
The Performance of Private Equity Backed Companies in Portugal

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Abstract

The purpose of this dissertation is to study the impact on the operating performance of the Portuguese Companies that have received a participation of Private Equity Funds after the financial crisis of 2013. After this crisis, conversely to what has occurred in Europe, the PE activity in Portugal has increased on a regular basis. Using a sample of 100 transactions, clear evidence was found that Private Equity activity prevails on the domestic domain in Portugal.

In order to meet the goal proposed I studied the operating performance before and after the transaction was carried out. During the pre-transaction period, the companies that received Private Equity sponsorship were those that grew (in terms of assets and sales) and that invested (higher CAPEX) more. In post-transaction period, Private Equity backed companies still experienced a growth in their total assets and total sales, but investment suffered a decrease. These companies also experienced a significant increase in the number of employees.

To assess their performance, five ratios were used: return on assets, return on sales, asset turnover, CAPEX/Total Sales ratio and Total Debt/Total Assets ratio measuring the operating performance, profitability, productivity, investment, and capital structure, respectively.

After analysing the results, we can see that the performance of the Private Equity backed companies has worsened.

Key Words: Private Equity, Operating Performance, Investment

JEL-Codes: G24, G34, G39

Sumário

O objetivo desta dissertação é estudar o impacto no desempenho operacional das empresas portuguesas que receberam uma participação de Fundos de Private Equity após a crise financeira de 2013. Após esta crise financeira, contrariamente ao que se verificou na Europa, a atividade de Private Equity em Portugal teve uma tendência regular crescente. Usando uma amostra de 100 transações foi encontrada uma evidência de que a atividade de Private Equity em Portugal prevalece no domínio doméstico.

Para atingir o objetivo proposto estudei o desempenho operacional antes e depois da transação ser consumada. Pré-transação, as empresas que receberam investimento de Private Equity foram aquelas que cresceram mais (em termos de ativos e vendas) e investiram (CAPEX maior) mais. Pós-transação, as empresas apoiadas por Private Equity ainda experimentaram um crescimento no total dos seus ativos e das suas vendas totais, mas o investimento sofreu uma queda. Essas empresas tiveram um aumento significativo no número de funcionários.

Para avaliar o desempenho foram utilizados cinco rácios. return on assets, return on sales, asset turnover, CAPEX/Vendas Totais e Dívida Total/Total de Ativos que medem desempenho operacional, rentabilidade, produtividade, investimento e estrutura de capital, respetivamente.

Após a análise destes rácios, podemos ver que o desempenho das empresas apoiadas por Private Equity piorou.

Palavras-Chave: Private Equity, Desempenho Operacional, Investimento

Códigos-JEL: G24, G34, G39

Contents

Acknowledgements	i
Abstract	ii
Sumário	iii
List of Tables	v
List of Figures.....	v
1. Introduction	1
2. Definition of Private Equity	3
2.1. Evolution of Private Equity	4
2.2. Sources of Value Creation.....	6
2.2.1. Tax Benefits.....	7
2.2.2. Corporate Governance and Agency Costs.....	8
2.2.3. Performance.....	11
3. Private Equity Activity in Portugal.....	13
4. Private Equity Transactions in Portugal – Empirical Work	15
4.1. Methodology	15
4.2. Sample Selection.....	17
4.3. Comparable Sample	19
4.4. Descriptive Statistics.....	20
4.5. Pre-Transaction Operating Performance	26
4.6. Post-transaction Operating Performance	28
4.6.1. Growth	28
4.6.2. Operating Performance	31
4.6.3. Profitability	32
4.6.4. Productivity.....	33
4.6.5. Capital Structure	34
4.6.6. Investment	35
5. Conclusions	37
Bibliography	39

List of Tables

Table 1 - Factors Considered in the Compilation of the Sample	19
Table 2- Transaction Year Distribution.....	20
Table 3 - Types of Transactions	21
Table 4 - Private Equity Firms by Number of Transactions.....	22
Table 5 - Industry Distribution.....	22
Table 6 - Characteristics in the Year Prior to Transaction	24
Table 7 - Growth Before Transaction.....	27
Table 8 - Growth After the Transaction (in %).....	30
Table 9 - Change in Operating Performance After the Transaction (in %)	32
Table 10 - Change in Profitability After the Transaction (in %)	33
Table 11 - Change in Productivity After the Transaction (in %)	34
Table 12 - Change in Capital Structure After the Transaction (in %).....	35
Table 13 - Change in Investment After the Transaction (in %)	36

List of Figures

Figure 1 - Total Funds Raised by All Private Equity Funds in Europe (2007-2016).....	6
Figure 2- Total Amount Under Management in Portugal (2007-2016).....	13

1. Introduction

In the past decade, the world experienced a financial crisis, which caused many companies to go bankrupt or enter in financial distress. With this economic downturn, companies faced some financial constraints and experienced difficulties in obtaining funding. Portuguese companies were no exception. The Portuguese market is dominated by private Small or Medium-sized Enterprises (SMEs), only a few of which are listed. This kind of companies, the private SMEs, are generally acutely informationally opaque in contrast with the listed ones, that are relatively informationally transparent (Berger and Udell, 1998).

Private SMEs seek financing from an inside source such as the personal financing of its entrepreneur or asking for bank loans, but these types of companies can receive external funding (Berger and Udell, 1998). During this adverse situation, SMEs or start-up companies sought an alternative source of financing to run their businesses. Private Equity (PE) industry emerged as a solution.

Nowadays, the PE industry plays a more important role than it did in the 1980's (Lerner et al., 2011). Moreover, PE has been a huge sponsor of the extensive investment in the economy (Axelson et al., 2009).

Companies that experience PE fundraising can have their profitability, productivity, and working capital management enhanced in comparison to those that did not have PE fundraising (Wilson et al., 2012). Moreover, PE backed companies suffer changes in the CEO's position with the CEO being replaced by an outsider chosen by PE funds (Hellmann and Puri, 2002). Companies that are under PE management experience an increase on patenting activity without promoting cost-cutting in the short-term (Amess et al., 2016) and an alleviating in constraints of the investment (Chung, 2011).

To sum up, with all the aforementioned significant measures combined with the uniqueness of the Portuguese market, I intend to examine this market in the last decade (where the PE activity increased considerably) in order to draw conclusions about how the Private Equity sponsorship impacts the performance in the Portuguese companies. Thus, the main question that will be addressed is the following - Has Private Equity improve the performance of the Portuguese companies after the financial crisis?

This dissertation is structured as follows: Section 2 presents the literature review where I start by describing what Private Equity is and how Private Equity adds value to the companies that they finance. Section 3 presents briefly how Private Equity activity has evolved in Portugal. In section 4 the sample selection and methodology are explained and the empirical work is presented as well as its results. The final section concludes and presents a suggestion for further research.

2. Definition of Private Equity

To run their business companies need funds. In order to finance their activities companies can resort to public markets or private markets (Berger and Udell, 1998).

Since the 1980s, when Private Equity (PE) funds arose as a source of financing for companies, PE has increased its role significantly as it is now more important than ever before (Kaplan and Strömberg, 2009; Lerner et al., 2011). The investments made by PE funds are carried out through equity participation of majority or minority stakes (Battistin et al., 2017; Gilligan and Wright, 2014).

When we refer to the term PE, it is better to clarify that it encompasses Venture Capital (VC) and Leveraged Buyouts (LBO) (Braun et al., 2017; Gompers et al., 2016; Harris et al., 2014). Hence, to better understand what distinguishes these two branches of PE, one must consider that the investments made by VC and LBO have different targets. On the one hand, VC invests in start-ups or in companies at an early stage of their life with high growth potential. On the other hand, LBO investments occur in companies established in a late-stage of their life, in other words, mature companies.

Behind this financing mechanism are PE funds that are arranged as limited partnerships funds. The capital raised for these funds is provided by institutional investors - high net worth individuals, insurance companies, banks, pension funds, investment funds and endowment funds - that are known as Limited Partners (LP). General Partners¹ (GP) are committed to managing the capital raised by LPs seeking profitable investments to apply that money (Braun et al., 2017; Gilligan and Wright, 2014; Holloway et al., 2016; Kaplan and Schoar, 2005; Metrick and Yasuda, 2010; Sensoy et al., 2014; Sorensen et al., 2014). Apart from this capital, portion of the capital used by PE funds in buyouts is provided from bank debt, Gilligan and Wright (2014) stated that “*this debt is the ‘leverage’ of a LBO*”.

