Performance and capital structure of privatized firms in the European Union

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ABSTRACT

The objective of this paper is to analyze whether there are differences in performance between firms that have been privatized and private firms in the EU. We also analyze whether previous ownership (state-owned versus private) and regulation affect capital structure. Focusing on economic reasons that justify privatizations, we compare the differences in the profitability, leverage and labor intensity of privatized firms in the EU countries with a matched-pairs sample of private firms, during the period 1999-2002. For the total sample, we have found evidence that privatized firms are more profitable, less leveraged and more efficient than private firms. With respect to capital structure, for the total sample, privatization and regulation determine leverage, being the privatized firms less leveraged and the regulated firms more leveraged. However, we have found important differences between zones.

Keywords: privatization; efficiency; capital structure; European Union.

JEL Classification: G32; L33; L43

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1.- INTRODUCTION

In recent decades, the privatization of state-owned enterprises (SOEs) has been one of the most common policies carried out in economies worldwide and OECD countries have also been involved in this phenomenon (OECD, 2003).

Reasons for privatization can be categorised as economic, financial and political (Vickers and Yarrow, 1988). Economic aims are associated with improvements in efficiency of the privatized firm. Financial reasons are based on the positive effects on public finances, specifically the public deficit, because the State obtains an important source of income from the sale of these enterprises. Finally, political reasons refer to distributional effects on society because privatization allows increasing the number of stockholders and facilitates the access of citizens to capital markets.

The economic reasons that justify privatizations are based on microeconomic theory. With perfect competition, private firms achieve efficiency by maximizing profits. In principle, SOEs can reach the same levels of financial performance as private firms. Nevertheless, there are some problems that make it difficult to reach this objective, such as principal-agent relationships, the non-definition of objectives and the contradiction between the objectives of the principal and the agent. Many studies have focused on the differences in performance between SOEs and private enterprises and on the impact of privatization on the performance of the privatized firms (Megginson et al., 1994; Dewenter and Malatesta, 2001). In consequence, it is expected that there will not be differences with private firms, once public companies have been privatized. Also, the interventionism of government through ownership and regulation is also reflected in the financial structure of the firm (Titman and Wessels, 1988; Kole and Mulherin, 1997).

The objective of this paper is to analyze whether there are differences in performance between firms that have been privatized and private firms in the EU. We also analyze
whether previous ownership (state-owned versus private) and regulation affect capital structure.

In consequence, we analyze the economic and financial situation of recently privatized firms in the EU countries compared to a matched-pairs sample of private firms, during the period 1999-2002, in order to investigate whether privatization means better business performance. The empirical work consists of analyzing whether there are differences between the profitability, leverage and efficiency in privatized SOEs and private firms. We also analyze the determinants of the capital structure of these firms. To do this, we focus on the impact of the intervention of the Administration on the leverage of the firms in our sample, distinguishing between privatized and non-privatized firms, and also between regulated and competitive companies.

With respect to previous research, this paper adds new evidence about the privatization process and the capital structure of firms in the EU. Previous research focuses either on the comparison between SOEs and private enterprises or the comparison between before and after privatization. Here, we compare performance of previous SOEs after privatization with private companies of similar characteristics. Also, previous research refers to a specific European country. By contrast, this paper provides an analysis of the effects of the privatization process on firm performance for all the EU.

The paper is organized as follows. In the next section, we review the theory and previous literature. Section 3 details the research methodology. Section 4 describes the data employed. Section 5 presents the empirical results and, finally, Section 6 contains the conclusions.
2.- LITERATURE AND THEORY

Previous research shows the differences between the performance of private firms and SOEs. The agency theory (Jensen and Meckling, 1976) justifies these divergences as a result of the differences in the principal-agent relationship. In private companies the principal is the shareholders, whereas in SOEs the principal are voters and government, who have limited capacity to control the agent (Vickers and Yarrow, 1988). Also, in SOEs, the objectives are related to the public interest (maintenance of the employment, etc.), whereas in private firms, the objectives are related to maximising profits and the firm’s value. In consequence, there are two fundamental problems: the adverse selection of the agent and the moral hazard because the agent’s behaviours can not be observed at all times (Cohen, 2001). Boycko et al. (1996) highlight agent problems in the SOEs using a model that shows the gap between the objectives of politicians and managers. They show the relative inefficiency of SOEs and the improvements of efficiency after privatization.

There are several studies that document the effect of privatization on profitability, leverage and performance. According to property rights theory, private companies are expected to have higher profits because their objectives are focused on profits, whereas public companies have other socio-political objectives. In consequence, it is expected that profitability increases after privatization. Many studies have documented a significant improvement in profitability following privatization (Dewenter and Malatesta, 2001; Boardman et al., 2002).

Efficiency measures take into account the resources used to generate the output. Usually, it is measured as sales per employee or net income per employee\(^1\). Previous research find evidence that efficiency improves following privatization (Dewenter and Malatesta, 2001; Boardman et al., 2002; Goldstein, 2003; Omran, 2004).

