NEW EVIDENCE ON THE PERFORMANCE OF ITALIAN PRIVATIZED FIRMS: SHOULD THE EXPERIMENT BE REPEATED IN THE AFTERMATH OF THE RECENT FINANCIAL CRISIS?

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Abstract

We provide new evidence on the performance of privatized firms in Italy. On a large sample of 53 non-financial firms privatized from 1992 to 2005, our study shows that privatizations improve efficiency and profitability ratios, sales, and dividend payout. The most important determinant of performance and efficiency gains is the full transfer of control to private investors. Unlike the prevalent international evidence, we find that privatizations result in an increase of leverage ratio and do not affect the number of employees. Moreover, in contrast to international studies, we also find that efficiency and performance improvements are larger in firms operating in protected sectors, and that state-owned firms acquired by foreign investors do not appear to fare better after their privatization. Finally, we find that performance and efficiency gains already occur some years before the date of privatization.

Keywords: Capital Structure, Dividend Policy, Efficiency, Performance, State-owned Firm

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1 Introduction

About 20 years ago, the privatization process of Italian firms took place. It consisted in the partial or total transfer to private entities of the ownership of state-controlled firms. The process triggered significant changes in the structure of Italian industry, in the size and development of capital market, in the competition among firms, etc. The implementation of the process was aimed at pursuing at least one of the following goals: 1) increasing the state incomes in order to reduce the public debt; 2) increasing the operating efficiency of the most poorly managed firms; 3) decreasing the state interference in economy; 4) promoting a broader investor participation in the stock market as well as the development of large, widely held industrial groups, able to successfully compete internationally; 5) creating competition in areas characterized by public monopolies so as to make the public enterprises subject to the market forces.

During the severe financial crisis that has affected the world economy since 2008 and the following sovereign debt crisis that has particularly influenced the economy of debt-burdened countries such as Italy, the issue has regained popularity as instrument to increase the state revenues through further divestments in order to slash the huge debt accumulated during past years.

Through an empirical analysis conducted on a sample of 53 Italian non-financial companies privatized between 1992 and 2005, the study aims to analyze the financial effects that the privatization process has induced in the privatized enterprises in terms of changes in profitability, sales, efficiency, invested capital, capital structure, dividend policy, and number of employees. It also analyzes the determinants of these changes.

The study shows a significant increase in all efficiency ratios, sales and dividends, as well as a growth in profitability ratios. Leverage ratio appears to have increased after the government has divested its stake. In Italy, the improved access to external financing sources, after privatization, seems to have allowed firms to raise more debt rather than rebalance their capital structure as a result of the trivial role of private and public equity markets. Through the comparison of financial indicators both in the third year before the privatization with those of the year of privatization and in the year of privatization with those of the third year after privatization, the study demonstrates that the effect of privatization took place in Italy gradually during the seven years under investigation. This means that government has restructured and reorganized the management of public enterprises even before the date of privatization. The regression analysis points out that

the full transfer of control of public enterprises to private entrepreneurs is the most significant determinant of performance changes; it significantly affects profitability and efficiency ratios.

The study advances the existing empirical evidence on Italian privatizations (e.g., Barucci and Pierobon, 2007 and 2010) in the following ways: first, it examines a larger sample of privatized firms. To the best of our knowledge, the sample investigated is the most comprehensive sample of non-financial privatized firms. Second, it analyzes new determinants of the effects of Italian privatizations; third, the results are strengthened by using statistical techniques, such as the PLS regression, suitable for small samples and a large number of regressors. We have not taken into account companies belonging to the financial sector since the performance of privatized banks and insurance companies may have been influenced by the process of mergers and acquisitions that characterized these sectors. Moreover, the privatization of financial institutions has unique profiles that make it difficult to compare their privatization with the privatization of non-financial companies.

The remainder of the article is organized as follows. In Section 2 we make a comparison between public and private enterprise, reporting several theories in favor of the higher efficiency of the private enterprise over the public one; section 3 summarizes the main international empirical evidence on the privatization with a focus on those studies analyzing the effects of privatization on a firm's management and performance; section 4 describes the empirical study carried out on the Italian firms; section 5 concludes.

2 Comparison between state ownership and private ownership

In this section we compare the characteristics of private and state-owned enterprises. First, we report the aims of these two types of firms, in order to understand the goals they want to achieve, and then we describe the main theories which point out the supposed higher efficiency of the private enterprise over the public one (Vickers and Yarrow, 1991; Shleifer, 1998).