In this type of contractual arrangement, LPs allocate capital right from the origin of PE fund, but this engagement is not wholly “funded up front”. Over the time, GPs detect opportunities to invest (“capital calls” or “takedowns”) and due to the contractual

¹ Also known as PE manager see Cumming et al. (2010).

commitment, LPs are obliged to fulfil these capital calls when they arise. Whenever the fund leaves its investment, LPs collect distributions from the GP (Robinson and Sensoy, 2016).

According to Sorensen et al. (2014), the investments made by PE funds are illiquid and long-term. These funds have a limited lifetime, usually lasting for a period of ten years. However, this period can be extended by a period of three years more (Buchner et al., 2016; Cumming and Walz, 2010; Jenkinson et al., 2013).

As per Braun et al. (2017) and Hotchkiss et al. (2014), funds exceed the ten years because it is necessary to take into consideration the time needed “to acquire, work with, and exit” of the investment and return the proceeds to LPs. During the first five or six years, a major investment is launched by GPs using the committed capital by the LPs is known as the investment period. The GPs are committed according to the deal terms into giving back the capital invested by LPs in a period of time typically between five to ten years. PE funds have a limited lifetime, i.e., there exists a pre-agreed date on which the fund will not make more investments, before its liquidation, GPs raise a subsequent (and independent) fund (Gilligan and Wright, 2014; Jenkinson et al., 2013; Kaplan and Schoar, 2005; Sensoy et al., 2014).

2.1. Evolution of Private Equity

As aforesaid, in the 1980s, PEs began to gain importance in the business world. The first wave of LBOs occurred in the late 1980s. The quick growth originated not only due to the increase in the number but also due to the increase on the size of highly leveraged hostile takeovers of public companies, predominantly in the United States (Battistin et al., 2017; Guo et al., 2011; Ivashina and Kovner, 2011; Lichtenberg and Siegel, 1990). According to Kaplan (1991), LBO activity suffered a boost during this decade reaching the value of \$77 billion in 1988 when in 1979 this type of transactions was only worth \$1.4 billion².

Following this first boom in PE activity, the recession of the early 1990s, and high interest rates caused a slowdown in that activity (many leveraged investments in this period went into default) (Guo et al., 2011). From 2005 until mid-2007, the second wave of PE

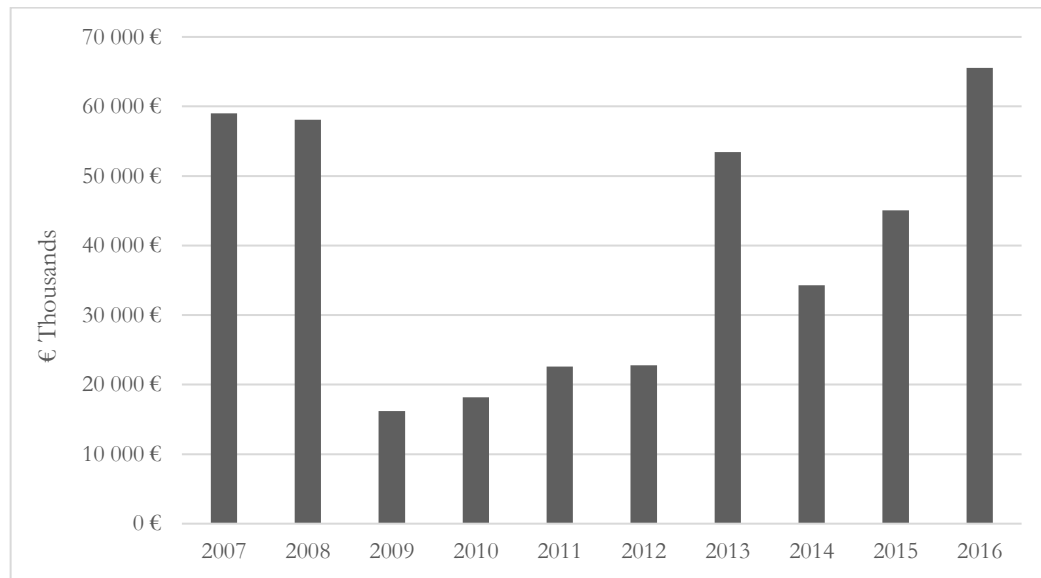
² See Table 1 by Jensen (1989).

arose. Since mid-1990s the economic growth and low inflation provided favourable conditions for the practice of this kind of activities (Gilligan and Wright, 2014). The PE phenomenon did not remain concentrated only in the United States, where the most important transactions were registered in the first wave. This phenomenon spread to Western Europe and to the United Kingdom (U.K.) (Strömberg, 2008). According to Amess et al. (2012), “the Western European market grew by more than 50% in 2005, and the U.K. private equity market rose some 70% in value in 2007”. The second wave of PE reached a peak in 2007 (Wilson et al., 2012) and Metrick et al. (2010) stated that PE funds were responsible for managing roughly \$1 trillion capital where buyout funds were responsible for two-thirds of this capital.

But due to the financial crisis, which began in late 2007 PE activity dropped. In order to meet their needs, banks held cash instead of lending it and as a consequence the number of deals and the funds raised decreased. A lot of funds that used debt in their structure were the highly affected, even going into an insolvency situation. In the years after the financial crisis, the interest rates were low which avoided the PE funds being pushed into bankruptcy due to their high indebtedness levels (Gilligan and Wright, 2014).

Looking at figure 1, showing the evolution of the total amount raised by all PE funds for Europe, we can state that after the economic downturn of 2008 the amount raised in 2009 fell drastically (to be more precise 72% in comparison to 2008). From that year the funds raised increased substantially. Only in 2013, the total amount raised grew considerably (almost 58% in comparison to 2012), peaking in 2016.

Figure 1 - Total Funds Raised by All Private Equity Funds in Europe (2007-2016)



Source: Invest Europe- Yearbook 2016

As PE practitioners “use as much leverage as they can”, market conditions (for example changes in interest rates) affect the PE activity (Axelson et al., 2013). Since these market conditions are linked with the world’s economic situation, then the boom and bust of the PE are related with worldwide economic cycles.

2.2. Sources of Value Creation

“Takeovers and buyouts both create new value and unlock value destroyed by management through misguided policies” - Jensen (1989)

For Jensen (1989), the implementation of those transactions would be perceived as a solution to the problems in public companies whose owners are “large institutions and entrepreneurs” which rely on managers to act on their behalf. Turning into private companies through buyouts it can bring an increase in operating performance, employee productivity and reduce the agency problems. In the same year, Kaplan (1989a, 1989b) provided two studies where he found evidence that buyouts companies would benefit from the tax benefits and an increase in operating income.

Twenty years later after the “*Eclipse of the Public Corporation*” made by Jensen, Kaplan and Strömberg (2009) also shared a similar opinion. They stated that “private equity activity

creates economic value on average”. They also explained that the companies that experienced PE investments had evidenced changes in their capital structure, corporate governance, and management incentives.

Later, Guo et al. (2011) also corroborated those previous studies. They found that value creation through the increase in operating performance and taxes benefits. In addition, Acharya et al. (2013) suggested that the operational improvements brought on by PE funds were related with the past operational background of the fund manager.

In 2016, Amess et al. noticed that PE alleviates the financial constraints, promoting an easier “investment in innovation activity”. As a consequence, an increase in patenting activity without promoting cost-cutting in the short-term was observed.

Recently, Faccio and Hsu (2017) analysed the effect of PE on employment in the United States. Apart from an increase in employment, they found evidence that there is an increase in employment during election years. Moreover, they noted that PEs that are politically connected presented a higher job creation than those that are politically nonconnected.

2.2.1. Tax Benefits

As stated previously, PE activity, more particularly LBOs, resorts to debt to finance their acquisitions. The usage of debt on the target companies allows them to extract a very important source of value, once GPs are more disciplined in their decisions of capital investment thus avoiding the waste of resources and the usage of debt might serve as a “tax shield”.

The effects of taxes on PE activity has been studied since the 1980s. Kaplan (1989a) detected the existence of tax benefits of seventy-six Management Buyouts³ (MBOs) in the period from 1980 to 1986. Under an array of assumptions, on his study, he found that tax benefits result from the increase in interest deductions. The tax benefits provided by the leverage were covered between 18.3% to 144.2% of the premium paid to pre-buyout

³ According to Weir (1996), MBOs result from the acquisition of the company (or a division of the parent company) by its incumbent managers.

shareholders⁴. Moreover, he noted that tax advantages increase when the debt maturity is higher or even permanent. In addition, he also found the existence of a strong correlation between the premium paid and the tax benefits concluding “tax benefits being an important source of the wealth gains in management buyouts”.

In 2011, Guo et al. studied the second wave of LBOs in order to understand how it created value. They identified that “larger tax shields” were produced by substantial increments in leverage. It could increase the returns by rising the free cash flows to the capital providers. But they warned that these tax benefits depend on whether the increment of the leverage would maintain after the PE firm exited from their portfolio companies.