\(^1\) There are other types of efficiency as technical efficiency (or X-efficiency).
Private companies are also expected to have lower leverage. Public companies have access to funds from the state in very good conditions of interest rates and repayment terms. As consequence of the privatization, these conditions disappear. Furthermore, companies that have been privatized through a public offering can reduce leverage because they have access to equity in capital markets. Empirical research finds evidence that leverage decreases after privatization (Megginson et al., 1994; Dewenter and Malatesta, 2001; Boardman et al., 2002).

In some countries, SOEs were restructured to be more profitable and subsequently to be sold to private companies and improvement in performance takes place before privatization. This is the case of France (Berne and Pogorel, 2004) and Spain (Vergés, 2000). Also, in the UK there is evidence that efficiency improved in some companies three years before the privatization (Boussofiane et al., 1997).

Nevertheless, the privatization itself does not necessarily lead to an increase of the efficiency without a liberalisation of the competitive environment. Competition affects efficiency in two ways (Vickers and Yarrow, 1988): first, competition in the market of products increases efficiency because it eliminates monopolist margins, second, competition forces to companies to introduce innovations. In Germany, Knieps (2004) concludes that, after deregulation in German network industries, service quality increased and industry efficiency improved. Likewise, in Sweden, Springdal and Mador (2004) assert that privatization increased competition in the information technology sector and this led to an improvement in service quality and a drop in price. In Spain, Villalonga (2000) shows that the effect of privatizations has not always led to increases in efficiency and it is influenced by political and organizational factors.

Finally, in Eastern Europe, Hyclak and Kina (1994) demonstrate that the privatization experience in this zone is different to any other region, because of the lack of developed capital markets.
The interventionism of government is also reflected in the financial structure of the firm. Titman and Wessels (1988) document the theoretical determinants of the capital structure. These factors are: competition, regulation, profitability, asset tangibility, size and institutional environment. According to the pecking order theory, companies that do not operate in competitive industries achieve higher profit levels and lower debt levels. Kole and Mulherin (1997) show the existence of competitive markets and control of the managers of privatized firms are essential requirements to improve the performance. Newbery (1997) argues that regulation affects capital structure. The greater the fluctuations in a company’s cash flow, the greater the chance of being unable to meet its obligations. In consequence, firms with rate regulation have lower cash flow risk and can support higher debt levels. Also, Parker (1998) asserts that an optimal regulatory system incentives for management to manage business assets efficiently.

The relationship between leverage and profitability is controversial. Myers and Majluf (1984) predict a negative relationship between leverage and profitability, because firms will prefer to finance with internal funds rather than debt. In consequence, more profitable firms will issue less debt. Titman and Wessels (1988) and Rajan and Zingales (1995) find evidence of this. However, Jensen (1986) predicts a positive relationship if the market for corporate control is effective in forcing firms to commit to paying out cash by leveraging up. If it is ineffective, managers of profitable firms prefer to avoid the disciplinary role of the debt, which would lead to a negative relationship between profitability and leverage.

Another factor that may affect the firm’s debt-equity choice is the tangibility of assets. According to bankruptcy costs theory, tangible assets keep their value even in bankruptcy, so firms with more tangible assets can support higher levels of debt at lower costs because of the ability of firms to collateralize their debt (Jensen et al. 1992; Rajan and Zingales, 1995). By contrast, Titman and Wessels (1988) assert that firms
with fewer intangibles may choose higher debt levels to limit their managers’ consumption of perquisites because bondholders or bankers will closely monitor such firms.

The effect of size on leverage is ambiguous. It is argued that very large firms pay less than small firms to issue equity, so they would be less levered than small firms (Ryen et al., 1997; Rajan and Zingales, 1995). However, large firms tend to be more diversified and fail less often, so size should decrease the probability of bankruptcy and have a positive impact on leverage (Rajan and Zingales, 1995). Rajan and Zingales (1995), in an international study for the G-7 countries find evidence that leverage increases with size in all countries, except Germany.

Finally, La Porta et al. (1997) find that institutional and legal characteristics determine capital structure because the legal environment has a significant effect on the ability of firms to raise external finance. Also, Wald (1999) points out that variables associated with risk, growth, firm size and inventories show different effects across countries. However, Rajan and Zingales (1995) show that, at aggregate level, differences between the leverage of firms are not explained by institutional differences.

Focusing on Europe, Hall et al. (1999) carry out an analysis of small and medium sized enterprises. They conclude that variations in the determinants of capital structure between countries are due to the financing requirements of firms, their relationship with banks, taxation and other national economic, social and cultural differences. In the United Kingdom, Ozkan (2001) concludes that profitability, liquidity and growth opportunities have a negative effect on the leverage ratios. In Spain, Arrondo and Gómez-Ansón (2003) find that the agency model is determinant in the firm’s security issue choice. Likewise, De Miguel and Pindado (2001) compare the determining factors of capital structure in Spanish and US firms, finding that transaction costs in Spain are lower than those for US firms due to the higher percentage of private debt in Spain.
3.- METHODOLOGY

Firstly, we compare the economic-financial characteristics of privatized firms and the control group (private firms) by carrying out the Wilcoxon two-sample paired signed rank test, which does not require normality. In accordance with the previous section, the factors to be compared are profitability, leverage and efficiency.

