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TRABALHO FINAL DE MESTRADO
DISSERTAÇÃO

THE IMPACT OF THE PRIVATIZATION PROCESS ON COMPANY PERFORMANCE: EVIDENCE FROM EUROPEAN COUNTRIES.

JOAQUIM ALEXANDRE DE FREITAS JUSTINO

FEVEREIRO – 2013

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Abstract

The present study investigates the impact of the privatization process on a sample of 125 privatized European companies, during the period 2001-2011. We compare company performance before and after the privatization process and evaluate the impact of changes in private shareholding on the performance of the privatized companies. Additionally, we investigate how different combinations of private participation and state participation influence company performance.

We find that privatized companies reveal superior performance in the period after the privatization process and that increases in private participation have a positive impact in company performance. The results also show that there seems to be an optimal combination between state participation and private investment that maximizes company performance.

Resumo

O presente estudo investiga o impacto do processo de privatização numa amostra de 125 empresas Europeias privatizadas, durante o período de 2001-2011. Comparamos o desempenho das empresas antes e depois do processo de privatização e avaliamos o impacto de mudanças na participação privada no desempenho das empresas privatizadas. Adicionalmente, investigamos como diferentes combinações de participação privada e participação do Estado influenciam o desempenho das empresas.

Os resultados mostram que as empresas privatizadas revelam um desempenho superior no período posterior ao processo de privatização e que o aumento da participação dos privados tem um impacto positivo no desempenho das empresas. Os resultados mostram também que parece haver uma combinação ótima entre a participação do Estado e o investimento privado, que maximiza o desempenho da empresa.

1 – Introduction

We are currently witnessing a wave of financial assistance programs in Europe. Given the difficulty of some countries to fulfill their financial commitments, privatization of public enterprises is one of the items in the agenda. We can find some examples of this situation in Portugal or Greece where a memorandum has been singed between national institutions and international European authorities. This brings back an old debate in the European society, with valid arguments for and against privatizations. Efficiency gains have been pointed out as an advantage of this process (Boubakri and Cosset, 1998), while market power exploitation has been presented as a disadvantage (La Porta and Lopez-de-Silanes, 1999). The present study intends to provide additional insights to this debate.

This study seeks to examine the relationship between the privatization process of state owned companies and their performance. Empirical literature has provided evidence that privately owned firms perform better than state owned companies, which in turn has been one of the arguments in favor of selling state shares (Gupta, 2005). Given the current sovereign debt crisis Europe is facing, European countries provide a perfect laboratory for analyzing the efficiency of privatization processes. It's interesting that Europe, most important representative of welfare state policies, becomes involved in such an intense debate about sustainability of its own model. Given the present crisis, we could question the sustainability of state intervention in the economy, as most of the southern countries have welfare policies that are unrealistic when compared to the level of wealth they create. This mismatch will inevitably lead to an unsustainable level of public debt. Actually, in most European countries economic growth seems unable to sustain social commitments made to their citizens. The role of public enterprises is of great importance to this debate. Citizens need to question their viability, independence and added value for society. This

necessity seems to provide us a framework that justifies the relevance and opportunity of this study.

This study compares public and private sector, to clarify the context involving the Business Manager and the key variables to be taken into consideration for the decision process, and consequently the success of the organization. Managing a state owned company appears to require a different set of criteria from those followed by a private sector company, especially regarding shareholder's objectives, financial management and employees' perception and motivation (Gupta and Dinc, 2011). Furthermore, it is in businesses and tax payer's best interest that state intervention in the economy is studied and monitored. This intervention is crucial for employment and for private sector decisions, as state owned companies usually are important players in the market and are responsible for a considerable number of jobs (Gupta and Dinc, 2011). Most importantly this intervention is crucial in its application of public resources. At the end of the day, results of this application determines the state's financial needs, in turn determining the level of taxation that is imposed to society.

The present study relies on public information, namely firms' financial statements, in order to perform a comparative analysis of business performance in state owned firms that where subsequently sold to private owners. This comparative exercise is based on a set of financial indicators that aim to represent the different features that compose a company's performance and the way these features change throughout a privatization process. Particularly, the performance of a set of privatized firms is compared with the performance of state owned firms. The results obtained in the present study provide strong evidence that state owned firms perform better after the privatization process since they confirm that companies have better performance after privatization. The results also show that firm performance is a positive function of private participation and that there is a

combination between private and state participation that maximizes company performance.

The remaining of the paper is organized as follows. In the following chapter, we review the relevant literature. The third chapter identifies the problem by defining the hypotheses raised by this study. Chapter four addresses data that supports our analysis and methodology is presented in chapter five. We discuss the results in chapter six and present our conclusions in chapter seven.

2 – Literature Review

Theory on this subject argues that the privatization process has a positive influence on the efficiency of privatized firms. This relationship seems to be explained by existing differences between the objectives of privatized companies and objectives of state owned companies (Vickers and Yarrow, 1991). When a company is controlled by the state, objectives are established seeking to maximize a combination of social welfare and the personal agenda of the minister, politician or government bureaucrat who controls it. This personal agenda can be determined by different factors like favoring specific interest groups, aiming to high wages and high employment levels in specific firms or specific sectors, or be subject to patronage pressure that requires returns for the previously granted political support. When a company is controlled by private investors, objectives are set according to a profit maximization perspective, which can also constitute in itself a component of social welfare (Vickers and Yarrow, 1991). Between these two opposing perspectives lies one of the reasons for the difference between the efficiency of state owned enterprises and private enterprises, since strategies for improving business performance necessarily require restructuring measures and resource optimization. These measures can turn out to be very unpopular for any politician (Gupta and Dinc, 2011).