In the study made by Fama and Jensen (1983) it is suggested that when the corporate decision-making and equity ownership were centred on just a few of the decision-makers this led to these owner-managers being more risk averse and consequently, not invest in projects that possess a high risk. Other studies presented in a paper carried out by Badertscher et al. (2013) identified that tax avoidance could be a “risky activity”. Badertscher et al. (2013) compared the “income tax avoidance of management-owned and PE backed private firms”. They found that companies, with PE in their structure were able to benefit from tax benefits much more than companies that were run by owner-managers. Finally, they claimed that the lower effective tax rates of the companies that have PE in their ownership may be the result of taking advantage of “intangible assets, tax-exempt investments, tax credits, and the use of multi-jurisdictional tax planning, including affiliates in low-tax rate foreign countries”.

2.2.2. Corporate Governance and Agency Costs

“Large debt-service payments force managers to find ways to generate cash and prevent them from wasting resources. Larger equity stakes give managers an incentive to find ways to pay off the debt while increasing value” - Kaplan (1989b)

As stated previously, by Jensen (1989), public companies suffer from the wide dispersion of their owners which provoke “conflict between the owners and managers over the control and use of corporate resources”. For him this is the “central weakness of the

⁴ Table 3 presented by Kaplan (1989a).

large public corporations”. According to Kaplan (1989b), by becoming private companies through LBOs, those companies received the inbound of a “buyout specialist” that would be responsible for the structuration, monitorization and the control of the management team. Thus, it can be said that apart from the benefits that debt can bring to these transactions, debt can also discipline the decision-making, avoiding the waste of resources and an increase in the performance. Moreover, giving managers a portion of equity, could bring into line their interests with the owners – i.e., to maximize the value of the company. Wruck (1989) pointed out that a private sale of equity enhances the ownership concentration. He concluded that this enhancement causes a positive effect on the value of the firm once “blockholders generally serve as catalysts that align manager and shareholder interests”. However, this is not always verified as sometimes these blockholders appear as an obstacle to the alignment of interests.

Axelson et al. (2009) proposed a model of the financial structure of a PE firm. This model was based on the agency conflicts between GPs and their LPs and explains how the PE firm could finance its investments. GPs are qualified for the identification and the management of the “potentially profitable investments”. GPs tend to overstate the quality of these investments due to their limited liability. Sometimes GPs invest in projects that may not be the most correct from the point of view of the company this is because they often finance projects that will pay them a higher return in detriment of the best interests of the company as it would bring them less profit.

In their model, Axelson et al. (2009) stated that a PE firm could finance the investments through two regimes, either *ex ante* financing or *ex post* financing. The *ex ante* financing consists of pooling capital that can sponsor some future deals and the *ex post* financing consists in providing capital to sponsor deals only when GPs detect an opportunity to invest. Thus, the financial structure of the fund can prevent GPs from making bad decisions for the fund. They concluded that in order to mitigate part of these kind of agency conflicts, several contractual features common that restrict the decision of the investment by GPs could be a solution.

Ivashina and Kovner (2011) studied the relationship between LBOs and banks. They examined 1,590 financing loans that banks provided to PE firms from 1993 to 2005. The authors stated that “LBOs firms are important clients for banks” due to their scale and the periodicity of their investments. Successive transactions of precedent LBOs could diminish

the costs of financing future transactions once the banks already have information on the PE firm. So, a strong bank relationship with PE firm generated through successive transactions lead to banks providing “better loans terms” in order to increase the likelihood of the bank being selected to fund further transactions seeing the banks “want to sell other fee-based services to LBOs firms”. A long relationship also increases the confidence between the parties in the due diligence process decreasing the asymmetric information that could exist if this relationship was recent.

The “governance engineering” characterised by Kaplan and Stromberg (2009) assumes that PE investors control their investments through direction boards and they are more engaged in the “governance than boards of public companies”. Earlier studies presented in the paper found that boards of PE backed companies are more compact than the public ones. Moreover, the number of meetings in the boards of PE backed companies are higher. The performance of managers is linked to their board position, in other words, in the case of poor performance by a manager, PE investors replace him. Thus, in order to achieve a long longevity in the board of directors, managers must achieve a good performance on the PE investments’ management.

In the survey made by Da Rin and Phalippou (2017), it was pointed out that the fees paid to GPs by the LPs can greatly affect the GPs performance. These fees are established in the contracts made by PE. The inclusion of these fees paid to GPs, although costly, due to the legal technical requirements and the lengthy documents that are necessary can reduce agency problems. Hence to receive these fees, GPs should make sure that they behave in accordance with the interests of LPs. Sorensen et al. (2014) stated that GPs receive two types of fees. An annual management fee and a performance-based incentive fee (carried interest). In general, they receive for each fee 1.5%–2% of the committed capital and 20% of profits, respectively.

In the survey, Da Rin and Phalippou (2017) it was also stated that apart from LPs monitoring activities (this could be done by sitting in an advisory board member, which possess a certain level of expertise) to understand if the company is being managed properly, monitoring GPs actions is also important to clarify the decision of LPs on reinvestment in the next fundraising.

Finally, *“governance engineering involves creating a better alignment of incentives between managers and shareholders or providing better oversight that can limit empire building and opportunistic behaviour”*- Gompers et al. (2016) , this quote emphasizes briefly the importance of the changes in the corporate governance promoted by PE firms in the mitigation of the agency problems.

2.2.3. Performance

Another source of value creation of the PE activity emerges from the increase in the operating performance of the companies that benefit from the entrance of PE funds in to their business.

Kaplan (1989b) studied the MBOs of the public companies that took place from 1980 to 1986 and showed that in the three years subsequent to the buyouts contained in the sample, these companies experienced an increase on the operating income (before depreciation), an increase on the net cash flow and at the same time, noting a decrease on capital expenditures (CAPEX). He concluded that from the two months prior to the announcement of the buyout to the post-buyout sale, the market value of the company increased 77% on average resulting from the operating changes applied.

Guo et al. (2011) examined how the LBOs in the second wave of PE created value. They noted that in comparison to the first wave of PE, this wave had less leverage. In the same line of the Kaplan (1989b) study, they found evidence that there is an increase in operating performance. However, the cash flow gains did not present a similar magnitude to what was observed from the 80s buyout wave. Finally, they conclude that 22.9% of the return was provided by the changes in operating performance.

The PE backed buyouts occurring in the U.K. enhanced the value of the portfolio companies. Comparing the economic and financial performance of PE backed buyouts in the U.K. with non-buyouts companies it was found that the companies that had experienced PE sponsorship presented a substantial growth in many drivers in comparison to the companies that did not suffer the buyout. An increase in the CAPEX, in the number of employees and a growth in the assets and sales was observed. Those companies that did not

experience the buyout transaction presented lower growth, productivity, profitability, and a deteriorating working capital management (Chung, 2011; Wilson et al., 2012).

According to Acharya et al. (2013), the size and the maturity of the PE fund are related to the dimension of the returns once they pointed out that the higher and more mature the PE fund is, the higher the returns the fund will generate. These characteristics impact positively the operating performance of the portfolio companies. During the participation of PE fund in the company, an increase in EBITDA/Sales ratio by around 0.4% per annum above the sector median is achieved and an increase in EBITDA/Enterprise Value ratio increases by around 1 (or 16%) above the sector median. But, we can state from the study of Bernstein and Sheen (2016) which examined the operational consequences in the restaurant industry promoted by the PE buyouts, PE activity does not take into consideration only the financial side, such as the improvements in some financial ratios. They noted an improvement in operational practices. The improvements observed were that restaurants were safer, cleaner, and better maintained. These improvements were achieved due to the higher influence and control of the PE firm.

