PERFORMANCE IN PRIVATE EQUITY: WHY ARE MANAGEMENT COMPANIES' OWNERS IMPORTANT?

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Abstract

Our study shows that the ownership of private equity funds influences the investments' performances. Our analysis focuses on the universe of private equity investments, made by Italian closed-end funds, from 1999 to 2005. We verify that internal rates of return are higher for corporate funds and lower for bank based funds. Previous lending relationship between the participated firm and the bank owner of the fund is especially significant in affecting performances. We find that IRR is linked to the participated firm's revenue annual growth. We also find that bank based funds are able to carry into effect a less pronounced monitoring of the companies in which they invest, because of a less effective participation as members of the firms' boards of directors. This leads to a lower revenue growth of portfolio companies and consequently to lower IRR.

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1. Introduction

It is widely acknowledged that private equity investments produce a positive impact on the target firms. First of all, private equity financing provides firms with "patient" capital, which supports their start up, as well as their expansion plans, new strategies, acquisitions, privatization, internationalization, technological development, generational or governance change and other critical phases during their life cycle. Both in the US and Europe, several studies highlighted that private equity providers are able to support and speed up the transformation of the internal processes of the target firms, mapping every business unit along two dimensions: strategic fit and economic value. In addition to providing capital, private equity houses perform many other roles in their portfolio companies, such as serving as a sounding board to the entrepreneur, developing production or service techniques, assistance in finding and selecting key management team personnel, solicitation of essential suppliers and customers, selecting vendors and equipment, strategic and operational planning, assistance in obtaining additional financing, replacement of management personnel when appropriate (Gorman and Sahlman 1989, Stein and Bygrave 1990, Bygrave and Timmons 1992, Lerner 1995, EVCA and Coopers & Lybrand 1996, Sapienza, Manigart and Vermeir 1996, Hellmann 1998, Hellmann and Puri 2002). If necessary, private equity providers do not hesitate to replace the management if it proves to be unable to implement the strategy to satisfaction.

Representatives of the private equity funds, as supervisory directors or non executives, keep their finger on the pulse of the participated company, aligning management and shareholder incentives, and providing better monitoring of managers.

None of the above mentioned studies empirically examined how the private equity provider's involvement correlates with the firm performance. MacMillan et al. 1988 attempted to identify any correlations between venture capitalists' involvement with venture performance. Whether or not VCs actually add value through involvement remains controversial (Sapienza 1992). For example, MacMillan et al. observed both positive and negative associations between involvement and venture performance.

So far, most of the literature on private equity and venture capital has tended to be descriptive and has dedicated relatively poor attention to the industry performance. This is mainly due to the lack of public data about the cash flows deriving from PE and VC investments, which prevents the estimate of internal rates of return. However, the existing empirical research about this topic has developed along two main directions. The first research stream concerns investments' performances and includes the pioneering study by Gompers and Lerner (1997), as well as analyses by Berk et al. (1999), Peng (2001), Quigley and Woodward (2003), Woodward and Hall (2003), Hand (2004), Cochrane (2005), Hege et al. (2008). The second investigation area regards funds' performances and counts Ljungqvist and Richardson (2003), Kaplan and Schoar (2005), Phalippou and Zollo (2005), Phalippou and Gottschalg (2007) among the main scientific contributions.

While all these studies deal with the private equity industry as if it were homogenous, in this study we verify that private equity providers differ in their investments' performances, depending on the entity which owns the general partnership (hereinafter called "fund's management company") and we attempt to give an explanation.

A few studies analysed the impact that different types of private equity providers have on the investment and divestment patterns, both cross country (Mayer et al. 2005) and within one country (Tykvová 2006). In particular, Tykvová (2006) argues that the private equity industry should not be treated as homogenous, since diverse private equity providers carry into effect different behavioural patterns. In particular, independent and corporate private equity providers tend to have a more pronounced role in corporate governance and monitoring of the companies they finance. These different behavioural patterns may result from different incentives for their managers that are induced by disparate corporate governance structures of these funds. Besides, varying strategic goals of different types of private equity providers may also lead to differing investment and divestment strategies.

However, a knowledge gap still exists concerning the influence that the owners of the fund's management company have on the investments' performance. To our knowledge, the only study which highlights that private equity performances are different among

diverse fund categories is KPMG (2006). However, no explanation is provided for these differences and no mention is done of the management companies' owners.

In Italy this issue is particularly relevant, since the Italian private equity market is characterised from a wide variety of domestic fund types. Most of the private equity investments are realized by bank-based funds, as a result of the traditionally bank-centred structure of the Italian financial system. However, in consequence of the rapid growth of the private equity market, a considerable portion of private equity investments are from corporate funds (around 25%), independent and public entities' funds (over 15%).

For the purpose of our study, namely the investigation of the investments' performances of private equity funds owned by diverse entities, we distinguish among corporate, bank-based, public, independent and other entities' funds. We collected a dataset of all the deals realized by Italian closed-end funds from 1999 and 2005. For the performance measurement, the gross internal rate of return on realised investments is considered.

Our analysis follows three steps.

First of all, we show that funds owned by diverse entities have different investment patterns. We define the funds' investment patterns by observing the following features:

- the time that the funds' representatives can devote to monitor the portfolio companies' activities;
- the investment kind (early stage, expansion, buy out, turnaround);
- the exit way from the investment;
- the portfolio companies' business sector;
- the holding period of the investments.

Secondly, we verify that the investments' internal rate of return differs among funds belonging to diverse entities.

Finally, we identify the determinants of IRR and we demonstrate that they are affected by the variables which define the investment pattern of the funds owned by different entities.

The remainder of this paper is divided into four parts. In Sect. 2 we describe our dataset and show some summary statistics. In Sect. 3 we illustrate the analysis framework and we discuss the regression results. Section 4 concludes.

2. Data description and summary statistics

The typical structure available for carrying on private equity activity in Italy is the closed-end fund. The legislation introducing this vehicle was enacted with the Law No. 344, of August 13, 1993. All the provisions included in that Law and regarding the civil law issues of the investment funds were replaced by the Legislative Decree No. 58, of February 24, 1998 (The Consolidated Act on Financial Intermediation).

The entities involved in the set-up of a fund are the management company, the investors and the custodian bank.

The management company has the duty to act on behalf of the investors and in their best interest. It assumes the full responsibility for the management of the fund, including all decisions to invest and divest. However, it may assign specific investment choices to intermediaries which have been authorised to supply asset management services.

Usually Italian private equity funds are reserved to the so-called "qualified investors", i.e. investment firms, banks, management companies, pension funds, insurance companies, holding companies of banking groups, foreign intermediaries authorised under the law in force in their home country to perform the same activities as those performed by above mentioned intermediaries, banking foundations, natural and legal persons, other entities with specific expertise and experience in transactions involving financial instruments.

