides services to the portfolio companies in the fund. Related-party services may include accounting, property management, brokerage and provision of credit facilities (Beekman Wealth Advisory, 2013).

3 The Italian Private Equity Market

The birth in Italy of a proper sector of professional operators specialized in equity investments dates back to the 1980s, when nine bank-originated private financial investment firms got together to give birth to a trade association called AIFI (which stands for Italian Association of Financial Investors and it is now better known as Italian Association of Private Equity and Venture Capital[3]).

Over the years, the number and profile of operators significantly evolved in accordance to changes in the financial and economic landscape and the progressive reform of the regulatory framework disciplining the legal structures employed for the investment activity. Initially, and until 1986, credit institutions were not allowed to invest in risk capital, ruling out one of the most active and financially rich categories of players from the investment activity. It was only subsequently, with the ruling of the CICR (International Committee for the Credit and Saving) and the intervention of the Bank of Italy, that these financial institutions were finally allowed to the investment activity, despite within some strictly defined limits. A milestone in the development of the sector was the formal institution, in 1993, of close funds under Italian law, which became the principal vehicle for investing in private companies. The birth of close funds gave rise to a quick expansion of the private equity market, which exploded between 1997 and 2001 when the advent of new ITC technologies attracted financial resources and operators. After a relatively stable period, activity started to peak again in 2005, identified as the first year of the new wave, marked by renewed sparkle and interest in early stage firms (Bentivogli, et al., 2009).

In the following pages, we will present and describe the principal descriptive statistics about the Italian private equity market in the window period from 2003 to 2016, providing insights on the evolution of the sector's dynamics and players through targeted comparisons. The analysis will be broken down into the following categories: operators, fundraising, investments, and disinvestments. The data analysed have been previously collected and elaborated by AIFI in collaboration with PricewaterhouseCoopers Transaction Services as part of their semi-annual surveys on the Italian private equity and venture capital markets.

Following some methodology indications in order to assist the reader in the interpretation of the of the illustrated data. The fundraising activity regards the independent operators having the Italian market as specific focus (SGR and investment companies) and the Italian captive operators, which does not carry out independent fundraising activities but rather receive financing by the parent companies. In this case, the invested capital during the period is used as a proxy of the raised capital. Excluded from the statistics are instead international operators, since they do not provide a formal pre-allocation of the raised funds for the various target countries and public investors. With regards to the investment activity, the invested amounts include only equity and semi-equity investments and do not refer to the aggregate transaction amount. Both new investments and follow-on investments in already participated firms are included in the sample. The aggregate sample consists of the amount invested in Italian and foreign target companies by local sponsors and the amount invested in Italian targets by international operators. Finally, the

[3] AIFI was established in 1986 to represent the interests of institutional investors in the risk capital. Among the activities carried out by the association, aimed at supporting the development on the private equity market in Italy and abroad, there are a sustained effort to improve and refine the regulatory framework through a steady interaction with the relevant legislative bodies, a continued commitment intended to improve the industry perception and awareness and the drafting of periodic reports on the private equity market activity and players operating on the Italian territory.

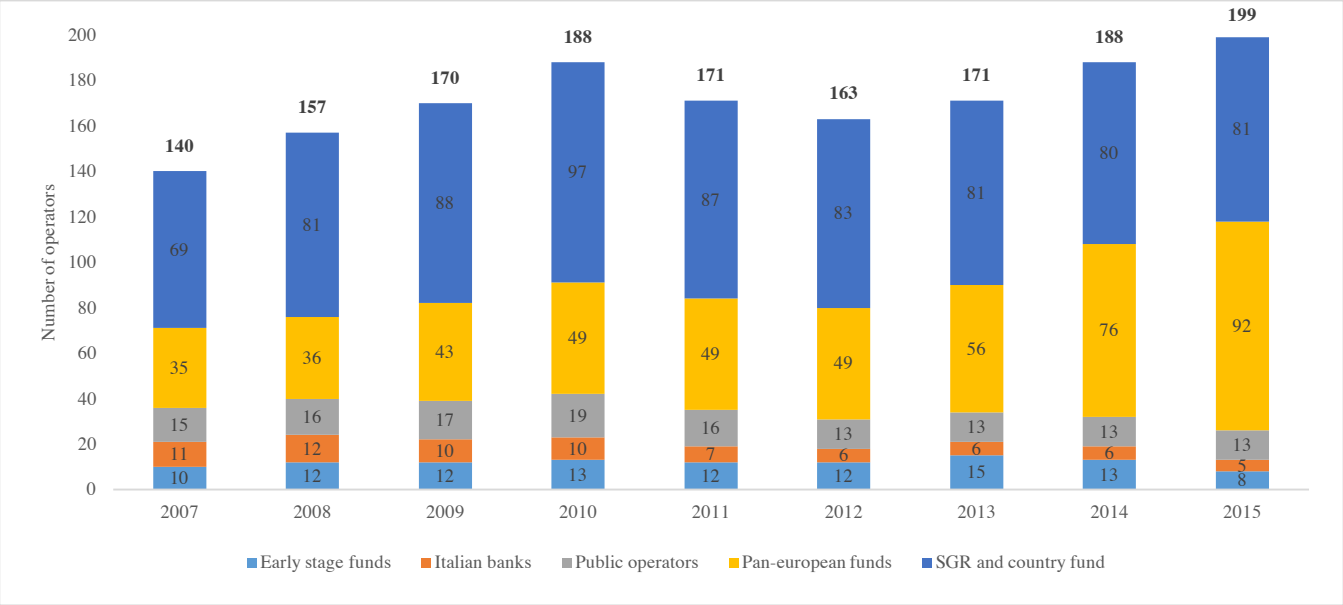
aggregate statistics about the disinvestment activity refers to the overall executed divestitures accounted for at acquisition cost rather than exit value.

The methodology outlined, despite differing from the one employed in our empirical analysis in various regards[4], is considered extremely insightful in providing the reader an understanding of the characteristics of the Italian private equity industry while offering a more comprehensive picture of the sector development.

3.1 Operators

The European Data Cooperative monitors overall more than 3,000 private equity operators active in Europe, both with headquarters in the continent and with a significant presence on the territory. All the subjects operating in Italy are included in the present analysis, which therefore comprises all AIFI associates, other Italian investors not part of the AIFI community, and foreign private equity players that executed investments in the country.

Figure 1 – Evolution of Operators by Type



As of 2015, pan-European funds make up 46% of the total number of operators, followed by SGR and country funds (41%); public investors, banks and early-stage funds lag far behind, with a total contribution of just 13% (Figure 1). The graph shows a clear growth trend of the number of operators active in Italy, which registered an overall growth of 42% throughout the 2007-2013 window period, with a slight decline in the years 2011 and 2012. Pan-European funds recorded the greatest increase in presence, going from 35 in 2007 to 92 in 2015 (+163%), and count, as of 2015, the greatest number of operators, overcoming SGR and country funds even though their sizeable increase of +17%. The surge was partially counter-balanced by a drop of bank involvement in the sector (-55%) and public operators (-13%) (in accordance with the dynamic, hallmark of the Italian market, described in section 2.2) and of early-stage funds.

[4] In our analysis, invested capital is referred to as Enterprise Value rather than equity while the transactions' universe comprises only those with an Italian company as target.

In terms of investment activity (Figure 2), the buyout segment registers the highest number of active investors (61) followed by expansion (34) and early-stage (30). Historically, expansion was the most active sector until 2013, when it started to lose participants and give way to the buyout segment, which now contributes to 44% of the overall activity. Investments in start-ups and early-stage companies have consistently attracted around 20% of all the market participants since 2007, while the niches of replacement and turnaround have been more volatile in terms of activity, luring never more than 15% of the market combined.

As of 31 December 2016, the number of firms in the overall portfolio of the operators monitored in Italy amounted to 1,255 for a total amount invested of c. €26,000m, more than half contributed by international players (Figure 3). As per the number of operators, the amount invested (and the committed capital) surged significantly since 2007 (+106%), when it was nearly half (€12,603m), testifying the boom of the sector and the growing interest of international actors in the country.

Figure 2 – Evolution of Operators by Segment Activity

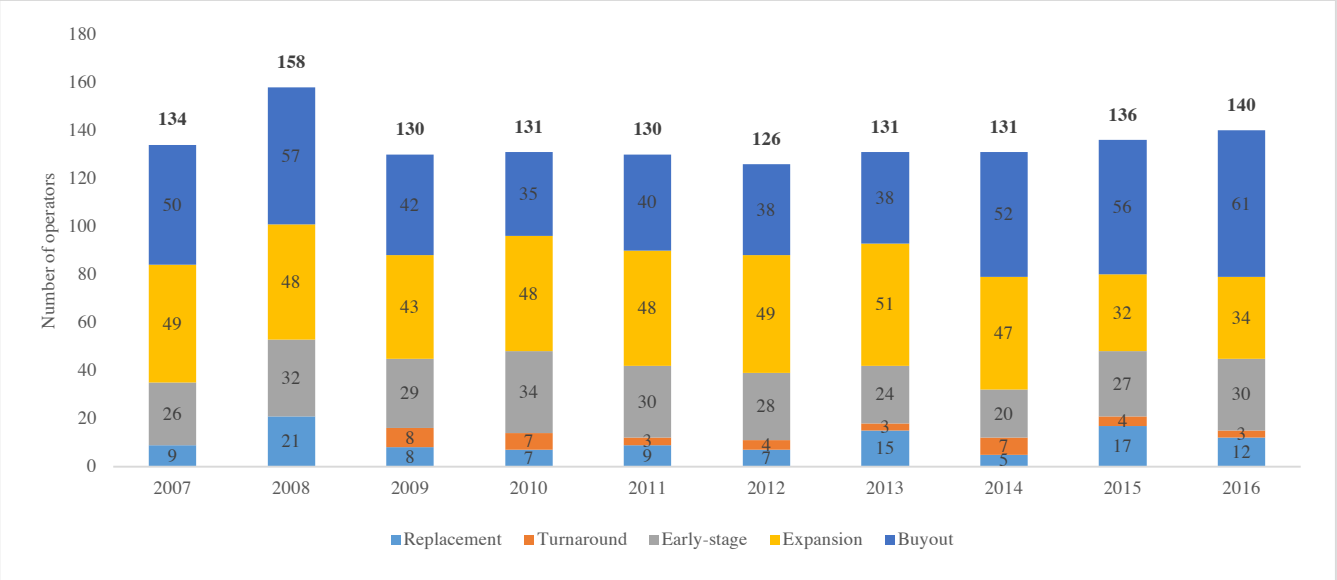
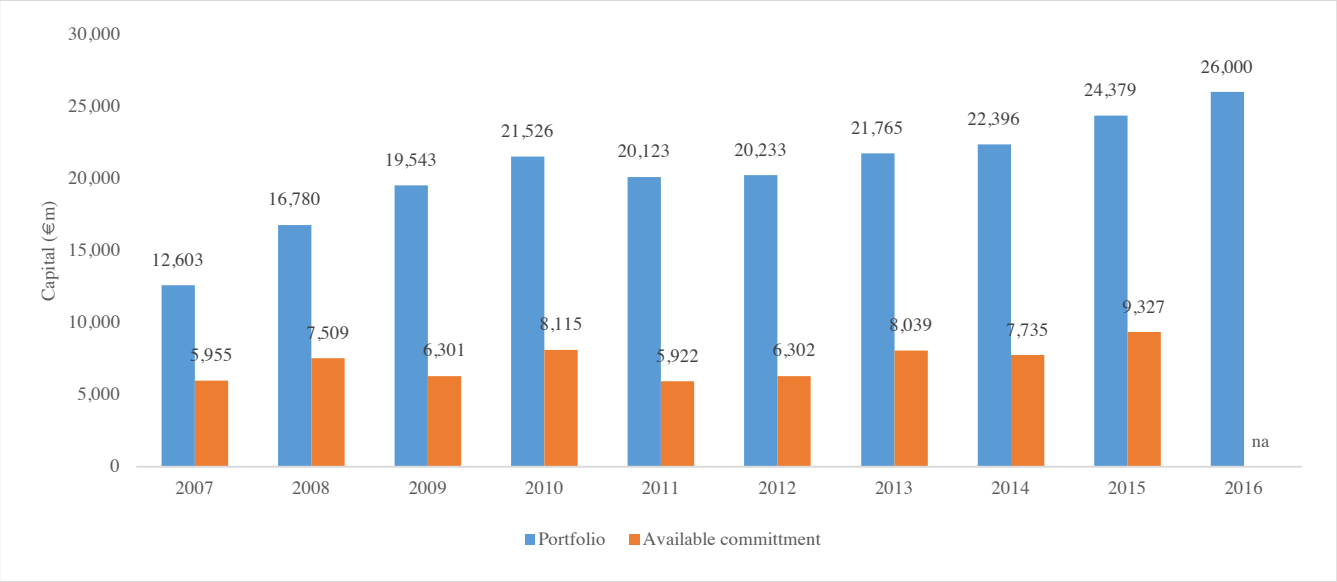


Figure 3 - Evolution of Operators' Portfolio



The investment scope of the Italian operators is still very focused on the home market though, with a staggering 96% of the investments executed in the country, in line with an average 94% throughout the measurement period (Figure 4). The proportion of private and public sponsors has remained constant around 1/3 and 2/3 respectively, with 67% of investments realized by private operators in 2016 (Figure 5).

Figure 4 – Evolution of Operators' Portfolio Composition

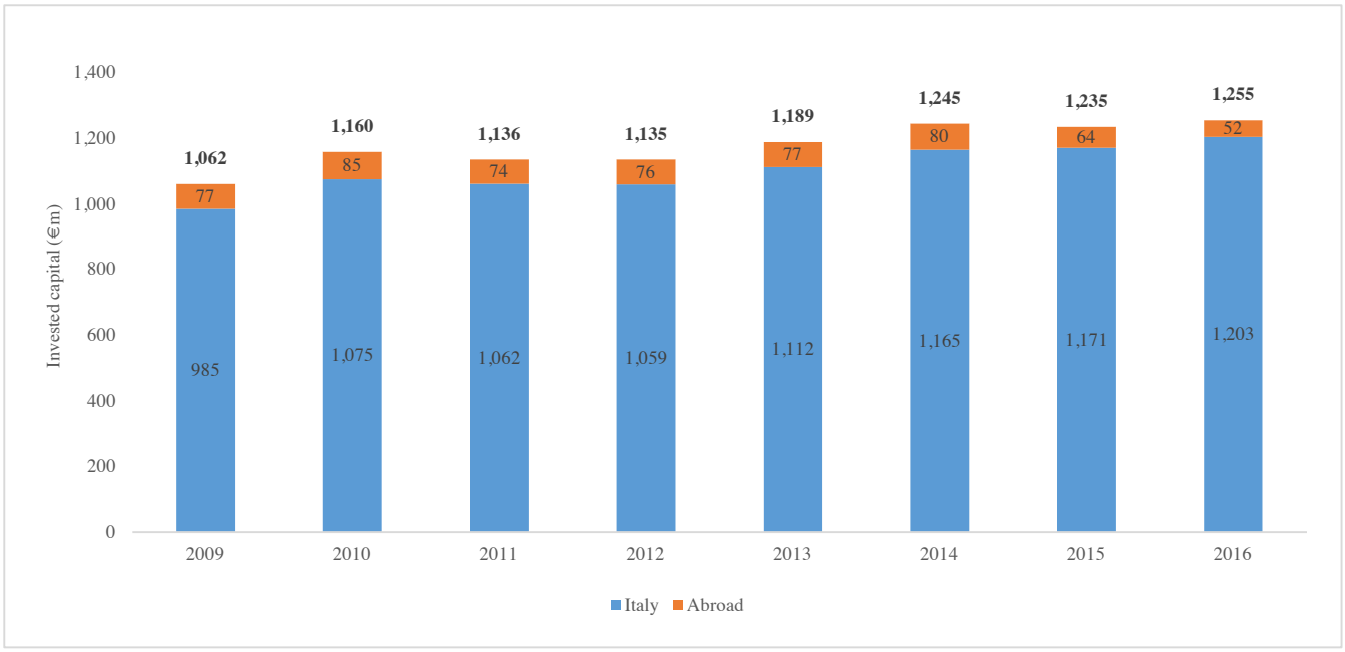
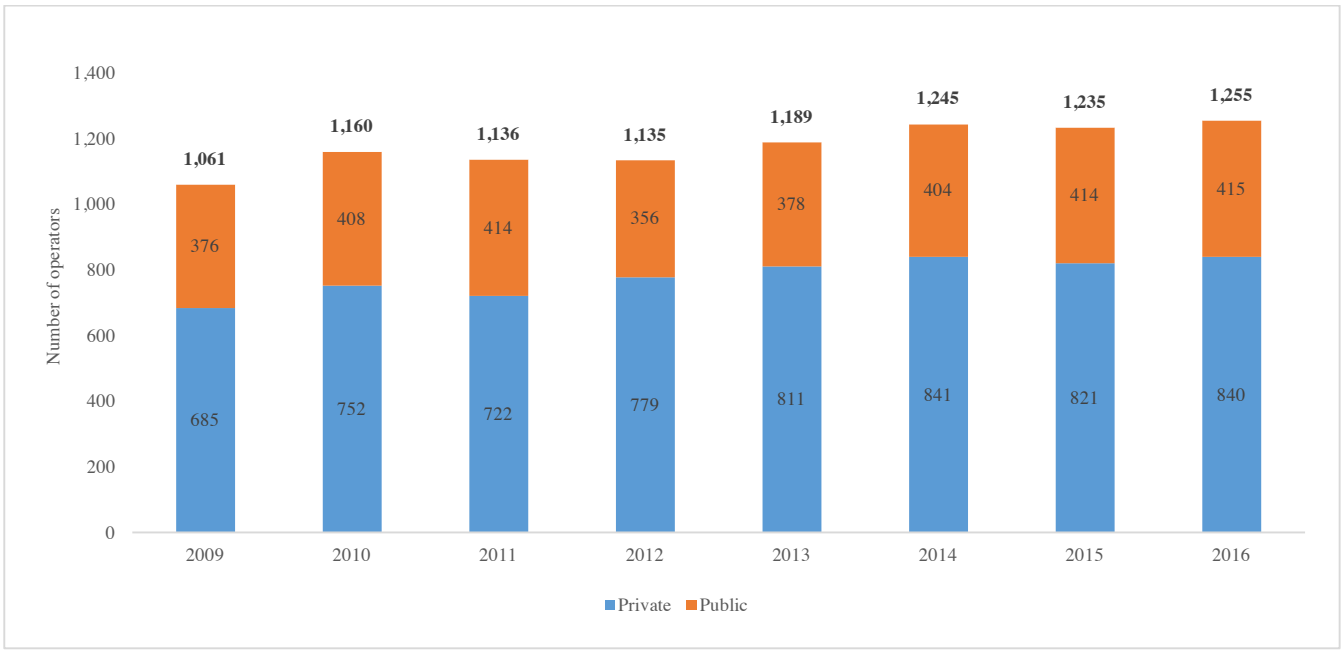


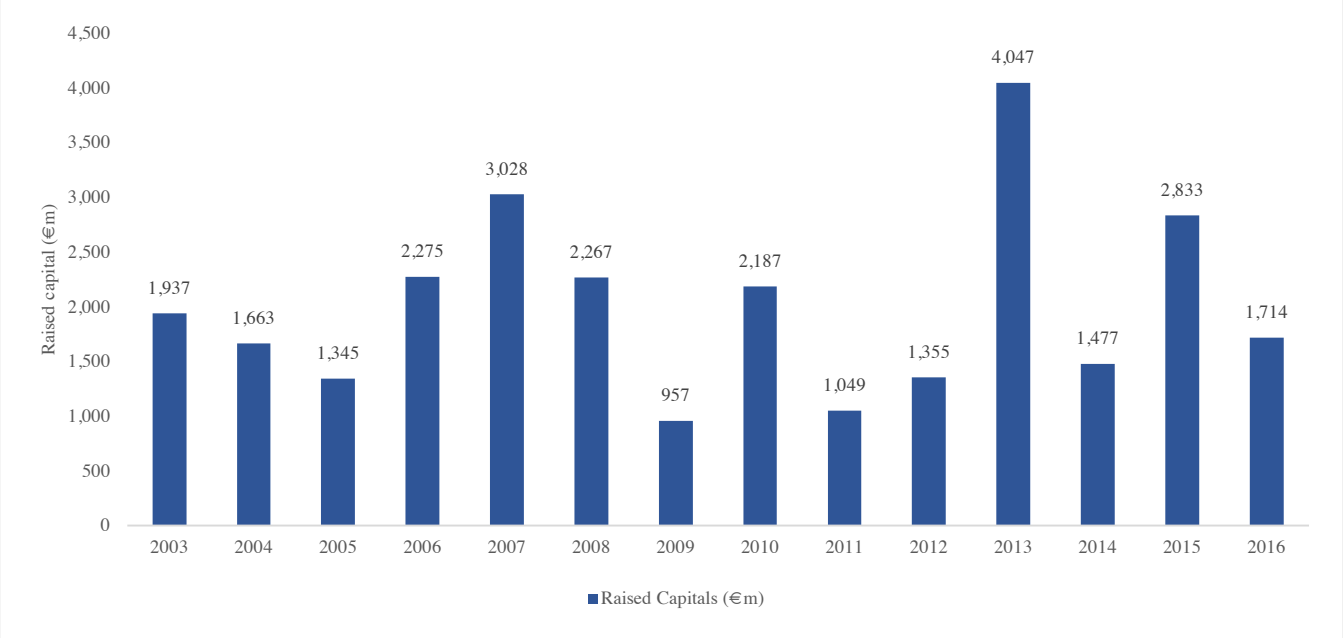
Figure 5 – Evolution of Operators by Ownership