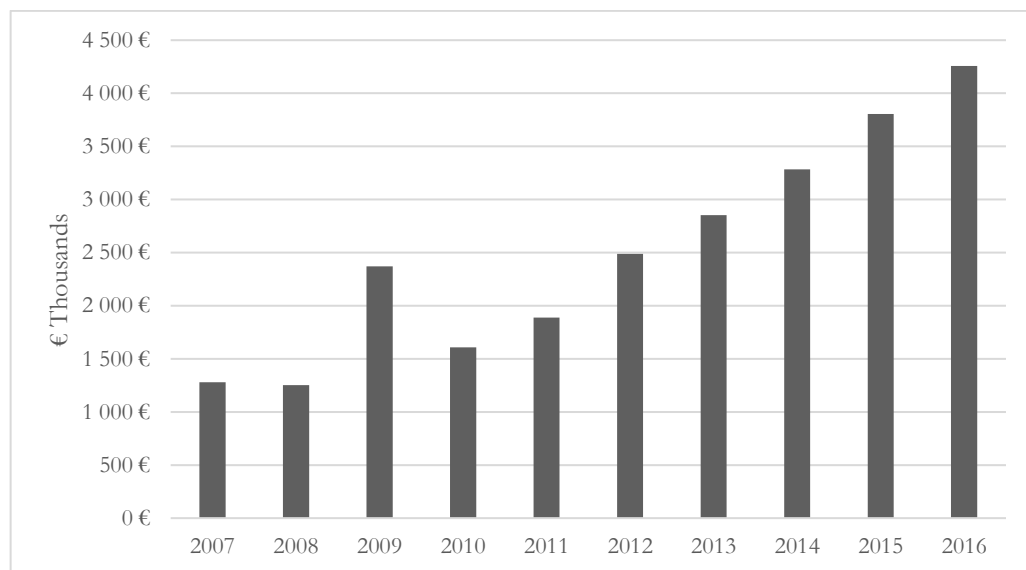
3. Private Equity Activity in Portugal

In this section, I present a description of the private equity activity in Portugal taking into consideration the data in the year 2016, the latest available data. According to the “*Relatório Anual da Atividade de Capital de Risco 2016*” provided by Comissão do Mercado de Valores Mobiliários (CMVM) at the end of 2016 there are 85 risk capital⁵ funds with an amount under management of around 4.3 billion Euros.

According to this report made by CMVM, in 2016 an increase was verified in the amount under management of 450.4 million Euros (11.83%) in comparison with the previous year.

In figure 2, we can observe the evolution of the total amount under management in Portugal registered in “*Relatório Anual da Atividade de Capital de Risco*” at the end of each year from 2007 to 2016. Since 2010, the total amount under management follows an increasing regular trend, reaching a peak in 2016.

Figure 2- Total Amount Under Management in Portugal (2007-2016)



Source: CMVM - *Relatórios Anuais da Atividade de Capital de Risco*

⁵ I use the same approach that Mendes (2011) used to translate "Capital de Risco" into "Risk Capital". He stated that "Capital de Risco" encompasses the PE industry as a whole, and it should not be considered as VC.

In 2016 it was noted that the sector that accounted for the major part of the investment (36.1%) was the non-financial holding companies totalling an amount of 1,248 million Euros. The remaining sectors that accounted for a significant part of the investment were the manufacturing industry (11.3%) and real estate activities (11%) (CMVM, 2017).

Concerning the type of investment, private equity totalled 81% and venture capital the remainder, leading to the conclusion of the existence of a huge gap between these two types of investment (CMVM, 2017).

Finally, the most common defined exit route of the investments made by private equity firms were trade sale (30.5%) and management buy-in (12.5%) since the large part of exit route was not defined (54.2%) (CMVM, 2017).

4. Private Equity Transactions in Portugal – Empirical Work

In this section the sample will be defined, and the methodology used will be explained. Furthermore, the outcome that will enable us to answer the main question of this dissertation will be presented, - Has PE improved the performance of the Portuguese companies after the financial crisis?

The objective of the study is to analyse, empirically, the effects on the performance of the companies that suffered an entry of the PE firms. As such purpose, I resorted to a quantitative study, based on secondary data.

4.1. Methodology

The methodology adopted in this dissertation encompasses the analysis of seven variables which aim to assess the evolution of the company before and after the transaction. As a proxy for the size the book value of total assets and total sales are used. To quantify the investment activity of the PE backed company the CAPEX⁶ is used. EBITDA (earnings before interest, taxes, depreciation and amortization) quantifies the cash generated by the activity of the company. The net operating cash flow measures the cash generated by the activity of the company that is used to pay the debt and that can be distributed to the equity holders. To calculate the net operating cash flow the CAPEX is deducted from the EBITDA. The remaining variables are the total debt⁷ and the number of employees that allow us to observe the evolution of the amount of debt and the labour force used by the companies, respectively.

To assess the performance of the company before and after the transaction five ratios are used. To measure the operating performance the return on assets is used, to evaluate the profitability return on sales is used and CAPEX/Total Sales ratio is used to quantify the investment, to assess the productivity asset turnover is used, and with regards to the capital structure, Total Debt/Total Assets ratio is used. Dividing the EBITDA by the end-of-period

⁶ CAPEX = Δ Fixed Assets – Depreciations and Amortizations

⁷ Total Debt = Short-Term Financial Debt + Medium/Long-Term Debt to Third Parties

total sales and CAPEX by the end-of-period total sales enables us to measure the profitability and the end-of-period total assets is used to measure the productivity. These ratios are useful to verify the ability of the company to improve or maintain its profitability margin and the operating performance in asset utilization. The asset turnover, that is calculated through the division of total sales by total assets, allows us to verify the productivity of the company in the utilization of the assets in generate sales. Finally, dividing the total debt by the total assets allows us to verify how the capital structure changes after the transaction and the amount of debt that is used to finance the assets. These ratios have been used by Kaplan (1989b), Chung (2011) and Guo et al. (2011) in their studies.

Throughout this study the difference-in-difference approach will make it possible to measure the median changes of the seven variables and the five ratios used in a three-year period after the transaction (year +1 to year +3) in relation to the last fiscal year before the transaction (year -1) in the companies that experienced PE transaction. For the pre-transaction period, an analogous analysis will be made but in relation to the prior year (year -2). The fiscal year of the transaction (year 0) will not be considered since it will be difficult to distinguish the pre and post-transaction performance in that year.

The following formula $\frac{X_i^{t+j} - X_i^{t-1}}{X_i^{t-1}}$ evaluates the median changes in the seven variables in the post-transaction period. To evaluate the median changes of those variables in the pre-transaction period the formula used is the following $\frac{X_i^{t-1} - X_i^{t-2}}{X_i^{t-2}}$. Regarding the median changes of the five ratios, $X_i^{t+j} - X_i^{t-1}$ is the formula used for the analyse for the post-transaction period. $X_i^{t-1} - X_i^{t-2}$ is the formula used for the analysis of the pre-transaction period. For the previous formulas, X signifies the variable or the ratio in analysis, i the company, t the fiscal year of the transaction and j the fiscal year after the transaction.

Apart from this, an adjustment to the industry was made. This adjustment to the industry is obtained by subtracting the changes in variables and ratios of sample companies from the comparable sample changes in the same variables and ratios during the same period. This adjustment will enable us to draw conclusions about the performance of the companies that received PE in comparison to the others which did not. The process to select the companies that will be present in the comparable sample is fully explained in section 4.3.

Then the results are presented both unadjusted⁸ and adjusted by the industry during the period of analysis.

Due to the presence of outliers which distort the average value of the outcome of the analysis it was necessary to resort to *winsorization*⁹ in the post-transaction period. Thus, the results of the analysis will be focused on and presented by the median¹⁰ value instead of the average value.

In order to check whether the median percentage value, for both the unadjusted and adjusted industry, is significantly different from zero, a *Wilcoxon Sign Rank Test* was performed. In addition, a *T-test* and *Wilcoxon Rank Sum Test* (or *Wilcoxon–Mann–Whitney test*) were used. These tests were performed to check whether average values and median values of the sample companies, respectively, are significantly different from the comparable companies.

4.2. Sample Selection

The data compilation started with the access to the *Zephyr*¹¹ database, from where I extracted the PE transactions that involved Portuguese target companies that were carried out from the beginning of 2007 until the end of 2015. The period that was chosen to analyse the transactions that had taken place in Portugal coincide with the period where the PE activity notably increased since the last financial crisis (*Figure 2*). Those transactions involve *Management-buy-in*, *Management-buy-out*, *Take Private's*, and *Minority Stake*. This compilation resulted in an initial sample of 176 transactions. Of those companies that appear more than

⁸ In this dissertation, unadjusted results are the ones obtained directly from the sample companies that were originally gathered from the database.

⁹ *Winsorization* is a process which limits the smallest and higher values present on the sample replacing them by values closest to the sample. The finality of *winsorization* is to smoothen the average value of the sample which is distorted initially by the extreme values known as outliers. In this dissertation, the *winsorization* was made at 5% for the variables which have a number of observations higher or equal to 40 and for those variables that have a number of observations inferior to 40 the *winsorization* was made at 10%.

¹⁰ The median value is also used in other studies (namely by Guo et al. (2011) and Kaplan(1989b)) rather than the average value.