2.1 Goals

For privately-owned firms, the goals of managers are well defined and identified in the profit and value maximization. Differently, state-owned firms also pursue the allocative efficiency and redistribution aims; their agendas therefore include the maximization of several social welfare functions. However, their goals are not always well defined, tend to change over time according to government successions, and this may create instability and uncertainty about their management.

2.2 Agency theory

The agency theory provides us with inspiring concepts required to compare the private with the public enterprise. An agency relationship is established by means of a contract by which one or more individuals (the principal) entrust another individual (the agent) with tasks that should be performed on behalf of the principal (Jensen and Meckling, 1976). The principal should define the main objectives of the organization, while the agent has to take the proper actions to implement these goals. Agency costs arise when the two parties of the agency relationship have conflicting interests and the principal is not fully informed on the agent's actions.

In private enterprises the agency relationship involves the owner-manager relationship. On the contrary, the agency relationship in a public firm is more complex, because we have at least two levels of the principal-agent relationship: the voter-politician relationship and the politician-manager relationship. In addition, public enterprises face more difficulties than private firms in identifying correctives and governance mechanisms that may align the goals of the agents (managers) to those of the principals (politicians and, ultimately, voters) (Vickers and Yarrow, 1991).

The usual governance mechanisms of private firms do not hold in state-owned firms. First, a private company can go bankrupt whether managers do poorly; this possibility induces both the shareholder to carry out a careful monitoring of the company and the manager to run the company efficiently in order to avoid the risk of losing its job should bankruptcy occur (Perotti and Spier, 1993). The private company's debt helps reduce agency costs: it maintains ownership concentration (Jensen and Meckling, 1976), reduces the management entrenchment (Grossman and Hart, 1982; Hart and Moore, 1995), and leads managers not to waste the firm's resources in unprofitable investments (Jensen, 1986). In addition, when the private company is heavily leveraged, creditors will be highly interested in further monitoring the actions of managers (Harris and Raviv, 1990).

Second, if the private company is listed on the stock market, poorly performing firms will experience a decline in their market value and hence may become the target of takeovers (Mikkelson and Partch, 1997); takeover threat should induce managers to manage the company better, since the new controlling shareholder could replace them with a more efficient management team. When the markets are efficient and stock price incorporates any information on the firm, the market itself becomes a governance instrument (capital market pressure monitoring), especially when the compensation of managers is linked to the firm's market value, so that their goals are more aligned to those of shareholders.

The governance mechanisms of state-owned firms are less effective. First, a state-owned firm is not likely to go bankrupt, since its creditworthiness may benefit from collaterals pledged by the state. As a consequence, such a company will have a soft budget constraint in the sense that potential losses may be covered by public finances and capital expenditures exceeding cash inflows can also be made by exploiting state resources. The state can ensure a soft budget constraint via subsidies, guarantees, social security cushions, and tariff increases. These characteristics, which are not present in a private company, may produce a significant managerial inefficiency; managers that do not face bankruptcy risks are likely to be induced to pursue low-quality, high-risk projects.

Moreover, most state-owned firms are not listed on the stock exchange. Consequently, there is no market price of their shares that would allow the investors to make a prospective evaluation and monitoring of their management; furthermore, the absence of a market price makes it harder to correlate the remuneration of managers to profit and value maximization aims. This also prevents any disciplining effect of the market for corporate control to be effective. Consequently, state-controlled enterprises should be managed more poorly than private firms.

2.3 Agency relationship with two or more principals

Some scholars (Dixit, 1996 and 1997; Martimort, 1996) have studied the agency relationship with two or more principals. They advocate privatizations by pointing out that one of the main characteristics of state-owned firms is that such enterprises are generally accountable to several individuals who are variously entitled to exercise ownership rights; but, each of these individuals tends to pursue its own goal.

Let's consider, for example, two state authorities, A and B, that seek to exercise their influence in order to achieve a particular result, respectively, α and β. Accomplishing these outcomes requires a certain commitment on the part of manager, which may not be monitored by the two principals. Since the amount of time and the degree of the manager's commitment is limited, a greater commitment in pursuing α implies less commitment in pursuing β; the principal A then offers a marginal remuneration to the agent whether he is committed in favor of α, and a marginal penalty otherwise; vice versa for the principal B. In other words, part of the compensation of A shifts to B. As soon as the two principals realize the real dynamic of the game, the monetary amount of the incentive to the agent will tend to decrease. As the number of the principals increases, the effectiveness (i.e., the monetary amount) of these incentive schemes decreases. Such a result may also be associated to a higher probability that the agent chooses, in equilibrium, not to make any effort in performing its assigned tasks. We can conclude that the incentive schemes of a firm subject to a single principal, as it is in a private company, are more efficient than those of a state-controlled firm, subject to several principals.