3.2 Fundraising

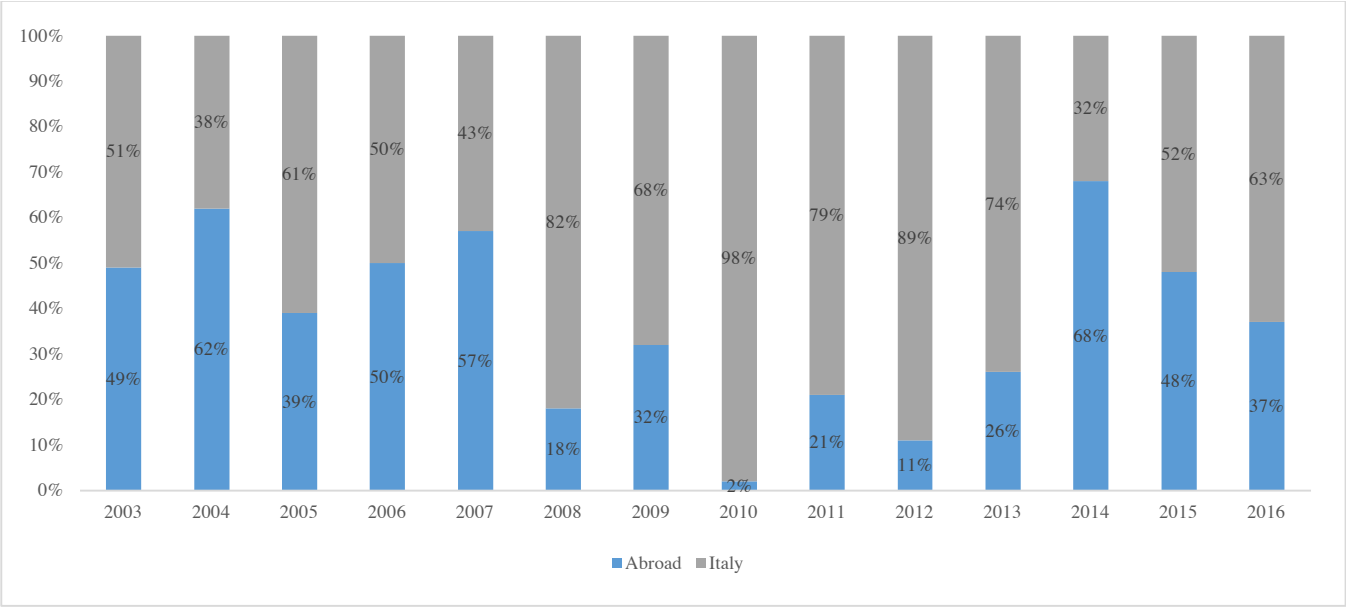
The fundraising remains the most critical activity for the Italian private equity market, especially for independent operators. During the year 2016, the total amount of resources raised by domestic operators resulted in €1,714m, 39% down with respect to the €2,833m raised in the previous year, which was characterised by the closing of some of the major Italian funds (ex. F2i) (Figure 6). The outer amount registered in the year 2013 (€4,047m) is significantly influenced by the activity of the Fondo Strategico Italiano, holding company controlled by CDP Group, the Italian National Promotional Institution. In fact, in 2013, 85% of the funds raised was attributable to parent companies of captive investment vehicles. Overall, despite fundraising activity has been very volatile and a clear pattern is not recognizable, the amounts raised are consistent with the aggregate market conditions, with peaks of activity in the years 2006 and 2007 and plunge in the aftermath of the financial crash. It is to be noted that the methodology employed does not account for the amounts raised by international operators with a stable base in Italy, therefore underestimating the amount of resources available in the market. Should the capital invested from these operators be assumed as a proxy of fundraising, the total amount of capital flowed into the country in 2016 would amount to €3,488m.

Figure 6 - Evolution of Raised Capital



With regards the geographical origin of the capital raised, we can divide the analysed window into three periods: from 2003 to 2007 Figure 7 shows a modest growth trend of foreign capitals flowing in Italy, with a peak of 57% of the total amount raised in 2007; between 2008 and 2013 international contribution was minimal (18% on average) due to constraints on available capitals following the financial crisis and the unattractive local economy of those years; the year 2014 registered the highest foreign capital flows, reaching 68% of total contributed capital, and was followed by a steady decline in the following years, with 2016 setting back at just 37%.

Figure 7 – Evolution of Capitals' Geographical Origin



The analysis of the capital raised by type of source and its evolution (Figure 8), highlights that funds of funds have been and continue to be the main source of capital (25.3% in 2016; 20.3% on average during 2007-2016), together with individual investors (20.9% in 2016; 11.7% on average during 2007-2016) and pension funds (12.2% in 2016; 12.7% on average during 2007-2016), which are also the most consistent and less volatile fund providers. Italian banks, despite having originated, on average, 17.6% of the total amount of capital raised, recorded a depressed activity in the last few years, probably due to their struggling credit conditions.

Figure 8 – Evolution of Capital Raised by Provider

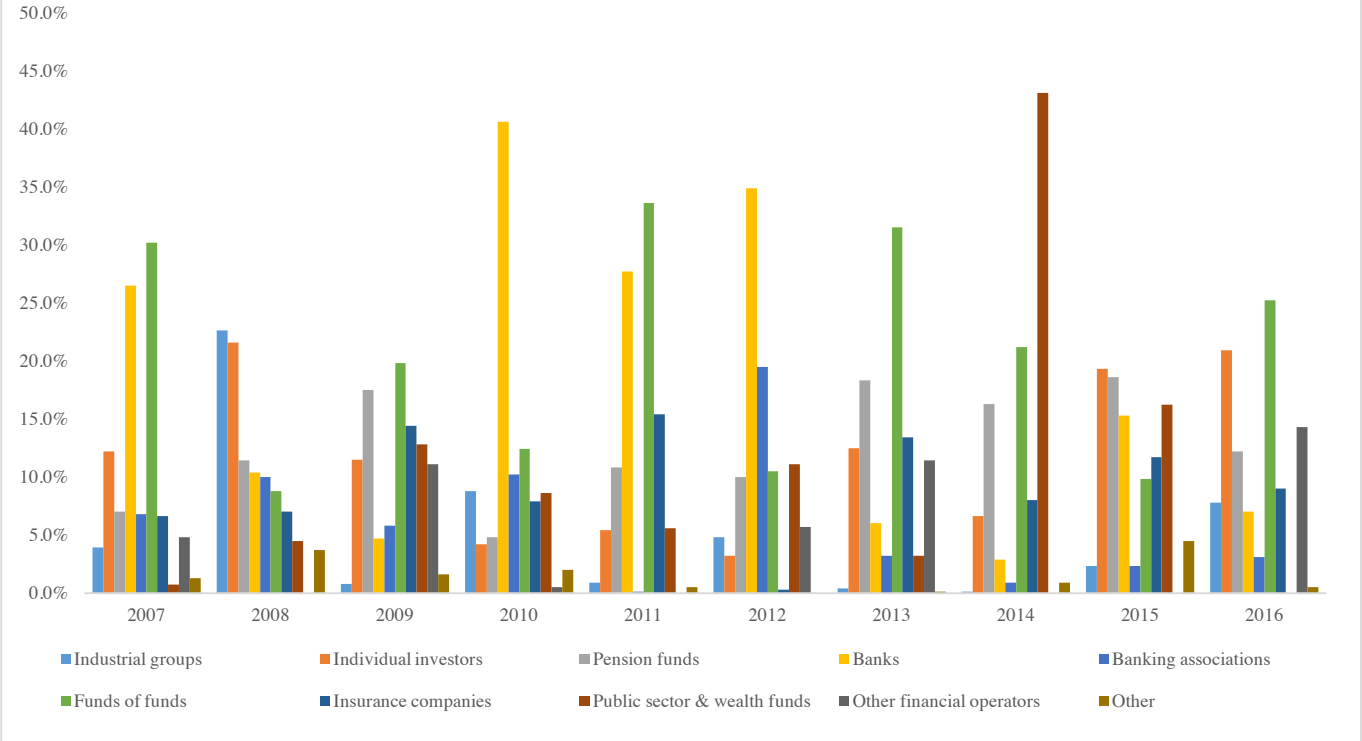
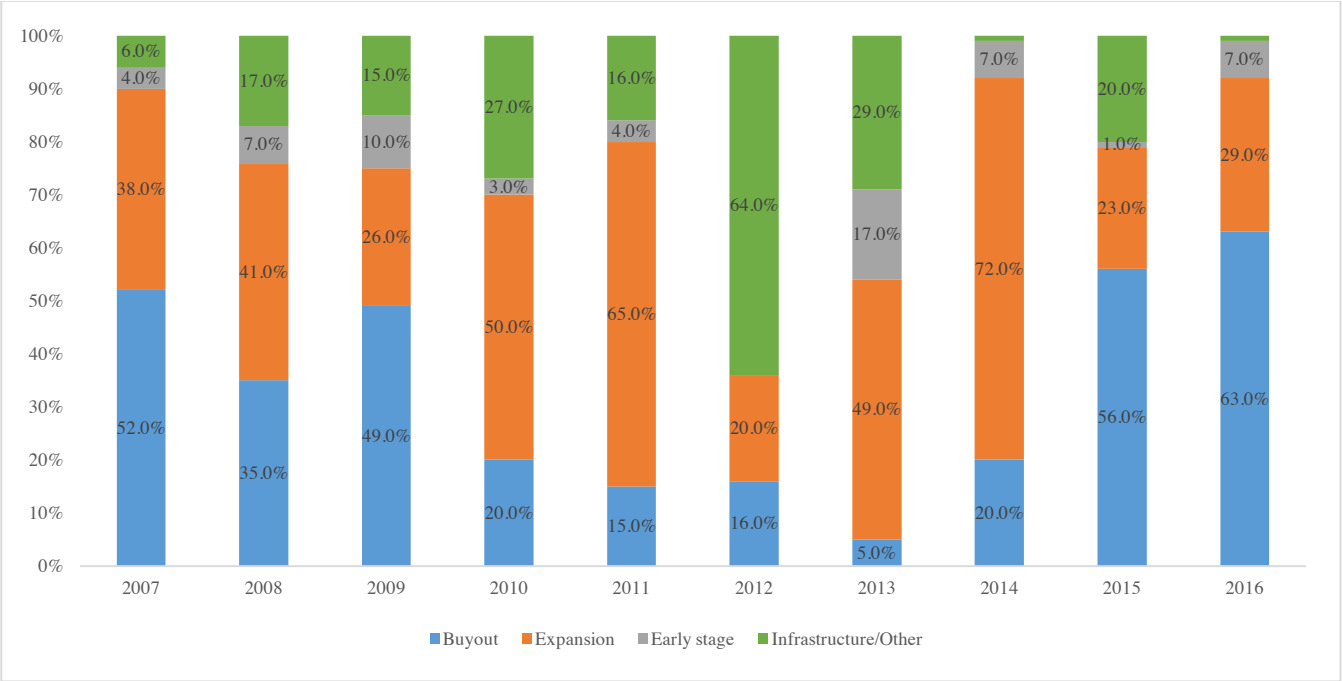


Figure 9 – Investment Distribution by Investment Target Type

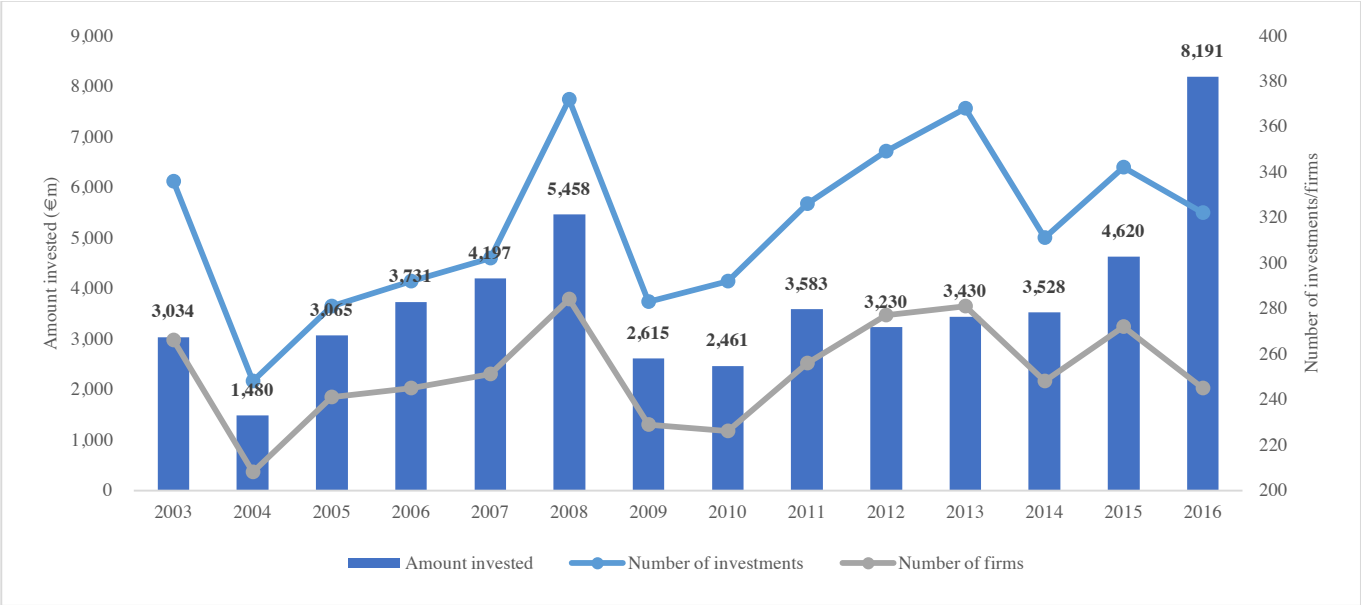


On the fundraising distribution side (Figure 9), in line with the data from operators, most of the capitals raised in 2016 are expected to be employed in buyout transactions (63%, up from 56% in 2015), followed by expansion (29%) and early-stage (7%) operations. Expansion segment was the greatest collector of funds in the years 2010 to 2014 (ranging from 50% to 72%) except for the year 2012 when the infrastructure boom, spurred by a low-interest environment, made the sector extremely attractive for investors, who contributed to it 64% of the total capital raised.

3.3 Investments

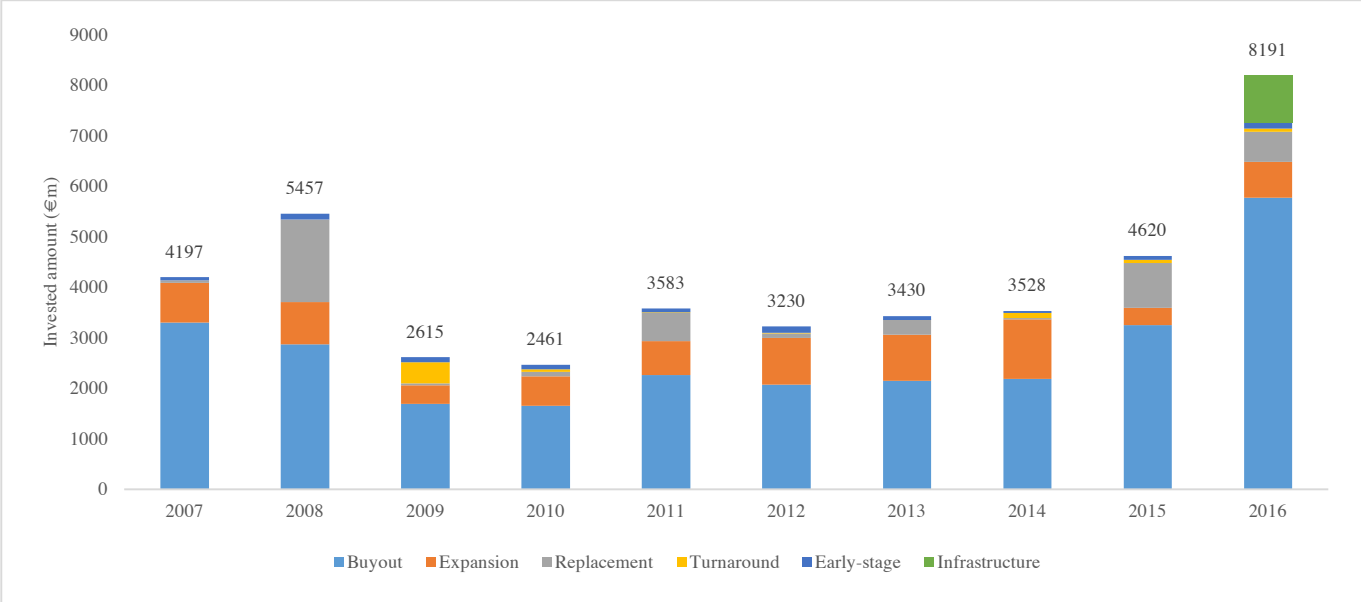
During the year 2016, 322 new transactions were registered in the Italian private equity and venture capital markets, distributed among 245 firms, for a total consideration of €8,191m, a 77% increase with respect to 2015, when the resources invested totalled €4,620m. The record-breaking figure, however, has been deeply influenced by a few sizeable transactions realized by international players and is the highest investment amount ever registered in the country. Figure 10 shows that an overall growth trend is recognizable during the 2003-2016 period, with an average 17% year-on-year growth. With regards to the number of investments and the number of firms, the graph shows that the two set of data are extremely correlated between themselves and with invested capital. The drop in 2016, in counter-trend with respect to the surge in investments, can be explained by the impact of a few very large transactions, as mentioned before, happened in the infrastructure sector, newly introduced category in 2016 by AIFI in accordance with the European methodology.

Figure 10 – Evolution of Investing Activity



Looking at the investments' universe from a transaction type perspective, Figure 11a shows that buyouts continue to represent the market segment with more capital inflows (€5,772m in 2016), followed by the newly adopted infrastructure sector (€942m in 2016) and the expansion segment (€710m in 2016), both characterized by few transactions of significant size. More specifically last year saw a drastic increase in the average deal size, which reached €25m (more than double with respect to €14m of 2015) and was led not only by some big infrastructure investments (with an average of €79m per deal) but also by a major surge in buyout and replacement transactions' size, which registered a record of €59m and €43m respectively (Figure 11b).

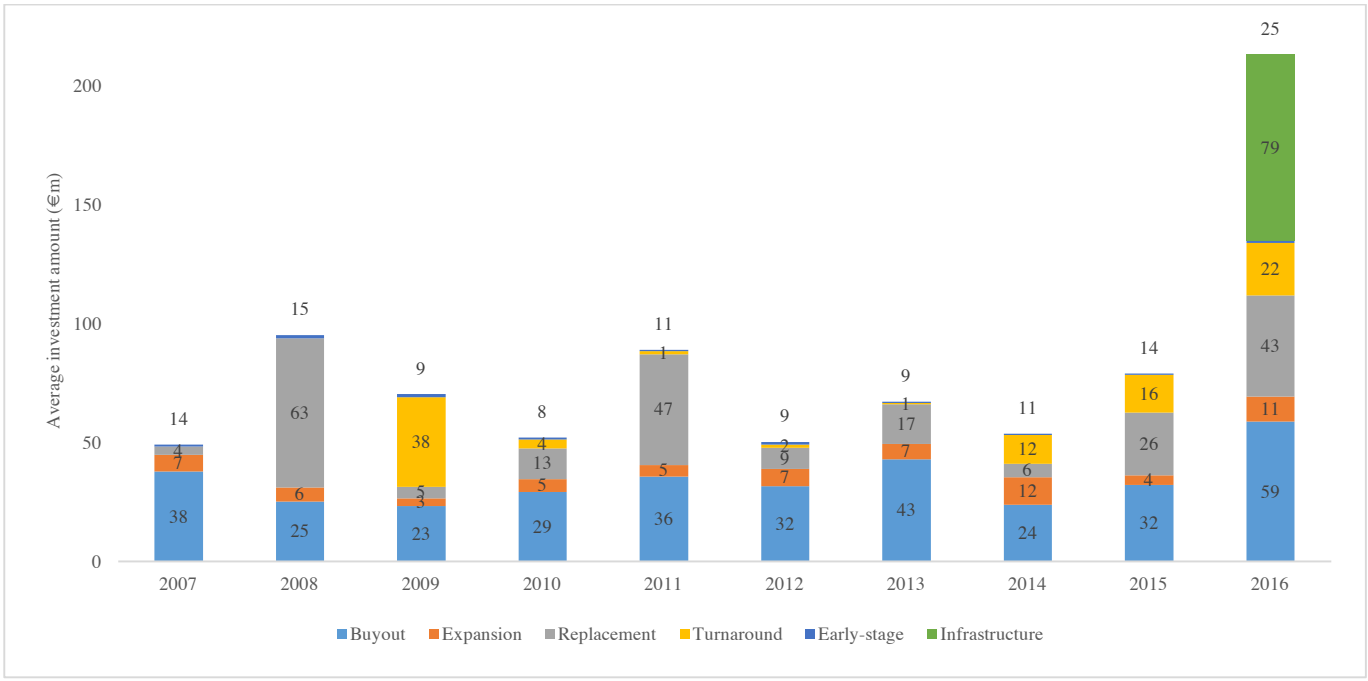
Figure 11a – Evolution of Investments' Distribution by Type



In terms of number of transactions, with 128 investments realized in 2016, the early-stage segment continues to rank at the first place due to the growing attractiveness of start-up firms and the relatively small seed funding contributions.