¹¹ *Zephyr* Database description and potential biases on sample are discussed in detail in the appendix.

once only the first transaction has been considered which produced a reduction from 176 to 162 companies. Although the *Zephyr* database, provides the name of the PE firms, the name of the Portuguese target companies involved in the transactions, and the transaction date, this database does not provide the historical financial data of the target companies. So, it was necessary to resort to another database, the *Sabi*¹² database, in order to collect the historical financial data which are essential to assess the evolution of the PE backed companies' performance. The PE Sponsor involved in these transactions was not be affiliated with government or other public entities. Since PE sponsors involved in these transactions should not be affiliated with government or other public entities those that were so, were excluded. This was done because of the difference in aims that these PE sponsors have in comparison to the independent PE funds (those that are not affiliated with the government or other public entities). The transactions that involve government or other public entities are established by statute or some other political and regulatory process, and not through private negotiations between the contracting parties. Moreover, government PE sponsors do not have the same ability in monitoring their investments as non-government PE sponsors. In addition, when comparing the government PE sponsors and non-government PE sponsors, the latter increments the productivity of the companies and brings a better management practice to the companies (Alperovych et al., 2015; Cumming et al., 2017; Grilli and Martinu, 2014).

Resorting to *Sabi* database I looked at each transaction carried out by the companies which had received PE sponsorship and the outcome was 133 companies found from the previous list provided by *Zephyr* database (29 companies which were described on the previous list were not found on *Sabi* database). Later, their CAE Rev. 3 Code¹³ was searched and in order to carry out a careful study those companies which had a CAE Rev. 3 Code starting with the number 64 (Financial Services Activities) or 70 (Head Offices Activities and Consulting to the Management) were excluded. At this stage of the data compilation, 16 companies were ruled out, thus leaving 117 companies. Subsequently, in the *Sabi* database financial information was gathered for each of those companies two years prior to the transaction date up to three years after the transaction date. At this point, those companies

¹² *Sabi* Database description and potential biases on sample are discussed in detail in the appendix.

¹³ CAE-Rev.3 Code is an Instituto Nacional de Estatística's release and whose finality is to classify all the statistical producing units of goods and services according to the economic activity.

that did not have the book value of total assets in the year prior to the transaction, were also removed from the sample, once the book value of total assets in that year would be an important measure at a later stage of the study. 17 of those companies did not fulfil this requirement and were consequently removed from the sample. In the end, the final sample was composed of 100 companies. Table 1 summarizes the process that led to a final sample of 100 transactions.

Table 1 - Factors Considered in the Compilation of the Sample

This table reports all the stages in sample compilation.

Initial Sample -<i>Zephyr</i>	176
Restrictions:	
Only the first transaction counts	14
Sample-<i>Sabi</i>	162
Restrictions:	
Target companies were not available	29
Target companies whose CAE Rev. 3 starts with 64 or 70	16
Target companies which did not have the Book Value of Total Assets in the year prior to the transaction available	17
Final Sample	100

4.3. Comparable Sample

Having concluded the previous stage and in line with the goal proposed by this study, that is the assessment of the performance of the PE backed companies in Portugal from 2007 to 2015 after a post-crisis period, it was then necessary to obtain another sample composed of similar companies which did not experience PE sponsorship in order to compare the two. Consequently, it was necessary obtain a peer company for each target company. Then, another sample was formed: a Comparable Sample. To do this some conditions had to be fulfilled. Once again resorting to *Sabi* database a peer which is present in the same industry was sought, for each transaction, having a similar book value of total assets in the year prior to the transaction, and a return on assets value close to what the company had in the year prior to the transaction.

In order to be as close as possible to the sample companies, the comparable companies must fulfil the following requirements: the comparable company must have the same first three digits of the CAE Rev. 3 Code of the company that experienced PE

sponsorship (as Kaplan (1989b) used in his study but instead of using SIC code in the present study the CAE Rev. 3 code was used), the comparable company's book value of total assets in the previous year of the transaction must be compressed in the range of 80% to 120% of the PE backed company's book value of total assets in that year, and the return on assets of the comparable company must be the closest value of the PE backed company in the year prior to the transaction. In this way it was possible to build a Comparable Sample to achieve the proposed goal. Then, the Industry Adjustment was built through the difference the changes in the sample companies and the comparable companies in the same variables and ratios during the same time period. This adjustment will enable us to draw conclusions about the performance of the companies that received PE in comparison with those that did not.

4.4. Descriptive Statistics

The final sample of this study encompasses the 100 PE transactions occurred in Portugal from 2007 to 2015. In table 2 it is possible to observe that 70% of the transactions occurred in the last 3 years of the period of study, coinciding with the post-crisis period. Before that, PE activity suffered a slowdown not only in Portugal but also in Europe as it is possible to observe in Table 2 and Figure 1. In 2013, both Portugal and Europe experienced the same trend, the PE activity increased in comparison to 2012.

Table 2- Transaction Year Distribution

This table reports the transactions occurred each year during the sample period.

Year	Number of Transactions
2007	5
2008	8
2009	7
2010	3
2011	6
2012	1
2013	11
2014	23
2015	36
Total	100

Table 3 focuses on the characteristics of the transaction namely if the transaction has one or more participants, i.e., if it was non-syndicated or syndicated respectively and the nationality of the PE firms participating in the transaction. From there it is possible to state that a major part (71%) of the transactions was carried out through non-syndicated transactions. Apart from this, it is also possible to observe that 86% of the transactions only involve Portuguese PE firms and thus it can be concluded that the Portuguese market remains a domestic one. Only 7% of the transactions were carried out by foreign PE firms.

Table 3 - Types of Transactions

This table reports the type of transactions that occurred as well as the nationality of PE players.

	Number of Transactions
Non-syndicated	
Portugal	65
Others	6
Total	71
Syndicated	
Portugal only	21
Portugal and others	7
Others	1
Total	29
Total Deals	100

Table 4 displays the PE firms involved in the transactions that are the object of the study. In these 100 transactions had 145 PE firms were involved the biggest role is that of Portugal Capital Ventures - S.C.R. SA which participated in 34 transactions. All the remaining participants present on the table are Portuguese and they represent 51% of the PE firms in the transactions. On the whole, what has been shown previously demonstrates a clear evidence that PE activity in Portugal prevails on the domestic domain.

Table 4 - Private Equity Firms by Number of Transactions

This table reports the PE firms involved in the transactions that occurred.

Private Equity Firms by Number of Transactions	
Portugal Capital Ventures - S.C.R. SA	34
Explorer Investments - S.C.R. SA	9
Caixa Capital - S.C.R. SA	7
Banco Espírito Santo SA	7
Oxy Capital - S.C.R. SA	6
Inovcapital - S.C.R. SA	6
Espírito Santo Ventures - S.C.R. SA	5
Others (54)	71
Total	145

Table 5 specifies the industries and companies that suffered a PE entry. Those companies were present in a vast range of industries, but the prevailing industry is Information and Communication Activities (43%) followed by Manufacture Industry (18%) and Consulting, Scientific, Technical and Similar Activities (11%).

Table 5 - Industry Distribution

This table reports the industry of the PE backed companies involved in the transactions.

Industry Distribution of Sample Companies	
Information and Communication Activities	43
Manufacture Industry	18
Consulting, Scientific, Technical and Similar Activities	11
Wholesale and Retail Trade, Repair of Motor Vehicles and Motorcycles	6
Accommodation and Food Service Activities	5
Electricity, Gas, Steam, Water and Air-Conditioning Supply	4
Construction	3
Transportation and Storage	3
Real Estate Activities	3
Administrative and Support Service Activities	3
Human Health and Social Work Activities	1
Total	100

Table 6 reports some characteristics in the year prior to the transaction of the sample companies and the comparable companies as well as the difference between them. According to Panel A, the companies that suffered an entry of PE firms were almost 5 years younger (on average at a 1% significance level) than those that did not suffer an entry of PE firms. CAPEX of the sample companies was higher, on the median, in 107.4 thousand euros which led to those companies presented, on the median, having a net operating cash flow 21 thousand euros lower at a 1% and 10% significance level, respectively. Apart from this, on average, sample companies presented a lower size (book value of total assets) as well as a lower value on total sales but these companies displayed a higher EBITDA. They were more indebted and had more employees than the comparable companies. However, these values are not statistically significant.

From Panel B, some financial ratios were analysed in the year prior to the transaction of the sample companies and the comparable companies, and finally the difference between them was computed. For all the financial ratios presented in the Panel B, they presented negative average and median values (that are not statistically significant) for the sample companies in comparison to the comparable companies with the exception of the CAPEX/Total Sales ratio which presented a positive median value (11.2 percentage points higher for the sample companies at a 1% significance level).

It can, therefore, be concluded that PE firms sponsor companies that are younger and that have spent a higher amount of money on investment.