Because of the potential differences between countries, we also compare these groups for different geographical zones. Following La Porta et al. (1997), we have classified the companies between the French, German, Scandinavian or British zones\(^2\).

As in Dewenter and Malatesta (2001), profitability is measured using the return on sales (ROS), return on assets (ROA) and return on equity (ROE). With respect to leverage, there are several measures in the literature. Following to Bevan and Danbolt (2002), we have chosen the following ratios:

\[
\text{LEV}_1 = \frac{\text{Total Debt}}{\text{Total Assets}}
\]

\[
\text{LEV}_2 = \frac{\text{Long Term Debt}}{\text{Total Assets}}
\]

\[
\text{LEV}_3 = \frac{\text{Total Debt} - \text{Trade Credit and Equivalent} - \text{Debt} - \text{Credit Trade Debt}}{\text{Total Assets}}
\]

These authors define two variants of measures using the book value or the market value; however, we only use book value measures because not all firms are quoted on the Stock Exchange.

\(^2\) In the French zone we include Belgium, Holland, Italy, France, Portugal and Spain; in the German zone Germany and Austria; in the Scandinavian zone Denmark, Sweden; in the British zone Ireland and United Kingdom and in the Eastern zone Slovakia, Hungary, Latvia, Poland and Malta, which does not belong to this zone but entered the EU at the same time.
Finally, we measure efficiency as labour intensity. Following Dewenter and Malatesta (2001), we use two different measures of labour intensity:

$$LAB1 = \frac{Employees}{Sales \ (in \ million \ of \ dollars)}$$

$$LAB2 = \frac{Employees}{Assets \ (in \ million \ of \ dollars)}$$

In order to analyze leverage determinants, we carry out a multivariate panel data analysis. As we have mentioned, the uniqueness of privatized firms means, according to pecking order theory, less leverage. Therefore, we introduce the variable PRIV that indicates whether company has been involved in a privatization process. It is a dummy variable that has value one in the affirmative case and zero otherwise. Another factor is regulation, so the REG variable shows whether the firm operates in a regulated industry; this is also a dummy variable with value one for the energy, tobacco, telecommunications and transport sectors. To study the effect of size on leverage, we use the SIZE variable, measured by the total assets in million of dollars$^3$.

Following Titman and Wessels (1988), we define tangibility (TAN) as the proportion of tangible assets over total assets and we measure profitability as ROA.

Finally, to correct for endogeneity we introduce one-period lagged dependent variable. Accordingly, we estimate the following model:

$$Leverage_i = \alpha + \beta_1 PRIV + \beta_2 REG + \beta_3 SIZE + \beta_4 TAN + \beta_5 ROA + \beta_6 Leverage_{i, t-a} + \varepsilon_i \quad (1)$$

where Leverage is the LEV3 ratio aforementioned.

$^3$ We express in millions so that the coefficients of regression are not practically zero because there are differences of size between leverage and total assets.
4.- DATA

The list of privatized firms in Europe has been obtained from the Web [www.privatizationbarometer.net](http://www.privatizationbarometer.net). This link provides information about the enterprises that have been involved in a privatization process since 1995 and the percentage that has been privatized. However, there is no information about the percentage that is not privatized. In consequence, in our sample, we cannot distinguish between completely privatized and partially privatized companies.

From the firms privatized in recent years, we selected the companies whose privatization or final phase of privatization (if there were several phases) took place after 1995, because the 2001 OECD report establishes this year as the most significant in Europe, except for the United Kingdom.

The economic-financial data was derived from Amadeus Bureau van Dijk Electronic Publishing. From the 1449 privatized firms in Europe, we have selected those that report consolidated balance sheets. Furthermore, we excluded financial firms and those for which data could not be obtained for 2002. Consequently, the sample is comprised of 133 privatized firms and 451 firms-year observations.

Having selected the privatized firms, the control group was constructed with private firms. For this, for every privatized company we chose a private firm belonging to the same geographical zone (La Porta et al., 1997), and to the same industry. In this way, we control for differences in accounting rules and firms are paired up with other firms which operate in the same sector.

Table 1 presents the distribution of the companies in the sample by industry and geographical zone.
Table 1: Sample Distribution of privatized firms by industry and geographical zone

Panel A: Industry (NACE code)

<table>
<thead>
<tr>
<th>Sector</th>
<th>Number of Companies</th>
<th>% Companies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Construction</td>
<td>6</td>
<td>4.51%</td>
</tr>
<tr>
<td>Energy</td>
<td>26</td>
<td>19.55%</td>
</tr>
<tr>
<td>Holding</td>
<td>18</td>
<td>13.53%</td>
</tr>
<tr>
<td>Manufacture of food and tobacco products</td>
<td>6</td>
<td>4.51%</td>
</tr>
<tr>
<td>Manufacture of basic metals</td>
<td>7</td>
<td>5.26%</td>
</tr>
<tr>
<td>Transport</td>
<td>12</td>
<td>9.02%</td>
</tr>
<tr>
<td>Computer and related activities</td>
<td>4</td>
<td>3.01%</td>
</tr>
<tr>
<td>Manufacture of chemical products</td>
<td>6</td>
<td>4.51%</td>
</tr>
<tr>
<td>Manufacture of petroleum</td>
<td>5</td>
<td>3.76%</td>
</tr>
<tr>
<td>Telecommunications</td>
<td>14</td>
<td>10.53%</td>
</tr>
<tr>
<td>Wholesale trade</td>
<td>6</td>
<td>4.51%</td>
</tr>
<tr>
<td>Other sectors</td>
<td>23</td>
<td>17.29%</td>
</tr>
<tr>
<td>Total</td>
<td>133</td>
<td>100%</td>
</tr>
</tbody>
</table>