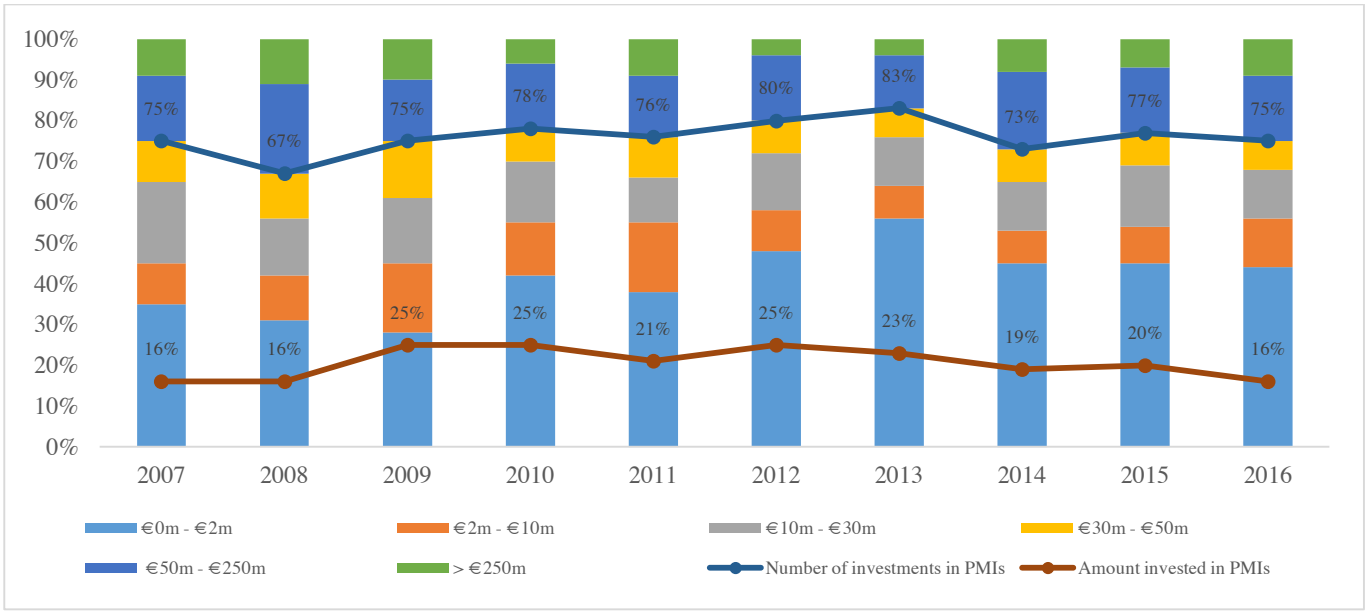
From 2015, in line with the trend witnessed in terms of operators (Section 3.1, Figure 2), buyouts have taken over from expansion transactions in the second place. These three sectors steadily represent, since 2007, more than 90% of all the transactions executed.

Figure 11b – Evolution of Transactions' Size



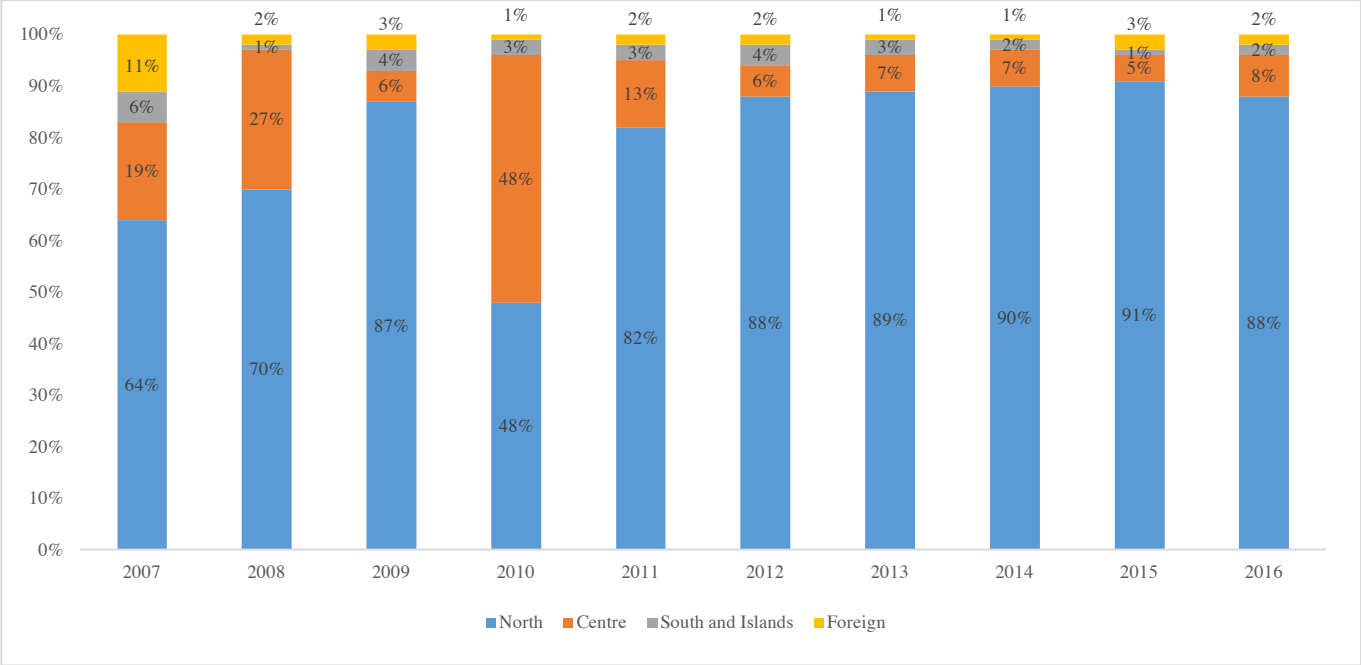
In accordance with the Italian productive fabric, micro enterprises dominated as private equity target, with firms between €0m and €2m in revenues making up 44% of the investments in 2016 and an average of 41% in the 2007-2016 window period (Figure 12).

Figure 12 - Evolution of Investments' Distribution by Revenue Class



Overall investments in PMI, with revenues ranging from €0m and €50m, steadily represented around 75% of the total investment number although attracting always less than 25% of the available resources, due to the small size of the mentioned deals. Large and mega deals, targeting firms with revenues over €50m, continue to contribute to a small percentage of the overall amount of transaction but attract most of the capital in the market, with a peak of 84% in 2016 (up from 80% in 2015).

Figure 13 – Geographic Distribution Evolution of Amount Invested



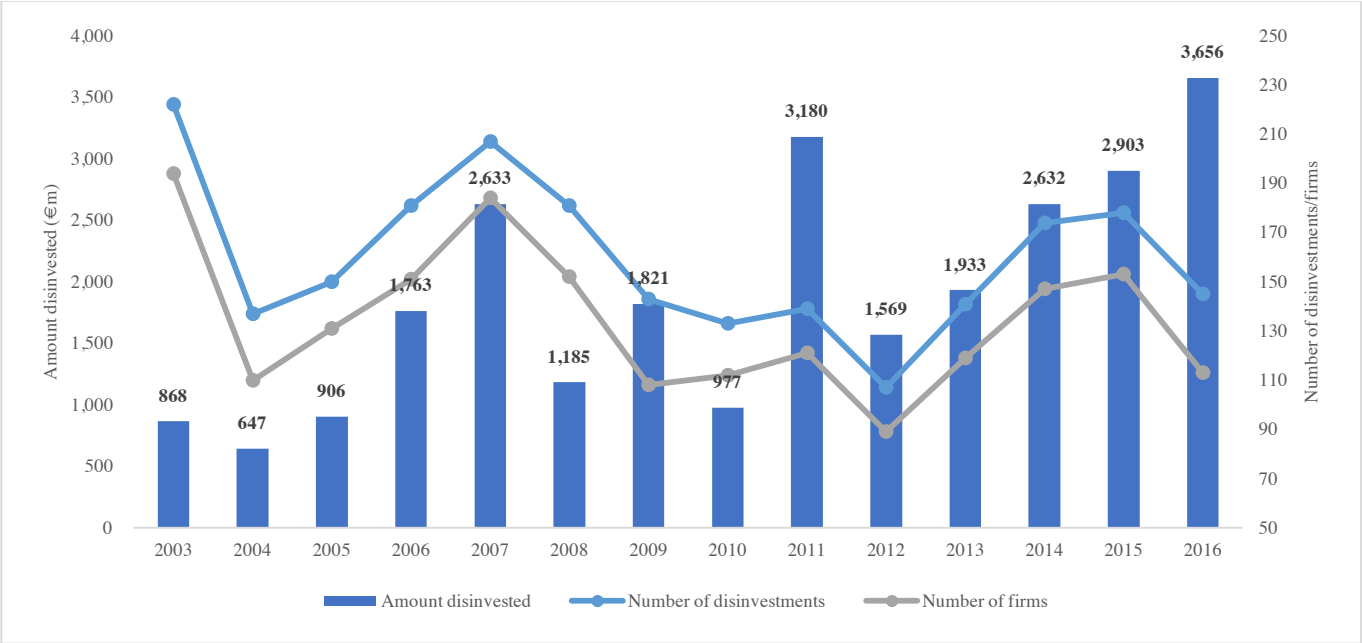
Finally, Figure 13, indicates that 98% of the amount invested in 2016 from private equity firms had Italy as target, with just 2% invested abroad, broadly in line with the results from previous years. More in details of the 98% of capital invested in the local market, 88% was allocated to the North of Italy, followed by the Centre (8%) and Southern Italy and Islands with a minimal 2%. The north of Italy, the most developed and advanced region of the country, has historically attracted most of the capital available for investments except for the year 2010 when the Centre was able to lure an unusual 48%.

3.4 Disinvestments

The amount disinvested in 2016, in line with the sustained activity registered from the buy-side, reached a new peak of €3,656m, up 26% with respect to the €2,903m of 2015 (Figure 14). In terms of numbers, instead, 145 exits happened, marking a significant plunge from the 178 of 2015 and consistent with the greater average transaction size (Section 3.3, Figure 11b). Similar to the evolution of amounts invested, the disinvestments registered a dramatic increase since 2003, with a clear and sustained growth trend from 2012 onward of c. 24% year-on-year.

In terms of disinvestment strategy (Figure 15a), sale to industrial partners appears to be the most common exit in 2016 (37%), closely followed by secondary LBO (31%). The latter exit strategy has seen his popularity increase in the last years jumping from an average of 16% throughout 2007-2014 to an average of 32% in 2015 and 2016.

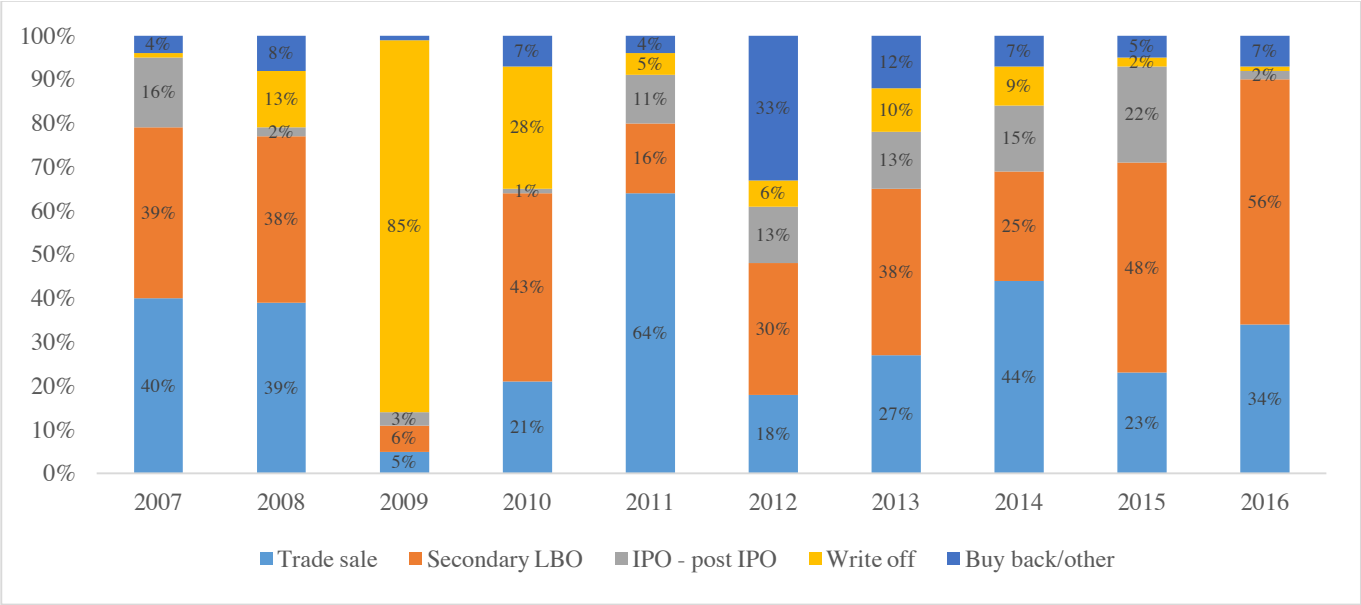
Figure 14 – Evolution of Disinvestment Activity



Realisation of the investment through public markets remains the least common option, given the dimension of the average target firm (Figure 12, Section 3.2). In terms of disinvested amount, instead, Figure 15b indicates that secondary LBOs dominate as an exit strategy, with 56% of the disinvestments in 2016 realized through the sale to a financial sponsor, ranking second only in the years 2009 and 2011. More specifically in 2009, as a consequence of the financial crisis, 85% of the disinvestments were written-off; the crash significantly impacted also the year 2010, which registered still an unusually high percentage of write-offs (28%), while 2011 witnessed a return to normality (5%).

Figure 15a – Evolution of Number of Disinvestments by Type

Figure 15b – Evolution of Amount Disinvested by Type



4 Literature Review

Buyouts have been historically regarded as an efficiency-enhancing tool to streamline organizational processes, cut workforce, improve revenue growth and reduce costs. It is up to the managers to identify the strategy that best suits the target company and is likely to maximize its value. Write et al. (2001) identify three superior strategic value creation strategies: the first type is Efficiency buyouts, where it is argued that concentrated ownership would allow to solve the long-standing agency problem and the main focus is on exploitation and maximising efficiencies; the second type is Revitalization buyouts, in which managers target firms with weak competitive position to then undertake incremental, though not radical, improvements and upgrades; the third type is the Entrepreneurial buyout, which involves businesses with incentive misalignment and managerial frustration or troubled technology-based businesses (busted-tech buyouts). But how is value created in practice? Which are the main value creation drivers? Which is their single contribution to the overall value added (if any)?

4.1 Financial Engineering

Modigliani & Miller (1958) stated that, supposing a world with neither taxes nor costs of financial distress, the value of a firm would be independent from the percentage of debt or equity in its capital structure. However, once taxes are taken into consideration, taking on debt can increase the value of the corporation, thanks to the tax deductibility of interest expenses (Modigliani & Miller, 1963). The potential upside of using debt, and therefore alter the capital structure of the targets, has been widely acknowledged by the PE industry and can be summarised as Financial Engineering. Buyouts are typically financed with 60 to 90 percent of debt (hence the term leveraged buyout) and this increased leverage embedded in the transaction creates value in three major ways: 1) decreasing the weighted average cost of capital (WACC) of the firm, being cheaper than the sponsor's equity; 2) increasing the value of the tax shield, by means of additional tax-deductible interest expenses; 3) reducing the probability of management engaging in

opportunistic behaviour since available cash flows must be employed for interests and principal repayments.

The first explanation can be demonstrated by considering the Cost of Capital approach: by means of this method expected cash flows to the firm are discounted back at the cost of capital. If a company can lower its cost of capital by leaving its cash flows unchanged, the result will be an increase in its present value. Cost of Capital, also known as weighted average cost of capital WACC, is the average of the cost of equity and of debt weighted by the proportions of the two components. This means that replacing equity with debt has the positive effect of substituting an expensive way of funding with a cheap one, but in the process, the increased cost of equity and debt, due to increased default risk, will push up these two costs and have a negative effect on the cost of capital. By borrowing an optimal amount of debt, so that the positive effect dominates, can, therefore, increase the value of the entity acquired.

Lowenstein (1985) is one of the firsts to document the tax consequences arising from leverage on target firms in LBOs. Examining 28 MBO proposals during 1979-1984, he provides evidence that tax savings are the real driving force behind buyouts and, citing Warren Buffet, affirms that "if one can eliminate the government as a 46% partner" a business would be significantly more valuable. Singh (1990), further addressing the tax savings argument studying a sample of 99 publicly held companies that underwent MBO between 1980 and 1987, found rather contrasting results. He argued that post-buyout superior performance compared with industry would have supported the value creation argument, while inferior or non-significant changes in performance would have favoured the managerial opportunistic or tax savings arguments. Results from the study demonstrated the willingness of managers to do rather drastic changes in the portfolio firms' operations and significant improvements in performances, giving credit to the value creation argument.

Managers are the agents of shareholders, a relationship burdened by conflicts of interests that gave rise to the agency theory, the study of such conflicts. Most of these conflicts arise from the fact that distributing cash to shareholders, in the form of dividends or share repurchases, reduce the resources available to corporate managers and consequently their power. Managers have significant incentives in growing the firm's size beyond the optimal: first, growth, increasing the magnitude of the company, increases thereby the power, prominence and prestige of its managers; secondly, the compensation of top management is usually positively correlated with sales expansion (Murphy, 1985). These incentives make the managers often engage in investments with returns under the cost of capital, low-benefits or even value-destroying takeovers and money wasting activities. Tensen (1986), in what he calls "control hypothesis", discusses the role of debt in motivating organizational efficiency and realigning managers' and shareholders' interests. Providing evidence from the oil industry, he argues that debt reduces agency costs by reducing discretionary cash flow available to managers and that the threat of missing debt repayments serves as motivating force to increase organizations' efficiency. Jensen (1989) pushes the concept contending that even overleveraging can be desirable as a powerful agent for change. The assumption of an unsustainable amount of debt makes companies rethink their entire strategy and structure: the crisis atmosphere requires managers to shrink overhead, dispose of non-core assets and cut unsound investments program, which ultimately leads to leaner and more competitive organization. Corporate jets are a perfect example of agency costs: they are perquisite which are likely to maximise shareholders' value if used correctly but, being difficult to monitor and incentivize correctly, easy prey of over-use. Edgerton (2012), examining a sample of 1686 US firms and 69 buyouts, shows that: 1) firms owned by PE funds have on average smaller jet fleets and 2) clear reductions in the fleet size is experienced from target

firms of LBOs.

Following the evidence on the positive effect of debt on value creation, in the three ways discussed above, LBO transactions are expected to carry with them high amounts of leverage. Axelson et al. (2013), examining an extremely significant sample of 1197 international buyouts during the period 1980-2008, find that LBO companies have a D/EV (debt-to-enterprise-vale) of 0.7 compared with 0.35 of a matching sample of public firms, and a D/EBITDA (debt-to-EBITDA) 34% higher. Accordingly, Guo et al. (2011) found leverage to increase after the transactions: for a sample of 192 LBOs completed in the US during 1990-2006, they show a change in Debt to Capital post-buyout of 45.7% and a post-buyout D/EBITDA of 6.0 compared to 1.8 pre-buyout. However, the credit crunch started in summer 2007, combined with softening corporate earnings, is expected to slow down private equity activity, reduce the amount of leverage used in LBOs, thereby decreasing returns, and ultimately shift the emphasis from financial to operating engineering (Kaplan & Strömberg, 2008). This, combined with the fact that most of the cited studies rely on transactions dating back to 1990s, makes a case for exploring if the use of leverage is still a prevailing factor for private equity industry in recent years and what is its contribution to overall returns. An analysis of deals distribution and their characteristics will be carried out to clarify the role of debt in the latest period (2007-2013) and will further serve to investigate if the revival signs from the PE deal market marked the dawn of a new wave.

Demonstrated the value creation argument and the effectiveness of leverage in avoiding wastes of free cash flows by compelling managers to pay out funds that they would have otherwise retained, we are left to investigate the correlation of leverage with operating performance and returns. Colla et al. (2012), executing a regressive analysis using a worldwide dataset of 238 buyouts during the period 1997-2008, discover that profitability is significantly related to firm's leverage (defined as debt over enterprise value), while this relation is negative for the control group made up of public firms. Guo et al. (2011), besides providing evidence of post-buyout increases in aggregate debt levels, document that firms with a greater rise in leverage resulting from the transaction show consistently better cash flow performances due to the disciplining effect of debt. They also show that the leverage effect on returns is significant and primarily driven by the increased value of tax shield, with an estimated 33.8% contribution to overall returns. Also Achleitner et al. (2011) focused their research on returns and showed that, in their 206 European buyouts sample, a third of the total returns was attributable to financial engineering. Baker and Wruck (1989) document the organizational changes that took place at O.M. Scott & Sons Company after being subject to LBO and confirm the findings of large-sample studies that the pressure of large amounts of debt forces managers to rationalize operations and this lead to operating performance improvements. Summarizing it is possible to conclude that leverage has been a considerable tool of value creation in the context of LBOs and it has shown to be positively correlated with operating performance; starting from this evidence we will investigate if and to what extent leverage is still used as a value creation tool in the 2007-2013 window period and for the Italian market.