The custodian bank keeps custody of the investments of the fund and verifies the legitimacy of the operations of issuance and redemption of the units and the allocation of fund income. It also verifies the correctness of the calculation of the value of the units or makes the calculation if appointed to do so by the management company. Besides, the custodian bank verifies that in transactions involving fund's assets, any consideration is remitted to it within the customary time limits.

Our dataset includes detailed information about 804 private equity investments, realized by 87 Italian closed-end funds from 1999 and 2005. The number of deals coincides with the number of private equity backed firms, since there were no syndicated deals during

our period of observation. The data source is Bocconi University's Department of Finance.

Though we have data from only one country, we benefit from the availability of the universe of investments, which grants a higher significance of results in comparison with analyses on samples.

Information provided by our dataset refer to the features reported in Table 1.

[TABLE 1 APPROXIMATELY HERE]

In particular, CNF and CNMC measure the plurality of offices held by the funds' representatives. We use these variables as proxies for the time that the funds' representatives can devote to monitor the strategic fit and the economic value of the portfolio companies' activities. We conjecture that the higher are CNF and CNMC, the busier are the funds' representatives and the lower is the investments' internal rate of return. We believe that when funds' representatives are very busy, they are not able to keep their finger on the pulse of the participated companies, nor to monitor their results effectively.

In Sect.3 we come back on these corporate governance issues, testing whether they affect the investments' performances.

In this Section, we provide some summary statistics about our dataset.

The funds entered in our database are managed by 58 management companies, the 69% of which manage only one fund, while 17% take care of 2 funds and only the 14% manage 3 or 4 funds.

For the purpose of our study, namely the investigation of the investments' performances of private equity funds owned by diverse entities, we distinguish among corporate, bank-based, public, independent and other entities' funds. Over 56% of the funds are bank-based. In 86% of cases, the bank financed the firm during the five years before the private equity investment. In the remaining 14% of cases, no lending relationship existed before the private equity investment. Corporate funds account for 25% of

private equity providers, while private investors' and public entities' funds represent 9.8% and 7.8% respectively. A minority of funds (1.1%) are managed by other entities.

The number of seats that the funds' representatives hold in portfolio companies' boards of directors, during the holding period (CNF), ranges from 1 to 9; mean CNF is 3 and median is 2.
The number of seats that the funds' representatives hold in boards of firms belonging to the funds' management company (included non private equity backed firms), during the holding period (CNMC), ranges from 1 to 15; mean CNMC is 7 and median is 8..

The size of the funds ranges from 8.4 to 182.2 millions euro. The average funds' size is 71.8 millions (median: 65.5 millions, standard deviation: 37.9 millions); in the 75% of cases, the Italian funds' size amount at less than 86.8 millions euro.
Most of the transactions included in our database are focused on minority stakes (see figure 1). Italian private equity funds make from 3 to 19 deals; the average number of investments is 10 (median: 10 investments, standard deviation: 3 deals). In the 75% of cases, the funds make less than 12 investments.

[FIGURE 1 APPROXIMATELY HERE]

Over 35% of the participated firms are small and medium enterprises, which have an annual turnover not exceeding 50 million euro (see figure 2). The year before the private equity investment, the average annual turnover of the participated firms is 128 millions euro (median: 82 millions).

[FIGURE 2 APPROXIMATELY HERE]

During the holding period, the annual revenues of the participated firms have grown by 7.4% on average (median: 4.1%, standard deviation: 11.9%). In the 75% of cases the revenue growth rate is lower than 8% (see figure 3). The 4% of the portfolio companies

show a decrease in revenues or a growth rate equal to zero. The 40% of these investments concern turnaround financing.

Annual return on assets has grown by 6.7% on average (median: 3.4%, standard deviation: 12.10%). In the 75% of cases the annual ROA growth rate is lower than 7.2% (see figure 4).

Annual return on equity has grown by 21% on average (median: 8.4%, standard deviation: 51.27%). In the 75% of cases the annual ROA growth rate is lower than 7.2% (see figure 5).

[FIGURE 3 APPROXIMATELY HERE]

[FIGURE 4 APPROXIMATELY HERE]

[FIGURE 5 APPROXIMATELY HERE]

In Italy private equity investments support a wide variety of business sectors. About 25% of the transactions concern the sectors of aerospace and defence, electronic and electrical equipment, engineering and machinery. About 20% of the deals involve firms operating in the car sector, household goods and textiles (see figure 6).

About 52% of Italian private equity investments are aimed at financing firms in their expansion stage (see figure 7), without distinction among economic sectors. Originally, Italian funds looking for profit maximization oriented concentrated on early stage financing. Because of low performances on those transactions, as from the beginning of the Nineties Italian private equity funds have invested mostly in more consolidated companies, aiming at carrying through their development plans.

[FIGURE 6 APPROXIMATELY HERE]

[FIGURE 7 APPROXIMATELY HERE]

The goal of private equity funds is to sell the restructured and improved business at a profit in three to five years, though the holding period may vary depending on the portfolio companies' potential to produce consistent cash flows in the short term.

Concerning our data, the time between the way in and the way out, ranges from 6 months to 5.5 years. The average holding period is almost 3 years. In the 75% of cases, the holding period is shorter than 3.5 years.

The average holding period is higher (3 years) for transactions concerning the sector of cyclical services (general retailers - leisure & hotels - media & entertainment - support services – transport) and cyclical consumer goods (automobiles & parts - household goods & textiles), as well as investments supporting firms' early stage (3.5 years). See table 2 for details.

[TABLE 2 APPROXIMATELY HERE]

The investment size ranges from 0.25 to 30.4 millions euro. The average investment size is 6.7 millions euro (median: 4.1 millions) and in 75% of cases less than 9.8 millions are invested in a single firm (see table 3). On average, the invested capital is higher in the finance and utility sectors (8.8 and 8.4 millions, respectively), in buyout operations (15.6 millions) and in shorter transactions (up to 12 months, 8.7 millions). See table 3 on this matter.

[TABLE 3 APPROXIMATELY HERE]

Concerning the exit from the investment (i.e. the opportunity for the private equity of selling the investment), in almost 88% of cases the companies included in the dataset was sold to another private equity house or entrepreneur, while only 6% was floated to the stock market. In 6% of cases the participation was cancelled because the investment failed and the firm went to bankruptcy. Trade sale is the most common exit way for Italian private equity providers, without distinction among either business sector or investment kind (see table 4).

[TABLE 4 APPROXIMATELY HERE]

We now concentrate on the investments' performances.

The most common measure of performance within the private equity capital industry is the internal rate of return or IRR. The IRR is that rate of discount which equates the present value of cash outflows associated with an investment, with the sum of the present value of the cash inflows accruing from it and the present value of the valuation of the unrealised portfolio.

Performance calculations quantify the cleverness of the private equity managers at two main stages. On one hand, on their ability to choose suitable investment opportunities, manage them and divest from them. On the other hand, to assess their overall cost effectiveness by computing the return to investors, net of the total cost of carrying out these tasks.