Additionally, the privatization process contributes to change the means of monitoring managerial behavior. The possibility of transferring the property rights acquired by private investors may lead to market pressure. This pressure reveals information because of the need to establish prices for those property rights. These prices should reflect the possibility of current decisions becoming future profits, thus evaluating management decisions (Vickers and Yarrow, 1991). Another kind of monitoring management mechanism that results from the privatization process is the possibility of

bankruptcy. Privatized firms no longer have the shelter provided by state protection that subsidizes loss-making activities with taxpayer money when necessary. These companies are now subject to a competitive environment that facilitates performance comparisons but also requires an increase in productive efficiency for the companies to be able to survive (Vickers and Yarrow, 1991).

In Table I we present a summary of the main studies on this subject and its main conclusions. The time period of the study, the methodology and the geographic context from where the sample was collected, are also presented. Overall the studies report performance improvements for partially privatized and fully privatized companies, regardless of different samples, different methodologies and different time periods.

Table I - Summary of literature review

Authors	*Country(ies) analyzed*	*Time period*	*Methodology*	*Main conclusions*
Boubakri and Cosset (1998)	21 developing countries	1980-1992	Mean difference test	Significant improvement in output, operating efficiency, investment, dividends payment and employment. Significant reduction in debt levels.
Boardman, Laurin and Vining (2000)	Canada	1988-1995	OLS Regression	Profitability doubles after privatization, sales and efficiency also increase but not so significantly. Increase in investment followed by a debt and employment decrease. The returns on the shares prove to be higher than the average returns of the market.

Authors	*Country(ies) analyzed*	*Time period*	*Methodology*	*Main conclusions*
Boardman and Vining (1989)	500 largest non US industrial firms	1983	OLS Regression	State owned and mixed ownership firms are significantly less profitable and productive than private firms. Mixed firms do not prove to be more profitable than state owned companies, full private ownership is a necessary condition for efficiency gains.
Boardman and Vining (1992)	Canada	1986	OLS Regression	Partially privatized companies are more profitable than companies fully owned, there is an ownership effect that can be isolated from the competition effect.
Chen, Firth, Xin and Xu (2008)	China	1996-2000	OLS Regression	When control is transferred to a private company there are positive effects on performance. When the transfer is made to an entity controlled by the Government there are no significant changes in performance.
Claessens and Djankov (1999)	Czech Republic	1992-1997	OLS Regression	Greater concentration of ownership is associated with higher levels of profitability and productivity. Foreign investment and investment that is not associated with banks contribute more to performance.
Dewenter and Malatesta (2001)	500 largest non US industrial firms	1981-1994	OLS Regression, Mean difference test	Results show significant improvements in profitability and a sharp decrease in debt and labor intensity, both in the short-term and the long-term.
D'Souza and Megginson (1999)	28 industrialized countries	1990-1996	Mean difference test	Performance improvements where verified in efficiency, profitability and reduced debt levels. The results show a modest increase in investment and a significant decrease in the employment level.

Authors	*Country(ies) analyzed*	*Time period*	*Methodology*	*Main conclusions*
D'Souza, Nash and Megginson (2001)	29 industrialized countries	1961-1995	Mean difference test	Restructuring and changes in corporate governance are determinant for performance improvements. Foreign investment contributes to performance improvements but also has higher levels of debt associated.
Friedman, Gray, Hessel and Rapaczynski (1999)	Czech Republic, Hungary and Poland	1990-1993	OLS Regression	Privatized firms that remain controlled internally rarely begin restructuring processes, while firms that admit new shareholders grow faster.
Gupta (2005)	India	1990-2000	OLS Regression, Mean difference test	Growth rates associated with productivity and profitability increase significantly while sate participation decreases.
Gupta and Dinc (2011)	India	1990-2004	OLS Regression	Deciding which companies to privatize will depend on a combination of financial characteristics and specific electoral considerations.
Harper (2002)	Czech Republic	1991-1994	Mean difference test	Results suggest the existence of a seasoning effect. The success of a privatization process requires preparation and favorable political and economic conditions.
Huang and Wang (2011)	China	1996-2005	OLS Regression, Mean difference test	As long as the Government holds a stake in the company that enables it to retain control, the organization will not function as a private company. Authors suggest a concept of ultimate privatization.
Kang and Kim (2012)	China	1994-2002	Generalized Methods of Moments	Private participation in companies controlled by the Government still contributes to block political interests and to monitor its management, improving company performance.

Authors	*Country(ies) analyzed*	*Time period*	*Methodology*	*Main conclusions*
La porta and López-de-Silanes (1999)	Mexico	1983-1991	Mean difference test	Layoffs are an important source of performance improvement. However, before privatization, state owned companies worked with excess workers and wages exceeded market values.
Majumdar (1996)	India	1973-1989	Efficiency scores	State owned companies are less efficient than mixed enterprises and private firms. Mixed companies prove to be less efficient than private firms.
Megginson, Nash and van Randenborgh (1994)	18 Countries	1961-1989	Mean difference test	Results show improvements in real output, capital investment, dividend payment and a significant decrease in debt levels. While a significant change in executives was observed, no evidence of a reduction in the level of employment was found.
Megginson and Netter (2001)	Non-transition and transition economies	Existing literature until 2001	Survey	Results show significant improvements in output, efficiency, profitability and investment as opposed to a significant debt reduction after the privatization process, both for transition and non-transition economies.
Omran (2004)	Egypt	1994-1998	Mean difference test	Privatized firms show significant improvements in profitability, efficiency and reduced debt in line with the existing literature but state owned companies show a very similar result. Author suggests the existence of a spillover effect.