2.4 X-efficiency theory

X-efficiency theory (Leibenstein, 1978) argues that certain inefficiencies are not only the result of mistakes in the allocation of inputs; enterprises, even though they have the same kind of workforce (labor factor) and the same technology (capital factor), can achieve different performance in terms of worker productivity and output quality. Leibenstein (1978) points out that, within this framework, there is an X-factor, different from the traditional inputs (labor and capital), which may explain the efficiency or inefficiency shown by companies having the same inputs.

The absence of external pressures is an inefficiency factor of any public enterprise. The author points out that these companies are often monopolists; this favors a peaceful management and does not encourage the workers to put their best effort to improve their company's competitiveness. Another issue that the author highlights to explain the poor performance of state-owned firms pertains to their "immortality", in the sense that they benefit from public subsidies which significantly reduce their probability to go bankrupt. In such a context, managers will tend to pay less attention to implement projects that spur innovation. The problem of multiple goals is another factor that can explain their inefficiency: economic and social aims, often conflicting with each other, tend to exacerbate managerial issues. For these reasons, X-efficiency theory claims that privatization could substantially reduce inefficiency sources of state-owned firms, thus allowing them to improve their performance and competitiveness.

2.5 Public choice literature and the modern political economy

According to the theories above, privatization represents a means to restore efficiency regardless of any interest and goal of politicians and governments. The public choice literature and the modern approach to the political economy make it clear that even the goals of the politicians might be misaligned with respect to the maximization of social welfare (and therefore of the voters' interests). These theorists criticize the fact that politicians may be interested in pursuing their own specific goals such as misusing their own powers to pursue ideological interests, the interests of a lobby or simply their re-election, and accordingly influencing the management of state-owned firms (Barucci and Pierobon, 2007; Vickers and Yarrow, 1991).

2.6 Privatization, liberalization and regulation

The theoretical discussion outlined above allows us to demonstrate the supposed better financial performance of private companies compared to that of state-controlled firms. Therefore, the sale to private entities of state-owned companies should result in profitability and efficiency gains. However, this perspective seems to be narrow since it does not consider the consequences of privatization in the framework of the whole social system. Florio (2004) points out that any assessment of privatizations which is exclusively carried out on the basis of a firm's balance sheet is necessarily biased towards a positive view of privatizations, because it does not take into account all possible redistributive/social instances that may characterize the state-owned firms. Therefore, on the one hand, allocative efficiency may deteriorate as a consequence of privatization; on the other hand, privatization could improve dynamic efficiency (to be intended as ability to grow) and technical-managerial efficiency.

Vickers and Yarrow (1991) tend to emphasize that the true distinction between efficiency and inefficiency should be sought in the market conditions in which a company is operating. A sufficient competitive pressure is able to motivate managers to pursue efficiency conditions. Competition, even as a governance mechanism, may play a positive role since it allows us to properly compare the company performance with the performance of its competitors. Therefore, perfect competition would ensure allocative efficiency (Pareto Optimality of the allocation of goods) and would play a positive role in ensuring the proper use of inputs (technical-managerial efficiency) with a decrease in the price of products. Without any adequate competitive pressure on the markets, private individuals will tend to appropriate the incomes permitted by the protections deriving from the markets; this may worsen allocative efficiency and, at the same time, may not maximize dynamic and managerial efficiency being inefficiencies associated with a protected status and with the absence of competitive pressures.

Consequently, in order to reach a positive and as high as possible net result of privatization, it is desirable to associate to privatization proper measures aimed at inducing privatized companies to charge prices not too far from those deriving from competition; this may be effected through liberalization and regulation policies. Liberalization and regulation policies are not alternative but complementary to privatizations since they allow the firms to pursue dynamic efficiency, technical-managerial efficiency as well as a high level of allocative efficiency.

3 Literature review

Empirical studies on the effects of privatizations generally perform two kinds of analyses: a) comparing the performance of companies before and after their privatization (hereafter, "Before-After" methodology); b) analyzing the motives behind the performance changes of privatized companies.

3.1 "Before-After" methodology: main empirical results

The most commonly used methodology to study the impact of privatizations consists in comparing a company's financial performance during the years immediately before and after the date of its privatization.