Pure IRRs can only be computed when all investments have been realised and the cash has been paid back to investors, after the deduction of carried interest, management fees and other applicable professional and ancillary charges. This is the net ("cash-on cash") return on the wholly realised investment portfolio. However, users of financial information regarding private equity companies need to be able to measure returns on a regular basis. At this purpose a gross return can be computed on realised investments. Such "interim" return is no more than an indicator of the pure IRR.

The measure adopted in our study is a gross return which is based on the cash outflows and inflows concerning realised investments, including realisation values and dividend. In particular, we consider annual gross IRR.

The average IRR of the investments included in our dataset is 11.4% (median: 11.3%; standard deviation: 24.77%). High standard deviation is typical of private equity investments. In our case, IRR can range between -100.0% and 97.9%.

The highest annual IRR is achieved on investments concerning the business sector labelled "general" (aerospace & defence, electronic & electrical equipment, engineering & machinery), while "resource" (mining, oil & gas) and "utility" sectors show the lowest IRR. Concerning performances among different kinds of investment, the highest

IRR is achieved in buyout transactions (16.38%), while turnaround financing seems to be quite bad performing on average (-22.8%). See Table 5 for details.

[TABLE 5 APPROXIMATELY HERE]

3. Analysis framework and regressions results

In our study we distinguish among five types of private equity providers, depending on the entity which owns the management company: corporate, bank-based, public, independent and other entities' funds. Among bank-based funds we further distinguish two categories: funds in which the bank financed the firm during the five years before the private equity investment and funds in which any lending relationship never occurred between the bank and the firm.

Our objective is to test whether the owners of the funds' management companies influence the investments' internal rate of return and provide an explanation.

As we mentioned in the Introduction, our analysis follows three steps.

First of all, we examine whether funds belonging to diverse entities have different investment patterns. We define the funds' investment patterns by observing the following features:

- the time that the funds' representatives can devote to monitor the portfolio companies' activities;
- the investment kind;
- the exit way from the investment;
- the portfolio companies' business sector;
- the holding period of the investments.

As proxies for the time that the funds' representatives can devote to monitor the portfolio companies, we use the variables CNF and CNMC. As we mentioned in Sect. 2, CNF and CNMC measure the plurality of offices held by the funds' representatives. We conjecture that the higher are CNF and CNMC, the busier are the funds'

representatives and the lower is the investments' internal rate of return. We believe that when funds' representatives are very busy, they are not able to keep their finger on the pulse of the participated companies, nor to monitor their results effectively.
The second step consists in verifying whether the investments' IRR differs depending on the entity which owns the fund's management company.
Finally, we identify the determinants of IRR and we test whether they are affected by the variables which define the investment pattern of funds belonging to different entities.

3.1 Differences in investment patterns among the private equity providers

We use Wald test to verify whether private equity providers differ in terms of investment kind, exit way, portfolio companies' business sectors and holding period.
Wald test results in Table 6 support the conclusion that the holding period of the investments is an important basis for discrimination. No difference seems to exist among the funds belonging to diverse entities, in terms of the investment kind, exit way and portfolio companies' business sectors.

[TABLE 6 APPROXIMATELY HERE]

Table 7 shows the regression results on the holding period. Each coefficient measures the difference in the average holding period among the funds belonging to diverse entities. The results highlight that on average bank-based funds (BL and BNL) stay in the portfolio companies for longer, while the holding period for corporate funds is shorter on average.

[TABLE 7 APPROXIMATELY HERE]

Concerning the time which the funds' representatives can devote to monitor the investments, we use two variables as proxies for funds' representatives' involvement:

CNF and CNMC. As we mentioned Sect. 2, the former indicates the total number of seats that the funds' representatives have in the boards of directors of the private equity backed firms, during the holding period. The latter measures the total number of seats that the funds' representatives have in the boards of firms which belong to the funds' management company (included non private equity backed firms) during the holding period.

We argue that the higher are CNF and CNMC, the busier are the funds' representatives and the lower is IRR.

Using an OLS multivariate regression model, we test for difference in CNF and CNMC among the funds belonging to diverse entities. The dependent variables are represented by the following variables: BL is a dummy variable which takes the value of 1, if the fund is managed by a bank which financed the firm in the five years before the private equity investment, with an amount at least of 5% of total debt, and 0 otherwise; BNL is a dummy variable which takes the value of 1, if the fund is managed by a bank which did not finance the firm in the previous five years and 0 otherwise; CORP is a dummy variable which takes the value of 1, if the fund is managed by industrial or service companies and 0 otherwise; PA is a dummy variable which takes the value of 1, if the fund is managed by public authorities or public entities and 0 otherwise; OTH is a dummy variable which takes the value of 1, if the fund is managed by other entities and 0 otherwise.

We report coefficients on the private equity fund types in Table 8. Each coefficient measures the difference in average CNF among the private equity providers. A positive coefficient implies a higher number of seats which are held by the funds' representatives in the boards of the private equity backed firms during the holding period. The results of one-sided t-test show that the dummy variables BL and BNL have statistically significant positive coefficients, while CORP has a statistically significant negative coefficient. No statistically significant difference exists in the average CNF among other private equity providers.

[TABLE 8 APPROXIMATELY HERE]

Table 9 shows coefficients of the multivariate regression on CNMC. Once again, the results of one-sided t-test show that the dummy variables BL and BNL have statistically significant positive coefficients, while CORP has a statistically significant negative coefficient. On average, bank-based funds' representatives hold a higher number of seats in the boards of firms participated by the management company (including non private equity backed firms) during the holding period. The contrary occurs for corporate funds. No statistically significant difference exists in the average CNF among other private equity providers.

[TABLE 9 APPROXIMATELY HERE]

The results shown in Table 8 and Table 9 provide empirical evidence for the fact that bank based funds' representatives are busier than other funds' representatives, while the opposite occurs in corporate funds.

Moreover, in both regressions the coefficient of BL is higher than the coefficient of BNL. This result tells us that the BL funds' representatives can devote less time to the monitoring of the private equity investments, than BNL funds' representatives. Probably management companies of BL funds think that a close monitoring of the portfolio company is not necessary, because the bank owner already knows the quality of the firm, thanks to the previous lending relationship. Besides, if the firm's economic conditions got worse, the bank could finance it again.

3.2 Multivariate regressions on IRR

In this section, we provide evidence of the difference in IRR among the funds belonging to diverse entities and we investigate why.

Using an OLS multivariate regression model, we test for difference in average IRR. As in paragraph 3.1, the dependent variables are the dummies representing the owners of the funds' management companies.

We report coefficients on the private equity fund types in Table 10. Each coefficient measures the difference in average IRR among the private equity providers. The results of one-sided t-test show that the dummy variables BL and BNL have statistically significant negative coefficients, while CORP has a statistically significant positive coefficient. On average, bank-based funds achieve a lower performance on their investments. The contrary occurs for corporate funds.