Authors	*Country(ies) analyzed*	*Time period*	*Methodology*	*Main conclusions*
Sun, Tong and Tong (2002)	China	1994-1997	OLS regresssion	The authors suggest the existence of an inverted U-shaped pattern between state ownership and firm performance, where an optimal combination between state ownership and private investors might exist.
Tian (2000)	China	1998	Propose a theoretical model	Performance of private firms is significantly higher than performance of partially privatized firms. Additionally, the researcher concludes that in most cases company value decreases in the presence of a state participation.
Wang (2005)	China	1994-1999	OLS Regression, Mean difference test	Ownership concentration has a different impact depending on the type of shareholder. Private participation and domestic entities' participation are significantly associated with performance improvements, while state participation does not seem to provide any changes.
Wei, Varela, D'Souza and Hassan (2003)	China	1990-1997	Mean difference test	Privatized firms have significant improvements in profitability and firms with more than 50% of private equity show superior results when compared with companies in which Government retains control.

3 – Hypotheses

3.1. Before-after performance comparison.

The hypothesis that there is an improvement in company performance after the privatization process takes place will be tested. Following the literature presented in the previous section, we can expect performance improvements after the privatization process. The results for our sample of European companies should be in line with most of the studies in this subject that report significant improvements after selling shares to private investors. Privatizing companies reduces state intervention, thus contributing for more competition. To succeed without sate protection companies need greater managerial accountability and a results oriented strategy, requirements that should improve performance in the long run (Vickers and Yarrow, 1991).

H1 - Performance is higher in privately owned firms.

3.2. Firm performance as a positive function of private ownership.

In our analysis we will test whether increasing private participation can be linked to improvements in company performance. As already mentioned private participation increases at the expense of a decrease in state participation. Consequently, we can expect less intervention in company's management and a growing ability to follow performance strategies over the traditional political objectives (Gupta and Dinc, 2011). Therefore, an increase in private investment should have a positive impact in company performance. This hypothesis has been tested in the existing literature with successful results for a sample of Indian companies, confirming that company performance is a positive function

of private investment (Gupta, 2005). We will try to verify the existence of similar results for our sample of European companies.

H2 - Firm performance is a positive function of the level of private ownership.

3.3 Inverted U-shaped pattern: Private ownership and firm performance.

Some authors suggest the existence of an optimal combination between state participation and private equity in order to maximize the performance of privatized firms (Sun, Tong and Tong, 2002). This approach questions if the full privatization option, that gathers a wide consensus among researchers regarding better performance (Boardman and Vining, 1989), is the best solution for the previously sate owned companies. Sun, Tong and Tong (2002) investigate this situation by testing the existence of an inverted U-shaped pattern between performance and state participation, which can support the previous line of thought. Their results suggest that an excessive state participation involves an interference in the organization's management and control of its destinies. Too small a stake provides insufficient support to the difficulties that these companies will be facing, due to market competition. Our study will test the existence of a similar pattern between performance and private participation for European privatized firms.

H3 - The relationship between performance and private ownership follows an inverted U-shaped pattern.

4 – Data

The basis of the present study are non-financial companies owned by the central governments in Europe that have sold equity to private investors within a defined time range, in this case between 2001 and 2011. Partial privatization and full transfer of the company to the private sector have both been considered for this analysis. Working with partial privatization provides a wider scope on the effects of the privatization process, according to Gupta (2005), Sun, Tong and Tong (2002) and Tian (2000).

Privatization data was collected from the Privatization Barometer Database, which provides information about privatizations in Europe. We used this data base to confirm which companies where privatized within our time range and to collect data, namely the percentage of equity sold to private investors and the year that the sale took place. All privatized firms between 2001 and 2011 were selected for this study. For comparison purposes, and following Gupta (2005), a second group of companies was also selected. This group consists of 100% state owned companies from the same European context of the previous companies, with comparable data within the time range of our study. For this control group, the data source used was the European Public Companies Database from SPC Network (Strategy and Policy Consultants Network). This database was used to identify sate owned companies and to verify its shareholder structure.

The sample resulted in two groups of 125 firms (i.e. 250 firms), from 26 European countries. For each firm, yearly financial statements from 2001 to 2011 were collected, resulting in an initial sample of 2,500 firm year observations. Accounting information was collected from the Amadeus database. In some cases it was necessary for analysis purposes, to complement this information with the annual reports of the companies. These reports are available in the web pages of each firm, more precisely in the Investors section.

The information collected from financial reporting consists of the value of annual Assets, annual Liabilities, Equity, current Assets, current Liabilities, net Profit, annual Sales, total number of employees, operating Income and Income before taxes. Collecting information for each year of our sample was not possible for a number of companies. For this reason some firms have more information available than others, leading the panel to be unbalanced. Additionally, information on workforce for each year of our sample was not available for some companies. However, this limitation does not prevent us from following the author's methodology. Missing data regarding employment was estimated based on time average. After eliminating companies with incomplete information, the total accounting data collected for this study consists of 2,315 financial years, including the study group and the control group.