Panel B: Geographical zones

<table>
<thead>
<tr>
<th>Zone</th>
<th>Number of Companies</th>
<th>% Companies</th>
</tr>
</thead>
<tbody>
<tr>
<td>French</td>
<td>58</td>
<td>43.61%</td>
</tr>
<tr>
<td>German</td>
<td>13</td>
<td>9.77%</td>
</tr>
<tr>
<td>Scandinavian</td>
<td>9</td>
<td>6.77%</td>
</tr>
<tr>
<td>British</td>
<td>13</td>
<td>9.77%</td>
</tr>
<tr>
<td>Eastern</td>
<td>40</td>
<td>30.08%</td>
</tr>
<tr>
<td>Total</td>
<td>133</td>
<td>100%</td>
</tr>
</tbody>
</table>

It can be seen that the number of French firms is greater than those in the other zones studied. In the British zone the number of pairs is lower because the privatization process began before 1995⁴.

Table 2: Summary statistics

Panel A: Statistics of privatized firms

<table>
<thead>
<tr>
<th></th>
<th>Mean</th>
<th>Median</th>
<th>SD</th>
<th>Minimum</th>
<th>Maximum</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Assets (million dollars)</td>
<td>10,33</td>
<td>0,78</td>
<td>24,98</td>
<td>0,01</td>
<td>170,57</td>
<td>445</td>
</tr>
<tr>
<td>ROS</td>
<td>9,28</td>
<td>6,42</td>
<td>62,29</td>
<td>-170,39</td>
<td>862,71</td>
<td>360</td>
</tr>
<tr>
<td>ROA</td>
<td>3,46</td>
<td>3,96</td>
<td>9,89</td>
<td>-64,71</td>
<td>39,16</td>
<td>402</td>
</tr>
</tbody>
</table>

⁴ As the OECD (2001) report points out, the greatest global amount raised from privatization in United Kingdom during the nineties was in 1991.
Table 2 provides summary statistics (mean, median, standard deviation, minimum, maximum and number of observations) of the variables from pooled data used in the study and the size of the firms by zones.

The mean size of the privatized firms (Table 2, Panel A) is greater than that of the private firms (Table 2, Panel B). This is due to the fact that most privatized companies have been in a monopolistic situation before its privatization. As Table 2 Panel C shows, British firms are the smallest in the sample because this zone began its privatizations before the other zones and the most important companies were privatized previously and are not included in the sample.
5.- RESULTS

In this section, the results obtained in the study are presented. Firstly, we carry out a comparative analysis between the cited variables to study whether there are differences in the economic-financial characteristics of privatized and private firms and, secondly we study the capital structure of the firms in the sample.

5.1.- Univariate analysis

We examine the differences in the profitability, leverage and labour intensity of the firms using matched pairs as we explained in Section 3.

<table>
<thead>
<tr>
<th></th>
<th>Privatized firms</th>
<th>Non-Privatized firms</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Z Kolmogorov-Smirnov</td>
<td>Sig.</td>
</tr>
<tr>
<td>ROE</td>
<td>7.50</td>
<td>0.000</td>
</tr>
<tr>
<td>ROA</td>
<td>3.77</td>
<td>0.000</td>
</tr>
<tr>
<td>ROE</td>
<td>4.92</td>
<td>0.000</td>
</tr>
<tr>
<td>LEV1</td>
<td>10.90</td>
<td>0.000</td>
</tr>
<tr>
<td>LEV2</td>
<td>10.34</td>
<td>0.000</td>
</tr>
<tr>
<td>LEV3</td>
<td>3.71</td>
<td>0.000</td>
</tr>
<tr>
<td>LAB1</td>
<td>6.36</td>
<td>0.000</td>
</tr>
<tr>
<td>LAB2</td>
<td>5.55</td>
<td>0.000</td>
</tr>
</tbody>
</table>

Table 3 presents the Kolmogorov-Smirnov normality test for the data in both groups, as we have already said. We can see that the variables do not follow a normal distribution, which justifies the Wilcoxon test.
Table 4: Wilcoxon test results