[TABLE 10 APPROXIMATELY HERE]

In particular, our results show that the average difference in IRR is -1.3% concerning investments by BL funds and -1% concerning investments by BNL funds. On the other side, the average difference in IRR is +2.96% with reference to deals by CORP funds.

We notice that among bank based funds, the difference is higher for BL funds, than for BNL funds.

No statistically significant difference exists in the average IRR among other fund types.

We now explore the determinants of internal rates of return on private equity financing in a multivariate regression approach.

The regression on IRR involves variables concerning the economic performances of the private equity backed firm and the investment pattern adopted by the closed-end fund.

In particular, the performances of the portfolio company are represented by the annual revenue growth rate (ΔSALES), the annual variation in return on assets (ΔROA) and the annual variation in return on equity (ΔROE).

The variables concerning the investment pattern of the closed-end fund indicate the amount of capital invested in the firm (I-SIZE), the percentage of shares owned by the closed-end fund (%SHARE), the exit strategy (EXIT) used by the private equity fund, the holding period of the investment (HOLD-PER), the investment kind (I-KIND)and the business sector of the portfolio company (BUS).

Our choice of explanatory variables to use in the multivariate regression takes into account the strong correlations among some "independent" variables. In fact, as seen in the correlation matrix in Table 11, a value higher than the 0.5 threshold (as absolute value) can in no way be considered casual. This occurrence, from a statistical standpoint, is labeled "multicollinearity;" it greatly complicates any estimate of the impact of each variable on the dependent variable (in this case, IRR).

[TABLE 11 APPROXIMATELY HERE]

In particular, we find that ΔSALES, ΔROA, ΔROE and HOLD-PER are strongly correlated. Consequently, we consider four multivariate models, which consider separately these variables.

$$IRR=\alpha+\beta_1\cdot\Delta SALES+\beta_2\cdot ISIZE+\beta_3\cdot\%SHARE+\beta_4\cdot EXIT+\beta_5\cdot IKIND+\beta_6\cdot BUS \quad [1]$$

$$IRR=\alpha+\beta_1\cdot\Delta ROA+\beta_2\cdot ISIZE+\beta_3\cdot\%SHARE+\beta_4\cdot EXIT+\beta_5\cdot IKIND+\beta_6\cdot BUS \quad [2]$$

$$IRR=\alpha+\beta_1\cdot\Delta ROE+\beta_2\cdot ISIZE+\beta_3\cdot\%SHARE+\beta_4\cdot EXIT+\beta_5\cdot IKIND+\beta_6\cdot BUS \quad [3]$$

$$IRR=\alpha+\beta_1\cdot HOLDPER+\beta_2\cdot ISIZE+\beta_3\cdot\%SHARE+\beta_4\cdot EXIT+\beta_5\cdot IKIND+\beta_6\cdot BUS \quad [4]$$

Concerning the sign of the coefficients, we expect a positive sign for ΔSALES, ΔROA and ΔROE, since it is reasonable to assume that the higher economic performances of the portfolio company, the higher internal rates of return of private equity investments.

We also expect a negative sign for the coefficient of HOLD-PER. We believe the holding period is longer when the economic conditions of the portfolio company are not good enough to achieve a high IRR in a short period of time.

Table 12 shows coefficients of the multivariate regressions on IRR. The only coefficients which are statistically significant are those concerning the firms' economic performances, holding period, exit way and investment kind. With reference to business sector, the "RESOURCE" coefficient is statistically significant only in regression 4, while t-ratios in regression 1 and 3 show borderline significance.

[TABLE 12 APPROXIMATELY HERE]

As we expected, the results of one-sided t-test show that the firms' economic performances have statistically significant positive coefficients. Also, the holding period is negatively linked to IRR.

The best regression model is the first one (R^2 = 0.54), which involves the annual variation of the portfolio company's revenues. We conclude that ΔSALES is the best explanatory variable for IRR.

In the following paragraph, we test whether the IRR determinants are affected by behavioural patterns of the different private equity providers.

3.3 Univariate regressions on the determinants of IRR

In paragraph 3.1 we have highlighted that funds owned by diverse entities differ in terms of the holding period of their investments and the number of seats that their representatives have in the board of directors, both of private equity backed firms and other companies belonging to the funds' management company.

In paragraph 3.2, we have verified that IRR is lower on investments by bank-based funds (especially BL funds) and IRR is higher on investments by corporate funds. We also have found that IRR is influenced by the economic performances of the portfolio company and by the holding period of the investment. Besides, we have found that IRR is different among diverse investment kinds and exit ways.

In this paragraph we test whether the IRR determinants are affected by the variables which define the investment patterns of the funds belonging to diverse entities.

From paragraph 3.1, we already know that the holding period, which is one of IRR determinants, differs among the funds owned by diverse entities. We also have found that private equity providers do not differ in terms of investment kind and exit way.

Here we consider ΔSALES, which is the best explanatory variable for IRR. We argue that ΔSALES is affected by the time which funds' representatives can devote to their monitoring tasks.

In paragraph 3.1 we have found that representatives of bank-based funds have a higher number of seats in the boards of directors both of private equity backed firms and other companies belonging to the funds' management company, than corporate funds' representatives. As a consequence of plurality of offices, bank-based funds' representatives have less time to devote to the monitoring of the investments, than corporate funds. Less time should translate in lower performances.

In this paragraph, we test whether ΔSALES is affected by CNMC and CNF, which we used as proxies for the funds' representatives involvement. Based on our previous considerations, we expect a negative sign for the coefficient of both CNMC and CNF. Moreover, we expect that CNMC is more detrimental on revenue growth rate, than CNF. On one hand, sitting in many boards of directors could be very time consuming and keep the funds' representatives from being deeply involved in the choices of each portfolio company. On the other hand, the funds' representatives who participate to the boards of directors of several private equity backed firms could benefit from experience effects, which could partially compensate for the above mentioned negative effect. A different situation should occur when the funds' representatives sit in the board of directors of several companies, included non private equity backed firms. In this case, we believe that time they can spend to adequately monitor the investments' performance is much less than in the previous case.

Table 13 shows coefficients of the univariate regressions on ΔSALES. A negative coefficient indicates that the plurality of offices held by the funds' representatives badly influences the firms' revenue growth rate. As we expected, the results of one-sided t-test show that CNMC and CNF have statistically significant negative coefficients.

In particular, a unitary increase in CNMC produces a decrease in ΔSALES of 42%, while a unitary increase in CNF leads to a decrease in ΔSALES of 12%. As we expected CNMC has a more detrimental effect on firms' performances than CNF.

[TABLE 13 APPROXIMATELY HERE]

4. Conclusions

Based on a dataset including the universe of private equity investments, made by Italian closed-end funds from 1999 to 2005, we verify that the ownership of the private equity funds influences the investments' performances and we provide an explanation.