Following Gupta (2005), the present study focuses on two categories of business performance: profitability and productivity. The impact of the privatization process on employment levels will also be addressed, as some researchers have questioned the positive effect of the privatization process in this variable (Malatesta, 2001). Annual sales and return on assets information is used as proxies for profitability. The annual profit considered to calculate the return on assets is the Operating Income of each company. We measure productivity with two ratios, the average product of labor, which is calculated by the ratio of sales to the total number of workers and the return to labor ratio, calculated by the ratio of operating income to the number of workers. The total number of workers in each year will be used to assess the impact of the privatization process on employment. The use of debt at each moment is calculated by the ratio between total liabilities and total assets value, providing information on possible changes in financing patterns for each company. We further control for the size of the company measured by the total book value of assets.

Some of the variables used in the study are presented as logarithms in order to control for skewness in the data. Description of main variables used in this study and the source from where the information has been collected is presented in table II. Table III presents descriptive statistic of those variables.

Table II – Variables description and information source

Variables	Description	Source
assets_log	Logarithm of the book value of assets as of the end of fiscal year, reported by the firm.	Amadeus/company reports
average product	Ratio of annual sales to Labor.	Amadeus/company reports
debt/assets	Ratio of total liabilities to annual assets.	Amadeus/company reports
employees_log	Logarithm of the total number of employees at the end of the year	Amadeus/company reports
priv	Variable that lies between 0 and 100, measuring the the percentage of equity that is private in a firm in a given year.	Amadeus/SPC Database
roa_log	Logarithm of the Ratio of annual operating income to annual assets plus one.	Amadeus/company reports
return to labor	Ratio of annual operating income to labor.	Amadeus/company reports
sales_log	Logarithm of the annual sales generated by an enterprise from its main activity.	Amadeus/company reports

Notes: Description of main variables used in this study and source from where the information has been collected.

Table III – Descriptive statistics

Variables	Obs (firms)	Mean	Std. Dev.	Min	Máx
Panel A: Privatized Firms					
assets (millions)	1,225 (125)	13,900.00	33,000.00	1.60	263,000.00
average product	1,225 (125)	449.42	802.98	1.20	10,520.56
debt/assets	1,225 (125)	0.57	0.23	0.02	2.89
employees	1,225 (125)	22,662.91	54,485.40	13.00	502,763.00
priv	1,225 (125)	0.40	0.34	0.00	1.00
roa	1,225 (125)	0.07	0.12	-0.56	0.83
return to labor	1,225 (125)	70.13	193.93	-330.17	2,575.61
sales (millions)	1,225 (125)	7,404.31	18,100.00	0.57	167,000.00
Panel B: State owned Firms					
assets (millions)	1,090 (125)	2,816.66	10,900.00	0.03	97,700.00
average product	1,090 (125)	338.05	803.60	0.00	16,958.30
debt/assets	1,090 (125)	0.57	0.43	0.00	3.54
employees	1,090 (125)	6,680.41	18,985.51	2.00	156,529.00
roa	1,090 (125)	0.03	0.16	-3.51	0.74
return to labor	1,090 (125)	58.91	305.88	-1,892.34	5,685.01
sales (millions)	1,090 (125)	839.64	2,263.84	0.00	23,800.00
Panel C: All firms					
assets (millions)	2,315 (250)	8,660.42	26,200.00	0.03	263,000.00
average product	2,315 (250)	396.98	805.02	0.00	16,958.30
debt/assets	2,315 (250)	0.57	0.34	0.00	3.54
employees	2,315 (250)	15,137.67	42,468.67	2.00	502,763.00
priv	2,315 (250)	0.21	0.32	0.00	1.00
roa	2,315 (250)	0.05	0.14	-3.51	0.83
return to labor	2,315 (250)	64.85	252.90	-1,892.34	5,685.01
sales (millions)	2,315 (250)	4,313.38	13,600.00	0.00	167,000.00

Notes: This table reports descriptive statistics of the variables used in the study. All data was obtained from the Amadeus database and the companies' financial reports. Refer to table II for variables definitions. All values are in thousands of euros unless stated otherwise.

This table includes both privatized companies and companies completely owned by the state. The number of observations corresponds to the number of financial years available in our sample for the two groups. Average values are calculated for each variable

followed by the standard deviation to evaluate dispersion around de mean value. Minimum and maximum values are also presented to evaluate the range of each variable. We can observe that European privatized firms are quite big, with an asset value average of 13,900,000,000 euros. This value is significantly higher than the asset value average of 2,816,660,000 euros, reported by state owned companies. Privatized companies also sell more than state owned companies, with average annual sales of 7,404,308,000 euros compared to 839,637,700 euros of state owned companies. Regarding profitability there is a 4% difference between the two groups. Privatized companies have a 7% average return on assets while state owned companies only have 3% returns.

5 – Methodology

We will use two different approaches to test the proposed hypotheses. To test the first hypothesis, we investigate changes in performance before and after privatization. In order to evaluate this transition, the average for each variable is calculated and then the hypothesis for the mean difference between the two periods will be tested, using the t-student statistic. The two periods are separated using the first sale of equity to private investors as a reference. Thus, for the firms in our sample that were privatized, i.e. 125 firms, the first period is comprised with all the yearly observations from the period beginning in 2001 until the beginning of the year the first sale was made. The second period is set from that year onwards until 2011.

The second approach, follows Gupta (2005) methodology. In this approach we evaluate the impact of changes in the percentage of private equity in company performance by creating the variable *Priv*. This variable measures the percentage of the company capital held by private owners at the end of each year. The second hypothesis is then tested by mean of a baseline panel regression model. We will investigate the significance of the *priv* variable explaining each performance measure. The results are calculated using the following model:

Equation 1: $y_{it} = \beta 1 + \beta 2 priv_{it-1} + \beta 3 debt\_assets_{it-1} + \beta 4 assets\_log_{it-1} + e_{it}$

Where y_{it} represents each of the independent variables analyzed, more precisely annual sales, return on assets, labor productivity, return to labor and employment. The *priv* variable, as already mentioned, represents the fraction of privately owned capital, *debt_assets* is the debt to assets ratio used to evaluate financing patterns and the *assets_log* the control variable for firm size. All independent variables are lagged one period in order to avoid reverse causality in the model.