3.1.1 Cross-country empirical studies

Megginson et al. (1994) and D'Souza et al. (2005 and 2007) compare the median of the performance indicators of privatized firms during the three years before and the three years after the year of privatization; sampled companies belong to developed countries. They find that, after privatization, enterprises become more profitable, increase their sales, operational efficiency and payout ratio, and reduce their leverage ratio. They do not show a significant change in the number of employees. With reference to investments, Megginson et al. (1994) and D'Souza et al. (2005) find a significant increase, while D'Souza et al. (2007) show a significant decrease. Boubakri et al. (2005), who have investigated the effects of privatizations in developing countries, find significant improvements in profitability, production efficiency, investments and sales; the number of employees decreases, but it is not statistically significant. Dewenter and Malatesta (2001) analyze the impact of privatization both in the medium term (i.e., by comparing the performance during the three years before and the three years after privatization) and in the long-term (i.e., by comparing the performance during the ten years before and the five years after the privatization). They show a significant increase in profitability, as well as a significant decrease in the number of employees both in the medium and in the long-term. Their studies also point out that operating efficiency significantly improves even before privatization but not after it. They therefore argue that the privatization process can produce effects on the firm performance that may occur prior to the date of privatization. This probably means that governments could have reorganized and increased the efficiency of state-owned enterprises even before the date of privatization in order to sell their shares at a better price and to attract a greater number of investors.

3.1.2 Country-wide empirical studies

Alexandre and Charreaux (2004) emphasize the need to perform single-country studies; indeed, the evidence concerning a single country may not be consistent with cross-country studies in which the same individual country is included since the effects of privatizations are, at least in part, country-specific. In single European countries, the results of privatizations appear to be less evident.

In a sample of French privatizations, Albouy and Obeid (2007), after the study by Alexandre and Charreaux (2004), confirm a significant increase in profitability ratios (only return on sales) and all efficiency ratios, while Alexandre and Charreaux (2004) only show an increase of the net income per employee ratio, and a significant decrease in debt ratio. Furthermore, they point out a decrease in capital invested ratios due to a higher increase of assets and sales than the increase in invested capital, while Alexandre and Charreaux (2004) show a statistically insignificant increase of them. Both studies carry out the previous analysis by dividing the period into two sub-periods: they compare the performance indicators of privatized enterprises during the pre-privatization period (year -3 vs. year 0) and the post-privatization period (year 0 vs. year +3). It emerges an increase in performance even before the date of privatization and this increase is greater than the increase registered during the post-privatization period; this result is probably due to restructurings of enterprises to be privatized which were already performed by the government prior to privatization, in order to improve the efficiency of state-owned firms, making them more attractive to private investors so as to sell them at a better price.

Spanish experience does not seem to show that privatizations result in the beneficial effects that were expected to be produced according to theoretical and empirical international studies. Garcia and Anson (2007) point out a significant decrease in production efficiency (net income per employee ratio) and do not observe changes in profitability ratios. Farinos et al. (2007) show a slight decrease in profitability; unlike the previous study, they point out significant increases in efficiency (net income per employee ratio) and sales. In contrast with the most common assumptions, they find a significant growth in the number of employees. Invested capital indicators increase, but they are not statistically significant.

Privatizations in UK are investigated by Parker (2003) who analyzes the main studies on UK firms. Hutchinson (1991), Bishop and Thompson (1992), Haskel and Szymanski (1993), Burns and Weyman-Jones (1994), Martin and Parker (1997), Harris et al. (1998), Cox et al. (1999), and Newbery and Pollitt (1997) study the performance of UK privatized firms and point out that production efficiency improves significantly after privatization. In addition, Haskel and Szymanski (1993) and Martin and Parker (1997) find larger performance improvements in industries where privatizations were accompanied by an increase in competition and by a regulatory process. UK experience therefore shows that privatization policies lead to better results depending on whether they are simultaneously associated with liberalization and competition policies.

With reference to the privatizations in Italy, Goldstein (2003) examines a sample of 25 privatized enterprises and shows a significant growth in sales and invested capital, and a significant decrease in leverage. However, the increase in profitability as well as the decrease in efficiency are not statistically significant. Gallo (2005) considers a sample of 14 firms and remarks a significant increase in productivity, a significant decrease in leverage and in the number of employees. Mediobanca (2001) makes a comparison between the average of some performance ratios related to 24 companies during the three years before and the three years after privatization; it points out that, after privatization, profitability and efficiency ratios increase, invested capital indicators decrease, and capital structure remains unchanged. Barucci and Pierobon carried out several studies on Italian privatizations in 2007 and 2010. Barucci and Pierobon (2007) analyze a sample of 51 companies which were privatized between 1992 and 2001, while in their 2010 study, they consider a sample of 71 companies which were privatized between 1992 and 2005. This latter includes both industrial companies and financial institutions such as banks and insurance companies. They point out a significant increase in profitability, production efficiency, sales and dividends, while the number of employees did not change. Barucci and Pierobon (2007) show larger performance gains in the financial sector. They also point out that firms belonging to sheltered sectors, unlike the international empirical evidence, fared better than firms operating in competitive sectors. Finally, they make a comparison between performance changes of enterprises whose control was transferred to private entities (full privatizations) and performance changes of enterprises still controlled by the state (partial privatizations). They show significant efficiency improvements for both sub-groups. However, partial privatizations produced a non-significant increase in profitability and a significant increase in sales, employees and dividends; full privatizations were characterized by a significant increase in profitability and a non-significant increase in dividends.