We verify that internal rates of return are higher on investments realized by corporate funds and lower on investments realized by bank-based funds. Previous lending relationship between the participated firm and the bank owner of the fund is especially significant in affecting performances. In particular, our results show that the average difference in IRR is -1.3% concerning investments by BL funds and -1% concerning investments by BNL funds. On the other side, the average difference in IRR is +2.96% with reference to deals by CORP funds.

We also find that the ownership of the private equity funds is an important basis for discrimination in terms of the time which funds' representatives can devote to monitor the investments. Bank-based funds' representatives are busier than corporate funds' representatives. We conclude that bank-based funds are able to carry into effect a less pronounced monitoring of the companies in which they invest, because of a less effective participation as members of the firms' boards of directors. Among bank-based funds, those in which the bank financed the firm before the private equity investment (BL funds) show busier funds' representatives, than funds in which the bank did not finance the firm (BNL funds). Probably, management companies of BL funds think that a close monitoring of the portfolio company is not necessary, since the bank owner already knows the quality of the firm. Besides, if the firm's economic conditions got worse, the bank could finance it again.

A less effective participation of the funds' representatives to the firms' boards of directors leads to a lower revenue growth of portfolio companies.

Since the revenue growth rate is strongly correlated to IRR and is influenced by funds' representatives involvement in the portfolio companies, we conclude that the ownership of the private equity funds affects the investments' IRR, because of a different effectiveness of the participation of funds' representatives to the firms' boards of directors.

REFERENCES

Berk J.B., Green R.C., Naik V. (1999), "Optimal investment, growth options and security returns", Journal of Finance, vol. 54, issue 5.

Bygrave W.D., Timmons J.A. (1992), Venture Capital at a crossroad, Harvard Business School Press, Boston.

Cochrane J. (2005), "The risk and return of venture capital", Journal of Financial Economics, vol. 75, issue 1.

EVCA, Coopers & Lybrand (1996), "The economic impact of venture capital in UK", mimeo.

Gompers P.A., Lerner J. (1997), "Risk and reward in private equity investments: the challenge of performance assessment", Journal of Private Equity, n. 1, Winter.

Gorman M., Sahlman W.A. (1989), "What do venture capitalists do?", Journal of Business Venturing, vol.4, issue 4.

Hand J. (2004), "Determinants of the returns to venture capital investments", available at http://leeds-faculty.colorado.edu/Bhagat/ReturnsVCInvestments.pdf

Hege U., Palomino F., Schwienbacher A. (2008), "Venture Capital performance: the disparity between Europe and the United States", available at http://www.ecb.int/events/ pdf/conferences/ecbcfs_cmfi2/ Frederic_Palomino_paper.pdf.

Hellmann T. (1998), "The allocation of control rights in venture capital contracts", Rand Journal of Economics, vol. 29, issue 1.

Hellmann T., Puri M. (2002), "Venture capital and the professionalization of start-up firms: empirical evidence", Journal of Finance, vol. 57, issue 1.

Kaplan S.N., Schoar A. (2005), "Private equity performance: returns, persistence and capital flows", *The Journal of Finance*, vol. 60, issue 4.

KPMG (2006), "2006: a successful year! Italian Private Equity and Venture Capital market: 2006 performances", available at www.kpmg.it

Lerner J. (1995), "Venture capitalists and the oversight of private firms", Journal of Finance, vol. 50, issue 1.

Ljungqvist A., Richardson M. (2003), "The investment behaviour of private equity fund managers", Working Paper NYU, available at http://www.lse.ac.uk/collections/RICAFE/pdf/ RICAFE-WP05-Ljungqvist.pdf.

Mayer C., Schoors K., Yafeh Y. (2005), "Sources of funds and investment activities of venture capital funds: evidence from Germany, Israel, Japan and the United Kingdom", Journal of Corporate Finance, vol. 11, issue 3.

Peng, L. (2001), "Building a Venture Capital Index", Working Paper, Yale School of Management, August, available at http://viking.som.yale.edu/finance.center/html/WorkingPapers/ papers/2001/Peng08A.pdf

Phalippou L., Gottschalg O. (2007), "The Performance of Private Equity Funds", available at: http://ssrn.com/abstract=473221

Phalippou V., Zollo M. (2005), "What drives private equity funds performance?", available at http://fic.wharton.upenn.edu/fic/papers/05/0541.pdf.

Quigley J., Woodward S.E. (2003, "An Index for Venture Capital", Working Paper, University of California at Berkeley, reperibile all'indirizzo http://repositories.cdlib.org/cgi/viewcontent.cgi? article =1059&context=iber/econ

Sapienza H.J. (1992), "When do venture capitalists add value?" Journal of Business Venturing, vol. 7, issue 1.

Sapienza H.J., Manigart S., Vermeir W. (1996), "Venture capitalist governance and value added in four countries", Journal of Business Venturing, vol.11, issue 6.

Stein M., Bygrave W.D. (1990), "The anatomy of high tech IPOs: do their venture capitalists, underwriters, accountants and lawyers make a difference?", Babson Entrepreneurship Conference, Boston.

Tykvová T. (2006), "How do investment patterns of independent and captive private equity funds differ? Evidence from Germany", Financial Markets and Portfolio Management, vol. 20, issue 4.

Woodward, S. and R. Hall (2003), "Benchmarking The Returns to Venture", NBER WP 10202, available at http://www.nber.org/papers/w10202.

Table 1 – Definition of variables

The table reports the variables which describe the features of the Italian private equity funds' and their deals.

Variables	Description
OWNER	The entity which owns the funds' management company
CNF	The total number of seats that the funds' representatives have in portfolio companies' boards of directors, during the holding period
CNMC	The total number of seats that the funds' representatives have in boards of firms which belong to the funds' management company (included non private equity backed firms) during the holding period
I-KIND	The investment kind, which mainly refers to the stage of the portfolio company's life cycle
I-SIZE	The amount of capital invested in the portfolio company (millions euro)
F-SIZE	The fund size, measured by the sum of the investments realized by the fund (millions euro)
%SHARE	The percentage of shares of the portfolio company owned by the private equity fund
HOLD-PER	The holding period of the investments (years)
EXIT WAY	The exit way used by the private equity fund
Y_INVIRR	The annual gross internal rate of return on realised investments
C-SIZE	The portfolio company's annual sales (millions euro), the year before the private equity investment
BUS	The portfolio company's business sector
ΔSALES	The annual sales growth rate of the portfolio company
ΔROA	The ROA's annual growth rate of the portfolio company
ΔROE	The ROE's annual growth rate of the portfolio company

Table 2. Make up of the dataset by holding period of the investments (years)

The table shows the average holding period of private equity investments (years), by business sector and kind of investment
The business sectors in which Italian private equity invested are the following:
RESOURCE: Mining - Oil & Gas
BASIC: Chemicals - Construction & building materials - Forestry & paper - Steel & other metals
GENERAL: Aerospace & defence - Electronic & electrical equipment - Engineering & machinery
CG-CYCL: Automobiles & parts - Household goods & textiles
CG-NONCYC: Beverages - Food producers & processors - Health - Personal care & household products - Pharmaceuticals & biotechnology - Tobacco
CYCLSERV: General retailers - Leisure & hotels - Media & entertainment - Support services - Transport
NONCYSER: Food & drug retailers - Telecommunication services
UTILITY: Electricity - Other utilities
FINANCE: Banks - Insurance - Life insurance - Investment companies - Real estate
IT: Information technology hardware - Software & computer services