Finally, the existence of an optimal combination of state participation and private participation in the ownership structure of a privatized company is investigated (H3). We follow Sun, Tong and Tong (2002) study to test if this is the case. Using the *priv* variable we will check for a maximum absolute value in a quadratic function that combines the different variables of company performance with the percentage of private shares at each moment. If the *a* coefficient of each polynomial function in the form $f(x) = ax^2+bx+c$ is negative, and the *b* coefficient is positive, this reveals the existence of a maximum absolute value for the quadratic function. If such a result is found then the inverted U-shaped pattern hypothesis is accepted. Meaning that there is an optimal combination between state and private equity that maximizes the performance of the privatized company.

6 – Results

6.1 – Before-after performance comparison

In Table IV we can verify the performance changes before and after the privatization process for our sample of partially privatized and fully privatized companies. We can find this methodology in studies like Megginson, Nash and van Randenborgh (1994) and Boardman, Laurin and Vining (2000). The following results are obtained by calculating the mean of each variable and testing for the mean difference between the two periods, using the t-statistic mean difference test. The post privatization period is defined using the first sale of shares to private investors as a reference.

Table IV – T-statistics mean difference

Variables	Average before privatization	Average after privatization	After-before t-statistics of difference in means
Profitability			
Sales	13,120	13,787	13,559***
	(0,126)	(0,087)	(0,072)
Return on assets	0,053	0,066	0,062**
	(0,006)	(0,003)	(0,003)
Productivity			
Average product	327,789	512,652	449,421***
	(22,598)	(32,619)	(22,942)
Returns to labor	49,363	80,929	70,132***
	(8,162)	(7,249)	(5,541)
Employees	7,786	8,214	8,068***
	(0,120)	(0,075)	(0,064)
Financing			
Debt/Assets	0,588	0,556	0,567**
	(0,013)	(0,007)	(0,007)
Assets and investment			
Assets	13,565	14,352	14,083***
	(0,135)	(0,087)	(0,074)

Notes: Standard errors in parentheses. *, ** and *** refer to significance at 10%, 5% and 1% levels respectively. *Sales* is the annual sales from the main activity of the firm. *Return on assets* is the ratio of annual operating income to annual assets. *Average product* is the ratio of annual sales to labor. *Returns to labor* is the ratio of annual operating income to labor. *Employees* is the total number of employees at the end of the year. *Debt/assets* is the ratio of total liabilities to annual assets and *Assets* is the book value of assets as of the end of the fiscal year. The total of observations is 1225 financial years for 125 firms.

Results show with a significance level of 1% that the mean difference for the measures of performance is positive and statistically significant between the two periods, more precisely for annual sales, average product and returns to labor. Return on assets shows a similar result at a 5% significance level. These results show that the performance of companies improved after allowing private investors to enter the capital structure. In general terms partially privatized and fully privatized firms show an increase in sales, become more profitable and achieve higher levels of productivity, in line with the results found in Gupta (2005). This result confirms our hypothesis of better performance following private investment in companies of our sample.

We can verify that the annual assets show an increase in the post privatization period. With a significance level of 1% the positive difference between averages of the two periods is significant. Since Megginson, Nash and Randenborgh (1994) report an increase in capital investment following the privatization process, this result might be a sign of investment and indicate that companies grew after the privatization process.

The number of employees also show a significant positive difference after privatization took place, with a significance level of 1%. This result shows that more employees where hired following private investment. We could expect a different result since in most cases the privatized processes implies restructuring of the company, which can lead to reduction of personnel (Malatesta, 2001). This happens because state owned companies generally operate with more staff than they need and with above-average wages (La Porta and Lopez-de-Silanes, 1999). In the present analysis, contrary to these prior studies, it is found that the level of employment increases after the privatization process. In this case the effect of reducing personnel due to restructuring may have been absorbed by the effect of company growth. This might have led to an increase in the total number of employees after the privatization process, despite the usual layoff policy

normally encountered in these processes. The annual assets result combined with the higher numbers off employment seems to give some support to this line of thought. Again this information is in line with our hypothesis of improvements after the privatization process. More assets and more employees indicates growth for the companies in our sample, presumably as a result of better performance.

Regarding the debt/assets ratio which represents the debt utilization of firms, the average difference is negative and statistically significant. The results show with a 5% level, a reduction in debt usage patterns after admitting private investors to the ownership structure. As discussed in the literature review section, most studies show significant changes in financing patterns, as private investment seems to contribute to a lower level of debt, bringing new resources both at management level and financial level, to the companies. The negative difference between the mean values of the two periods of our sample indicates a reduced level of indebtedness after privatization. This result verifies the expected reduction in the level of debt that seems to be associated with the privatization process.

Overall these results are in line with the existing literature and confirm, within the mean difference test methodology, that there is actually an improvement in performance of firms after a partial privatization or full privatization process. However, this type of analysis, before and after privatization performance, faces some limitations regarding changes in the overall sate of economy during the years of our sample or changes in the life cycle of some of the organizations (Gupta, 2005). For this reason we will test the following hypotheses in an attempt to strengthen the results found so far.