4.2 Operational Engineering

One of the most studied and documented value creation tools is Operational Engineering and it refers to the operational expertise and industry knowledge that the PE firms bring to the table. More specifically, it creates value by improving profitability, margins and cash flow streams. Evidence on operational improvements after buyout transactions has been firstly provided by Kaplan (1989): studying a sample of 48 large management buyouts of public

American companies between 1980 and 1986, he finds that portfolio companies experience strong improvements in operating income, cash flow and capital expenditure (both absolutely and relative to industry) and abrupt increases in market value, presenting evidence in favour of reduced agency costs as an explanation for increased performances (Kaplan, 1989a). Similar results are found by Smith (1990). Muscarella and Vetsuypens (1990) instead, examining a sample of 72 reverse LBOs, hypothesised that changes in the governance structure of those firms toward more concentrated residual claims created a more efficient organizational form; they found that firms in the sample, after being taken private, underwent significant restructuring activities, which resulted in improvements in profitability and efficiency. The momentum of the sector was so significant in those years that some considered that publicly held corporations had outlived its usefulness in many sectors and was going to be eclipsed by the raising private equity industry (Jensen, 1989).

After the 1980s many researchers switched their focus on the European market mainly due to data availability; consistent with the US case, most of the works demonstrate that LBOs are associated with considerable improvements in operational efficiency and profitability. Wright et al. (1996), examining the longer-term effects of management buyouts using two representative UK samples, provide evidence of superior performance of buyouts in terms of returns on assets. Bergström, Grubb and Jonsson (2007), analysing a comprehensive Swedish dataset, demonstrate that buyout companies present significantly improved EBITDA and ROIC metrics and, finding that changes in wage and employment levels, leverage, management shareholding and type of buyout have little explanatory power on operating performance, show how the value creation process is extremely complex and poorly proxied by a few easily measurable variables (Bergström, et al., 2007). On the same line, Desbrierès and Shatt (2002) analyse specific features of French companies subject to MBOs but the results obtained on operating performances are mainly inconsistent with evidence from UK and USA, with portfolio companies experiencing decreases in ROE, ROIC and margins after the buyout. More recently Acharya et al. (2013) conducted a comprehensive analysis on 395 deals closed between 1991 and 2007 in Western Europe by thirty-seven large and mature PE houses finding that 1) large and mature PE firms generate positive and statistically significant abnormal returns even during periods of low sector returns; ii) ownership by this category of PE houses has an impact on operating margins (EBITDA/Sales) and deal multiple (EV/EBITDA) that is positive and above the sector; iii) general partners with a consultancy or investment banking background are associated with outperforming deals focusing on internally generated value creation. The importance of specialization is confirmed by Singh (1990), who notes that firms that grew most aggressively among its 99 MBOs sample are spinoffs of large corporations; these former divisions experience great shift in governance and incentives, moving from a unit in a large firm to an independent entity controlled by its managers, and appear to benefit substantially from going private. In our country of interest, Tutino and Paoloni carried out a qualitative research that shows that minority private equity stakes in SMEs enhance their network relations with financial players, while Bentivogli et al. (2009) provide a broad overview of the Italian players and their characteristics. To the best of our knowledge, there is currently no work that investigated the post-buyout performances of Italian portfolio companies.

All these studies rely at least partly on accounting measures and are prey of possible manipulation of financial statements around the time of buyouts. Although DeAngelo (1986), Kaplan (1989a) and Lee (1992) cast doubt on statements' manipulation and the phenomenon of insider trading, Wu (1997) provide evidence that managers in 87 MBOs happened during 1980-1987 manipulated earnings downward just before the operation, earning an average

potential benefit of $50 million. Chou et al. (2006) provide further evidence of earnings manipulation around security offerings; specifically, using a sample of 247 MBOs transactions during 1981-1999, they find evidence of positive and considerable discretionary accruals around offerings.

To overcome the limitations of an accounting approach Lichtenberg and Siegel (1990) investigated the effect of LBOs on productivity using a large plant-level database of 19,000 firms (both public and privately owned) for the years 1972-1988, arguing that the Total Factor Productivity (TFP) is the purest measure of technical efficiency. Harris, Siegel and Wright (2005) extending Lichtenberg and Siegel's productivity analysis, considering a larger UK market sample, and implementing more sophisticated economic techniques, provide evidence that suggests that takeovers shift firms' resources to more efficient uses.

In our analysis, we will follow the methodology used in Kaplan (1989a) to compute returns on capital and identify the impact of each value driver on the aggregate return. The mentioned methodology will compute a return based on actual price paid and exit realized (or, where not possible, estimated on the base of a multiple). This approach is also helpful in avoiding to contaminate our results with the effect of investors' information gaps and market irrationality on the stock prices of the few public firms included in our sample, which Gilson (2000) shows to be a serious issue. A similar approach has been used by Perembetov et al. (2014), who in their analysis decomposed the PE value creation impact in its key value drivers and documented how operational improvements accounted for roughly half of the overall value creation and the increasing importance of the EBITDA growth component.

4.3 Multiple Expansion

Multiple Expansion is a form of arbitrage where the buyer pays an entry valuation multiple lower than the exit one. Essentially it refers to the concept of buying low and selling high and is often achieved by applying value creation strategies to the target company acquired. However macroeconomic market conditions, such as periods of expansion or recession, can deeply influence multiple expansion and significantly inflate/deflate the returns over the life of the investment. Achleitner et al. (2010), in order to analyse the impact of general economic and stock market conditions on the transactions, split their dataset of 206 buyouts completed in Europe in the period 1991-2005 in two sub-groups: 1) deals with entry dates in 1994-2000 or 2004-2005, consisting of transactions completed during economic growth periods; 2) deals completed in the 1991-1993 or 2001-2003 timeframes, marked by recessionary environments. They find that median times money of deal completed in recession years is considerably higher than in expansion ones, indicating that the former offers more interesting investing opportunities for private equity actors. Overall, they display that value creation measured in times money explained by multiple expansion amounts to 0.45 times money or 18%, over an aggregate 2.47 times money value added by the LBO. Meerkat et al. (2008) find consistent results in their sample of 32 companies in the portfolios of seven European private equity firms; comparing the EV of target firms at time of purchase with time of exit, they document that improvements in the EBIT multiples account for about 20% of the total average value created (or 10% over an overall IRR of 48%). Pindur (2007), in his study on 42 European buyouts completed between 1993 and 2004 suggests, instead, that multiple contribution can go as high as 28% of aggregate returns. Brigl et al. (2016), using a dataset of 2,372 deals exited from 1998 through 2012, show how the contribution of multiple expansion to value creation changed throughout the years: the driver created 31% of the value in the 1980s, surged to 46% during the 1990s, subsequently set-back at 39% in the 2000s and finally

stood at 40% in 2012. Winnowing down their sample to 121 deals, they focus their research on buy-and-build deals, which experienced a considerable surge in recent years due to their superior returns (average IRR of 31.6% compared to 23.1% of standalone deals); in this type of transactions PE firms build on the "platform" of the target company through add-on acquisitions in order to boost revenue growth and margin expansion thanks to the realization of synergies. Analysing the relative contribution of each value-creation lever to the aggregate deal performance they discover that multiple expansion, which is in many cases determined by improved expectations on profit growth, is the principal engine of superior performance in PE deals, accounting for 7.5% of the 23.1% average IRR for standalone deals; this is even more true for buy-and-build deals where multiple expansion account for nearly 50% of total returns thanks to favourable investors' expectations on revenue growth and margins expansion. Guo et al. (2011), asserting that, even with no gains in operating performance or from restructuring, positive returns could result from increases in industry or market valuation multiples, proceed to analyse the buyout firm multiple from pre-buyout to exit. They document that the median increase in industry multiple from before the transaction to terminal date is 1.08 EBITDA and therefore a significant portion of returns is likely due to broader market conditions rather than firm-specific factors. They then attempt to isolate the changes in multiple caused by industry and market conditions and quantify their impact on deal returns; employing a methodology that requires to compute hypothetical returns that would have been realized had the industry multiples remained stable and compare them with actual returns, they document that 17.7% of overall returns over pre-buyout capital is attributable to industry valuation changes. Perembetov et al. (2014), in their comprehensive analysis of 701 exits completed in the period 1990-2013, attempted to separate the impact of changes in valuation multiples on enterprise value creation into 1) pure market movement or market timing and 2) firm-specific operational performance's increases and qualitative improvements under general partners' ownership. Comparing PE deal multiples, defined as EV/EBITDA, at entry and exit with a benchmark formed by public companies, they find that of the 18% impact due to multiple expansion lever, 7% was attributable to an uplift in market valuations. The remaining 11%, instead, is imputable to general partners' ability to improve asset quality by gaining market share, increasing brand recognition and diversifying customer base; the GP's skills are exemplified also by the findings that the median entry multiple for PE firms was 10% lower than that public comparable, whit the difference narrowing down to 1% for the exit multiple.

Following Guo et al. (2011), we will analyse the contribution of multiple expansion (mainly assessed through market multiples expansion due to limited available data on exit prices) to overall value creation and document if its impact is consistent with previous literature.

5 Methodology

The chapter provides an outline of the methodology that has been designed for the purpose of this study. We follow Kaplan (1989a) in order to obtain results as comparable as possible to the previous analysis (among which Guo et al. (2011)) and easily point out discrepancies.

5.1 Returns Analysis

For every company with post-buyout data available, the return on capital invested, for the period spanning from the

buyout to the final resolution, is computed based on the methodology used by Kaplan (1989a, 1989b, 1994) and Andrade and Kaplan (1998). In Guo et al. (2011) (which draw form Kaplan methodology as well) the nominal return on capital is estimated as: $\frac{\sum Interim\ Payments\ to\ Capital + Terminal\ Value}{Capital} - 1$. The *Interim Payments to Capital* are the post-buyout cash flows to providers of equity and debt and include cash interests, net debt principal paid, dividends and net equity repurchased; *Terminal Value (TV)* is the amount of cash received by the buyer at the outcome date; *Capital* is defined as the buyout price and includes both market value of equity and net debt, since debt usually needs to be renegotiated for the PE to effectively take control of the target. Since interim cash payments are demonstrated to contribute to a minimal part of the overall return, and given the unavailability of cash flow information for the sample under consideration, we will estimate returns as $\frac{Terminal\ Value}{Capital} - 1$. Nominal returns are adjusted for the performance of the FTSE MIB Index[5] in order to control for market-wide economic conditions.

To compute the TV it is necessary to identify the outcome of the transaction, otherwise known as the "exit" for the financial sponsor firms. We search SDC Platinum, Bloomberg and PEM (Private Equity Monitor) databases to identify outcomes including IPOs, Secondary LBOs (acquisition by another PE firm), acquisitions by another company or distressed restructuring and bankruptcy. When Terminal Value cannot be detected (cases in which the investment in the target company has not been exited yet or there is no information about the outcome), it is estimated as a multiple of EBITDA (or Sales, should the EBITDA have negative value). We use the average TV/EBITDA multiple of transactions taking as target firms with the same four-digit SIC code happened in Western Europe in the 2003-2016 window period (geographic and SIC code criteria are relaxed when the transactions' sample identified was too small). The choice of using the average of the industry multiples instead of the median is justified by the lower differential observable between the median of the implied TV/EBITDA of the subsample of deals with observable exit price and the median of the average industry multiples (1.46x) compared to the differential between the former and the median of the median industry multiples (4.16x). The choice of using comparable transaction multiples should return more representative results by incorporating takeover premium into the price paid.

The sensitivity of returns to Terminal Value estimates has already been investigated by Guo et al. (2011) by 1) excluding cases where returns use estimates of TV and 2) comparing effective and estimated TV impacts on returns, where actual values are observable. Differences in median and mean results are found not statistically significant and hence the demonstration will not be repeated in the current study.

5.2 Measurement of Performance

To examine the impact of PE ownership on the portfolio companies we first have to determine the measurement period, which consists of observations prior and after the buyout event (t=0) and should be long enough to capture the effect of PE firms' actions. The length of the event window is also influenced by data availability and at the end should be the result of an optimal trade-off between the time necessary to implement improvements and a reasonable sample size. We selected a window period that spans from -1 to last (represented by deal outcome date or last financial

[5] The choice of the FTSE MIB Index, rather than the more size-wise comparable MSCI Italy Small Cap Index, is driven by its better match in terms of industry composition and less weight of financial institutions (c. 25% less), which are completely absent in our sample.

year for firms still private), with interim data collections at +2 and +3; the mentioned measurement period is believed adequate to capture most of the impact of changes and improvements implemented by the PE funds and also makes the results comparable to previous studies.

5.2.1 Financial Engineering Measures

In previous researches, various indicators of financial engineering have been used. For example, Axelson et al. (2013) employ Debt/EV, Engel et al. (2012) Debt/Equity ratio, Guo et al. (2011) use Deb/Capital and Debt/EBITDA measures while Vinten (2008) utilises the Solvency Ratio (measured as Equity on Total Assets). The selected measures in the present study draw from all the mentioned works and are the following: Debt/Equity (D/E), Debt/EBITDA and Solvency Ratio. D/E ratio is used to measure a company's financial leverage and indicates how much debt is the firm using to finance its assets compared to the amount provided by equity investors. Debt/EBITDA multiple, unlike the previous one, does not measure directly the indebtedness of a company, but rather shows its ability to repay its obligations by giving investors insights on the approximate amount of time needed to pay off all its debt. Finally, Solvency Ratio explains how much of a company is owned by its investors and answers the basic question: if the company goes bankrupt, how much will be left to investors after paying all debts?
We will provide a breakdown and analysis of the changes in debt and solvency ratios during the selected measurement period, with reference at the following section on Operational Engineering for more insights on the significance on its impact on operating performance.

5.2.2 Operational Engineering Measures

As extensively discussed in the literature review, one of the main value creation drivers in previous studies appears to be changes in operating performances after the buyout. In order to evaluate the economic and statistical significance of pre- to post-buyout improvements, changes in operational performance must be compared against a benchmark. Several approaches have been followed historically in the empirical literature. We will adjust the results using the FTSE MIB Index as benchmark, considered the most comparable aggregate performance tracker.
A wide arrays of financial statements' items can be used to measure the change in performances. Early studies focused on EPS, while in more recent researches were employed measures of operating income (EBIT, EBITDA), which are more representative of the operational performance of the company since they are capital structure neutral. Accordingly, this study will employ a range of scaled performance measures to assess the use and the extent of operational engineering in the Italian market. The selected ratios are the following: EBIT/Assets (ROA); EBITDA/Sales (EBITDA margin) and EBIT/Sales (ROS); ROE (EPS/Equity). The first multiple measures the productivity of the assets in place but has two drawbacks: 1) the denominator (Assets) is recorded at historical costs while the numerator (EBIT) is a current measure, and the mismatch could create inconsistency; 2) it would be more appropriate to use only Operating Assets as denominator, since the now included Financial Assets do not influence operating performance and could, therefore, lead to an underestimation of operating profitability (Barber & Lyon, 1996). The second and third ratios attempt to overcome the discussed drawbacks by using Sales as scaling measure; unlike EBIT/Assets, the multiples do not measure the productivity of the available resources directly, instead,

showing the impact of COGS and Operating Expenses on revenues, give insights on the operating efficiency of the firm. Lastly, ROE will provide an estimate of the return of equity investors in the portfolio company and combines both operational improvements and financial engineering changes.

In addition to the three measures presented, which mainly gauge operating profitability, this study will employ three other indicators more focused on operating efficiency: Asset Turnover (Sales/Assets), Cash Conversion Cycle (CCC) and Employees performance. The first multiple is an indicator of the efficiency with which a company is employing its assets in generating revenues. Cash Conversion Cycle is a metric that expresses the amount of time necessary for a company to convert resource inputs into cash flows and provides insights on the efficiency of working capital management. The last ratio, computed as the sum of operating revenues divided by total employee costs, is expected to gauge the improvements in employees' productivity under PE ownership.

After analysing the presence and extent of operating improvements, we examine the relation between operating performance and the following factors expected to be related to post-buyout operating gains:

1. *Management incentives*. Management and shareholders' interests are expected to be more aligned when management contributes some fraction of the equity and therefore a dummy variable, taking value D_i=1, if the management invest in the deal, and D_i=0 otherwise, will be used as indicator.
2. *Benefits of Increased Debt*. Greater amount of debt may have a disciplining effect on management, helping in reducing agency costs (as discussed in Section 2.2). Changes in Debt-to-EBITDA multiple are used as proxy for leverage.
3. *Improved Governance and Monitoring*. A variable controlling for Club Deals is employed, since it is believed that shared governance could reduce the incentives to monitor. Club PE is a dummy variable taking value D_i=1, if the deal is executed by more than one PE firm, and D_i=0 otherwise.
4. *Pre-Buyout Firms Characteristics*. The room for improvements in terms of operating performance may be greatest for companies that are underperforming in the period antecedent the buyout. Return on Sales (ROS) in the year immediately before the acquisition (t=-1) is used as indicator of pre-buyout underperformance; in addition, we control for pre-buyout debt levels.

We will execute three cross-sectional regressions for post-buyout operating performance, with dependent variables being the firms' profitability ad deal outcome (computed as EBITDA margin at Last year) and market-adjusted changes in cash-flows (proxied by EBITDA margin and ROA adjusted for the performance of the FTSE MIB Index) from the year before the buyout to the last post-buyout year (-1, Last). The independent variables include the four indicators described before and a control variable for deal size (ln(capital)). The regression models may be summarized as follows:

$$\Delta Adj.EBITDA\ margin(EBITDA\ margin_{Last}, ROA) = \beta_1 + \beta_2 * \ln(capital) + \beta_3 * Adj.EBITDA\ margin\ (ROA)_{-1} + \beta_4 * Pre-buyout\ Leverage + \beta_5 * \Delta Leverage + \beta_6 * Management\ Equity + \beta_7 * Club\ PE$$

All regressions are OLS with heteroskedasticity adjusted standard errors.

5.3 Returns Explanation

In this section, we outline the methodology, largely based on Kaplan (1989a) and Guo et al. (2011), employed to examine the impact and contribution of our identified value drivers: Financial Engineering Operational Engineering, and Multiples Expansion.

5.3.1 Impact of Operational Engineering

To quantify the impact of changes in operating performance on returns we calculate for each firm a hypothetical return that would have been realized if the firm's profitability, adjusted for the performance of the benchmark index, had remained at its pre-buyout level. More specifically, at outcome date, we compute a hypothetical after-tax cash flow so that the EBITDA margin (EBITDA/Sales) remains constant at the pre-buyout level. We then compute the TV as the final year's cash flow time the industry valuation multiple at exit. The proportion of return attributable to firm-specific changes in operating performance is determined as the difference between the median realized return and the hypothetical return divided by the median absolute value of realized return.

5.3.2 Impact of Multiple Expansion

Even without changes in operating performances, positive returns could be the result of increases in industry or broader market valuation multiples after the buyout.

We quantify the impact of changes in market multiples computing, for each firm, the return that would have been realized had the mentioned ratios remained at the buyout date value. Specifically had the market multiple remained at the buyout date level the TV would change by $EBITDA_{(last\ year)} * [Market\ Multiple_{(last\ year)} - Market\ Multiple_{(buyout\ year)}]$. Subtracting this amount from the actual TV and recalculating the return will produce a hypothetical return that assumes constant market multiple. The proportion of total returns due to multiple expansion will, therefore, be the difference between the medians of actual and hypothetical returns (calculated assuming constant industry market multiples) divided by the median of actual returns. The multiples employed are the median multiples reported in the annual Italian Private Equity Monitor (PEM) reports, considered an appropriate, despite conservative, measure for the market under consideration.

5.3.3 Impact of Financial Engineering

A similar analysis is performed to quantify the impact of realized tax benefits, originating from an increased amount of leverage, on returns. We compute the tax-benefits from increasing debt calculating hypothetical tax payments under the assumption the sample firms maintain their pre-buyout interest coverage ratio or pay no interests in unprofitable years. Taxes are calculated by using EBIT and the firms' marginal tax rates. The present value of the tax-benefit is then computed as the sum of the differences between the hypothetical tax payments and the actual ones, discounted to the pre-buyout date at the LIBOR plus a spread. The terminal value of the tax-benefit is then computed as $\frac{Interest_{Actual} * t}{r} - \frac{Interest_{Hypothetical} * t}{r}$, assuming that the firms maintain their increase in leverage after the outcome

date and discounted at the buyout date using a discount rate of 8.35% to assure comparability with the results of Guo et al. (2011). The effect of financial engineering on returns is estimated by subtracting the present value of tax-benefits, divided by buyout capital, from the realized returns. The impact is finally computed as the median of the actual returns, divided by the median of the hypothetical returns, minus one.

The assumption of a constant increased leverage after the outcome date is reasonable for firms undergoing a secondary LBO or strategic acquisition but less so for IPO exits, where typically leverage is reduced with some portion of the proceeds from going public. In contrast, firms facing bankruptcy must deleverage substantially. Being made up almost exclusively by SMEs and including no IPO exit and few cases of bankruptcy, the approximation is considered reasonable and not to have a material impact on the validity of results.