<table>
<thead>
<tr>
<th>Zones classification</th>
<th>Wilcoxon Test</th>
<th>ROS</th>
<th>ROA</th>
<th>ROE</th>
<th>LEV1</th>
<th>LEV2</th>
<th>LEV3</th>
<th>LAB1</th>
<th>LAB2</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Total sample</td>
<td>-6.048***</td>
<td>-2.851***</td>
<td>-0.998</td>
<td>-2.410**</td>
<td>-2.549**</td>
<td>-1.567</td>
<td>-0.691</td>
<td>-4.471***</td>
</tr>
<tr>
<td></td>
<td>p-value</td>
<td>0.000</td>
<td>0.004</td>
<td>0.318</td>
<td>0.016</td>
<td>0.011</td>
<td>0.117</td>
<td>0.499</td>
<td>0.000</td>
</tr>
<tr>
<td></td>
<td>Positive ranks (Var_c &gt; Var_p)</td>
<td>114</td>
<td>156</td>
<td>197</td>
<td><strong>197</strong></td>
<td><strong>176</strong></td>
<td>194</td>
<td>138</td>
<td><strong>190</strong></td>
</tr>
<tr>
<td></td>
<td>Negative ranks (Var_c &lt; Var_p)</td>
<td><strong>209</strong></td>
<td><strong>223</strong></td>
<td>188</td>
<td>167</td>
<td>129</td>
<td>169</td>
<td>138</td>
<td>132</td>
</tr>
<tr>
<td>French</td>
<td>Z</td>
<td>-5.567***</td>
<td>-4.268***</td>
<td>-2.371***</td>
<td>-1.928**</td>
<td>-3.788***</td>
<td>-1.600</td>
<td>-0.744</td>
<td>-2.214**</td>
</tr>
<tr>
<td></td>
<td>p-value</td>
<td>0.000</td>
<td>0.000</td>
<td>0.018</td>
<td>0.000</td>
<td>0.054</td>
<td>0.000</td>
<td>0.109</td>
<td>0.000</td>
</tr>
<tr>
<td></td>
<td>Positive ranks (Var_c &gt; Var_p)</td>
<td>51</td>
<td>59</td>
<td>68</td>
<td><strong>106</strong></td>
<td><strong>83</strong></td>
<td><strong>104</strong></td>
<td>76</td>
<td><strong>103</strong></td>
</tr>
<tr>
<td></td>
<td>Negative ranks (Var_c &lt; Var_p)</td>
<td><strong>116</strong></td>
<td><strong>116</strong></td>
<td><strong>98</strong></td>
<td>56</td>
<td>61</td>
<td>58</td>
<td>79</td>
<td>55</td>
</tr>
<tr>
<td>German</td>
<td>Z</td>
<td>-1.366</td>
<td>-0.173</td>
<td>-0.776</td>
<td>-1.500</td>
<td>-0.294</td>
<td>-2.458**</td>
<td>-0.744</td>
<td>-2.214**</td>
</tr>
<tr>
<td></td>
<td>p-value</td>
<td>0.172</td>
<td>0.862</td>
<td>0.437</td>
<td>0.133</td>
<td>0.769</td>
<td>0.014</td>
<td>0.456</td>
<td>0.027</td>
</tr>
<tr>
<td></td>
<td>Positive ranks (Var_c &gt; Var_p)</td>
<td>13</td>
<td>21</td>
<td>22</td>
<td>21</td>
<td>22</td>
<td><strong>27</strong></td>
<td>12</td>
<td><strong>18</strong></td>
</tr>
<tr>
<td></td>
<td>Negative ranks (Var_c &lt; Var_p)</td>
<td>20</td>
<td>16</td>
<td>15</td>
<td>17</td>
<td>15</td>
<td>11</td>
<td>15</td>
<td>13</td>
</tr>
<tr>
<td>Scandinavian</td>
<td>Z</td>
<td>-1.754*</td>
<td>-2.159**</td>
<td>-1.194</td>
<td>-2.743***</td>
<td>-1.755*</td>
<td>-2.386**</td>
<td>-1.045</td>
<td>-1.704*</td>
</tr>
<tr>
<td></td>
<td>p-value</td>
<td>0.079</td>
<td>0.031</td>
<td>0.232</td>
<td>0.006</td>
<td>0.079</td>
<td>0.017</td>
<td>0.296</td>
<td>0.088</td>
</tr>
<tr>
<td></td>
<td>Positive ranks (Var_c &gt; Var_p)</td>
<td>6</td>
<td>6</td>
<td>9</td>
<td><strong>15</strong></td>
<td><strong>15</strong></td>
<td><strong>14</strong></td>
<td>10</td>
<td><strong>13</strong></td>
</tr>
<tr>
<td></td>
<td>Negative ranks (Var_c &lt; Var_p)</td>
<td><strong>14</strong></td>
<td><strong>17</strong></td>
<td>11</td>
<td>7</td>
<td>6</td>
<td>8</td>
<td>10</td>
<td>9</td>
</tr>
<tr>
<td>British</td>
<td>Z</td>
<td>-2.051**</td>
<td>-1.329</td>
<td>-2.037**</td>
<td>-1.455</td>
<td>-2.646***</td>
<td>-</td>
<td>-0.229</td>
<td></td>
</tr>
<tr>
<td></td>
<td>p-value</td>
<td>-</td>
<td>0.040</td>
<td>0.184</td>
<td>0.042</td>
<td>0.145</td>
<td>0.008</td>
<td>-</td>
<td>0.819</td>
</tr>
<tr>
<td></td>
<td>Positive ranks (Var_c &gt; Var_p)</td>
<td>-</td>
<td><strong>23</strong></td>
<td>16</td>
<td>12</td>
<td>20</td>
<td>11</td>
<td>-</td>
<td>15</td>
</tr>
<tr>
<td></td>
<td>Negative ranks (Var_c &lt; Var_p)</td>
<td>-</td>
<td>16</td>
<td>13</td>
<td><strong>26</strong></td>
<td>17</td>
<td><strong>27</strong></td>
<td>-</td>
<td>20</td>
</tr>
<tr>
<td>Eastern</td>
<td>Z</td>
<td>-2.059**</td>
<td>-0.698</td>
<td>-0.379</td>
<td>-1.906*</td>
<td>-0.099</td>
<td>-2.684***</td>
<td>-0.816</td>
<td>-0.077</td>
</tr>
<tr>
<td></td>
<td>p-value</td>
<td>0.039</td>
<td>0.485</td>
<td>0.704</td>
<td>0.057</td>
<td>0.921</td>
<td>0.007</td>
<td>0.414</td>
<td>0.938</td>
</tr>
<tr>
<td></td>
<td>Positive ranks (Var_c &gt; Var_p)</td>
<td>44</td>
<td>47</td>
<td>52</td>
<td>43</td>
<td>36</td>
<td>38</td>
<td>40</td>
<td>41</td>
</tr>
<tr>
<td></td>
<td>Negative ranks (Var_c &lt; Var_p)</td>
<td><strong>59</strong></td>
<td>58</td>
<td>51</td>
<td><strong>61</strong></td>
<td>30</td>
<td><strong>65</strong></td>
<td>34</td>
<td>35</td>
</tr>
</tbody>
</table>