3.2 How can we explain the performance changes?

Although the literature generally points out that privatization increases efficiency and performance, we need to analyze the reasons why privatization can contribute to increase a company's performance.

3.2.1 Competitive framework of the sector where the company operates

Haskel and Szymanski (1993), Martin and Parker (1997), and Vickers and Yarrow (1991) claim that competition is the most important determinant of the increase in the company's post-privatization performance; indeed, an enterprise has to compete with other companies to attract customers and increase its market share, being subject to a beneficial pressure which is required to ensure its survival and to stimulate greater efficiency and profitability.

Megginson et al. (1994) and Boubakri and Cosset (1998) find significant efficiency enhancements in companies that were operating in competitive sectors. Boubakri et al. (2005) also point out that market liberalization is associated with an increase in efficiency, investments, and sales. D'Souza et al. (2007) underline a positive relationship between competitive structure and sales. Boardman and Laurin (1998) highlight that companies operating in the utilities sector, not being subject to a pressing competitive framework, are less likely to benefit from privatization.

3.2.2 Full vs. partial privatization

As a consequence of the ownership change, privatization redefines the company goals. It is well known that state-owned firms can also pursue goals that depart from profit and value maximization aims; therefore, the increase in performance of privatized companies may also depend on the percentage of their ownership that is held by the government, which might be equivalent to the ability of the government to interfere in the privatized company. Boubakri and Cosset (1998) point out a remarkable increase in efficiency when the government relinquishes its controlling stake. Larger increases in performance are therefore expected as a consequence of privatizations characterized by private owners that control the majority of equity interest.

3.2.3 Control held by foreign vs. domestic private investors

The presence of foreign investors may also affect the performance improvements of privatized companies. Foreign owners can bring new technical knowledge and managerial skills, as well as can give access to new markets and new sources of capital. D'Souza et al. (2007) document a significant positive relationship between foreign ownership and efficiency after privatization. D'Souza et al. (2005 and 2007) also find that foreign ownership negatively influences the number of employees. Foreign owners are less likely to be influenced by domestic policy and national social problems and appear to be able to reorganize overstaffed companies better.

4 The empirical analysis of the Italian case

4.1 Sample description

The sample investigated consists of 53 companies that were privatized by the government from 1992 to 2005, the period during which Italy has performed the greatest number of privatizations. The sample, which almost represents the entire population of Italian privatized firms, was constructed by selecting the privatized companies whose financial information, needed to carry out the estimations, was available for a three-year period before and after the year of privatization. The companies included in the sample are detailed in Table 1 together with the date of privatization.

The firms considered in the sample operate in a large number of industrial sectors. According to the classification provided by Mediobanca (2001), sampled firms are distributed in the following sectors: airports and transportation (4 firms); food production, distribution and catering (6 firms); aluminum production (3 firms); cement and glass (2 firms); chemical products (2 firms); heavy construction (6 firms); publishing (2 firms); mechanical and electronic industries (5 firms); iron and steel production (4); telecommunications (2 firms); textile goods (1 firm); utilities (14); service industries not elsewhere classified (2 firms).

Accounting-based data and ownership structure information have been collected from the following sources: a) the research commissioned by the Chamber of Deputies to Mediobanca, the largest and most prestigious Italian investment bank (Mediobanca, 2001), "*Le privatizzazioni in Italia dal 1992*"; b) the yearly publication "Il Calepino dell'Azionista", edited by "Ricerche & Studi spa" and the research division of Mediobanca; c) CONSOB, the public authority responsible for regulating the Italian stock market. Finally, we have also tapped the "Centrale dei Bilanci" for collecting accounting information not otherwise available from the sources a) and b).

4.2 Description of financial indicators used in the analysis and hypotheses on their expected change after the privatization

Table 2 reports the financial indicators as well as the expected sign of their change resulting from privatization process. The indices reflect seven different dimensions of the firm's behavior: profitability, sales, efficiency, investment policy, capital structure, dividend policy, and the number of employees.