6.2 – Private participation

Table V shows the results of the multivariate regression model, i.e. the impact of changes in private participation in the ownership structure on the different performance measures used in this study.

Table V – Panel data regression results

VARIABLES	(1) *sales_log*	(2) *roa_log*	(3) *laborprod*	(4) *returnlabor*	(5) *employees_log*
L.priv	0.566***	0.026***	78.040	2.172	0.126
	(0.101)	(0.007)	(59.010)	(17.640)	(0.104)
L.debt_assets	0.740***	-0.035***	12.450	2.399	0.475***
	(0.093)	(0.007)	(54.520)	(16.290)	(0.096)
L.assets_log	0.887***	0.002*	47.500***	9.620***	0.663***
	(0.012)	(0.001)	(7.205)	(2.153)	(0.013)
Constant	0.250	0.040***	-246.900***	-63.690**	-1.653***
	(0.158)	(0.012)	(92.350)	(27.600)	(0.163)
Observations	2,061	2,060	2,061	2,061	2,061
R-squared	0.760	0.021	0.027	0.011	0.614
F-statistic	2171,870	14,540	18,79	7,760	1092,690
P-value	0,000	0,000	0,000	0,000	0,000

Notes: Huber-White heteroscedasticity-consistent standard errors. *, ** and *** refer to significance at 10%, 5% and 1% levels respectively. The dependent variable in the first regression (1) is *sale_log*, measured as the logarithm of annual sales of main activity of the firm. The dependent variable in the second regression (2) is *roa_log*, measured as the logarithm of return on assets plus one. The dependent variable in the third regression (3) is *laborprod*, measured as the ratio of annual sales to labor. The dependent variable in the fourth regression (4) is *returnlabor* measured as the ratio of annual operating income to labor. The dependent variable in the fifth regression (5) is *employees_log*, measured as the logarithm of total number of employees at the end of the year. Refer to table II for independent variables definitions.

This analysis includes both the study group and the control group where the *priv* variable takes the value zero because these companies are completely owned by the state. The dependent variable *y* assumes for each regression, the different performance measures that we want to study. The variable *debt_assets* represents the use of debt by the companies and the variable *assets_log*, the assets logarithm, is used as a control variable for firm size.

The first regression in Table V represents the impact of changes in private participation in the annual sales of companies, presented as its logarithm. Results show that with a significance level of 1% the *priv* variable is statistically significant for explaining the changes in annual sales of privatized firms. The positive coefficient reveal that on average, an 1% increase in the percentage of capital held by private investors lead to an increase of 57% in annual sales of these companies in the following periods. This confirms the hypothesis that more private investment has a positive impact in this measure of firm performance. Regarding the use of debt, this variable is also significant with a significance level of 1% to explain the dependent performance variable. The positive coefficient allows us to conclude that the increase in indebtedness of privatized firms has a positive impact on the annual sales of companies in the next period. This result seems to indicate that companies gathered resources to finance investments that had a positive outcome, which may be reflected in increased annual sales. Further, the annual assets of the companies also show as statistically significant as an explanatory variable for annual sales with a significance level of 1%. The positive coefficient suggests that increasing assets have a positive impact on annual sales, which can be explained by the fact that most of the asset increases result from investment policies. The combination of these three variables prove to be statistically significant to explain de dependent performance variable, the F test for the global significance of the model shows Prob > F = 0,000 as a result. This means that increases in private participation combined with more debt use presumably for investment, and more assets, contribute to more sales in the following period.

The second regression of Table V shows the impact of private investment in the return on assets ratio of the privatized companies. At a significance level of 1% the *priv* variable is positively related to this performance measure. The positive coefficient shows

that increasing private participation for our sample results in an increase in returns on assets in the following period. On average, a 1% increase in the percentage of capital held by private investors leads to an increase of 2,6% in returns on assets. Again, this confirms our hypothesis of higher performance as a result of private investment. Regarding the use of debt this variable assumes a negative coefficient which suggests a decrease in return on assets on the following period as a consequence of companies borrowing money. This variable, with a significance level of 1%, proved to be statistically significant to explain the return on assets of the companies in our sample. This result shows that companies have to take in to consideration smaller returns on the short term when they gather financial resources for new investments. The annual assets show as statistically significant for the dependent variable with a positive impact in the next period, but only at a 10% significance level. Never the less, this result is in line with the previous regression. The F test confirms the global significance of this model (Prob > F = 0,000) which confirms that these variables combined are statistically significant explaining the dependent performance variable. Return on assets depends on private investment, debt use and asset value all together. Private investment provides the company with more resources, equivalent to the value of shares sold to the new investors. This reduces financial needs and correspondent costs, increasing the results of the company and its ability to grow. On the other hand, using more debt implies borrowing costs that reduce the company profitability.

The third regression of Table V examines the relationship between labor productivity and changes in private investment for the companies in our sample. Changes in private percentage did not reveal a statistically significant impact on the productivity of workers within the current analysis. This result does not confirm our hypothesis of better performance measured by workers profitability, following private investment. This

may be explained by the need for restructuring, already mentioned in the literature that privatized firms usually face (Gupta and Dinc, 2011). This restructuring process generally requires some layoffs in the short term, therefore the positive effect on labor productivity may require a longer time range than the one presented in our analysis to be confirmed. The impact of debt use in this performance variable did not show as statistically significant, which means that for this group of companies the debt use did not seem to influence the productivity of workers. The annual assets show an opposite result, which suggests the existence of a significant positive relationship between the company's growth and the productivity of its workers. The two variables seem to be linked together as more productive workers brings growth to the company and bigger companies provide better conditions that may stimulate productivity. The F test suggests that the model is globally significant explaining the dependent variable. This means that although the two first variables are not significant in their isolated impact, its combined effect with the others variables prove to be significant explaining the dependent variable.