Notes: (a) La Porta et al. (1997) classification. Var_c: Variable of the control firm. Var_p: variable of the privatized firm.
* Statistically significant at the 10% level.
** Statistically significant at the 5% level.
*** Statistically significant at the 1% level.
(=) Indicates insufficient observations to estimate.
The first line in Table 4 shows the differences between the profitability, leverage and labour intensity of the privatized firms and the control group. The ROS and ROA are significantly larger for privatized than for private firms; although there are no significant differences in the ROE ratio. As for leverage, using both total leverage (LEV1) and long-term leverage (LEV2), we observe that the control group firms use more leverage than the privatized firms. The differences between both groups are not significant for ratio LEV3. Private firms have a significantly higher employment to assets ratio (LAB2) than privatized firms but there are no significant differences in the employees to sales ratio (LAB1).

Because the privatization process has not been homogeneous throughout the countries analyzed, we divide them into several geographical zones following La Porta et al. (1997). We find that the profitability, measured by ROS, ROA or ROE, is significantly greater in firms in the process of privatization than in private firms in the French zone. This result is repeated in the Scandinavian zone with the ROS and ROA ratios and in the Eastern zone where only the ROS ratio is significant. In the British zone, the results are the opposite, that is, private firms have a significantly greater ROA than privatized firms. The ROE ratio does not show significant differences between the two groups and the lack of observations does not allow the estimation of the ROS variable or any conclusions. In the German countries, profitability measured by the three ratios does not show significant differences between the two groups.

As for leverage, in both the French and Scandinavian zones the three ratios show that private firms tend to use more leverage than privatized firms do. Nevertheless, in the German zone, this result is only valid for the leverage calculated by subtracting the trade credit and equivalent (LEV3), so we cannot say anything about the other ratios. In the British and Eastern zones, LEV1 and LEV2 indicate that privatized companies are characterized by a higher leverage compared to private firms. With respect to labour
intensity, LAB1 (employees to sales) is not significant in any zone. LAB2 (employees to assets) indicates higher labor intensity in private companies in the French, German and Scandinavian zones. In the British and Eastern zones there are no differences between the two groups.

From these results, we can see that there are important differences between zones. The differences between private and privatized companies are similar in the French and in the Scandinavian zone: higher profitability for privatized firms and higher leverage and employment intensity for private firms. In the German zone, differences in profitability are not significant, but leverage and labor intensity have the same behavior as in the French and Scandinavian zones. In the British and Eastern zones the characteristics of the firms are very different to the other zones. With regard to profitability, in the Eastern zone the evidence is weaker but similar to the other zones (the privatized firms are more profitable). In the British zone the opposite occurs, privatized companies generate less ROA than control firms. Leverage in the two zones is significantly less in private firms. Finally, there are no differences in labour intensity in the firms of these countries.

These zonal differences in the results may be due to the different processes and aims of privatization in the countries of the sample. Gonzalo et al. (2003) show that the objectives pursued by the governments in the privatization process vary between countries. Their results reveal that privatization in developed countries (French, German, British and Scandinavian zones) can be viewed as a way to reduce the public deficit or indebtedness, while in the Eastern zone the aim is to reduce the State’s weight in the economy.