Table 1. Sample description

Firm name	Privatization date		Firm name	Privatization date	
	Month	Year		Month	Year
Acea	July	1999	Fiera di Milano	December	2002
Acegas	February	2001	Finmeccanica	June	2000
Acsm	October	1999	Garboli Rep	May	1998
Aem Milano	July	1998	GS	February	1995
Aem Torino	November	2000	Hera	June	2003
Aeroporti di Roma	July	1997	Ilva Laminati Piani	March	1995
Aeroporti di Firenze	July	2000	Ilva Servizi Energetici	December	1995
Alcantara	January	1995	Inca International	January	1996
Alumix	March	1996	Italstrade	March	1997
Amga	October	1996	Lottomatica	May	2001
Ansaldo Trasporti	December	1993	Meta	March	2003
Asm Brescia	January	2002	Montefibre	July	1996
Autogrill	February	1995	Nuova Same	March	1997
Autostrade	December	1999	Nuovo Pignone	May	1994
Beni Stabili	June	2001	Pai	December	1992
Cementir	February	1992	Saipem	March	1998
Centrale del Latte di Torino	October	2000	Save	May	2005
Cirio Bertolli De Rica	March	1994	Savio Macchine Tessili	June	1995
Cogne Acciai Speciali	March	1994	Siv	December	1993
Comital	November	1996	Sme	December	1994
Dalmine	February	1996	Snam Rete Gas	March	2004
Dea	September	1994	Società Italiana Condotte	April	1997
Editrice il Giorno	March	1997	Telecom Italia	September	1997
Enel	October	1999	Terna	June	2004
Eni	December	1995	Tubi Ghisa	December	1992
Esaote Biomedica	July	1994	Wind Telecomunicazioni	August	2005
Eurallumina	December	1997			

Table 2. Variable description

Financial indicators	Variable name	Operationalization	Expected trend
1) Profitability	ROS	EBIT / Sales	+
	ROA	EBIT / Total assets	+
	ROE	Net income / Equity	+
2) Sales	SALES	Deflated sales	+
3) Efficiency	EFFICIENCY_1	Deflated sales / Number of employees	+
	EFFICIENCY_2	Deflated net income / Number of employees	+
	EFFICIENCY_3	Deflated total assets / Number of employees	+
4) Invested capital	INVESTED_1	Deflated net fixed assets	+
	INVESTED_2	Net fixed assets / Sales	+
5) Capital structure	CAPITAL_1	Total debt / Total assets	-
	CAPITAL_2	Interest-bearing debt / Total assets	-
	CAPITAL_3	Long-term debt / Total assets	-
	CAPITAL_4	Interest-bearing debt / Equity	-
6) Dividend policy	DIVIDEND_1	Cash dividends / Sales	+
	DIVIDEND_2	Deflated cash dividends	+
7) Employees	EMPLOYEES	Number of employees	-

Profitability, sales and, especially, efficiency indicators, are expected to increase as a result of the privatization. In fact, the main goal of a private firm is the maximization of profits and value, while state-owned firms largely aim at improving social welfare and allocative efficiency, regardless of the level of costs and the prices at which their services/products are offered to the public.

The indicators related to the invested capital are expected to grow after the privatization, since the privatized enterprises may access new financial resources as a result of the listing on the stock exchange and, more in general, their better shape to tap into the capital market after the privatization (D'Souza et al., 2005); furthermore, the privatized enterprises are expected to increase their investments in order to be more competitive and to increase sales.

Privatized firms are expected to reduce their leverage ratio. On the one hand, privatized enterprises are no longer entitled to benefit from the government's credit guarantees (D'Souza et al., 2005); on the other hand, they could benefit from their easier access to financial market that allows them to rebalance and diversify their capital structure by issuing new shares, convertible bonds, etc.. This should lead to a decrease of the debt ratio.

Privatization process is expected to result in a reduction of the number of employees due to the improved efficiency in the use of the work force; moreover, unlike state-owned enterprises, where

managers are typically appointed by politicians and could be induced to maintain an artificially high level of employment or to hire new employees so as to return a favor to friends or other politically connected people, privately owned firms are in a better position to make the use of the work force more efficient because they have to face the market forces.

Finally, privatized firms are expected to increase their dividends. After the privatization, the profitability should increase and the privatized enterprises are accountable to their shareholders and therefore they will have to pay higher dividends in proportion to the increased profits (Barucci and Pierobon, 2007).