The fourth regression in Table V represents the impact of changes in private equity on the returns to labor. The results are similar to previous regression. If we can't confirm the existence of a positive significant impact in labor productivity resulting from private investment for the time period of our sample, we also shouldn't expect for such a confirmation regarding returns to labor because it relies on the same premise, the employees. Once again this result does not confirm our hypothesis of better performance regarding returns to labor.

Finally the fifth regression in table V represents the level of employment in the organizations of our sample. We can observe that changes in the percentage of private equity in privatized companies of our sample do not prove to be statistically significant for explaining the number of employees at each moment. However, with a significance

level of 1% debt use shows as statistically significant. With a positive coefficient, this result suggests that an increase in debt level leads to increases in the number of employees working for the companies in the following period. This may come as a result of financing investments that have a positive return. This positive outcome leads to the growth of the organization as a whole, which may result in increases in the employment numbers as well. The statistically significant result for the annual assets with a positive impact on the number of employees comes in line with the previous result, strengthening the above reasoning. The F test confirms that the model is globally significant despite the result of the *priv* variable. There isn't a consensus around the privatization process impact in employment and related performance measures among the researchers in this subject. Studies like Gupta (2005) and Boubakri and Cosset (1998) report increases in employment level and better performance regarding employment performance measures. On the other hand, studies like La porta and Lopez-de-Silanes (1999), Malatesta (2001) and D'Souza and Megginson (1999) report that there is a decrease in the employment level and related performance measures after the privatization process takes place. The reduction of personnel is actually described as one of the necessary measures to increase performance in the short term.

Overall these results show that the privatization process leads to significant improvements in annual sales and in returns to assets of the privatized companies, in line with the existing literature on this subject. This conclusion is valid both for partial privatization and full privatization scenarios. On the other hand, the results also show that the admission of private investors in state owned companies do not seem to bring short-term improvements to the performance variables related to employment. It would be necessary to extend our time range of analysis to confirm the effects on these variables. Still, these results allow us to conclude that there is an effective performance

improvement of state owned companies when they become open to private investment. As already discussed in the literature review, this improvement comes from a greater ability for the management to define targets for the organization with less state interference. Managers have more leeway to pursue performance goals and sustainability instead of the traditional political objectives that guide most of state owned companies (Gupta and Dinc, 2011). There is more room for a result oriented strategy which in most cases requires politically unpopular measures. However, these same measures are essential to the performance of any company.

6.3 – Inverted U-shape pattern

Table VI shows the results regarding the pattern followed by the performance measures used in this study, when combined with different levels of private participation in the ownership structure. The goal is to verify the existence of an optimal proportion of private equity that maximizes the performance of the companies in our sample. This proportion of private shares would also represent an optimal combination with state participation, as the rest of the equity would be sate owned. Such a result would confirm the hypothesis that partial privatization is a better solution than full privatization regarding company performance.

Table VI – Inverted U-shaped pattern results

VARIABLES	(1) *sales_log*	(2) *roa_log*	(3) *laborprod*	(4) *returnlabor*	(5) *employees_log*
Panel A: All firms					
L.priv	2.788***	0.167***	753.9***	167.2**	1.135***
	(0.328)	(0.0283)	(254.4)	(72.22)	(0.362)
L.priv2	-2.701***	-0.172***	-821.7***	-200.6***	-1.227***
	(0.393)	(0.0329)	(270.7)	(77.15)	(0.422)
L.assets_log	0.859***	-0.000145	39.02***	7.550***	0.651***
	(0.0110)	(0.00117)	(5.688)	(1.511)	(0.0124)
L.debt_assets	0.806***	-0.0305***	32.56	7.309	0.505***
	(0.143)	(0.0112)	(37.41)	(14.88)	(0.0930)
Constant	0.505***	0.0566***	-169.4**	-44.76**	-1.537***
	(0.150)	(0.0141)	(66.51)	(19.92)	(0.161)
Observations	2,061	2,060	2,061	2,061	2,061
R-squared	0.765	0.035	0.032	0.015	0.616
F-Statistic	2348,030	13,940	32,420	20,760	966,090
P-value	0,000	0,000	0,000	0,000	0,000
Panel B: Privatized firms					
L.priv	0.802**	0.103***	964.9***	272.5***	-0.00278
	(0.344)	(0.0312)	(274.5)	(72.60)	(0.397)
L.priv2	-1.162***	-0.127***	-1,022***	-299.0***	-0.202
	(0.411)	(0.0344)	(288.1)	(79.61)	(0.449)
L.assets_log	0.857***	-0.00222	25.67***	1.353	0.709***
	(0.0105)	(0.00167)	(7.177)	(1.897)	(0.0126)
L.debt_assets	0.924***	-0.0408**	69.17	16.97	1.078***
	(0.182)	(0.0182)	(79.20)	(20.53)	(0.186)
Constant	1.014***	0.112***	-39.88	17.41	-2.453***
	(0.143)	(0.0233)	(84.74)	(21.80)	(0.166)
Observations	1,097	1,097	1,097	1,097	1,097
R-squared	0.858	0.026	0.030	0.024	0.738
F-Statistic	2811,640	5,180	19,030	8,960	1207,170
P-value	0,000	0,000	0,000	0,000	0,000

Notes: Huber-White heteroscedasticity-consistent standard errors. *, ** and *** refer to significance at 10%, 5% and 1% levels respectively. The dependent variable in the first regression (1) is *sale_log*, measured as the logarithm of annual sales of main activity of the firm. The dependent variable in the second regression (2) is *roa_log*, measured as the logarithm of return on assets plus one. The dependent variable in the third regression (3) is *laborprod*, measured as the ratio of annual sales to labor. The dependent variable in the fourth regression (4) is *returnlabor* measured as the ratio of annual operating income to labor. The dependent variable in the fifth regression (5) is *employees_log*, measured as the logarithm of total number of employees at the end of the year. Refer to table II for independent variables definitions.