5.3.4 Regressive Analysis of Determinants of Returns

To provide further comparisons on the relative impact of the determinants of returns, a regressive analysis explaining returns to buyout capital is performed. Three cross-sectional regressions are executed, with dependent variables being the market-adjusted return to buyout capital. The independent variables include indicators of 1) changes in operating performance, proxied by changes in EBITDA margin and ROA (-1, last) adjusted for benchmark index; 2) changes in market multiples, measured as the change in market EV/EBITDA (-1, last) (as per PEM reports); 3) changes in tax-benefits, gauged by the TV amount of tax benefits divided by the buyout capital. We also include a dummy variable to control for the effect of Club Deals. The equation of the regression model is the following:

$$Return\ to\ Capital\ \%_{Market\ Adj.} = \beta_1 + \beta_2 * \Delta Adj.EBITDA\ margin + \beta_3 * \Delta Adj.ROA + \Delta Market\ Multiple + \beta_4 * Tax\ Benefits + \beta_5 * Club\ PE$$

6 Sample description

We use SDC and PEM (Private Equity Monitor) reports to identify leveraged buyouts of Italian firms with acquirers Private Equity firms and completion date between January 2007 and December 2013. Our initial screening through SDC identifies 152 possible transactions. The sample is refined by eliminating buyouts involving target firms for which no financial data for the window period considered (-3; +3) were available and by adding transactions reported by PEM annual reports. This produces a final sample of 70 LBOs from 2007 to 2013.

In contrast to US deals from the 1990s (Guo, et al., 2011), fewer firms come from service industries (20% in our sample versus 28%) and significantly more from the manufacturing sector (71% in our sample versus 36%). More specifically the greatest number of deals happened in Business Services (13%), Machinery and Computer Equipment (11%) and Chemicals (10%).

A total of 66 different PE firms are involved in the buyouts, but no single sponsor invests in more than 7 companies[6]. The majority of the buyers are Italian Private Equities (59%), with the remaining mainly from UK (21%) and France

[6] The most active financial sponsors are Investindustrial (7 deals), Cape-Natixis (6 deals) and Clessidra (4 deals).

(8%). Low interest is registered from big international funds, which account for only 9% of the total[7]. We find that 21 deals in our sample (30%) have more than one PE firm involved and only in 6 transactions the management contributes some fraction of equity (9%).

Table 1 – Annual Medians for Deal pricing

This table presents descriptive statistics for the pricing of 70 LBOs completed between 2007 and 2013. The buyout price, referred to as *Capital,* is computed as the sum of the value of equity and net debt; EBITDA figures used in the *EBITDA/Capital* ratio are computed and the EBITDA for the year previous to the transaction.

Year	No. of Buyouts	Capital (€m)	EBITDA/Capital
2007	10	114.23	7.43%
2008	22	180.43	8.41%
2009	4	174.90	5.71%
2010	8	130.16	7.02%
2011	4	471.14	3.97%
2012	10	154.37	7.19%
2013	12	385.06	7.13%
Total	70	212.88	7.02%

Table 1 describes the buyout sample and the main pricing characteristics. The average yearly number of deals is very volatile, ranging from 4 deals in 2011 to 22 in 2008, with a median of 10. The extremely low figure for the year 2011 can be explained by the distressed condition of the market following the global financial crisis and the struggle in finding resilient business opportunities. The average deal value of €212.9m, despite significantly below the $463.7m result from the 1990-2006 US sample (Guo, et al., 2011), is consistent with the characteristics of the Italian productive fabric and the fact that our sample mainly consists of private-to-private transactions while the comparable paper focuses on public-to-private transactions. To provide a measure of the price paid relative to fundamentals we employ the firms' EBITDA in the last full year prior to the buyout as a percentage of the buyout price. The ratio indicates how expensive is the acquisition compared to EBITDA generation. A clear trend throughout the window period is not recognizable, however, the yearly number of deals and EBITDA/Capital multiple presents a significant correlation (c. 82%) explicable by opportunistic acquisitions from PE firms when capital is relatively cheap in terms of EBITDA. The sample average EBITDA/Capital (7.02%) is significantly lower than Guo et al.'s results (11.26%) and shows greater volatility; these results can be explained by the impact of the financial crisis on economic activity that led to deterioration in operating measures and peculiar acquisition dynamics, often driven by expectations of future recovery.

Overall, the sample deals appear highly priced relative to the US-based transactions of the 1980s and 1990s and the

[7] Namely The Carlyle Group, 3i Group, Apax Partners, Bain Capital and CVC Capital Partners.

results provide inputs about the singularity of the Italian PE market and the specific window period that will be examined in detail in the following sections.

7 Empirical Analysis

7.1 Returns to Capital

The boom in PE firms, with financial sponsors driving acquisitions at higher and higher buyout prices, raises the question of how much returns are the funds generating in the latest period. The following section reports nominal and market-adjusted returns for our 70 deals sample and for the 22 deals with observable exit, with further insights by group outcome.

Table 2 provides a breakdown of the post-buyout deal outcome by exit category. It shows that 6 firms enter bankruptcy proceedings, which is 9% of the sample. For comparison Guo et al. (2011) report that 15% of firms with post-buyout data available enter Chapter 11 or a distressed restructuring and Andrade and Kaplan (1998) report that 29% of their initial sample of 136 MBOs failed by 1995. As expected 83% of the bankruptcy cases happen at the outbreak of the financial crisis and in the two years immediately following. Median years to outcome are broadly in line with comparable studies.

Table 2 – Post-buyout Deal Outcomes
This table reports post-buyout outcomes as of March 2017 for the full sample of 70 buyouts with post-buyout data available.

	(1)	(2)	(3)	(4)	(5)	
Outcome:	IPO	Sold	2nd LBO	Bankruptcy	Still Private or Unknown	Total
LBO Year:						
2007	0	2	4	1	3	10
2008	0	7	6	3	6	22
2009	0	2	1	1	0	4
2010	0	0	4	1	3	8
2011	0	0	1	0	3	4
2012	0	4	1	0	5	10
2013	1	1	3	0	7	12
Total (2007-2013)	1	16	20	6	27	70
Percent of deals	1%	23%	29%	9%	39%	100%
Median years to outcome	2	4	5	4.5	-	5

Following the methodology discussed in section 3.1, we report realized returns grouped by post-buyout outcome and on an aggregate basis in Table 3. As expected, and consistently with US market results from the 1990s, the nominal and market-adjusted returns are negative for the bankruptcy group. Both unadjusted and adjusted returns for the other four categories are positive but significantly lower than Guo et al.'s results, with a mean return for the whole sample 63.4% lower on a nominal basis and 45.6% lower on a market-adjusted basis. Limitations on the reliability of returns derive from their significant dependence on estimated industry exit multiples, being the TV for 48 out of 70 deals not directly observable. In support of the hypothesis, we observe a market-adjusted return for deals with observable exit value of 90.92%, which is broadly in line with the result obtained by Guo et al. on their US sample (94.7%).

Unlike mentioned comparable study, the market-adjusted returns for our sample are higher than the nominal returns, due to the market crash following the explosion of the global financial crisis in 2008.

The returns for the different groups appear logic and accordant with past literature: PE firms realize higher returns through sale to strategic buyers (79.88% market-adjusted) relative to financial sponsors (58.80% market-adjusted) since the formers are willing to pay a higher price due to the expected achievable synergies. IPO group presents only one sample firm and the linked return cannot be considered representative of the category returns; the exiguous representation of IPO outcomes results consistent with the intrinsic nature of the Italian company base, composed mainly of micro, small and medium enterprises.

Overall Table 3 demonstrates that the mean and median returns are positive, with underperformance compared to the US sample mainly driven by the dependency on industry multiples and the non-inclusion of interim payments to capital in the returns calculation.

Table 3 – Realized Returns to Buyout Capital

This table reports nominal and market-adjusted returns to capital. The nominal return to capital is calculated as the TV estimated at the outcome date, divided by total capital, minus one. Capital refers to the buyout Enterprise Value price. TV is the total euro value received at the outcome date. Value at the outcome date is determined from the observed value at exit from Bankruptcy, sale of the firm or IPO or is estimated as a multiple of EBITDA (or Sales if EBITDA is negative) if not observable. Market-adjusted returns are computed for each transaction by subtracting from nominal returns the returns of the FTSE MIB Index in the same window period.

		Nominal Returns			Market-adjusted returns		
Outcome	N	Mean	Median	# of positive returns	Mean	Median	# of positive returns
1. IPO	1	32.74%	32.74%	1	19.82%	19.82%	1
2. Acquired	16	74.48%	53.66%	13	79.88%	80.26%	14
3. 2nd LBO	20	50.76%	64.92%	13	58.80%	74.83%	13
4. Bankruptcy	6	-50.34%	-51.74%	1	-34.28%	-28.25%	1
5. Still private or unknown	27	68.49%	-3.01%	12	58.08%	-12.88%	12
Total (1-5)	70	54.10%	26.12%	40	54.80%	28.28%	41
Total (1-4)	43	45.06%	42.86%	28	52.75%	60.12%	29
Deals with outcome	22	80.71%	81.51%	18	90.92%	96.61%	19

7.2 Financial Engineering

Following the profuse evidence on increases in debt levels during LBOs (as discussed in Section 2.2), we proceed in examining the evolution in debt levels and coverage ratios of our 70 sample firms throughout the examined window period. Table 4 reports in Panel A the percentage change in leverage and solvency measures for the last year pre-buyout (-1) to 2 and 3 years post-buyout (+2; +3) and to deal outcome or last available year if still private (last year). Panel B, instead, shows the percentage changes of those ratios from year -1 to last grouped by deal outcome.

In line with precedent comparable studies, we observe a significant increase in leverage measured as Debt to EBITDA and Debt to Equity ratios. However, with a peak of +108.45%, the registered increases appear significantly lower relative to results of Guo et al. (2011), who report a more than double pre- to post-buyout Debt to EBITDA ratio rise (+233.33%). Market-adjusted results present, on average, even lower figures. The effect can be explained by the credit crunch happened after the financial crisis that, combined with decreasing performances, especially constrained

the debt granted to the SMEs[9], characterized by a low amount of collateral assets, and by the different size and consequent debt capacity of the firms in the compared samples. The results may also suggest the shift of emphasis toward operational engineering advocated by Kaplan and Strömberg (2008). For debt levels we observe a peak in year +2 with subsequent deleveraging throughout the life of the investment, accordant to industry practice.

Table 4 - Changes in Debt Levels from Pre-buyout Period to Post-buyout Period

Panel A reports median changes in debt levels relative to the fiscal year ending prior to completion of the buyout year (year -1). Panel B reports median changes in debt levels from year -1 to last year, grouped by outcome. Last year is the last post-buyout fiscal year available prior to the deal outcome or the last available fiscal year for deals still private. Adjusted percentage change equals the difference between the change for the buyout company and the change for the FTSE MIB Index. Data are obtained from Aida (Bureau van Dijk) and Annual Reports.

Panel A: Median Percentage Change in Debt Characteristics from Year i to j (# Observations; # Positive Observations)									
	-1 to +2			-1 to +3			-1, last year		
A.1. Debt levels									
Debt/EBITDA									
Unadjusted change	108.45%	(67 ;	48)	82.14%	(49 ;	28)	45.69%	(70 ;	39)
Market-adjusted change	91.72%	(67 ;	50)	45.92%	(49 ;	27)	54.68%	(70 ;	41)
Debt/Equity									
Unadjusted change	63.33%	(66 ;	42)	26.47%	(49 ;	29)	2.14%	(70 ;	36)
Market-adjusted change	68.70%	(66 ;	46)	26.97%	(49 ;	30)	25.71%	(70 ;	40)
A.2 Solvency									
Solvency Ratio	-10.76%	(66 ;	27)	-5.84%	(49 ;	23)	-3.79%	(70 ;	33)

Results grouped by outcome appear logic and consistent with market dynamics: on a market-adjusted basis, firms sold through a secondary LBO register the lowest increase of debt from year -1 to last, explained by the need for secondary PE buyers to acquire modestly leveraged companies in order to raise new debt on them; bankruptcy group registers the highest percentage increase due to the significant deterioration of EBITDA performance in firms heading toward failure, followed by the group composed of companies still private (in accordance with the evidence of peak leverage in the first years after the buyout).

Overall, the debt level surge, despite significant, results modest relative to comparable studies due to the singularity of the window period and sample of firms under examination.

We refer to the following section on Operational Engineering for a more in-depth analysis of the impact of the described leverage characteristics on operating performance.

Table 4 - *continued*

Panel B: Median Percentage Change in Debt Characteristics from Year -1 to Last (# Observations; # Positive Observations), Grouped by Outcome										
	IPO		Sold		2nd LBO		Bankruptcy		Still private	
A.1. Debt levels										
Debt/EBITDA										
Unadjusted change	-69.89%	(1 ; 0)	85.50%	(15 ; 9)	-2.48%	(20 ; 10)	487.47%	(6 ; 3)	111.33%	(27 ; 17)
Market-adjusted change	-46.65%	(1 ; 0)	111.85%	(15 ; 10)	7.01%	(20 ; 10)	443.68%	(6 ; 3)	134.58%	(27 ; 18)
Debt/Equity										
Unadjusted change	-100.00%	(1 ; 0)	33.33%	(15 ; 9)	20.69%	(20 ; 11)	40.80%	(6 ; 3)	-12.36%	(27 ; 12)
Market-adjusted change	-76.40%	(1 ; 0)	104.25%	(16 ; 12)	32.78%	(20 ; 11)	59.89%	(6 ; 3)	9.56%	(27 ; 14)
A.2 Solvency										
Solvency Ratio	-13.89%	(1 ; 0)	3.34%	(16 ; 9)	-11.85%	(20 ; 9)	-282.21%	(6 ; 0)	6.88%	(27 ; 15)

7.3 Operational Engineering

7.3.1 Changes in Operating Performance

The large positive returns documented in Section 5.1 suggest that, on average, PE fund managers create value for their investors. We expect improvements in operating performance and efficiency gains under PE ownership to be primary determinants of the returns.

In this section we first assess the post-buyout changes in operating performance by post-buyout year and deal outcome; we then relate observed operating improvements to variables that proxy for sources of gains, such as improved management incentives, discipline of higher debt levels, better monitoring by sponsor firms and other pre-buyout characteristics as discussed in Section 3.2.2.

Table 5 reports the percentage change in operating performance for the last year pre-buyout (-1) to two and three years post-buyout (+2; +3) and to deal outcome or last available year if still private (last year). Panel A.1. of Table 5 reports measures of firm profitability. The unadjusted changes in EBITDA margin result negative for the changes to each post-buyout period, in accordance with the US sample from the 1990s. Unadjusted changes for ROS and ROE show similarly negative results, further depressed by the impact of CAPEX and interest expenses. However using market-adjusted measures, we observe positive improvements in EBITDA margin from year -1 to years +2, +3 and last, with a peak in year +3 (+17.73%). The results are broadly in line with those of Guo et al. (2011) (who report a peak of +11.43%) but significantly underperforming those reported by Kaplan (1989a) for the US sample from the 1980s. The substantially positive adjusted percentage change in ROE suffers from high sample volatility (with -243% in average) and therefore considered not statistically relevant.

Even if profitability doesn't significantly improve by the time of the exit, firms may still increase in value leveraging the increase in productivity of assets, for example by disposing of non-productive assets. Panel A.2. of Table 5 shows results for returns on assets measured as EBIT to Total Assets (ROA). Performance changes on unadjusted basis are not significant, however, we observe improvements in market-adjusted results by the last year prior to exit of 5.72%, consistent with results from the 1990s US sample (+11%) once adjusted for the impact of D&A. Limitations derive

from the high volatility of the sample results, the significant unadjusted negative changes and the contrasting results of changes in Asset Turnover.

Also improved productivity, efficiency and management of working capital could lead to perceived value creation from potential acquirers. Panel A.3 of Table 5 reports significant results for the Cash Conversion Cycle, which shows a reduction of 29.44% by last year and suggests a better contractual strength of PE owners toward creditors and debtors. The negative trend observed in employees' performance instead may be explained by the perceived job insecurity and eventual cultural clashes with the new owners.

Table 5 – Changes in Operating Performance from Pre-buyout Period to Post-buyout Period

Panel A reports median changes in operating performance relative to the fiscal year ending prior to completion of the buyout year (year -1). Panel B reports median changes in operating performance from year -1 to last year, grouped by outcome. Last year is the last post-buyout fiscal year available prior to the deal outcome or the last available fiscal year for deals still private. Adjusted percentage change equals the difference between the change for the buyout company and the change for the FTSE MIB Index. Data are obtained from Aida (Bureau van Dijk) and Annual Reports.

Panel A: Median Percentage Change in Operating Performance from Year i to j (# Observations; # Positive Observations)						
	-1 to +2		-1 to +3		-1, last year	
A.1. Profitability						
EBITDA/Sales						
Unadjusted change	-19.52%	(70 ; 24)	-17.56%	(70 ; 19)	-13.74%	(70 ; 29)
Market-adjusted change	0.37%	(70 ; 33)	17.73%	(70 ; 30)	8.14%	(70 ; 37)
ROS						
Unadjusted change	-49.56%	(70 ; 22)	-62.51%	(70 ; 20)	-35.11%	(70 ; 28)
Market-adjusted change	-19.96%	(70 ; 26)	-11.76%	(70 ; 24)	7.13%	(70 ; 37)
ROE						
Unadjusted change	-72.81%	(70 ; 22)	-75.78%	(70 ; 19)	-84.25%	(70 ; 27)
Market-adjusted change	-37.75%	(70 ; 26)	50.54%	(70 ; 31)	19.55%	(70 ; 36)
A.2 Return on assets						
ROA						
Unadjusted change	-72.80%	(70 ; 15)	-75.23%	(70 ; 18)	-66.06%	(70 ; 20)
Market-adjusted change	-34.84%	(70 ; 24)	46.62%	(70 ; 31)	5.70%	(70 ; 37)
Asset Turnover						
Unadjusted change	-22.65%	(70 ; 20)	-20.83%	(70 ; 16)	-13.14%	(70 ; 25)
Market-adjusted change	-24.95%	(70 ; 18)	-20.63%	(70 ; 15)	-31.69%	(70 ; 20)
A.3 Efficiency						
CCC	-9.82%	(70 ; 21)	-23.57%	(70 ; 15)	-29.44%	(70 ; 19)
Employees performance	-9.89%	(70 ; 21)	-11.37%	(70 ; 15)	-12.14%	(70 ; 18)

Panel B of Table 5 demonstrates the variability from year -1 to last year grouped by exit outcome. The changes for secondary buyouts and still private firms are substantially greater for almost all the profitability, productivity and efficiency measures. The underperformance of firms going through a strategic sale is consistent with the US sample and may be explained by a more strategic oriented focus with respect to financial buyers and by behavioral biases of acquiring firms' CEOs.

In view of the large positive returns to capital documented, the modest gains in operating performance may result puzzling. While the empirical methodology may slightly differ, our evidence is in line with the results of Guo et al.

(2011) (as already documented) and with more recent studies of buyouts in Europe and the UK[8], suggesting that this trend may not be unique to the Italian market.

Table 5 – *continued*

Panel B: Median Percentage Change in Operating Performance from Year -1 to Last (# Observations; # Positive Observations), Grouped by Outcome										
	IPO		Sold		2nd LBO		Bankruptcy		Still private	
A.1. Profitability										
EBITDA/Sales										
Unadjusted change	10.46%	(1 ;1)	-14.34%	(16 ;5)	-12.98%	(20 ;8)	-196.61%	(6 ;1)	0.12%	(27 ;14)
Market-adjusted change	9.90%	(1 ;1)	-9.29%	(16 ;7)	13.02%	(20 ;13)	-159.41%	(6 ;1)	22.77%	(27 ;15)
ROS										
Unadjusted change	18.77%	(1 ;1)	-55.46%	(16 ;5)	-13.39%	(20 ;8)	-137.11%	(6 ;1)	-24.31%	(27 ;13)
Market-adjusted change	6.87%	(1 ;1)	-10.10%	(16 ;7)	42.80%	(20 ;13)	-77.39%	(6 ;1)	8.70%	(27 ;15)
ROE										
Unadjusted change	-94.32%	(1 ;0)	-86.34%	(16 ;6)	-58.53%	(20 ;8)	-99.02%	(6 ;1)	-50.12%	(27 ;12)
Market-adjusted change	-228.89%	(1 ;0)	47.36%	(16 ;9)	76.57%	(20 ;13)	6.01%	(6 ;3)	-32.83%	(27 ;11)
A.2 Return on assets										
ROA										
Unadjusted change	-38.91%	(1 ;0)	-66.77%	(16 ;5)	-56.73%	(20 ;5)	-917.42%	(6 ;0)	-49.54%	(27 ;10)
Market-adjusted change	-185.97%	(1 ;0)	58.34%	(16 ;11)	66.69%	(20 ;15)	-796.21%	(6 ;0)	-11.30%	(27 ;11)
Asset Turnover										
Unadjusted change	-47.37%	(1 ;0)	-9.61%	(16 ;7)	-11.62%	(20 ;7)	12.53%	(6 ;3)	-14.75%	(27 ;8)
Market-adjusted change	-52.12%	(1 ;0)	-34.35%	(16 ;5)	-26.51%	(20 ;5)	2.32%	(6 ;3)	-40.40%	(27 ;7)
A.3 Efficiency										
CCC	-48.59%	(1 ;0)	-14.62%	(16 ;4)	-33.56%	(20 ;4)	-69.17%	(6 ;2)	-14.19%	(27 ;9)
Employees performance	2.96%	(1 ; 1)	-5.91%	(16 ; 5)	-17.28%	(20 ; 4)	-31.29%	(6 ; 1)	-11.15%	(6 ; 1)

7.3.2 Explanations for Changes in Operating Performance

Despite the modest gains in operating performance, the variation in performance (as seen across deal outcome in Table 4, Panel B) is quite large. We examine the relationship between changes in operating performance and four factors expected to influence operating gains as discussed in Section 3.2.1.