4.3 Methodology

We use three approaches based on the "Before-After" methodology in order to study the evolution of financial indicators. In the first approach, we calculate yearly financial indicators of each firm for a six-year period, three years before (i.e. from year -1 to year -3) and three years after (i.e., from year +1 to year +3) the year of privatization (the year of privatization is set to 0). We next determine, for each indicator and for each firm, the three-year average for the period before and after the privatization. The year of privatization is excluded from the analysis since it includes both private ownership and state ownership. Wilcoxon signed-rank[14] test is then used to check if the three-year average of each indicator calculated after the privatization is statistically different from that calculated before the privatization (i.e., average from -1 to -3 vs. average from +1 to + 3). The second approach is based on a comparison between the two years that border the six-year period around the year of privatization, that is, the 3rd year before and the 3rd year after the privatization (i.e., -3 vs. +3). If the effects of privatization do not appear immediately after the event and/or some effect could have appeared in the year(s) immediately before the privatization, the comparison of the two extreme years is more likely to show the effects of privatization, rather than considering the average value of the three years before and the three years after the privatization. Finally, the third approach compares, on the one hand, the 3rd year before the privatization with the year of privatization (i.e., -3 vs. 0, pre-privatization period) and, on the other hand, the year of privatization with the 3rd year after the privatization (i.e., 0 vs. +3, post-privatization period). These comparisons allow us to make a first evaluation of the dynamic profile of the privatization process in the sense that they allow us to understand whether the effects of the privatization took place before, after or gradually during the seven years under investigation (including also the year of privatization). Some studies (e.g., Dewenter and Malatesta, 2001; Alexandre and Charreaux, 2004; Albouy and Obeid, 2007) indeed argue that the privatization process can produce anticipated effects, with respect to the privatization date, on the performance of privatized firms. This means that the governments could have restructured and increased the efficiency of state-owned enterprises even before the privatization date, in order to sell the shares of the future privatized companies at a better price and to attract a greater number of shareholders.

4.4 Results of the "Before-After" analysis for the entire sample

4.4.1 Comparison between the financial indicators related to the 3 years before and the 3 years after the privatization

Table 3 shows the results of the analysis that compares the three-year average of financial indicators during the pre-privatization period with that of financial indicators during the post-privatization period (i.e., average from -3 to -1 vs. average from +1 to +3) for the entire sample. First, according to our hypotheses, the average profitability increases after the privatization with respect to all the evaluated indices and to more than half of the considered companies. Indeed, ROS (return on sales), ROA (return on assets) and ROE (return on equity) increase from an average value of, respectively, 8.07%, 4.58% and -5.95%, during the pre-privatization period, to an average value of, respectively, 11.37%, 5.39% and 6.23%, during the post-privatization period. However, the change is statistically significant only for ROS, which after the privatization increases from an average (median) value of 8.07% (8.62%) to an average (median) value of 11.37% (9.85%). Moreover, it is worth noticing that about 60% of the firms in the sample experience a positive change of this ratio. These results appear to be less clear-cut than those emerging from international empirical evidence; however, they are in line with Barucci and Pierobon (2007) that also study the Italian privatization process.

According to the international empirical studies and hypotheses, the average (median) value of deflated sales experiences a strong increase after the privatization, from 12,242 (1,406) to 14,012 (2,172). The increase is statistically significant and about 75% of sampled firms show a sales improvement.

[14] The Wilcoxon signed-rank test is a non-parametric test used when comparing two related samples, matched samples, or repeated measurements on a single sample to assess whether their population mean ranks differ.

Table 3. Before-after methodology: comparison between three years before and three years after the date of privatization (average from -3 to -1 vs. average from +1 to +3)

Financial indicators	Variable name	Firms	Mean Before	Mean After	Median Before	Median After	Wilcoxon signed-rank test	% of companies with expected trend
1) Profitability	ROS	53	8.07%	11.37%	8.62%	9.85%	2.041**	60.38%
	ROA	53	4.58%	5.39%	5.35%	5.14%	1.191	54.72%
	ROE	51	-5.95%	6.23%	7.41%	6.14%	0.637	52.94%
2) Sales	SALES (thousand euros)	53	12,242	14,012	1,406	2,172	3.546***	75.47%
3) Efficiency	EFFICIENCY_1	53	2.87	4.02	2.34	2.62	3.970***	75.47%
	EFFICIENCY_2	53	0.22	0.42	0.07	0.07	2.545**	71.70%
	EFFICIENCY_3	53	9.34	12.39	3.85	4.51	3.537***	60.38%
4) Invested capital	INVESTED_1 (thousand euros)	53	14,262	12,988	732	778	0.412	56.60%
	INVESTED_2	53	98.57%	85.42%	40.01%	38.36%	2.085**	43.40%
5) Capital structure	CAPITAL_1	49	44.34%	45.89%	39.67%	45.46%	0.691	42.86%
	CAPITAL_2	49	22.73%	24.19%	18.96%	22.87%	0.701	44.90%
	CAPITAL_3	49	11.10%	12.53%	5.36%	9.62%	0.878	46.94%
	CAPITAL_4	48	265.45%	99.79%	65.47%	76.25%	0.779	50.00%
6) Dividend policy	DIVIDEND_1	27	1.83%	4.42%	0.91%	3.46%	3.829***	77.78%
	DIVIDEND_2 (thousand euros)	28	214	1,248	10	67	3.314***	75.00%
7) Employees	EMPLOYEES	53	9,701	8,660	1,333	1,627	0.788	49.06%