The results are calculated using the variable *priv*, which represents the private participation in the capital structure of the company at each moment, to build a quadratic function that relates this information with performance measures (Sun, Tong and Tong, 2002). This type of function enables us to analyze the existence of a maximum or a minimum absolute value depending on the sign of the coefficients of variables *priv* and *priv2*. *Priv2* is the *priv* variable squared. The calculations follow the presented equation, where f(x) assumes each performance variable: $f(x) = priv^2 + priv + constant$.

Since all the coefficients of variable *priv* are positive and all the coefficients of variable *priv2* are negative for the sample including all firms, these results confirm the existence of a maximum absolute value in the function for all the five equations. This confirms the existence of a potential optimal point that maximizes each performance measure, which leads to the conclusion that there might be an optimal combination between private investment and state shares for our sample. This optimal combination maximizes annual sales, return on assets, returns to labor, labor productivity and employment, thus confirming our hypothesis. In Panel B of Table VI we can verify similar results for the sample of privatized companies, except for the variable measuring employment. As already discussed, there isn't a consensus around the effect of the privatization process in the employment level that leads to consistent results. Overall this outcome is in line with the Sun, Tong and Tong (2002) study that we use as a guide line, as we can verify by one of the concluding comments of their research: "Too much government holding of SOE (State Owned Enterprises) shares means too much control and interference in the economic operations of SOEs. Too little government holding means too little support from the government to pull the SOEs out from their difficulties".

These results reinforce the idea that partial privatization may be the best solution for better performance in previously fully owned state enterprises (Sun, Tong and Tong,

2002). An optimal allocation of shares between the two parties seems to combine the advantages of private management with specific resources of the public sector and still be effective in reducing excessive intervention by the state and the imposition of political objectives (Kang and Kim, 2012).

7 – Conclusion

The results confirm the three hypotheses proposed by this study. Companies privatized reveal superior performance in the period following the first private investment in the capital structure. Additionally, the performance of privatized companies depends on the percentage of private investment since it has been confirmed that an increase of this percentage reflects positively in the performance measures. Finally, there seems to be an optimal combination between the state participation and private investment that maximizes the performance of privatized firms, suggesting that state and private investors can co-exist with valid contributions in the capital structure of previously state owned companies.

The results referring to employment related performance measures, more precisely productivity, returns and changes in the total number of employees do not have a consistent outcome in our analysis. Still, this situation falls within the literature on the subject as already discussed. Although there is not a significant relationship of these measures with private investment for our sample, the positive outcome of the remaining performance measures and the other tests seem to be acceptable to support our conclusions.

These results for a sample of the European context, which is the scope of this study, are consistent with the existing literature on the subject, as they confirm an improvement in company performance resulting from the privatization process that does not seem to depend on the geographical area in which this process takes place. Therefore, this study strengthens the general application of the existing knowledge on this subject that points towards significant improvements resulting from the reduction of state intervention in the economy.

Additionally this study helps to reinforce the need to privatize existing state owned companies in European rescued countries, given the current context of adversity. This context is characterized by scarcity of resources, high unemployment, and a scenario of persistent economic recession accompanied by a high level of taxation due to budgetary constraints. In this difficult situation the efficiency, sustainability and profitability of enterprises becomes even more important, especially for those that spend public resources.

In this study some limitations were found regarding the availability of information that restricted the full application of the methodology used in Gupta (2005). The information available on the number of employees in the databases and financial reports that we used is limited for a number of companies and accounting information was not available for all the years in our sample. The researcher uses two additional analytical perspectives, more precisely investment and rotation of directors and evaluates its impact on company performance. However, given the difficulties in gathering information about capital expenditures, research and development costs and detailed information about executives, these features were not implemented in our study. Still, working with the information available we have tried to make this study and its findings as robust as possible.

Regarding future research and in coherence with the reported limitations, it would be important to gather the necessary conditions for the full implementation of the methodology that constitutes the basis of this study, in order to further strengthen its conclusions. Additionally, we should consider extending our sample to a larger set of companies, as more information leads to even more robust conclusions. Using a longer time range would help to confirm the effects on employment levels and employment related performance measures. As already mentioned, the effects of the privatization

process in these performance variables may not be visible within the time range selected for this study. It would be interesting to compare the application of this methodology in different contexts, in particular comparing the results of the original study conducted with a sample of Indian companies with the findings of this study using a European sample. This comparison could be extended by applying this methodology to other relevant geographical contexts like China or Russia where the state traditionally has a relevant position and privatization processes exist in sufficient number for analysis purposes.

All studies seem to confirm that less sate interference leads to better company performance, this does not necessarily mean a complete absence of state participation. Whether this positive effect is perceivable immediately or it takes some time to be identified, in the long run all evidence suggests that performance will have a positive outcome, regardless of the geographical contexts or the method used to evaluate the performance changes. Differences among researchers seem to rely more in the scale of this positive outcome than in the difference of their findings.

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