The cross-sectional regressions for changes in operating performance are reported in Table 6. The dependent variables are the level of operating profitability in the last year prior to the deal outcome (EBITDA margin at the last year) or the market-adjusted changes in operating performance from the year prior to the buyout to the last post-buyout year (change in EBITDA margin or ROA adjusted for the performance of the FTSE MIB Index). All regressions control for deal size (ln(*capital*)) and pre-buyout performance and debt levels. The dependent variables set is completed by the market-adjusted leverage change from year -1 to last and two dummy variables controlling for management's equity contributions and consortium of PE buyers. As per results of Guo et al.'s study on their 1990s US sample, management's involvement in the equity stake does not appear to deliver better performances.

[8] For instance, Weir, Jones and Wright (2008) and Vinten (2007) show decreases in profitability following buyouts in the U.K. and Denmark. However many studies on smaller divisional buyouts and private companies buyouts in Europe show that profitability increases more than benchmark firms (Cressy, et al., 2007)(Boucly, et al., 2011)(Acharya, et al., 2009).

Differently from the mentioned research, also increases in debt levels seem to have a non-significant impact on operating performances in our sample. Bergström et al. (2007) encounter similarly non-significant results for both management incentives and leverage increases, calling for the need for a more comprehensive approach to the study of determinants of operating performance. We find however that firms with greater pre-buyout debt levels consistently show worse cash flow performance, which supports our previous hypothesis. Also, deal size seems to positively affect the post-buyout operating performance due to the stronger resilience of bigger companies during recession periods, such as the one immediately following the global financial crisis of 2008[9], under consideration in our study. For the variable related to monitoring by PE firm, we find that the presence of multiple financial sponsors shows a significant negative impact on the last year operating performance and a nearly significant impact on the change in market-adjusted performance. The results support the hypothesis that multiple PE buyers' involvement can create a "free-rider" problem with the outcome being that each of the acquiring firms exercises a less effective monitoring of the target firm.

Table 6 – Regressions for Changes in Operating Performance

The table reports the multivariate regression results for post-buyout performance. Adjusted EBITDA margin and ROA subtract the performance of FTSE MIB Index. The dependent variable in model (1) is EBITDA margin, measured as (EBITDA/Sales) at the last post-buyout year. The dependent variables in models (2) and (3) are, respectively, the changes in adjusted EBITDA margin and ROA. Capital is the buyout purchase price. Pre-buyout leverage is computed as (Debt/EBITDA) at year -1. Leverage change is the market-adjusted change in Debt to EBITDA from year -1 to the last post-buyout year. Mgmt equity and Club PE are two dummy variables controlling respectively for management involvement in the buyout and multiple private equity buyers. P-values are in parentheses. All the regressions are OLS with heteroskedasticity adjusted standard errors. Coefficients that are significantly different from zero are indicated in bold. ***,**, and * indicate significance at the 1%, 5% and 10% level, respectively.

	(1) EBITDA margin at Last Year	(2) Change in Adjusted EBITDA margin (-1, Last)	(3) Change in Adjusted ROA (-1, Last)
ln (capital)	**5.916****	**0.714****	-4.411
	(0.017)	(0.048)	(0.448)
EBITDA margin (or ROA) at year -1	**0.587*****	-0.004	-0.910
	(0.009)	(0.912)	(0.288)
Pre-buyout Leverage	**-0.798****	**-0.098***	**-7.703*****
	(0.043)	(0.091)	(0.000)
Leverage change	0.000	0.000	-0.005
	(0.971)	(0.916)	(0.607)
Mgmt equity	14.054	2.271	-20.248
	(0.271)	(0.226)	(0.513)
Club PE	**-13.376***	-1.639	15.483
	(0.084)	(0.148)	(0.418)
Observations	70	70	70
Adjusted R^2	0.204	0.032	0.464

[9] Sahin et al. (2011), exploring why small businesses were hit harder by the 2008 recession, found that the underperformance was due to a heightened impact of poor sales and economic uncertainty relative to big firms and to a tightened access to credit combined with adverse financial conditions.

Overall, leverage changes and management involvement appear non-significant in explaining post-buyout performance, with the operating gains ultimately influenced by buyout firm characteristics, such as leverage and company size, and suggesting an irrelevant impact of PE ownership and activity.

7.4 Returns Explanation

In this Section, we examine the three potential determinants of returns to buyout capital and their relative contribution to the aggregate performance. We first quantify the proportion of returns that can be attributed to improvements in operating performance, changes in industry or market valuation or realized tax benefits due to an increased amount of leverage. We then use cross-sectional regressions to provide further evidence on the economic impact of the mentioned factors.

Table 7 – Impact of Changes in Operating Performance, Valuation Multiples, and Tax Benefits of Debt on Returns

This table presents the impact of each factor on returns. The median realized market-adjusted returns to buyout capital are as reported in Table 3. The proportion of return due to change in each factor is estimated as the ratio of the difference between the realized and "hypothetical" return to the absolute value of the realized return. Hypothetical returns are computed as follows. Panel A, Operating Performance: we calculate a hypothetical return that would have been realized if the firm's profitability, adjusted for the profitability of the FTSE MIB, had remained constant. Specifically, for the outcome year, we compute a hypothetical TV (equal to the final year's EBITDA times the industry multiple at exit), and calculate a hypothetical return using this estimated cash flow. Panel B, Market Multiple: a hypothetical TV is calculated by assuming the market multiple remains constant at buyout level. Panel C, Tax benefits of increased debt: for outcome year, a hypothetical tax payment is computed assuming the firm maintains its pre-buyout interest coverage level. Based on that estimate a TV of tax benefit is computed as (I_{Actual}*t/r – $I_{Hypothetical}$*t/r) and then discounted to the buyout date at an interest rate of 8.35%. Hypothetical returns subtract the present value of tax benefits while private (divided by buyout capital) from the realized return.

			A. Proportion of Return Due to		B. Proportion of Return Due to		C. Proportion of Return Due to
Outcome	Market-adjusted Returns	N	Change in Operating Performance	N	Change in Market Multiple	N	Tax Benefits of Increased Debt
Total	54.80%	70	22.86%	70	25.26%	53	12.12%
Total (except Still Private or Unknown)	52.75%	43	18.33%	43	21.11%	34	17.98%

Table 7 provides a breakdown of our empirical results. The realized returns shown are the market-adjusted returns to capital as reported in Table 3. The percentage of returns due to improvement in operating performance is estimated at 22.86% for the full sample and in 18.33% if we exclude firms that have still to reach an outcome. The results are perfectly in line with those observed by Guo et al. (2011) (22.9% and 17.6% respectively).

As expected from the analysis of operating performance performed in Section 5.3.1, the changes in market multiples have the greatest impact on realized returns, accounting for 25.26% for the full sample. Comparatively, Guo et al. (2011), employing a slightly different methodology, report similar returns on their US sample from the 1990s, with an estimated impact of 17.7%. The higher values observed in our sample can be explained by the growth premium recognised by investors in smaller businesses; more importantly, the significant impact is due to the greater delta

netted by PE investors who bought in the first years of the recession and exited their investments during market recovery, as evidenced by Achleitner et a. (2010). Lastly, we can attribute 12.12% of the returns to tax benefits of increased debt. Consistently with the significantly lower increases in debt recorded in our sample, the benefit from the tax-shield results almost three times lower relative to the impact for the US sample from the 1990s (33.8%).

Table 8 reports cross-sectional regressions explaining returns to capital, which provide further insights of the relative importance of determinants of returns. The dependent variable is the market-adjusted return to capital, while the independent variables include measures of the changes in operating performance, valuation multiple and tax benefits from increased leverage. The regressions return only two almost significant results: market-adjusted changes EBITDA margin in model (3) and impact of TV of tax benefits in model (1).

Limitations in the results of the regression models arise from the small sample dimension (only 53 observation) and the higher performance volatility compared with comparable studies (Guo, et al., 2011) .Overall, relative to comparable works, we observe in our sample a heightened impact of multiple expansion and a softer impact of tax benefits explainable with the credit crunch happened during the window period under consideration and by the singular characteristics of the sample firms. The inconclusive results in quantifying the determinants of returns advocate for the complexity and randomness of the private equity process of value creation, not suitable to be framed in a few quantitative variables.

Table 8 – Regressions for Returns to Capital

The table reports the OLS regression results for the return to capital for 53 deals with available variables data. The dependent variable is the market-adjusted return to buyout capital. *Change in market multiple* measures the change in the yearly median Private Equity Monitor's EV/EBITDA multiples from the buyout date to the TV date. *TV of tax benefits/Capital* is the discounted TV of tax benefits divide by buyout capital. *Club PE* is a dummy variable controlling for the involvement of multiple private equity buyers. P-values are reported under the coefficients in parentheses. Coefficients that are significantly different from zero are indicated in bold. ***, **, and * indicate significance at the 1%, 5% and 10% level, respectively.

	(1) Buyout Capital	(2) Buyout Capital	(3) Buyout Capital
Adjusted change in EBITDA margin	0.071 0.277	0.085 0.153	0.092 0.118
Adjusted change in ROA	0.001 0.594		
Change in market multiple	-1.672 0.456	-2.047 0.333	-1.505 0.453
TV of tax benefits/Capital	1.465 0.198	1.499 0.184	1.208 0.258
Club PE	0.299 0.469	0.338 0.402	
Observations	53	53	53
Adjusted R^2	-0.005	0.010	0.016

8 Conclusion

The origin of this paper comes from the need to fill an important gap in past literature on private equity, which overlooked the Italian market due to its negligible level of activity until recent times and the difficulties in the collection of both operating and deal outcome data. In addition, the work, covering the most recent window period, which spans from 2007 to 2016, provides insights on the evolution of value creation drivers in the sector and on the resilience of private equity investments in recession periods. The research, addressing these original angles, examines the impact of PE ownership on the operating performance and debt characteristics of portfolio companies and whether and how leveraged buyouts for the most recent wave create value, trying to provide an answer to the question: "What am I paying my PE fund manager for?".

The sample, extracted from SDC Platinum and PEM reports, comprises 70 leveraged buyouts happened between 2007 and 2013 having as target Italian firms. Results show that a predominant number of acquisitions is performed by local player suggesting a still limited internationalization and the relatively recent development of the sector in the country. The deals we examine frequently involve more than one private equity firm and show a concentration in years with cheap of capital to EBITDA generation, testifying the ability of fund managers to pursue opportunistic investments.

The returns to buyout capital obtained are, on average, large and positive both on absolute and market-adjusted terms and throughout all the group outcomes except, as expected, for bankruptcy scenarios. The sample, however, shows a significant underperformance with respect to comparable studies from the 1990s, which disappears when considering results for deals with an observable outcome, and hints the ability of fund managers to achieve better times money exit multiples relative to average industry multiples.

Results for changes in operating performance and leverage levels confirm many of the findings in previous literature: consistently with concept itself of leveraged buyout, we observe significant increases in debt levels after the transactions, though less marked than for previous timeframes, mainly due to the credit crunch happened in late 2007 and the lower credit accessibility for small businesses. Gains in operating performance are either comparable or slightly higher than those observed for the benchmark index; the magnitude of cash flows is in line with results from the 1990s but far from the levels registered in the 1980s buyout wave and may appear small in view of the estimated returns. Consistent with the evidence of overperformance of bigger firms in recessionary environments, cash flow gains are positively related to the size of the firm while negatively impacted by pre-buyout leverage level, which caps the debt assumption. The level of performance appears also affected by the presence of multiple private equity buyers, which generates monitoring issues.

We next show that improvements in operating performance, market multiples' expansion and tax benefits of increased debt explain economically large proportions of the realized returns. Relative to comparable studies, and in accordance with the returns for the subsample with an observable outcome, we observe a strengthened impact of multiple expansion, which contribute to more than 25% of average returns to capital. Cross-sectional regressions for the mentioned determinants of returns result insignificant, proving the complexity and variability of value drivers employed by PE firms and opening to further and more comprehensive researches focusing also on qualitative aspects of the value creation process.

Answering to our long-awaited question is an up-hill battle complicated by the limited sample under considerations and reliant on multiple assumptions. Overall, private equity funds result, on average, extremely successful in exploiting the debt capacity of target firms and in chasing the right moment to execute and exit their investments, achieving as a consequence great multiples gains. However, the high volatility in achieved returns and operating improvements suggest that a one-size-fits-all explanation on how value is created by PE fund managers is hard to identify and, beyond easy observable measures, should be looked for in the characteristics, skills and networks of the individual agents.

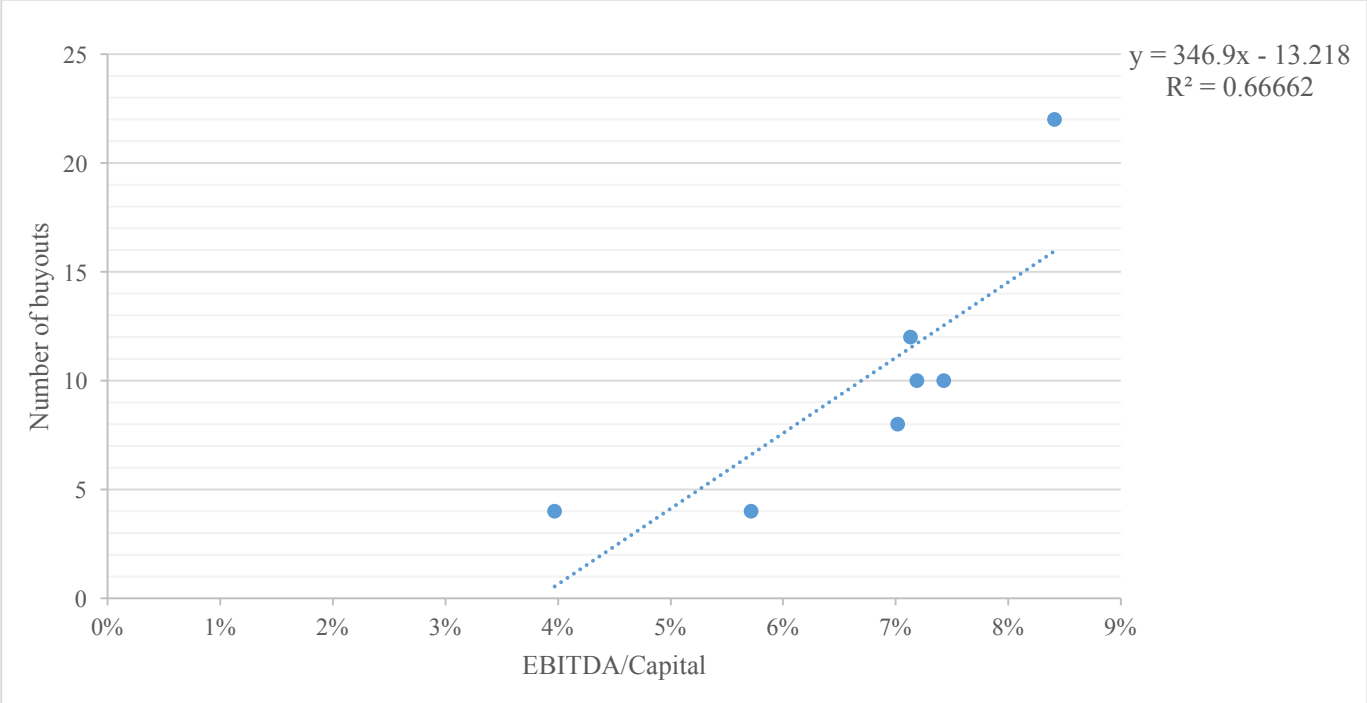
Appendix

A.1 – Analyzed Buyouts and Sponsors

Buyout Company	Entry Year	Exit Year	Sponsor
Nadella Srl	2007	2014	Mid Industry Capital
Ing Castaldi Illuminazione Srl	2007	2016	Cape-Natixis
Rhiag Inter Auto Parts Italia	2007	2013	Alpha Group
Azelis Italia Srl	2007	2015	3i Group
Plastiape SpA	2008	2013	Aksia Group
Poplast Srl	2008	2016	Credem Private Equity
Rosa Sistemi SpA	2008	2016	Aksia Group
Sirti SpA	2008	2016	21 Investimenti; Clessidra; Investindustrial; Eurazeo; Gruppo Banca Leonardo
N&W Global Vending SpA	2008	2015	Investcorp Bank; Barclays Private Equity
Cerved Group SpA	2008	2013	Bain Capital; Clessidra
RGI SPA	2009	2014	21 Investimenti
TeamSystem SpA	2010	2016	HGCapital
Arena Italia SpA	2010	2014	The Riverside Co.
EidosMedia SpA	2010	2015	Aksia Group; Wise
Octo Telematics SpA	2010	2014	Charme Capital Partners; Amadeus Capital; Rothschild Capital
I Pinco Pallino SpA	2011	2014	Opera
Limacorporate SpA	2012	2015	AXA Private Equity; Intesa Sanpaolo
Plastiape SpA	2013	2016	PM & Partners
DOC Generici Srl	2013	2016	Charterhouse Capital Partners
Buccellati Holding Italia SpA	2013	2016	Clessidra
Targetti Sankey SpA	2007	2015	3i Group PLC
Galeati Industrie Grafiche Srl	2008	2011	Credem Private Equity
Garioni Naval SpA	2008	2013	Cape-Natixis
Trafomec SpA	2008	2013	Cape-Natixis; Alba
ME Making Energy (Nice Ecostream Italy Srl)	2009	2013	Atlantis Capital Special Situations
Termoindustriale SpA	2010	2013	Argos Soditic Italia
Cerved Group SpA	2013	2015	CVC Capital Partners
Mida Srl	2007	2014	DGPA & Co.
Finder Pompe SpA	2007	2013	ABN Amro Capital
Gruppo Planter's (Dipros srl)	2008	2015	DGPA & Co.
Polynt SpA	2008	2016	Investindustrial
Microtecnica SpA	2008	2011	Stirling Square Capital
Ducati Motor Holding SpA	2008	2012	Investindustrial; BS Investimenti

Zero9 SpA	2008	2010	Investindustrial
XTEL Srl	2008	2014	Cape-Natixis
FullSIX SpA-Foreign Assets	2008	2015	Cognetas
Permasteelisa SpA	2009	2011	Investindustrial; Alpha Group
Esaote SpA	2009	2016	Ares Life Sciences; MPVenture; Equinox; Intesa Sanpaolo; Carige
Euticals SpA	2012	2016	Clessidra; Mandarin Capital Partners; Private Equity Partners; Idea Capital Funds
Izo Srl	2012	2015	Yarpa Investimenti
Tower Light Srl	2012	2013	Ambienta
Bellco SpA	2012	2016	Charme Capital Partners; Amadeus Capital; Capital Dynamics
Rhiag Inter Auto Parts Italia	2013	2016	Apax Partners
Morris Profumi SpA	2007	2015	Investindustrial
Sinteco Logistics SpA	2007	2015	Cape-Natixis
Tas Tecnologia Avanzata dei Sistemi SpA	2007	2015	Audley Capital Management
Sicurglobal SpA	2008	2015	Stirling Square Capital Partners
Tessitura Attilio Imperiali SpA & ITP Investment Textile Parcel Srl	2008	2015	Cape-Natixis
Jeckerson SpA	2008	2015	Stirling Square Capital Partners; Sirius Nominees; GSPS Investments
Kickoff SpA (Sundek)	2008	2015	DGPA & Co.
Glass Idromassaggio Srl (Wellness Solution Spa)	2008	2015	Iniziativa Gestione Investimenti
Nicotra Gebhardt SpA	2008	2015	Ergon Capital Partners; Fondo Athena
Nutkao Srl	2010	2015	Consilium
De Fonseca SpA	2010	2015	Consilium; Star Capital; Allianz Global Investor
Ecoteck Srl (AICO SpA)	2010	2015	Ambienta
Savio SpA	2011	2015	Alpha Group; Intesa Sanpaolo
Gruppo Coin SpA	2011	2016	BC Partners
Snai SpA	2011	2015	Investindustrial; Palladio Finanziaria
Lampogas SpA	2012	2015	4D Global Energy Advisors
Marcolin SpA	2012	2015	PAI Partners
SAGAT SpA	2012	2015	F2I
Alpitour SpA	2012	2015	Wise
Tucano Urbano	2012	2015	Consilium
Gazzotti SpA	2013	2015	H2i Holding di Iniziativa Industriale; Sangermano Investimenti
Rollon Srl	2013	2015	Iniziativa Gestione Investimenti; Chequers Capital
Ansaldo Energia SpA	2013	2015	CDP Equity
Marelli Motori SpA	2013	2015	The Carlyle Group
Castfutura SpA	2013	2014	Star Capital
Codyeco SpA	2013	2016	Star Capital
SIA SpA	2013	2015	Orizzonte; F2I; CDP Equity

A.2 – Correlation between Number of Buyouts and EBITDA to Capital



A.3 – Multiples' Expansion

Outcome	N	Change in Buyout Firm Multiple	Change in Private Equity Multiple	Change in FTSE MIB Multiple
1. IPO	1	16.57%	6.49%	8.45%
2. Acquired	16	84.68%	7.41%	10.90%
3. 2nd LBO	20	15.70%	1.03%	11.27%
4. Bankruptcy	6	9.68%	10.24%	3.66%
5. Still private or unknown	27	24.65%	6.49%	10.53%
Total (1-5)	43	26.09%	8.00%	11.27%
Total (1-4)	70	25.27%	4.58%	10.53%
Deals with outcome	22	59.98%	1.03%	10.90%

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Summary

1 Introduction

Private Equity firms made their first appearance during the 1980s and they were acclaimed by many as a superior managerial form that would have enabled to capture the value destroyed by agency problems in public firm. Since then Private Equity funds have grown from a tiny part of the financial market to a global force, representing 25% of global M&A activity as of 2007 (Jensen, 2007).