Table 6 - Characteristics in the Year Prior to Transaction

This table reports the characteristics of the sample companies and the comparable sample in the year prior to the transaction (year -1) as well as the difference between the average of both samples and the difference the in median of both samples. A *T-test* and *Wilcoxon Rank Sum Test* (or *Wilcoxon–Mann–Whitney Test*) were employed in order to test whether average values and median values of the sample companies, respectively, are significantly different from the comparable companies. *, **, *** indicate statistical significance at 10%, 5%, and 1% level for the *T-test* and *Wilcoxon Rank Sum Test*.

^a -Values in thousand Euro.

p.p. - Percentage points.

Panel A

	Characteristics of the Sample Companies					Characteristics of the Comparable Companies					Difference	
	Average	Median	Maximum	Minimum	N	Average	Median	Maximum	Minimum	N	Average	Median
Company Age (Year)	9.6	4.4	63.7	0.3	100	14.5	12.6	111.0	0.3	100	-4.8***	-8.2***
Total Assets ^a	20 309.5	849.9	493476.0	0.5	100	20 471.5	907.0	466 825.5	0.3	100	-162.0	-57.1
Total Sales ^a	6 547.4	251.3	64 496.0	0.0	100	6 723.1	373.3	67 265.4	0.0	100	-175.6	-122.0
EBITDA ^a	1 948.3	5.7	53 377.4	-2 464.7	100	1 749.3	15.7	44 408.8	-969.4	100	199.0	-10.1
CAPEX ^a	3 183.0	116.2	162 537.6	-10 405.0	84	743.8	8.8	15 630.1	-987.0	89	2 439.2	107.4***
Net Operating Cash Flow ^a	-859.3	-20.0	37 100.8	-160 544.8	84	1 215.4	1.1	40 142.6	-6 423.6	89	-2 074.7	-21.2*
Debt ^a	9 521.2	63.1	303 053.7	0.0	99	9 598.8	48.7	478 940.0	0.0	100	-77.6	14.3
Number of Employees	54.2	7.0	1 110.0	0.0	99	52.3	7.0	509.0	0.0	99	1.8	0.0

Table 6 - Continued

Panel B

	Characteristics of the Sample Companies					Characteristics of the Comparable Companies					Difference	
	Average	Median	Maximum	Minimum	N	Average	Median	Maximum	Minimum	N	Average	Median
Return on Assets (%)	-23.0	1.4	91.8	-994.1	100	-11.7	2.3	87.5	-255.4	100	-11.3 p.p.	-1.0 p.p.
Return on Sales (%)	-188.3	6.7	1 535.6	-6 248.9	84	-87.3	7.7	207.1	-3 664.6	82	-101.0 p.p.	-1.0 p.p.
Asset Turnover (%)	69.4	42.4	912.3	0.0	100	77.3	56.1	401.2	0.0	100	-7.8 p.p.	-13.7p.p.
CAPEX/Total Sales (%)	252.6	12.0	6 322.0	-143.2	74	173.7	0.8	16 683.5	-4 932.6	79	78.9 p.p.	11.2 p.p. ^{***}
Total Debt/Total Assets (%)	26.1	10.6	199.6	0.0	99	26.2	15.8	152.5	0.0	100	-0.1 p.p.	-5.2 p.p.

4.5. Pre-Transaction Operating Performance

In this section I will address how PE firms select the companies that they decide to sponsor. Table 7 reports the median growth from the year -2 to -1 of some characteristics of the companies that received PE sponsorship compared to the industry adjustment. Before the transaction, the target companies presented a significant growth on the book value of total assets, total sales, CAPEX, and debt (all these values are statistically significant as we can see in table 7). It is worth noticing that the most significant growth was on CAPEX which increased 29.0% at a 5% significance level. Despite the decrease of the net operating cash flow in the sample companies, these companies obtained a higher median value of 43.1% at a 10% significance level when compared to the industry. As for the number of employees, the median change from the year -2 to -1, experienced by the sample companies, was 0.0% at a 1% significance level which is due to the fact that of the 72 companies present in the sample, 20 experienced a change equal to 0.0%, 33 a change higher than 0.0% and the remaining companies a change smaller than 0.0%. As well as the change in the number of employees, the EBITDA also presented a higher growth compared to the industry, but these values are not statistically significant. In terms of operating performance (measured by return on assets) and profitability (measured by return on sales), an improvement (1.2% and 2.95%, respectively, both at a 5% significance level) in the sample companies, when compared to the industry, was observed. When compared to the industry, sample companies presented an increase in investment (measured by CAPEX/Total Sales ratio), and an equal capital structure (measured by Total Debt/Total Assets ratio) was observed but in terms of productivity (measured by asset turnover) a slight decrease was presented, although none of these values are statistically significant.

Table 7 - Growth Before Transaction

This table reports the median changes of all variables and ratios used in this study for both the sample companies and adjusted by the industry from year -2 to year -1 in percentage. A *Wilcoxon Sign Rank Test* was carried out to test whether the median percentage value is significantly different from zero. The average results are not present since they are affected by the presence of outliers. The adjusted median change is given by the sample median change subtracted by the comparable sample median change. *, **, *** indicate statistical significance at 10%, 5%, and 1% level for *Wilcoxon Sign Rank Test*.

	Sample		Adjusted	
	Median	N	Median	N
Total Assets	19.2***	84	13.1***	80
Total Sales	10.6***	74	6.8**	63
EBITDA	0.7	84	0.9	79
CAPEX	29.0**	59	37.0*	45
Net Operating Cash Flow	-9.8	63	43.1*	54
Debt	7.8***	84	4.2	42
Number of Employees	0.0***	72	1.9	6.1
Return on Assets	-0.6	84	1.2**	80
Return on Sales	0.4	71	2.9**	63
Asset Turnover	0.0	84	-0.1	80
CAPEX/Total Sales	4.3	59	4.4	48
Total Debt/Total Assets	0.0	83	0.0	79

To briefly sum up the results reached until this point, I observed that the PE firms opted for investing in the companies that presented a higher growth (in terms of total assets and total sales alike), that invested more (higher CAPEX and a higher CAPEX/Total Sales ratio), that had a higher level of indebtedness, and that also owned a greater net operating cash flow in comparison to the industry. Thus, as a consequence of the previously stated the companies that received PE investment were those which had grown more and presented better operating performance and profitability in comparison to the industry, which is in line with Chung (2011)'s findings.

4.6. Post-transaction Operating Performance

4.6.1. Growth

Table 8 provides the growth (median changes) in book value of total assets, total sales, EBITDA, CAPEX, net operating cash flow, debt and number of employees for the three years post-transaction for the sample companies and the industry adjustment.

Panel A shows a median growth in book value of total assets reaching its peak in the first year post-transaction at 76.5% and thereafter a continuous decrease was observed in the subsequent two years, 53.9% and 25.9% respectively. All these values present a significance level of 1%. The median increase in all the three-year period in the book value of total assets was 105.6% at a 1% significance level. When compared to the industry, the companies that had received PE sponsorship in the overall period had grown more, in the median, 42.5% at a 1% significance level. When looking at the change in each year it is possible to notice that in the third year post-transaction there is an approximation of the growth of the book value of total assets.

According to Panel B, the total sales of the sample companies had a median increase of 37.5% during the three-year period at a 1% significance level. When compared to the control sample during the same period, the sample companies achieved a median growth of 2% (statistically not significant).

From Panel C, the EBITDA's growth could be observed although not statistically significant in the majority of the results. In the subsequent year post-transaction, the EBITDA presented a median increase of the 29.8% at a 10% significance level for the sample companies. During this period EBITDA's sample companies always presented a better outcome in comparison to the comparative sample.

As for to the CAPEX (Panel D), in the overall period, CAPEX had a median decrease of 9.5% but this result is not statistically significant. Although results adjusted to the industry in the year after the transaction, these companies still invested more 58% (at a 5% significance level) than the comparable companies. However, the median growth of CAPEX in the overall period in the result adjusted to the industry was an increase of 28.9% (statistically not significant).

After the transaction was carried out the net operating cash flow (Panel E) of the sample companies diminished over the three-year period. The net operating cash flow of the sample companies presented a decrease of 56.2% and compared to the industry in the same period of time, the industry's net operating cash flow was higher by 19.1%. These results are not statistically significant.

Regarding the Debt (Panel F), it is possible to observe a decrease in the level of indebtedness. Taking these three years as a whole, the level of indebtedness of the sample companies decreased 6.2% (statistically not significant). The output adjusted to the industry showed an increase of the debt in the first year post-transaction of 5.5% (at a 5% significance level). During the three-year period post-transaction, the sample companies presented a higher level of indebtedness of 4.8% (at a 10% significance level) in comparison to the comparative sample.