Panel A: holding period by business sector	
RESOURCE	2.87
BASIC	2.82
GENERAL	2.70
CG-CYCL	3.01
CG-NONCYCL	2.82
CYCLSERV	2.97
NONCYSER	2.87
UTILITY	2.83
FINANCE	2.86
IT	2.72
Panel B: holding period by investment kind	
EARLY	3.49
EXP	2.82
BUY OUT	2.53
TURN	2.73
Overall Mean	*2.85*

Table 3. Average investment size (millions euro), by business sector, investment kind and holding period

The table shows the average investment size, by business sector, investment kind and holding period

Panel A: Investment size by business sector	
RESOURCE	4.48
BASIC	6.20
GENERAL	6.21
CG-CYCL	6.91
CG-NONCYCL	7.65
CYCLSERV	6.35
NONCYSER	7.35
UTILITY	8.43
FINANCE	8.81
IT	5.91
Panel B: Investment size by investment kind	
EARLY	1.03
EXP	3.89
BUY OUT	15.60
TURN	8.10
Panel C: Investment size by holding period	
0-12 months	8.68
12- 24 months	8.24
24- 36 months	7.50
36- 48 months	7.07
48- 60 months	6.07
Overall Mean	*6.71*

Table 4. Exit way by business sector and investment kind

The table shows the exit way of Italian private equity funds, by business sector and investment kind

Panel A: Exit way by business sector			
	TRADE	IPO	WOFF
RESOURCE	82.35%	0.00%	17.65%
BASIC	86.57%	2.99%	10.45%
GENERAL	89.39%	5.05%	5.56%
CG-CYCL	89.38%	6.25%	4.38%
CG-NONCYCL	91.30%	3.48%	5.22%
CYCLSERV	85.59%	7.21%	7.21%
NONCYSER	84.31%	9.80%	5.88%
UTILITY	76.92%	7.69%	15.38%
FINANCE	93.75%	0.00%	6.25%
IT	81.40%	13.95%	4.65%
Panel B: Exit way by investment kind			
	TRADE	IPO	WOFF
EARLY	85.61%	3.79%	10.61%
EXP	90.19%	5.50%	4.31%
BUY OUT	86.19%	8.10%	5.71%
TURN	77.27%	4.55%	18.18%

Table 5. IRRs by business sector and investment kind

The table shows the average internal rate of return, by business sector and investment kind

Panel A. average annual IRR by business sector	
GENERAL	14.91%
IT	13.32%
FINANCE	12.68%
NONCYSER	11.58%
CG-CYCL	11.24%
CG-NONCYC	11.02%
BASIC	9.36%
CYCLSERV	9.34%
UTILITY	3.56%
RESOURCE	1.58%
Panel B. average annual IRR by investment kind	
BUYOUT	16.38%
EARLY	11.84%
EXP	12.44%
TURN	-22.82%
Overall Mean	*11.4%*

Table 6. Effect Wald Tests on private equity providers

The table reports the results of Wald Test, which tests for difference among private equity providers in the investment kind, the exit way, the portfolio companies' business sector and the holding period of the investments.

Source	Wald ChiSquare	Prob>ChiSq
KIND	9.7121	0.8375
EXIT WAY	4.0790	0.9437
BUSINESS SECTOR	23.1591	0.9971
HOLD-PER	19.2273	0.0017

Table 7. The average difference in holding period (years) among private equity providers

The table reports the results of one-sided Student's t test, which tests for difference among private equity providers in the average holding period of the investments.

Dependent variable: HOLDING PERIOD		
	Estimate	t Ratio
Intercept	2.7623	36.55***
BL	0.2302	2.59***
BNL	0.1570	1.92**
CORP	-0.1421	-1.43*
OTH	-0.2994	-0.95
PA	0.1332	0.96

∗ Significance at the 10% level

∗∗ Significance at the 5% level

∗∗∗ Significance at the 1% level

Table 8. The average difference in CNF among private equity providers

The table reports the results of one-sided Student's t test, which tests for difference among private equity providers in the average number of seats that the funds' representatives have in portfolio companies' boards of directors, during the holding period.

Dependent variable: CNF		
	Estimate	t Ratio
Intercept	2.26	20.14***
BL	1.02	2.08**
BNL	0.63	1.31*
CORP	-0.81	-1.44*
OTH	-0.67	-1.17
PA	-0.03	-0.15

∗ Significance at the 10% level

∗∗ Significance at the 5% level

∗∗∗ Significance at the 1% level

Table 9. The average difference in CNMC among private equity providers

The table reports the results of one-sided Student's t test, which tests for difference among private equity providers in the average number of seats that the funds' representatives have in boards of firms which belong to the funds' management company (included non private equity backed firms) during the holding period.

Dependent variable: CNMC		
	Estimate	t Ratio
Intercept	6.04	38.08***
BL	1.27	2.02**
BNL	0.53	1.94**
CORP	-0.77	-1.38*
OTH	-1.17	-1.15
PA	-0.48	-1.02

∗ Significance at the 10% level

∗∗ Significance at the 5% level

∗∗∗ Significance at the 1% level

Table 10.The average difference in IRR among private equity providers

The table reports the results of one-sided Student's t test, which tests for difference among private equity providers in the average IRR.

Dependent variable: IRR		
	Estimate	t Ratio
Intercept	0.1160	6.96***
BL	-0.0130	-1.83**
BNL	-0.0104	-1.94**
CORP	0.0296	2.58***
OTH	0.0277	0.40
PA	0.0014	0.05

∗ Significance at the 10% level

∗∗ Significance at the 5% level

∗∗∗ Significance at the 1% level

Table 11. Matrix of correlations among explanatory variables of IRR

The table reports the correlation coefficients among the quantitative dependent variables used in multivariate regression on IRR.

	ΔSALES	ΔROA	ΔROE	HOLD-PER	I-SIZE	%SHARE
ΔSALES	1.000	0.931	0.804	-0.571	0.132	-0.059
ΔROA	0.931	1.000	0.887	-0.550	0.104	-0.072
ΔROE	0.804	0.887	1.000	-0.504	0.074	-0.073
HOLD-PER	-0.571	-0.550	-0.504	1.000	-0.198	0.030
I-SIZE	0.132	0.104	0.074	-0.198	1.000	0.035
%SHARE	-0.059	-0.072	-0.073	0.030	0.035	1.000

Table 12. Multivariate regressions on IRR (coefficients and t ratios)

The table shows the coefficients of multivariate regression on IRR and the value of one-sided Student's t test.