The abrupt growth of the industry spurred prosperous academic research on the value creation tools of PE firms and the performance of targets subject to leveraged transactions and a substantial body of empirical work from the 1980s showed that LBOs actually create value. In light of the renewed interest in the industry and the peak in PE activity that is being registered worldwide, and especially in the Italian market, our main research questions will be to 1) analyse the impact of private equity ownership on the characteristics and performance of target firms; 2) compute the return achieved by the industry and understand how each of the three mentioned value creation drivers (Operational Engineering, Financial Engineering, Multiple Expansion) contribute to the overall performance. The paper, following an approach similar to the one in "Do Buyouts (Still) Create Value?" (Guo, et al., 2011) on the US market, will try to provide a comprehensive picture and evidence on value creation by PE firms and show how each source impacts on the return on capital invested; the research takes two original angles: first, it will focus on the Italian market, which has been mostly overlooked due to its peculiar characteristics, small dimension, and low-value transactions; secondly, fill the gap with previous research examining the most recent period (2007-2016) upon which there is little (or no) evidence and that coincides with a new wave of PE activity in the country under consideration.

2 How Does the Private Equity Industry Works?

Leveraged buyout literally means acquisition throughout debt and consists in the acquisition of a company employing a relatively large portion of debt and a relatively small amount of equity. The sponsor's ultimate goal is to realize a return on the equity investment at the time of exit, usually through a sale or a public offer, historically aiming at annualized returns in excess of 20% within an investment horizon of five years. What makes the transaction extremely profitable is the ability to leverage the relatively small equity investment and exploit the additional benefits of tax savings realized due to the tax deductibility of interest expenses. A typical leveraged buyout provides for the creation of a special purpose vehicle (*newco*) in which the financial resources of the buyer are contributed in the form of equity (capital) and debt (leverage). The resources employed to finance the buyout project can, more specifically, be divided in equity and debt. Equity consists of the contribution made by the shareholders of the newco during its capital subscription and it generally represents from 30% to 40% of the total investment needed for the execution the buyout (Rosenbaum & Pearl, 2009). Debt, instead, has typically comprised 60% to 70% of the financing structure (Rosenbaum & Pearl, 2009).

A private equity firm raises equity capital through a private equity fund. These funds are "closed-end" investment vehicles in which investors commit to provide an agreed amount of money to pay for investments in target companies

and remunerate the private equity firm with management fees. As mentioned, legally, private equity funds are generally organized as limited partnerships (eg. Blackstone Capital Partners VII, L.P.), which offers two advantages: first and foremost, investors are exposed to limited liability and should anything go wrong in the investment process (bankruptcy, lawsuits etc.), the investors risk only the committed capital; secondly, a limited partnership is a pass-through entity for income tax purposes and helps to solve the problem of duplicating tax charges. To raise and operate a private equity fund two main actors are required: a financial sponsor and a group of investors. The sponsor is the team of professionals who identify, execute and manage investments in privately-held operating businesses and is generally comprised of a Manager (or Management Company) and a General Partner (GP). The Manager is the firm that structures the partnership, employs the investment professionals and is ultimately responsible for managing the fund being raised (eg. Blackstone Capital Partners, LLC). The General Partner of a fund is organized as a limited partnership controlled by the fund Manager and is the entity with legal authority to make all investment decisions for the fund and that assumes legal liability. The GP has a fiduciary responsibility to act for the benefit of the investors and is fully liable for its actions. It is customary for the general partner to provide at least 1% of the total capital (Bratton & McCahery, 2015). Because the funds, as discussed, are usually organized as limited partnerships, the investors are referred to as limited partners (LPs). The fund typically has a fixed life of ten years, but can generally extend for an additional three years. The financial sponsors, therefore, have around five years to deploy the committed capital and the remaining five to eight years to return money to the LPs. After committing their capital, the LPs have little say on how the general partners deploy the investment funds. Some restrictions, however, could span from the covenants included in the Limited Partnership Agreement (LPA). Common covenants include restraints on how much fund capital can be invested in a single company, on the types and sectors of securities a fund can invest in, and on debt at the fund level.

The private equity firm is remunerated primarily in two ways: Management Fees and Incentive Fees. Management fees are fees intended to compensate a fund manager for its day to day work of investing, whether or not the investments prove to be profitable. The private equity firm is remunerated primarily in two ways: Management Fees and Incentive Fees. Management fees are fees intended to compensate a fund manager for its day to day work of investing, whether or not the investments prove to be profitable. The private equity firm is remunerated primarily in two ways: Management Fees and Incentive Fees. Management fees are fees intended to compensate a fund manager for its day to day work of investing, whether or not the investments prove to be profitable.

3 The Italian Private Equity Market

The birth in Italy of a proper sector of professional operators specialized in equity investments dates back to the 1980s, when nine bank-originated private financial investment firms got together to give birth to a trade association called AIFI (which stands for Italian Association of Financial Investors and it is now better known as Italian Association of Private Equity and Venture Capital).Over the years, the number and profile of operators significantly evolved in accordance to changes in the financial and economic landscape and the progressive reform of the regulatory framework disciplining the legal structures employed for the investment activity. Initially, and until 1986, credit institutions were not allowed to invest in risk capital, ruling out one of the most active and financially rich

categories of players from the investment activity. It was only subsequently, with the ruling of the CICR (International Committee for the Credit and Saving) and the intervention of the Bank of Italy, that these financial institutions were finally allowed to the investment activity, despite within some strictly defined limits. A milestone in the development of the sector was the formal institution, in 1993, of close funds under Italian law, which became the principal vehicle for investing in private companies. The birth of close funds gave rise to a quick expansion of the private equity market, which exploded between 1997 and 2001 when the advent of new ITC technologies attracted financial resources and operators. After a relatively stable period, activity started to peak again in 2005, identified as the first year of the new wave, marked by renewed sparkle and interest in early stage firms (Bentivogli, et al., 2009).

5 Methodology

5.1 Returns Analysis

For every company with post-buyout data available, the return on capital invested, for the period spanning from the buyout to the final resolution, is computed based on the methodology used by Kaplan (1989a, 1989b, 1994) and Andrade and Kaplan (1998). The nominal return on capital is estimated as $\frac{Terminal\ Value}{Capital} - 1$. *Terminal Value (TV)* is the amount of cash received by the buyer at the outcome date; *Capital* is defined as the buyout price and includes both market value of equity and net debt. Nominal returns are adjusted for the performance of the FTSE MIB Index in order to control for market-wide economic conditions.To compute the TV it is necessary to identify the outcome of the transaction, otherwise known as the "exit" for the financial sponsor firms. When Terminal Value cannot be detected (cases in which the investment in the target company has not been exited yet or there is no information about the outcome), it is estimated as a multiple of EBITDA (or Sales, should the EBITDA have negative value). We use the average TV/EBITDA multiple of transactions taking as target firms with the same four-digit SIC code happened in Western Europe in the 2003-2016 window period (geographic and SIC code criteria are relaxed when the transactions' sample identified was too small).

5.2 Measurement of Performance

We selected a window period that spans from -1 to last (represented by deal outcome date or last financial year for firms still private), with interim data collections at +2 and +3; the mentioned measurement period is believed adequate to capture most of the impact of changes and improvements implemented by the PE funds and also makes the results comparable to previous studies.

5.2.1 Financial Engineering Measures

The selected measures in the present study are the following: Debt/Equity (D/E), Debt/EBITDA and Solvency Ratio. D/E ratio is used to measure a company's financial leverage and indicates how much debt is the firm using to finance its assets compared to the amount provided by equity investors. Debt/EBITDA multiple, unlike the previous one, does not measure directly the indebtedness of a company, but rather shows its ability to repay its obligations by

giving investors insights on the approximate amount of time needed to pay off all its debt. Finally, Solvency Ratio explains how much of a company is owned by its investors and answers the basic question: if the company goes bankrupt, how much will be left to investors after paying all debts?

5.2.2 Operational Engineering Measures

In order to evaluate the economic and statistical significance of pre- to post-buyout improvements, changes in operational performance must be compared against a benchmark. We will adjust the results using the FTSE MIB Index as benchmark, considered the most comparable aggregate performance tracker.

A wide arrays of financial statements' items can be used to measure the change in performances; this study will employ a range of scaled performance measures to assess the use and the extent of operational engineering in the Italian market. The selected ratios are the following: EBIT/Assets (ROA); EBITDA/Sales (EBITDA margin) and EBIT/Sales (ROS); ROE (EPS/Equity). In addition to the three measures presented, which mainly gauge operating profitability, this study will employ three other indicators more focused on operating efficiency: Asset Turnover (Sales/Assets), Cash Conversion Cycle (CCC) and Employees performance. After analysing the presence and extent of operating improvements, we examine the relation between operating performance and the following factors expected to be related to post-buyout operating gains:

1. *Management incentives*. Management and shareholders' interests are expected to be more aligned when management contributes some fraction of the equity and therefore a dummy variable, taking value D_i=1, if the management invest in the deal, and D_i=0 otherwise, will be used as indicator.
2. *Benefits of Increased Debt*. Greater amount of debt may have a disciplining effect on management, helping in reducing agency costs (as discussed in Section 2.2). Changes in Debt-to-EBITDA multiple are used as proxy for leverage.
3. *Improved Governance and Monitoring*. A variable controlling for Club Deals is employed, since it is believed that shared governance could reduce the incentives to monitor. Club PE is a dummy variable taking value D_i=1, if the deal is executed by more than one PE firm, and D_i=0 otherwise.
4. *Pre-Buyout Firms Characteristics*. The room for improvements in terms of operating performance may be greatest for companies that are underperforming in the period antecedent the buyout. Return on Sales (ROS) in the year immediately before the acquisition (t=-1) is used as indicator of pre-buyout underperformance; in addition, we control for pre-buyout debt levels.

5.3 Returns Explanation

In this section, we outline the methodology, largely based on Kaplan (1989a) and Guo et al. (2011), employed to examine the impact and contribution of our identified value drivers: Financial Engineering Operational Engineering, and Multiples Expansion.

5.3.1 Impact of Operational Engineering

To quantify the impact of changes in operating performance on returns we calculate for each firm a hypothetical return that would have been realized if the firm's profitability, adjusted for the performance of the benchmark index, had remained at its pre-buyout level. More specifically, at outcome date, we compute a hypothetical after-tax cash flow so that the EBITDA margin (EBITDA/Sales) remains constant at the pre-buyout level. We then compute the TV as the final year's cash flow time the industry valuation multiple at exit. The proportion of return attributable to firm-specific changes in operating performance is determined as the difference between the median realized return and the hypothetical return divided by the median absolute value of realized return.

5.3.2 Impact of Multiple Expansion

Even without changes in operating performances, positive returns could be the result of increases in industry or broader market valuation multiples after the buyout. We quantify the impact of changes in market multiples computing, for each firm, the return that would have been realized had the mentioned ratios remained at the buyout date value. Specifically had the market multiple remained at the buyout date level the TV would change by $EBITDA_{(last\ year)} * [Market\ Multiple_{(last\ year)} - Market\ Multiple_{(buyout\ year)}]$. Subtracting this amount from the actual TV and recalculating the return will produce a hypothetical return that assumes constant market multiple. The proportion of total returns due to multiple expansion will, therefore, be the difference between the medians of actual and hypothetical returns (calculated assuming constant industry market multiples) divided by the median of actual returns. The multiples employed are the median multiples reported in the annual Italian Private Equity Monitor (PEM) reports, considered an appropriate, despite conservative, measure for the market under consideration.

5.3.3 Impact of Financial Engineering

A similar analysis is performed to quantify the impact of realized tax benefits, originating from an increased amount of leverage, on returns. We compute the tax-benefits from increasing debt calculating hypothetical tax payments under the assumption the sample firms maintain their pre-buyout interest coverage ratio or pay no interests in unprofitable years. Taxes are calculated by using EBIT and the firms' marginal tax rates. The present value of the tax-benefit is then computed as the sum of the differences between the hypothetical tax payments and the actual ones, discounted to the pre-buyout date at the LIBOR plus a spread. The terminal value of the tax-benefit is then computed as $\frac{Interest_{Actual} * t}{r} - \frac{Interest_{Hypothetical} * t}{r}$, assuming that the firms maintain their increase in leverage after the outcome date and discounted at the buyout date using a discount rate of 8.35% to assure comparability with the results of Guo et al. (2011). The effect of financial engineering on returns is estimated by subtracting the present value of tax-benefits, divided by buyout capital, from the realized returns. The impact is finally computed as the median of the actual returns, divided by the median of the hypothetical returns, minus one.

The assumption of a constant increased leverage after the outcome date is reasonable for firms undergoing a secondary LBO or strategic acquisition but less so for IPO exits, where typically leverage is reduced with some portion of the proceeds from going public. In contrast, firms facing bankruptcy must deleverage substantially. Being made up almost exclusively by SMEs and including no IPO exit and few cases of bankruptcy, the approximation is

considered reasonable and not to have a material impact on the validity of results.

5.3.4 Regressive Analysis of Determinants of Returns

To provide further comparisons on the relative impact of the determinants of returns, a regressive analysis explaining returns to buyout capital is performed. Three cross-sectional regressions are executed, with dependent variables being the market-adjusted return to buyout capital. The independent variables include indicators of 1) changes in operating performance, proxied by changes in EBITDA margin and ROA (-1, last) adjusted for benchmark index; 2) changes in market multiples, measured as the change in market EV/EBITDA (-1, last) (as per PEM reports); 3) changes in tax-benefits, gauged by the TV amount of tax benefits divided by the buyout capital. We also include a dummy variable to control for the effect of Club Deals. The equation of the regression model is the following:

$$Return\ to\ Capital\ \%_{Market\ Adj.} = \beta_1 + \beta_2 * \Delta Adj.EBITDA\ margin + \beta_3 * \Delta Adj.ROA + \Delta Market\ Multiple + \beta_4 * Tax\ Benefits + \beta_5 * Club\ PE$$

6 Sample description

We use SDC and PEM (Private Equity Monitor) reports to identify leveraged buyouts of Italian firms with acquirers Private Equity firms and completion date between January 2007 and December 2013. Our initial screening through SDC identifies 152 possible transactions. The sample is refined by eliminating buyouts involving target firms for which no financial data for the window period considered (-3; +3) were available and by adding transactions reported by PEM annual reports. This produces a final sample of 70 LBOs from 2007 to 2013.

In contrast to US deals from the 1990s (Guo, et al., 2011), fewer firms come from service industries (20% in our sample versus 28%) and significantly more from the manufacturing sector (71% in our sample versus 36%). More specifically the greatest number of deals happened in Business Services (13%), Machinery and Computer Equipment (11%) and Chemicals (10%).A total of 66 different PE firms are involved in the buyouts, but no single sponsor invests in more than 7 companies. The majority of the buyers are Italian Private Equities (59%), with the remaining mainly from UK (21%) and France (8%). Low interest is registered from big international funds, which account for only 9% of the total. We find that 21 deals in our sample (30%) have more than one PE firm involved and only in 6 transactions the management contributes some fraction of equity (9%).

Table 1 – Annual Medians for Deal pricing

This table presents descriptive statistics for the pricing of 70 LBOs completed between 2007 and 2013. The buyout price, referred to as *Capital,* is computed as the sum of the value of equity and net debt; EBITDA figures used in the *EBITDA/Capital* ratio are computed and the EBITDA for the year previous to the transaction.

Year	No. of Buyouts	Capital (€m)	EBITDA/Capital
2007	10	114.23	7.43%

2008	22	180.43	8.41%
2009	4	174.90	5.71%
2010	8	130.16	7.02%
2011	4	471.14	3.97%
2012	10	154.37	7.19%
2013	12	385.06	7.13%
Total	70	212.88	7.02%

Table 1 describes the buyout sample and the main pricing characteristics. The average yearly number of deals is very volatile, ranging from 4 deals in 2011 to 22 in 2008, with a median of 10. The average deal value of €212.9m is consistent with the characteristics of the Italian productive fabric and the fact that our sample mainly consists of private-to-private transactions while the comparable paper focuses on public-to-private transactions. To provide a measure of the price paid relative to fundamentals we employ the firms' EBITDA in the last full year prior to the buyout as a percentage of the buyout price. The ratio indicates how expensive is the acquisition compared to EBITDA generation. A clear trend throughout the window period is not recognizable, however, the yearly number of deals and EBITDA/Capital multiple presents a significant correlation (c. 82%) explicable by opportunistic acquisitions from PE firms when capital is relatively cheap in terms of EBITDA. The sample average EBITDA/Capital (7.02%) is significantly lower than Guo et al.'s results (11.26%) and shows greater volatility; these results can be explained by the impact of the financial crisis on economic activity that led to deterioration in operating measures and peculiar acquisition dynamics, often driven by expectations of future recovery.

7 Empirical Analysis

7.1 Returns to Capital

The following section reports nominal and market-adjusted returns for our 70 deals sample and for the 22 deals with observable exit, with further insights by group outcome. Table 2 provides a breakdown of the post-buyout deal outcome by exit category.

Table 2 – Post-buyout Deal Outcomes
This table reports post-buyout outcomes as of March 2017 for the full sample of 70 buyouts with post-buyout data available.

Outcome:	(1) IPO	(2) Sold	(3) 2nd LBO	(4) Bankruptcy	(5) Still Private or Unknown	Total
LBO Year:						
2007	0	2	4	1	3	10
2008	0	7	6	3	6	22
2009	0	2	1	1	0	4

2010	0	0	4	1	3	8
2011	0	0	1	0	3	4
2012	0	4	1	0	5	10
2013	1	1	3	0	7	12
Total (2007-2013)	1	16	20	6	27	70
Percent of deals	1%	23%	29%	9%	39%	100%
Median years to outcome	2	4	5	4.5	-	5

Following the methodology discussed in section 3.1, we report realized returns grouped by post-buyout outcome and on an aggregate basis in Table 3. As expected, and consistently with US market results from the 1990s, the nominal and market-adjusted returns are negative for the bankruptcy group. Both unadjusted and adjusted returns for the other four categories are positive but significantly lower than Guo et al.'s results, with a mean return for the whole sample 63.4% lower on a nominal basis and 45.6% lower on a market-adjusted basis. Limitations on the reliability of returns derive from their significant dependence on estimated industry exit multiples, being the TV for 48 out of 70 deals not directly observable. The returns for the different groups appear logic and accordant with past literature: PE firms realize higher returns through sale to strategic buyers (79.88% market-adjusted) relative to financial sponsors (58.80% market-adjusted) since the formers are willing to pay a higher price due to the expected achievable synergies. The exiguous representation of IPO outcomes results consistent with the intrinsic nature of the Italian company base, composed mainly of micro, small and medium enterprises. Overall Table 3 demonstrates that the mean and median returns are positive, with underperformance compared to the US sample mainly driven by the dependency on industry multiples and the non-inclusion of interim payments to capital in the returns calculation.

Table 3 – Realized Returns to Buyout Capital

This table reports nominal and market-adjusted returns to capital. The nominal return to capital is calculated as the TV estimated at the outcome date, divided by total capital, minus one. Capital refers to the buyout Enterprise Value price. TV is the total euro value received at the outcome date. Value at the outcome date is determined from the observed value at exit from Bankruptcy, sale of the firm or IPO or is estimated as a multiple of EBITDA (or Sales if EBITDA is negative) if not observable. Market-adjusted returns are computed for each transaction by subtracting from nominal returns the returns of the FTSE MIB Index in the same window period.

		Nominal Returns			Market-adjusted returns		
Outcome	N	Mean	Median	# of positive returns	Mean	Median	# of positive returns
1. IPO	1	32.74%	32.74%	1	19.82%	19.82%	1
2. Acquired	16	74.48%	53.66%	13	79.88%	80.26%	14
3. 2nd LBO	20	50.76%	64.92%	13	58.80%	74.83%	13
4. Bankruptcy	6	-50.34%	-51.74%	1	-34.28%	-28.25%	1
5. Still private or unknown	27	68.49%	-3.01%	12	58.08%	-12.88%	12
Total (1-5)	70	54.10%	26.12%	40	54.80%	28.28%	41
Total (1-4)	43	45.06%	42.86%	28	52.75%	60.12%	29
Deals with outcome	22	80.71%	81.51%	18	90.92%	96.61%	19

7.2 Financial Engineering

We proceed in examining the evolution in debt levels and coverage ratios of our 70 sample firms throughout the examined window period. Table 4 reports in Panel A the percentage change in leverage and solvency measures while Panel B shows the percentage changes of those ratios grouped by deal outcome.In line with precedent comparable studies, we observe a significant increase in leverage measured as Debt to EBITDA and Debt to Equity ratios. However, with a peak of +108.45%, the registered increases appear significantly lower relative to results of Guo et al. (2011), who report a more than double pre- to post-buyout Debt to EBITDA ratio rise (+233.33%). Market-adjusted results present, on average, even lower figures. The effect can be explained by the credit crunch happened after the financial crisis that, combined with decreasing performances, especially constrained the debt granted to the SMEs[9], characterized by a low amount of collateral assets, and by the different size and consequent debt capacity of the firms in the compared samples. For debt levels we observe a peak in year +2 with subsequent deleveraging throughout the life of the investment, accordant to industry practice.