Lastly, in Panel G the trend of growth of the number of employees was presented. It is possible to observe a positive and steady growth in the two years after the transaction but in the third year despite the positive value, the growth was not as high as the two previous years (50.4%, 64.8%, and 12.9% respectively, all these values are statistically significant at a 1%). Over the three-year period as a whole, the median growth of the number of employees was 58.7% at a 1% significance level. When compared to the control sample, it was possible to observe, during the same period of time, an increase in the number of employees, on the median value of 25% at a 1% significance level in the sample companies.

Table 8 - Growth After the Transaction (in %)

This table reports the median changes after the transaction of all variables used in this study for both the sample companies and adjusted to the industry. A *Wilcoxon Sign Rank Test* was performed to test whether the median percentage value is significantly different from zero. The average results are not presented since they are affected by the presence of outliers. The adjusted median change is given by the sample median change subtracted by the comparable sample median change. In the first column, the change of the three years as a whole after the transaction in relation to the year prior to the transaction is presented. In the following columns, the change of the first, second and third year after the transaction in relation to the prior year of the transaction is displayed. *, **, *** indicate statistical significance at 10%, 5%, and 1% level for *Wilcoxon Sign Rank Test*.

		-1 to 3y Average	-1 to +1	-1 to +2	-1 to +3
Panel A: Total Assets					
Sample	Median	105.6***	76.5***	53.9***	25.9***
	N	86	94	56	33
Adjusted	Median	42.5***	53.2***	30.4***	4.1
	N	69	81	46	26
Panel B: Total Sales					
Sample	Median	37.5***	26.5***	26.0***	10.5**
	N	72	80	45	29
Adjusted	Median	2.0	3.7	5.3	0.7
	N	54	63	34	23
Panel C: EBITDA					
Sample	Median	14.9	29.8*	-13.0	45.6
	N	85	93	55	33
Adjusted	Median	40.5	62.6	4.6	84.4**
	N	68	80	45	26
Panel D: CAPEX					
Sample	Median	-9.5	18.9	-74.4	30.9
	N	71	76	47	28
Adjusted	Median	28.9	58.0**	-3.1	-37.4
	N	48	51	30	23
Panel E: Net Operating Cash Flow					
Sample	Median	-56.2	-29.4	-75.9	-64.9
	N	74	79	49	29
Adjusted	Median	-19.1	-9.1	17.8	-36.7
	N	57	63	36	23
Panel F: Debt					
Sample	Median	-6.2	-8.2	-9.8	61.4
	N	85	93	55	33
Adjusted	Median	4.8*	5.5**	-1.4	-11.6
	N	36	40	24	15
Panel G: Number of Employees					
Sample	Median	58.7***	50.4***	64.9***	12.9***
	N	78	86	49	31
Adjusted	Median	25.0***	25.8***	30.3***	4.2
	N	57	66	35	23

In general terms, the findings reported in table 8 validate part of the results of Chung (2011) and Wilson et al. (2012) since an increase in the size (total assets), total sales and number of employees after the transaction is observed. The outcome found in these empirical studies is higher than the outcome presented in this study. Mendes and Sousa (2013) in their study of the Portuguese market reached a similar conclusion about the total assets and total sales growth but their results are inferior to the results presented in this study. Contrary to what has been presented above concerning the size of the companies, Kaplan (1989b) found a reduction of the size of the PE backed companies following transaction. Regarding the median change of the EBITDA, Kaplan (1989b) and Chung (2011) found a stable growth in EBITDA's sample companies which is not verified in the study results but the study results present a better outcome when compared to the industry since the EBITDA industry adjustment in this study is positive for the three-year period and in the Kaplan (1989b)'s study the EBITDA industry adjustment only outperform in the third year. In comparison to the Mendes and Sousa (2013)'s study the present study present a better outcome for the EBITDA median change in the three-year average period, since the result present in their study was -9.18%. Contrary to Chung (2011), CAPEX did not follow a regular increase trend. CAPEX experienced a huge decrease in the second year post-transaction in line with what was found in the Kaplan (1989b) and Mendes and Sousa (2013) study. In contrast to the Kaplan (1989b) study, net operating cash flow suffered a decrease after the transaction but this decrease was not very sharp as was seen in the Mendes and Sousa (2013) study.

4.6.2. Operating Performance

In table 9 the median growth of return on assets is presented. There, it is possible to observe the median decrease in the return on assets in the years subsequent to the transaction. After the transaction, the median changes of return on assets grows at a slow pace. During the three-year period, the median growth of the return on assets, was -2.5% at a 1% significance level. The median growth for the three years after the transaction adjusted to industry followed the same trend that was followed by the sample companies and in the overall period, the industry sector exceeded the sample companies by 13.2% at a 1% significance level.

Table 9 - Change in Operating Performance After the Transaction (in %)

This table reports the median changes after the transaction of the return on assets for both the sample companies and adjusted to the industry. A *Wilcoxon Sign Rank Test* was performed to test whether the median percentage value is significantly different from zero. The average results are not present since they are affected by the presence of outliers. The adjusted median change is given by the sample median change subtracted from the comparable sample median change. In the first column, the change of the three years as a whole after the transaction in relation to the year prior to the transaction is presented. In the following columns, the change of the first, second and third year after the transaction in relation to the prior year of the transaction is displayed. *, **, *** indicate statistical significance at 10%, 5%, and 1% level for *Wilcoxon Sign Rank Test*.

		-1 to 3y Average	-1 to +1	-1 to +2	-1 to +3
Return on Assets					
Sample	Median	-2.5***	-2.2***	-1.8***	-0.6
	N	86	94	56	33
Adjusted	Median	-13.2***	-7.4***	-6.2***	-2.0*
	N	69	81	46	26

After the transaction, the operating performance results are in line with the results found in Mendes and Sousa (2013) and Chung (2011), both in sample companies and industry adjustment. The study results are not so negative as those found in the above mentioned studies. In their study Guo et al. (2011) found a decrease in sample companies' return on assets but the sample companies had surpassed the return on assets of the control sample. On the other hand, Kaplan (1989b) found improvement in the operating performance, not only for those that suffered PE sponsorship, but those companies that had exceeded the operating performance of the comparable companies.

4.6.3. Profitability

The median growth of return on sales can be observed in table 10. In the overall period, the return on sales had decreased 0.9%, but this value is statistically not significant. When compared to the control group a similar trend is observed with return on sales of sample companies in the three-year period worsening 5.8% at a 10% significance level.

Table 10 - Change in Profitability After the Transaction (in %)

This table reports the median changes after the transaction of the return on sales for both the sample companies and adjusted to the industry. A *Wilcoxon Sign Rank Test* was performed to test whether the median percentage value is significantly different from zero. The average results are not present since they are affected by the presence of outliers. The adjusted median change is given by the sample median change subtracted from the comparable sample median change. In the first column, the change of the three years as a whole after the transaction in relation to the year prior to the transaction is presented. In the following columns, the change of the first, second and third year after the transaction in relation to the prior year of the transaction is displayed. *, **, *** indicate statistical significance at 10%, 5%, and 1% level for *Wilcoxon Sign Rank Test*.

		-1 to 3y Average	-1 to +1	-1 to +2	-1 to +3
Return on Sales					
Sample	Median	-0.9	-0.3	-0.8	1.7
	N	70	77	44	29
Adjusted	Median	-5.8*	-4.3	-3.5	-1.7
	N	52	60	32	23

The results found in return on sales are not consistent with those found by Mendes and Sousa (2013), Guo et al. (2011), and Chung (2011). In these studies, a huge decrease is observed in the results of return on sales' results which is not verified in the present study. In this study the return on sales of sample companies became worse until the second year after the transaction. Only in the third year after the transaction is an improvement is observed in this ratio. Acharya et al. (2013) and Kaplan (1989b) found improvements in this ratio after the transaction both in sample companies and in the industry adjustment.

4.6.4. Productivity

Table 11 shows the median change of asset turnover ratio. In the overall period after the transaction, the asset turnover decreases 0.2% (at a 1% significance level) and compared to the control group the asset turnover was inferior by 6.7% (at a 1% significance level). In the subsequent transaction year, asset turnover ratio in sample companies decreased 1.1% and when compared to the industry, sample companies presented a worse result of 5.9%. These results are statistically significant at a 5% and 1% level, respectively.

Table 11 - Change in Productivity After the Transaction (in %)

This table reports the median changes after the transaction of the asset turnover for both the sample companies and adjusted to the industry. A *Wilcoxon Sign Rank Test* was performed to test whether the median percentage value is significantly different from zero. The average results are not present since they are affected by the presence of outliers. The adjusted median change is given by the sample median change subtracted from the comparable sample median change. In the first column, the change of the three years as a whole after the transaction in relation to the year prior the transaction is presented. In the following columns, the change of the first, second and third year after the transaction in relation to the prior year of the transaction is displayed. *, **, *** indicate statistical significance at 10%, 5%, and 1% level for *Wilcoxon Sign Rank Test*.