	1	2	3	4
Intercept	-0.0298 (-1.89**)	-0.0221 (-1.75**)	-0,0182 (-1.62**)	0.2556 (6.71***)
ΔSALES	0.0118 (20.39***)			
ΔROA		0.0121 (17.41***)		
ΔROE			0.0119 (12.97***)	
HOLDPER				-0.0724 (-10.13***)
I-SIZE	0.0012 (1.10)	-0.0003 (1.08)	0.0031 (1.03)	0.0018 (1.13)
%SHARE	-0.0004 (-0.41)	0.0082 (0.12)	-0.0004 (-0.26)	-0.0011 (-0.98)
EXIT WAY[IPO]	0.2275 (2.34***)	0.2041 (2.54***)	0.2189 (2.38***)	0.2100 (2.47***)
EXIT WAY[TRADE]	0.1318 (2.47***)	0.1145 (2.46***)	0.1079 (2.35***)	0.1189 (2.42***)
KIND[BUYOUT]	0.1676 (4.13***)	0.1648 (3.80***)	0.1550 (3.79***)	0.0679 (4.06***)
KIND[EARLY]	0.0623 (2.58***)	0.0585 (2.55***)	0.0641 (2.37***)	0.0048 (2.45***)
KIND[EXP]	0.0588 (2.64***)	0.0582 (2.50***)	0.0648 (2.59***)	0.0113 (2.62***)
BUSINESS SECTOR[BASIC]	-0.0018 (-0.08)	-0.0082 (-0.35)	-0.0146 (-0.58)	-0.0044 (-0.17)
BUSINESS SECTOR[CG-CYCL]	0.0144 (0.89)	0.0117 (0.69)	0.0036 (0.20)	0.0139 (0.73)
BUSINESS SECTOR[CG-NONCYC]	0.0033 (0.18)	0.0028 (0.14)	0.0020 (0.10)	0.0004 (0.02)
BUSINESS SECTOR[CYCLSERV]	0.0028 (0.15)	-0.0021 (-0.11)	0.0001 (0.01)	0.0065 (0.30)
BUSINESS SECTOR[FINANCE]	0.0510 (1.18)	0.0514 (1.13)	0.0460 (0.95)	0.0397 (0,79)
BUSINESS SECTOR[GENERAL]	0.0010 (0.07)	0.0057 (0.36)	0.0164 (0.96)	0.0267 (1.51)
BUSINESS SECTOR[IT]	0.0135 (0.49)	0.0180 (0.63)	0.0326 (1.06)	0.0287 (0.90)
BUSINESS SECTOR[NONCYSER]	-0.0090 (-0.35)	-0.0011 (-0.04)	0.0055 (0.20)	0.0109 (0.37)
BUSINESS SECTOR[RESOURCE]	0.0162 (1.34*)	0.0153 (1.27)	0.0118 (1.31*)	0.0136 (1.72**)
# obs.	804	804	804	804
R^2	0.5407	0.4827	0.3954	0.3434

∗ Significance at the 10% level; ∗∗ Significance at the 5% level; ∗∗∗ Significance at the 1% level

Table 13. Univariate regressions on ΔSALES (coefficients and t ratios)

The table shows the coefficients of multivariate regression on ΔSALES and the value of one-sided Student's t test.

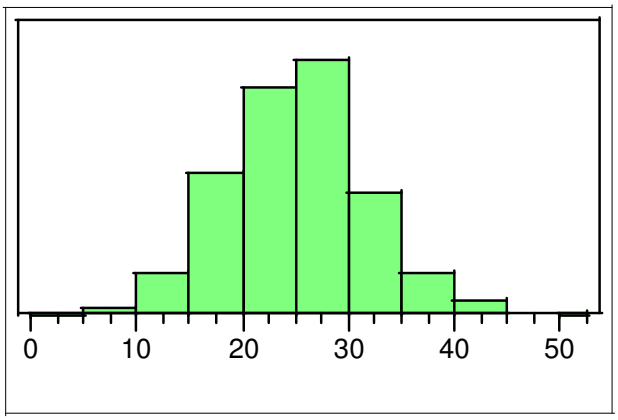
Dependent variable: ΔSALES		
	1	2
Intercept	10.3453 (9.20***)	7.7797 (10.52***)
CNMC	-0.4194 (-2.78***)	
CNF		-0.1223 (-2.55***)

∗ Significance at the 10% level

∗∗ Significance at the 5% level

∗∗∗ Significance at the 1% level

Figure 1. Distribution of private equity funds' shareholdings

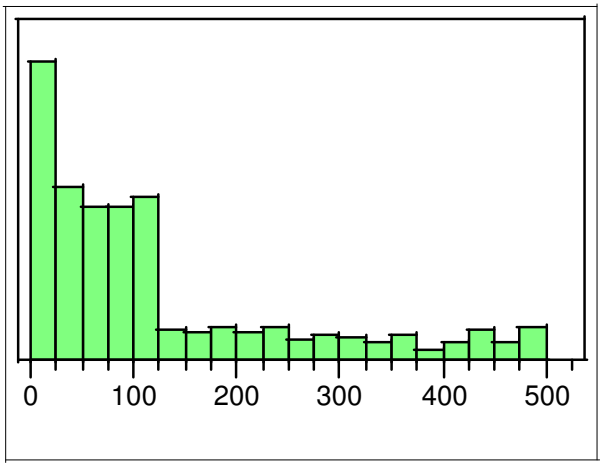


Quantiles		
100.0%	maximum	50.00%
99.5%		40.00%
97.5%		35.00%
90.0%		30.00%
75.0%	quartile	25.00%
50.0%	median	25.00%
25.0%	quartile	20.00%
10.0%		15.00%
2.5%		10.00%
0.5%		5.00%
0.0%	minimum	2.00%

Moments	
Mean	22.63%
Std Dev	6.77%
N	804

Figure 2. Distribution of participated firms by size

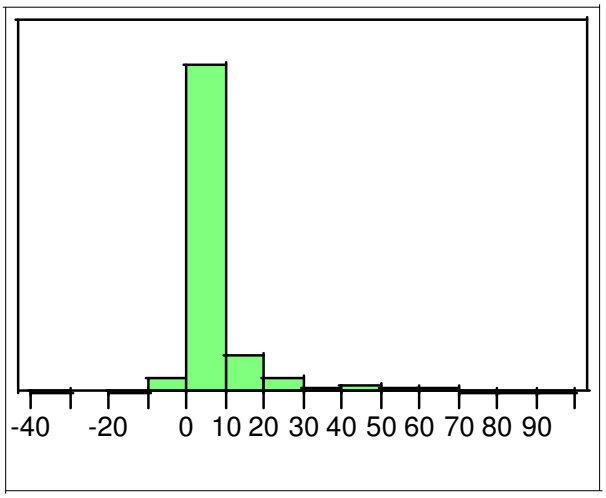
The firms' size is measured by annual sales (millions euro) the year before the private equity investment.