Table 4 - Changes in Debt Levels from Pre-buyout Period to Post-buyout Period

Panel A reports median changes in debt levels relative to the fiscal year ending prior to completion of the buyout year (year -1). Panel B reports median changes in debt levels from year -1 to last year, grouped by outcome. Last year is the last post-buyout fiscal year available prior to the deal outcome or the last available fiscal year for deals still private. Adjusted percentage change equals the difference between the change for the buyout company and the change for the FTSE MIB Index. Data are obtained from Aida (Bureau van Dijk) and Annual Reports.

Panel A: Median Percentage Change in Debt Characteristics from Year i to j (# Observations; # Positive Observations)

	-1 to +2			-1 to +3			-1, last year		
A.1. Debt levels									
Debt/EBITDA									
Unadjusted change	108.45%	(67 ;	48)	82.14%	(49 ;	28)	45.69%	(70 ;	39)
Market-adjusted change	91.72%	(67 ;	50)	45.92%	(49 ;	27)	54.68%	(70 ;	41)
Debt/Equity									
Unadjusted change	63.33%	(66 ;	42)	26.47%	(49 ;	29)	2.14%	(70 ;	36)
Market-adjusted change	68.70%	(66 ;	46)	26.97%	(49 ;	30)	25.71%	(70 ;	40)
A.2 Solvency									
Solvency Ratio	-10.76%	(66 ;	27)	-5.84%	(49 ;	23)	-3.79%	(70 ;	33)

Results grouped by outcome appear logic and consistent with market dynamics: on a market-adjusted basis, firms sold through a secondary LBO register the lowest increase of debt from year -1 to last, explained by the need for secondary PE buyers to acquire modestly leveraged companies in order to raise new debt on them; bankruptcy group registers the highest percentage increase due to the significant deterioration of EBITDA performance in firms heading toward failure, followed by the group composed of companies still private (in accordance with the evidence of peak leverage in the first years after the buyout). Overall, the debt level surge, despite significant, results modest relative to comparable studies due to the singularity of the window period and sample of firms under examination.

Table 4 - *continued*

Panel B: Median Percentage Change in Debt Characteristics from Year -1 to Last (# Observations; # Positive Observations), Grouped by Outcome

	IPO		Sold		2nd LBO		Bankruptcy		Still private	
A.1. Debt levels										
Debt/EBITDA										
Unadjusted change	-69.89%	(1 ; 0)	85.50%	(15 ; 9)	-2.48%	(20 ; 10)	487.47%	(6 ; 3)	111.33%	(27 ; 17)
Market-adjusted change	-46.65%	(1 ; 0)	111.85%	(15 ; 10)	7.01%	(20 ; 10)	443.68%	(6 ; 3)	134.58%	(27 ; 18)
Debt/Equity										
Unadjusted change	-100.00%	(1 ; 0)	33.33%	(15 ; 9)	20.69%	(20 ; 11)	40.80%	(6 ; 3)	-12.36%	(27 ; 12)
Market-adjusted change	-76.40%	(1 ; 0)	104.25%	(16 ; 12)	32.78%	(20 ; 11)	59.89%	(6 ; 3)	9.56%	(27 ; 14)
A.2 Solvency										
Solvency Ratio	-13.89%	(1 ; 0)	3.34%	(16 ; 9)	-11.85%	(20 ; 9)	-282.21%	(6 ; 0)	6.88%	(27 ; 15)

7.3 Operational Engineering

7.3.1 Changes in Operating Performance

The large positive returns documented suggest that, on average, PE fund managers create value for their investors. We expect improvements in operating performance and efficiency gains under PE ownership to be primary determinants of the returns. Table 5 reports the percentage change in operating performance for the last year pre-buyout (-1) to two and three years post-buyout (+2; +3) and to deal outcome or last available year if still private (last year). Panel A.1. of Table 4 reports measures of firm profitability. The unadjusted changes in EBITDA margin result negative for the changes to each post-buyout period, in accordance with the US sample from the 1990s. Unadjusted changes for ROS and ROE show similarly negative results, further depressed by the impact of CAPEX and interest expenses. However using market-adjusted measures, we observe positive improvements in EBITDA margin from year -1 to years +2, +3 and last, with a peak in year +3 (+17.73%). The results are broadly in line with those of Guo et al. (2011) (who report a peak of +11.43%) but significantly underperforming those reported by Kaplan (1989a) for the US sample from the 1980s. Even if profitability doesn't significantly improve by the time of the exit, firms may still increase in value leveraging the increase in productivity of assets, for example by disposing of non-productive assets. Panel A.2. of Table 5 shows results for returns on assets measured as EBIT to Total Assets (ROA). Performance changes on unadjusted basis are not significant, however, we observe improvements in market-adjusted results by the last year prior to exit of 5.72%. Limitations derive from the high volatility of the sample results, the significant unadjusted negative changes and the contrasting results of changes in Asset Turnover.

Also improved productivity, efficiency and management of working capital could lead to perceived value creation from potential acquirers. Panel A.3 of Table 5 reports significant results for the Cash Conversion Cycle, which shows a reduction of 29.44% by last year and suggests a better contractual strength of PE owners toward creditors and debtors. The negative trend observed in employees' performance instead may be explained by the perceived job insecurity and eventual cultural clashes with the new owners.

Table 5 – Changes in Operating Performance from Pre-buyout Period to Post-buyout Period

Panel A reports median changes in operating performance relative to the fiscal year ending prior to completion of the buyout year (year -1). Panel B reports median changes in operating performance from year -1 to last year, grouped by outcome. Last year is the last post-buyout fiscal year available prior to the deal outcome or the last available fiscal year for deals still private. Adjusted percentage change equals the difference between the change for the buyout company and the change for the FTSE MIB Index. Data are obtained from Aida (Bureau van Dijk) and Annual Reports.

Panel A: Median Percentage Change in Operating Performance from Year i to j (# Observations; # Positive Observations)						
	-1 to +2		-1 to +3		-1, last year	
A.1. Profitability						
EBITDA/Sales						
Unadjusted change	-19.52%	(70 ; 24)	-17.56%	(70 ; 19)	-13.74%	(70 ; 29)
Market-adjusted change	0.37%	(70 ; 33)	17.73%	(70 ; 30)	8.14%	(70 ; 37)
ROS						
Unadjusted change	-49.56%	(70 ; 22)	-62.51%	(70 ; 20)	-35.11%	(70 ; 28)
Market-adjusted change	-19.96%	(70 ; 26)	-11.76%	(70 ; 24)	7.13%	(70 ; 37)
ROE						
Unadjusted change	-72.81%	(70 ; 22)	-75.78%	(70 ; 19)	-84.25%	(70 ; 27)
Market-adjusted change	-37.75%	(70 ; 26)	50.54%	(70 ; 31)	19.55%	(70 ; 36)
A.2 Return on assets						
ROA						
Unadjusted change	-72.80%	(70 ; 15)	-75.23%	(70 ; 18)	-66.06%	(70 ; 20)
Market-adjusted change	-34.84%	(70 ; 24)	46.62%	(70 ; 31)	5.70%	(70 ; 37)
Asset Turnover						
Unadjusted change	-22.65%	(70 ; 20)	-20.83%	(70 ; 16)	-13.14%	(70 ; 25)
Market-adjusted change	-24.95%	(70 ; 18)	-20.63%	(70 ; 15)	-31.69%	(70 ; 20)
A.3 Efficiency						
CCC	-9.82%	(70 ; 21)	-23.57%	(70 ; 15)	-29.44%	(70 ; 19)
Employees performance	-9.89%	(70 ; 21)	-11.37%	(70 ; 15)	-12.14%	(70 ; 18)

Panel B of Table 5 demonstrates the variability from year -1 to last year grouped by exit outcome. The changes for secondary buyouts and still private firms are substantially greater for almost all the profitability, productivity and efficiency measures. The underperformance of firms going through a strategic sale is consistent with the US sample and may be explained by a more strategic oriented focus with respect to financial buyers and by behavioral biases of acquiring firms' CEOs. While the empirical methodology may slightly differ, our evidence is in line with the results of Guo et al. (2011) (as already documented) and with more recent studies of buyouts in Europe and the UK[10], suggesting that this trend may not be unique to the Italian market.

Table 5 – ***continued***

Panel B: Median Percentage Change in Operating Performance from Year -1 to Last (# Observations; # Positive Observations), Grouped by Outcome										
	IPO		Sold		2nd LBO		Bankruptcy		Still private	
A.1. Profitability										
EBITDA/Sales										
Unadjusted change	10.46%	(1 ;1)	-14.34%	(16 ;5)	-12.98%	(20 ;8)	-196.61%	(6 ;1)	0.12%	(27 ;14)
Market-adjusted change	9.90%	(1 ;1)	-9.29%	(16 ;7)	13.02%	(20 ;13)	-159.41%	(6 ;1)	22.77%	(27 ;15)
ROS										
Unadjusted change	18.77%	(1 ;1)	-55.46%	(16 ;5)	-13.39%	(20 ;8)	-137.11%	(6 ;1)	-24.31%	(27 ;13)
Market-adjusted change	6.87%	(1 ;1)	-10.10%	(16 ;7)	42.80%	(20 ;13)	-77.39%	(6 ;1)	8.70%	(27 ;15)

[10] For instance, Weir, Jones and Wright (2008) and Vinten (2007) show decreases in profitability following buyouts in the U.K. and Denmark. However many studies on smaller divisional buyouts and private companies buyouts in Europe show that profitability increases more than benchmark firms (Cressy, et al., 2007)(Boucly, et al., 2011)(Acharya, et al., 2009).

ROE										
Unadjusted change	-94.32%	(1 ;0)	-86.34%	(16 ;6)	-58.53%	(20 ;8)	-99.02%	(6 ;1)	-50.12%	(27 ;12)
Market-adjusted change	-228.89%	(1 ;0)	47.36%	(16 ;9)	76.57%	(20 ;13)	6.01%	(6 ;3)	-32.83%	(27 ;11)
A.2 Return on assets										
ROA										
Unadjusted change	-38.91%	(1 ;0)	-66.77%	(16 ;5)	-56.73%	(20 ;5)	-917.42%	(6 ;0)	-49.54%	(27 ;10)
Market-adjusted change	-185.97%	(1 ;0)	58.34%	(16 ;11)	66.69%	(20 ;15)	-796.21%	(6 ;0)	-11.30%	(27 ;11)
Asset Turnover										
Unadjusted change	-47.37%	(1 ;0)	-9.61%	(16 ;7)	-11.62%	(20 ;7)	12.53%	(6 ;3)	-14.75%	(27 ;8)
Market-adjusted change	-52.12%	(1 ;0)	-34.35%	(16 ;5)	-26.51%	(20 ;5)	2.32%	(6 ;3)	-40.40%	(27 ;7)
A.3 Efficiency										
CCC	-48.59%	(1 ;0)	-14.62%	(16 ;4)	-33.56%	(20 ;4)	-69.17%	(6 ;2)	-14.19%	(27 ;9)
Employees performance	2.96%	(1 ; 1)	-5.91%	(16 ; 5)	-17.28%	(20 ; 4)	-31.29%	(6 ; 1)	-11.15%	(6 ; 1)

7.3.2 Explanations for Changes in Operating Performance

Despite the modest gains in operating performance, the variation in performance is quite large. We examine the relationship between changes in operating performance and four factors expected to influence operating gains.

The cross-sectional regressions for changes in operating performance are reported in Table 6. As per results of Guo et al.'s study on their 1990s US sample, management's involvement in the equity stake does not appear to deliver better performances. Differently from the mentioned research, also increases in debt levels seem to have a non-significant impact on operating performances in our sample. Bergström et al. (2007) encounter similarly non-significant results for both management incentives and leverage increases, calling for the need for a more comprehensive approach to the study of determinants of operating performance. We find however that firms with greater pre-buyout debt levels consistently show worse cash flow performance, which supports our previous hypothesis. Also, deal size seems to positively affect the post-buyout operating performance due to the stronger resilience of bigger companies during recession periods, such as the one immediately following the global financial crisis of 2008, under consideration in our study. For the variable related to monitoring by PE firm, we find that the presence of multiple financial sponsors shows a significant negative impact on the last year operating performance and a nearly significant impact on the change in market-adjusted performance. The results support the hypothesis that multiple PE buyers' involvement can create a "free-rider" problem with the outcome being that each of the acquiring firms exercises a less effective monitoring of the target firm.

Table 6 – Regressions for Changes in Operating Performance

The table reports the multivariate regression results for post-buyout performance. Adjusted EBITDA margin and ROA subtract the performance of FTSE MIB Index. The dependent variable in model (1) is EBITDA margin, measured as (EBITDA/Sales) at the last post-buyout year. The dependent variables in models (2) and (3) are, respectively, the changes in adjusted EBITDA margin and ROA. Capital is the buyout purchase price. Pre-buyout leverage is computed as (Debt/EBITDA) at year -1. Leverage change is the market-adjusted change in Debt to EBITDA from year -1 to the last post-buyout year. Mgmt equity and Club PE are two dummy variables controlling respectively for management involvement in the buyout and multiple private equity buyers. P-values are in parentheses. All the regressions are OLS with heteroskedasticity adjusted standard errors. Coefficients that are significantly different from zero are indicated in bold. ***,**, and * indicate significance at the 1%, 5% and 10% level, respectively.

	(1) EBITDA margin at Last Year	(2) Change in Adjusted EBITDA margin (-1, Last)	(3) Change in Adjusted ROA (-1, Last)
ln (capital)	**5.916****	**0.714****	-4.411
	(0.017)	(0.048)	(0.448)
EBITDA margin (or ROA) at year -1	**0.587*****	-0.004	-0.910
	(0.009)	(0.912)	(0.288)
Pre-buyout Leverage	**-0.798****	**-0.098***	**-7.703*****
	(0.043)	(0.091)	(0.000)
Leverage change	0.000	0.000	-0.005
	(0.971)	(0.916)	(0.607)
Mgmt equity	14.054	2.271	-20.248
	(0.271)	(0.226)	(0.513)
Club PE	**-13.376***	-1.639	15.483
	(0.084)	(0.148)	(0.418)
Observations	70	70	70
Adjusted R^2	0.204	0.032	0.464

Overall, leverage changes and management involvement appear non-significant in explaining post-buyout performance, with the operating gains ultimately influenced by buyout firm characteristics, such as leverage and company size, and suggesting an irrelevant impact of PE ownership and activity.

7.4 Returns Explanation

In this Section, we examine the three potential determinants of returns to buyout capital and their relative contribution to the aggregate performance.

Table 7 – Impact of Changes in Operating Performance, Valuation Multiples, and Tax Benefits of Debt on Returns

This table presents the impact of each factor on returns. The median realized market-adjusted returns to buyout capital are as reported in Table 3. The proportion of return due to change in each factor is estimated as the ratio of the difference between the realized and "hypothetical" return to the absolute value of the realized return. Hypothetical returns are computed as follows. Panel A, Operating Performance: we calculate a hypothetical return that would have been realized if the firm's profitability, adjusted for the profitability of the FTSE MIB, had remained constant. Specifically, for the outcome year, we compute a hypothetical TV (equal to the final year's EBITDA times the industry multiple at exit), and calculate a hypothetical return using this estimated cash flow. Panel B, Market Multiple: a hypothetical TV is calculated by assuming the market multiple remains constant at buyout level. Panel C, Tax benefits of increased debt: for outcome year, a hypothetical tax payment is computed assuming the firm maintains its pre-buyout interest coverage level. Based on that estimate a TV of tax benefit is computed as (I_{Actual}*t/r – $I_{Hypothetical}$*t/r) and then discounted to the buyout date at an interest rate of 8.35%. Hypothetical returns subtract the present value of tax benefits while private (divided by buyout capital) from the realized return.

		A. Proportion of Return Due to		B. Proportion of Return Due to		C. Proportion of Return Due to
Outcome	Market-adjusted Returns	N	Change in Operating Performance	N	Change in Market Multiple	N	Tax Benefits of Increased Debt

Total	54.80%	70	22.86%	70	25.26%	53	12.12%
Total (except Still Private or Unknown)	52.75%	43	18.33%	43	21.11%	34	17.98%

Table 7 provides a breakdown of our empirical results. The realized returns shown are the market-adjusted returns to capital as reported in Table 3. The percentage of returns due to improvement in operating performance is estimated at 22.86% for the full sample and in 18.33% if we exclude firms that have still to reach an outcome. The results are perfectly in line with those observed by Guo et al. (2011) (22.9% and 17.6% respectively).The changes in market multiples have the greatest impact on realized returns, accounting for 25.26% for the full sample. Comparatively, Guo et al. (2011), employing a slightly different methodology, report similar returns on their US sample from the 1990s, with an estimated impact of 17.7%. The higher values observed in our sample can be explained by the growth premium recognised by investors in smaller businesses; more importantly, the significant impact is due to the greater delta netted by PE investors who bought in the first years of the recession and exited their investments during market recovery, as evidenced by Achleitner et a. (2010). Lastly, we can attribute 12.12% of the returns to tax benefits of increased debt. Consistently with the significantly lower increases in debt recorded in our sample, the benefit from the tax-shield results almost three times lower relative to the impact for the US sample from the 1990s (33.8%).

Table 8 reports cross-sectional regressions explaining returns to capital, which provide further insights of the relative importance of determinants of returns. The regressions return only two almost significant results: market-adjusted changes EBITDA margin in model (3) and impact of TV of tax benefits in model (1).

Limitations in the results of the regression models arise from the small sample dimension (only 53 observation) and the higher performance volatility compared with comparable studies (Guo, et al., 2011) .Overall, relative to comparable works, we observe in our sample a heightened impact of multiple expansion and a softer impact of tax benefits explainable with the credit crunch happened during the window period under consideration and by the singular characteristics of the sample firms. The inconclusive results in quantifying the determinants of returns advocate for the complexity and randomness of the private equity process of value creation, not suitable to be framed in a few quantitative variables.

Table 8 – Regressions for Returns to Capital

The table reports the OLS regression results for the return to capital for 53 deals with available variables data. The dependent variable is the market-adjusted return to buyout capital. *Change in market multiple* measures the change in the yearly median Private Equity Monitor's EV/EBITDA multiples from the buyout date to the TV date. *TV of tax benefits/Capital* is the discounted TV of tax benefits divide by buyout capital. *Club PE* is a dummy variable controlling for the involvement of multiple private equity buyers. P-values are reported under the coefficients in parentheses. Coefficients that are significantly different from zero are indicated in bold. ***, **, and * indicate significance at the 1%, 5% and 10% level, respectively.

	(1) Buyout Capital	(2) Buyout Capital	(3) Buyout Capital
Adjusted change in EBITDA margin	0.071 0.277	0.085 0.153	0.092 0.118
Adjusted change in ROA	0.001 0.594		
Change in market multiple	-1.672	-2.047	-1.505

	0.456	0.333	0.453
TV of tax benefits/Capital	1.465	1.499	1.208
	0.198	0.184	0.258
Club PE	0.299	0.338	
	0.469	0.402	
Observations	53	53	53
Adjusted R^2	-0.005	0.010	0.016

8 Conclusion

The returns to buyout capital obtained are, on average, large and positive both on absolute and market-adjusted terms and throughout all the group outcomes except, as expected, for bankruptcy scenarios. The sample, however, shows a significant underperformance with respect to comparable studies from the 1990s, which disappears when considering results for deals with an observable outcome, and hints the ability of fund managers to achieve better times money exit multiples relative to average industry multiples.

Results for changes in operating performance and leverage levels confirm many of the findings in previous literature: consistently with concept itself of leveraged buyout, we observe significant increases in debt levels after the transactions, though less marked than for previous timeframes, mainly due to the credit crunch happened in late 2007 and the lower credit accessibility for small businesses. Gains in operating performance are either comparable or slightly higher than those observed for the benchmark index. Consistent with the evidence of overperformance of bigger firms in recessionary environments, cash flow gains are positively related to the size of the firm while negatively impacted by pre-buyout leverage level, which caps the debt assumption. The level of performance appears also affected by the presence of multiple private equity buyers, which generates monitoring issues.

We next show that improvements in operating performance, market multiples' expansion and tax benefits of increased debt explain economically large proportions of the realized returns. Relative to comparable studies we observe a strengthened impact of multiple expansion, which contribute to more than 25% of average returns to capital. Cross-sectional regressions for the mentioned determinants of returns result insignificant, proving the complexity and variability of value drivers employed by PE firms and opening to further and more comprehensive researches focusing also on qualitative aspects of the value creation process. Answering to our long-awaited question is an up-hill battle complicated by the limited sample under considerations and reliant on multiple assumptions. Overall, private equity funds result, on average, extremely successful in exploiting the debt capacity of target firms and in chasing the right moment to execute and exit their investments, achieving as a consequence great multiples gains. However, the high volatility in achieved returns and operating improvements suggest that a one-size-fits-all explanation on how value is created by PE fund managers is hard to identify and, beyond easy observable measures, should be looked for in the characteristics, skills and networks of the individual agents.