		-1 to 3y Average	-1 to +1	-1 to +2	-1 to +3
Asset Turnover					
Sample	Median	-0.2***	-1.1**	0.0	-0.6
	N	86	94	56	33
Adjusted	Median	-6.7***	-5.9***	-3.8	-1.2
	N	69	81	46	26

The findings presented in table 11 are in line with Chung (2011), who stated that after the transaction is consummated the companies that had received PE sponsorship had grown in size (according to table 8), instead of improving their productivity. Comparing with Mendes and Sousa (2013), the median change of the asset turnover of sample companies has the same pattern since it also increased in the second year post-transaction and decreased in the third year post-transaction. However, the results in their study were worse than the results presented in the present study. Concerning the industry adjustment change, the results of this study were worse than those evidenced in the Mendes and Sousa (2013) study, since the sample companies never presented a better outcome in post-transaction in the change of asset turnover.

4.6.5. Capital Structure

Table 12 shows the evolution of the capital structure measured by Total Debt/Total Assets ratio. In the overall period of analysis as a whole, the sample companies' ratio increases 0.2% and these outperformed the comparable companies in 1.6%. None of these results are statistically significant.

Table 12 - Change in Capital Structure After the Transaction (in %)

This table reports the median changes after the transaction of the Total Debt/Total Assets ratio for both the sample companies and adjusted to the industry. A *Wilcoxon Sign Rank Test* was performed to test whether the median percentage value is significantly different from zero. The average results are not present since they are affected by the presence of outliers. The adjusted median change is given by the sample median change subtracted from the comparable sample median change. In the first column, the change of the three years as a whole after the transaction in relation to the year prior to the transaction is presented. In the following columns, the change of the first, second and third year after the transaction in relation to the prior year of the transaction is displayed. *, **, *** indicate statistical significance at 10%, 5%, and 1% level for *Wilcoxon Sign Rank Test*.

		-1 to 3y Average	-1 to +1	-1 to +2	-1 to +3
Total Debt/Total Assets					
Sample	Median	0.2	0.0	1.1	2.1
	N	85	93	55	32
Adjusted	Median	1.6	-1.1	2.5	5.4
	N	67	79	45	25

These results suggest that after an acquisition there are no changes in the Capital Structure of the PE backed companies. These unexpected results can (eventually) be supported by the absence of a public debt market in Portugal¹⁴ PE firms can resort to during (or after) the acquisition so as to increase the debt of the PE backed company.

4.6.6. Investment

In table 13, the evolution of the CAPEX/Total Sales ratio is displayed. After the transaction, CAPEX/Total Sales ratio suffered a continuous decrease and in the overall period of the analysis it presented a decrease of 1.7%. But in comparison to the median of adjusted to industry, this ratio, in the same period, presented an improvement (4.6%) for the sample companies. The major part of these results are not statistically significant.

¹⁴ The Portuguese debt market is clearly dominated by the banking system.

Table 13 - Change in Investment After the Transaction (in %)

This table reports the median changes after the transaction of the CAPEX/Total Sales ratio for both the sample companies and adjusted to the industry. A *Wilcoxon Sign Rank Test* was performed to test whether the median percentage value is significantly different from zero. The average results are not present since they are affected by the presence of outliers. The adjusted median change is given by the sample median change subtracted from the comparable sample median change. In the first column, the change of the three years as a whole after the transaction in relation to the year prior to the transaction is presented. In the following columns, the change of the first, second and third year after the transaction in relation to the prior year of the transaction is displayed. *, **, *** indicate statistical significance at 10%, 5%, and 1% level for *Wilcoxon Sign Rank Test*.

		-1 to 3y Average	-1 to +1	-1 to +2	-1 to +3
CAPEX/Total Sales					
Sample	Median	-1.7	1.3	-3.6	-2.9*
	N	63	67	41	27
Adjusted	Median	4.6	4.7	-9.0	4.5
	N	47	50	28	21

As for CAPEX/Total Sales ratio, once again the results found by Kaplan (1989b) are not consistent with those found in this study. The outcome of the study, for the sample companies, worsened after the second year, as happened in Kaplan (1989b)'s study but it never experienced a positive value, as was verified in the results of this study for the first year after the transaction, and in terms of comparison to the industry, the outcome of the study outperform in the first and third year after the transaction which is not verified in Kaplan (1989b)'s study once the sample companies never exceeded the industry. The same inconsistency is verified in Chung (2011)'s study but in this case, the trend for the sample companies was the same as the trend verified in the present study, although, in Chung (2011)'s study a negative value for these companies was never observed, only a decrease in the second year post-transaction and when compared to the control sample the results in the present study are better than those presented by Chung (2011), despite the decrease in the second year after the transaction in this study. In Chung (2011)'s study a decrease in CAPEX/Total Sales ratio was verified, in the second and third year post-transaction.

5. Conclusions

The main goal of this dissertation was to understand whether there is an improvement in the performance of the Portuguese PE backed companies after the financial crisis.

The sample includes the transactions which occurred between January 2007 and December 2015 and during the sample period there is evidence of an increase in the frequency of the transaction after the financial crisis (2013). These transactions that took place in Portugal during this period, were carried out mainly by individual and domestic players which allows one to conclude that PE Portuguese market prevails on the domestic domain.

In this study, evidence on pre and post-transaction performance was presented. Prior to the transaction, the companies which had been selected to be backed by PE were those which had presented higher growth in terms of total assets, total sales, investment (CAPEX), and debt. This is consistent with Chung (2011)'s view and thus we can see from this that PE firms base their selection of companies to be sponsored on certain criteria. After the companies were under the management of PE firms, they experienced a growth in size, sales, EBITDA and in the number of employees. These findings are consistent with Kaplan (1989b), Chung (2011) and Wilson et al. (2012). When compared with a similar study performed for the same market by Mendes and Sousa (2013), the present study found better outcomes in the median growth of total assets, total sales, EBITDA, and net operating cash flow. However, this latter one presented a decrease in both studies but in this study, this decrease was not as drastic as in the Mendes and Sousa (2013)'s study. The median growth in the overall three-year period as a whole that should be emphasized in the present study is the huge growth of total assets, total sales, and the number of employees (105.6%, 37.5%, and 58.7% respectively). Concerning the number of employees, the median growth experienced by PE backed companies is favourable in this period of economic turmoil (encompassed in the sample period), as during this financial crisis there was an increase in unemployment which lead to a feeling of fear and uncertainty among the population. As we can see, the outcome shows an improvement in the number of employees brought on by the PE firms leading one to conclude that PE activity could increase the employability thus contradicting the findings of Kaplan (1989b) and Chung (2011).

In terms of operating performance, the profitability, the productivity, the capital structure, and the investment measured by the return on assets, return on sales, asset turnover, Total Debt/Total Assets ratio, and CAPEX/total sales ratio, respectively, was assessed. The present study found a deterioration of the operating performance, the profitability, the productivity of the companies that received PE sponsorship and this deterioration was worse when compared to the industry. Mendes and Sousa (2013) also found a deterioration of these ratios but when compared to the industry their study presented a better outcome in comparison with the present study. In terms of capital structure, which is measured by the total debt/total assets ratio, the sample companies did not experience any post-transaction change. Regarding investment, it was possible to observe a decrease in the sample companies but when these companies are compared to the industry it is possible to observe an increase in investment.

Briefly, after analysing the performance of the Portuguese companies that received PE financing one can see that their performance worsened. However, it should be noted that after the transaction is carried out the size of the PE backed companies, total sales, and the number of employees experienced an improvement.

Finally, I would suggest, as further research, the investigation of the situation that PE backed companies are left in when the PE funds sell their participation in these companies and assess their performance years after the exit of PE funds.

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Appendix

***Zephyr* Database**

Zephyr is a database commercialized and managed by *Bureau Van Dijk* and encompasses the M&A, IPO, private equity and venture capital deals and rumours. This database is in the continuous process of updating, and so, despite being aware of its potential bias, it is believed that this database covers the major part of the transactions happening in Portugal and thus it is the best representation of the Portuguese's Private Equity industry.

***Sabi* Database**

Sabi is a database commercialized and managed by *Bureau Van Dijk* and encompasses the accounting and other information for the Portuguese and Spanish market.

The first bias of this database arises from the fact that the database does not cover the whole Portuguese Market once some companies identified in *Zephyr* database do not appear in *Sabi* database. Another bias occurs due to the fact that the *Sabi* database does not have all the accounting information available for every year of analysis in some companies.