Quantiles		
100.0%	maximum	499.10
99.5%		494.32
97.5%		476.72
90.0%		355.88
75.0%	quartile	170.08
50.0%	median	81.66
25.0%	quartile	30.24
10.0%		15.58
2.5%		9.39
0.5%		8.22
0.0%	minimum	6.31

Moments	
Mean	128.00507
Std Dev	131.28127
N	804

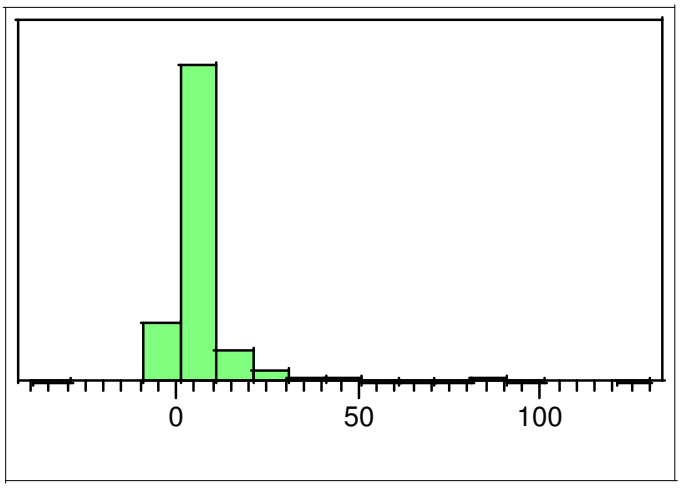
Figure 3. Distribution of participated firms' revenue annual growth rate



Quantiles		
100.0%	maximum	92.22
99.5%		75.81
97.5%		46.85
90.0%		15.47
75.0%	quartile	7.95
50.0%	median	4.09
25.0%	quartile	2.13
10.0%		0.85
2.5%		-1.05
0.5%		-8.25
0.0%	minimum	-35.37

Moments	
Mean	7.44
Std Dev	11.88
N	804

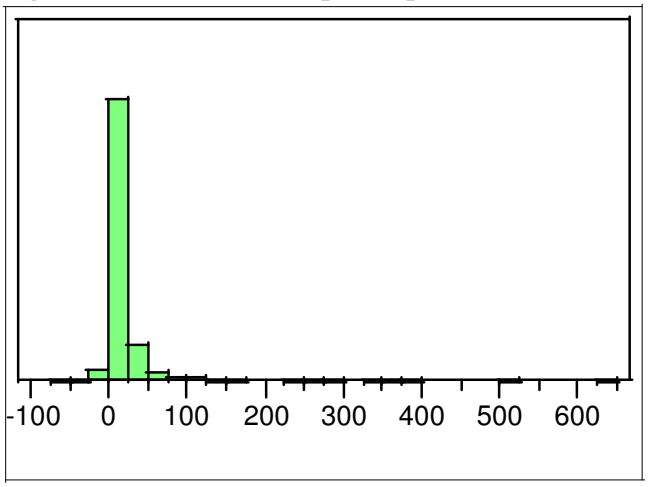
Figure 4. Distribution of participated firms' ROA annual growth rate



Quantiles		
100.0%	maximum	121.5
99.5%		89.1
97.5%		43.6
90.0%		13.9
75.0%	quartile	7.2
50.0%	median	3.4
25.0%	quartile	1.6
10.0%		0.7
2.5%		-0.9
0.5%		-7.4
0.0%	minimum	-30.4

Moments	
Mean	6.75
Std Dev	12.10
N	804

Figure 5. Distribution of participated firms' ROE annual growth rate

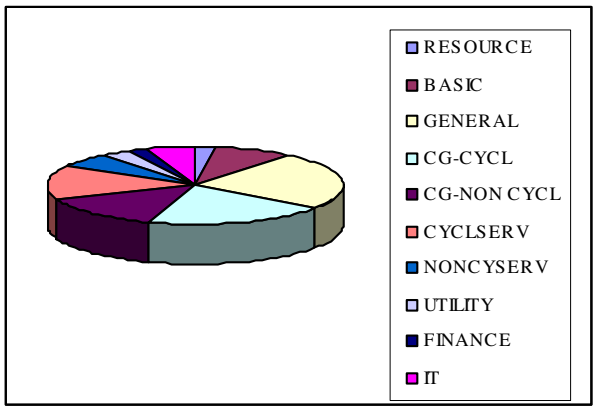


Quantiles		
100.0%	maximum	635.7
99.5%		382.0
97.5%		135.4
90.0%		40.2
75.0%	quartile	18.0
50.0%	median	8.4
25.0%	quartile	3.7
10.0%		1.4
2.5%		-1.7
0.5%		-28.9
0.0%	minimum	-70.8

Moments	
Mean	20.74
Std Dev	51.27
N	804

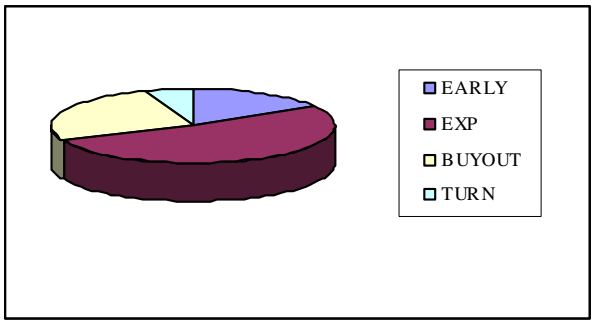
Figure 6. Business sectors of the participated firms

The business sectors in which Italian private equity invested are the following:
RESOURCE: Mining - Oil & Gas
BASIC: Chemicals - Construction & building materials - Forestry & paper - Steel & other metals
GENERAL: Aerospace & defence - Electronic & electrical equipment - Engineering & machinery
CG-CYCL: Automobiles & parts - Household goods & textiles
CG-NONCYC: Beverages - Food producers & processors - Health - Personal care & household products - Pharmaceuticals & biotechnology - Tobacco
CYCLSERV: General retailers - Leisure & hotels - Media & entertainment - Support services - Transport
NONCYSER: Food & drug retailers - Telecommunication services
UTILITY: Electricity - Other utilities
FINANCE: Banks - Insurance - Life insurance - Investment companies - Real estate
IT: Information technology hardware - Software & computer services



Economic sector	%	N
RESOURCE	2.11	17
BASIC	8.33	67
GENERAL	24.63	198
CG-CYCL	19.90	160
CG-NON CYCL	14.30	115
CYCLSERV	13.81	111
NONCYSERV	6.34	51
UTILITY	3.23	26
FINANCE	1.99	16
IT	5.35	43
TOTAL	*100.00*	*804*

Figure 7. Make up of the dataset by investment kind



KIND	%	N
EARLY	16.29	131
EXPANSION	51.99	418
BUYOUT	26.12	210
TURNAROUND	5.60	45
TOTAL	*100.00*	*804*