Also, the privatization process has been different in each country. In the Eastern countries and the British zone the privatized firms during the years of our study are

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5 For a detailed study of the debt in developing countries, see Correia Da Silva, Estache y Järvelä (2004)
smaller than in the rest of Europe. In the UK, the main companies were privatized before 1995. In the Eastern countries privatization has started recently. Moreover, in the Eastern countries, unlike other OECD countries, the government did not give subsidies to SOEs before privatization, whereas in other OECD countries SOEs were restructured before being sold (Vergés, 2000; Berne and Pogorel, 2004; Boussofiane et al., 1997).

Our results are not consistent with those of Megginson et al. (1994) and Dewenter and Malatesta (2001) where, at international level, it is observed that profitability and efficiency increases and leverage decreases after privatization. However, we find that privatized companies are more profitable, more efficient and less levered than privatized companies. These differences may be due to the fact that in our sample the control group includes smaller firms than the privatized group (see Table 2, Panels A and B). Most of the latter have operated in a natural monopoly where, consequently, new firms must overcome barriers to entry and so are less profitable than privatized firms.

5.2.- Multivariate Analysis

To study the factors that determine the leverage of the firms, we carry out a multivariate regression which includes the following determinants: privatized or non-privatized firm, regulated or non-regulated firm, total assets, tangibility and ROA, as can be seen in equation 1. Also, to correct for endogeneity we introduce the one-period lagged dependent variable.

To avoid the effect of outliers on the results, observations whose standardized absolute value for leverage is greater than three have been eliminated. In consequence, we have 545 observations.

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6 We have replicated this analysis to the total sample with other leverage measures and the results obtained have been similar but with less statistical significance.
Table 5: Multivariate regression results

<table>
<thead>
<tr>
<th>Regression</th>
<th>PRIV</th>
<th>REG</th>
<th>SIZE</th>
<th>TAN</th>
<th>ROA</th>
<th>LEV 3 (-1)</th>
<th>F-statistic</th>
<th>R²</th>
<th>R² corrected</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total sample</td>
<td>-0.315</td>
<td>0.183</td>
<td>0.004</td>
<td>0.146</td>
<td>-0.001</td>
<td>-0.095</td>
<td>19.207</td>
<td>0.935</td>
<td>0.886</td>
</tr>
<tr>
<td>(n = 545)</td>
<td>(-5.001)***</td>
<td>(3.711)***</td>
<td>(6.636)***</td>
<td>(2.253)**</td>
<td>(-0.462)</td>
<td>(-1.897)*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>French</td>
<td>-0.413</td>
<td>0.430</td>
<td>-0.003</td>
<td>0.060</td>
<td>-0.001</td>
<td>0.253</td>
<td>21.678</td>
<td>0.941</td>
<td>0.898</td>
</tr>
<tr>
<td>(n = 251)</td>
<td>(-5.336)***</td>
<td>(5.865)***</td>
<td>(-0.706)</td>
<td>(0.505)</td>
<td>(-0.404)</td>
<td>(3.221)*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>German</td>
<td>-0.186</td>
<td>0.137</td>
<td>0.003</td>
<td>0.692</td>
<td>-0.006</td>
<td>0.463</td>
<td>9.342</td>
<td>0.483</td>
<td>0.431</td>
</tr>
<tr>
<td>(n = 56)</td>
<td>(-3.038)***</td>
<td>(2.205)**</td>
<td>(3.550)***</td>
<td>(6.194)***</td>
<td>(-1.107)</td>
<td>(6.252)***</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Scandinavian</td>
<td>0.047</td>
<td>0.002</td>
<td>-0.001</td>
<td>0.077</td>
<td>0.001</td>
<td>0.964</td>
<td>59.279</td>
<td>0.897</td>
<td>0.882</td>
</tr>
<tr>
<td>(n = 40)</td>
<td>(1.617)</td>
<td>(0.079)</td>
<td>(-1.70)*</td>
<td>(1.785)*</td>
<td>(0.345)*</td>
<td>(20.531)***</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>British</td>
<td>0.001</td>
<td>0.021</td>
<td>9.30E-05</td>
<td>0.064</td>
<td>-0.002</td>
<td>0.892</td>
<td>64.369</td>
<td>0.867</td>
<td>0.854</td>
</tr>
<tr>
<td>(n = 55)</td>
<td>(0.008)</td>
<td>(0.609)</td>
<td>(0.333)</td>
<td>(1.068)</td>
<td>(-1.228)</td>
<td>(21.565)***</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Eastern</td>
<td>0.003</td>
<td>-0.033</td>
<td>0.001</td>
<td>0.053</td>
<td>0.001</td>
<td>0.942</td>
<td>168.791</td>
<td>0.860</td>
<td>0.855</td>
</tr>
<tr>
<td>(n = 143)</td>
<td>(0.201)</td>
<td>(-1.523)</td>
<td>(0.823)</td>
<td>(1.717)*</td>
<td>(0.295)</td>
<td>(32.886)***</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The Table shows estimated coefficients of the regression. The t-statistic in brackets.
* Statistically significant at the 10% level.
** Statistically significant at the 5% level.
*** Statistically significant at the 1% level.
As can be seen in the first line of Table 5, the results in the total sample show a negative and significant coefficient for PRIV. This means that this variable is inversely correlated with leverage and that privatized firms are less leveraged than private firms. On the other hand, the coefficient for REG is positive and significant, so, according to Newbery (1997) we find that regulated companies use more leverage than non-regulated firms. The coefficient of size is positive and significant; in consequence, this is consistent with the argument that larger firms use more leverage than smaller firms because they have less probability of bankruptcy. These results are the same as those found by Rajan and Zingales (1995) and Wald (1999).

The tangibility variable is significant and positive, implying that a firm with more tangible assets will use more debt. This result is supported by the bankruptcy costs theory and it is consistent with Rajan and Zingales (1995). The coefficient for ROA is not significant, that means that, for our sample, profitability does not determine leverage. Finally, the one-period lagged dependent variable, included to control for endogeneity, is statistically significant.

When we carry out the study by zones, in the French zone regulation and privatization coefficients are significant and with the same sign that the total sample. However, size, tangibility and profitability coefficients are not significant, that means that for this zone these variables do not determine leverage.

The results for the German zone are similar than for the total sample. The PRIV and REG variables have the same meaning than in the French zone and total sample. The size variable is positive and significant, which coincides with Wald (1999) in the case of German companies but disagrees with Rajan and Zingales (1995) results for the German sample. The tangibility variable is directly correlated with the leverage. This result
agrees with Rajan and Zingales (1995) in the G-7 study, in which Germany shows a direct relationship between tangibility and leverage.

In the Scandinavian zone, there is a significant relationship between leverage and size, tangibility and profitability. The coefficient for size is negative, different from that of the total sample, supporting the argument that large firms should issue equity rather than debt (Ryen et al., 1997). The coefficient for tangibility is positive, as that for the total sample. The coefficient for profitability is positive and shows a direct relationship between profitability and leverage. This is consistent with the argument from Jensen (1986) that if the market for corporate control can force firms to commit to paying out cash by leveraging up, it is expected a positive relationship. Finally, there is no significant relationship privatization and regulation with leverage in this zone.

In the Eastern zone, after controlling for endogeneity, only the TAN variable is significant, showing a direct relationship between leverage and tangibility.

Finally, for the British zone, after controlling for endogeneity, no variable is significant. As Bevan and Danbolt (2002) find for UK firms, that capital structure determinants are sensitive to leverage definitions, we have repeated the analysis for the total sample with the total debt (LEV1) and long-term debt (LEV2) variables. For these dependent variables, the most important difference with the reported results is that ROA coefficient is negative and significant, in accordance with Titman and Wessels (1988) and Rajan and Zingales (1995). Tangibility is not significant for the LEV1 regression and regulation is not significant for the LEV2 regression. However, the other coefficients obtained for the LEV1 and LEV2 regressions agree with those of the LEV3 regression.
6.- CONCLUSIONS

The objective of this paper is to analyze whether there are differences in performance between firms that have been privatized and private firms in the EU. We also analyze whether previous ownership (state-owned versus private) and regulation affect capital structure.

To fulfill these objectives, we compare the differences in the profitability, leverage and labor intensity of privatized firms in the EU countries with a matched-pairs sample of private firms, during the period 1999-2002.

For the total sample, we have found evidence that privatized firms are more profitable, less leveraged and more efficient than private firms. Our results for the EU are not consistent with those of Megginson et al. (1994) and Dewenter and Malatesta (2001) where, at international level, it is observed that profitability and efficiency increases and leverage decreases after privatization. These differences may be due to the fact that in our sample the control group includes smaller firms than the privatized group. Most of the latter have operated in a natural monopoly where, consequently, new firms must overcome barriers to entry and, in consequence, are less profitable than privatized firms. Nevertheless, results differ for each geographical zone.

With respect to capital structure, for the total sample, privatization, regulation and size determine leverage independently of leverage measurement. The influence of regulation and tangibility on leverage depends on leverage measurement.

However, we have found important differences between zones. This may be for different reasons. First, because of different economic and legal environments. Although our study refers only to the EU, there are legal and economic differences between countries. Also, the different privatization process, especially for the Eastern zone, where there are not developed capital markets (Hyclak and Kina, 1994) and the
UK, were privatizations started earlier than in other countries. Another reason may be the different expected goals in each country (Gonzalo et al., 2003). And finally, the small number of observation in some zones, particularly, the German, the Scandinavian and the British zones, that make our results by zones to be quite week.

One limitation to this research is that we have not been able to distinguish between firms that have been fully privatized from those that are still in process of privatization, because in the databases there is not information about ownership for each year. In consequence, our sample may include firms that are still controlled by the state.

Another difficulty in carrying out our study has been to find companies of the same size than privatized ones. In many cases, privatized companies, before privatization, operated in a monopoly or had a dominant position in the market. In consequence, the companies that are available for the control group are usually smaller companies, because either they had not a dominant position in the market or they have entered into the market after industry liberalization.

With respect to previous research, this paper adds new evidence about the privatization process and firms’ capital structure in the EU. Furthermore, this paper provides an analysis of the effects of the privatization process on firm performance for all the EU countries by analyzing the differences between privatized and private firms using a matched-pairs sample which allows for comparisons between companies of similar characteristics.
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