Note: *, **, and *** denote a statistical significance, respectively, of 10%, 5%, and 1%

Table 4. Before-after methodology: comparison between the 3rd year before and the 3rd year after the date of privatization (-3 vs. +3)

Financial indicators	Variable name	Firms	Mean -3	Mean +3	Median -3	Median +3	Wilcoxon signed-rank test	% of companies with expected trend
1) Profitability	ROS	47	6.77%	12.97%	6.79%	8.77%	2.381**	65.96%
	ROA	47	4.10%	5.75%	3.81%	5.09%	1.958**	65.96%
	ROE	45	-0.29%	6.54%	6.53%	5.93%	0.265	53.33%
2) Sales	SALES (thousand euros)	47	13,378	15,480	2,034	2,595	2.603***	61.70%
3) Efficiency	EFFICIENCY_1	47	2.65	4.33	2.16	2.81	3.524***	66.04%
	EFFICIENCY_2	47	0.21	0.51	0.06	0.06	2.064**	74.47%
	EFFICIENCY_3	47	10.84	13.80	3.50	4.88	3.175***	57.45%
	INVESTED_1 (thousand euros)	46	16,470	14,233	682	843	0.005	54.35%
4) Invested capital	INVESTED_2	46	115.92%	80.85%	48.10%	54.78%	1.994**	43.48%
	CAPITAL_1	40	46.78%	47.81%	43.44%	50.03%	0.349	45.00%
5) Capital structure	CAPITAL_2	40	24.43%	25.42%	21.28%	25.56%	0.363	47.50%
	CAPITAL_3	40	11.44%	12.43%	5.29%	7.37%	0.123	45.00%
	CAPITAL_4	39	435.84%	135.88%	178.40%	96.30%	0.056	43.59%
	DIVIDEND_1	23	1.05%	4.43%	0.00%	2.85%	3.099***	73.91%
6) Dividend policy	DIVIDEND_2 (thousand euros)	24	59	1,630	0	89	3.179***	57.14%
7) Employees	EMPLOYEES	47	11,165	9,393	1,545	1,724	1.386	55.32%

Note: *, **, and *** denote a statistical significance, respectively, of 10%, 5%, and 1%

Moving to efficiency ratios, all the three indicators show a large and statistically significant improvement after the privatization. More in detail, turnover, net income and total assets per employee ratios increase from an average (median) value of, respectively, 2.87 (2.34), 0.22 (0.0723) and 9.34 (3.85), during the pre-privatization period, to an average (median) value of 4.02 (2.62), 0.42 (0.074) and 12.39 (4.51), during the post-privatization period. Efficiency gains, after the privatization, seem to be mainly due to the improvement of business turnover and profitability, without a significant decrease of the number of employees. In fact, in contrast to our expectations, the number of employees does not experience any statistically significant change.

With reference to the investment policy indicators (i.e., deflated net fixed assets and net fixed assets to sales ratio), despite the most common evidence shows a positive change after the privatization, our analysis points out a statistically significant reduction of the net fixed assets to sales ratio that decreases from an average (median) value of 98.57% (40.01%), during the pre-privatization period, to an average (median) value of 85.42% (38.36%), during the post-privatization period. The change of deflated net fixed assets is not statistically significant. This result may be explained by the fact that sales experience a strong increase after the privatization, while net fixed assets tend to remain unchanged, therefore leading to a reduction of the net fixed assets to sales ratio.

Capital structure does not experience any statistically significant change after the privatization. The number of enterprises that increase their debt ratio

seems to offset the number of enterprises that decrease it. Finally, with regard to the dividend policy, a significant increase of deflated dividends and of dividends to sales ratio shows up for more than 75% of the sampled firms. According to our expectations, this ratio increases from an average (median) value of 1.83% (0.91%), during the pre-privatization period, to an average (median) value of 4.42% (3.46%), after the privatization. This result is also due to the fact that, before the privatization, a substantial number of enterprises (10 enterprises out of 27, whose data on dividends were reliably available) did not pay cash dividends.

The framework emerging from these estimations is mostly consistent with the basic assumptions concerning the expected effects of the privatization process. The injection of private capital in business activities results in an increase of profitability, sales, efficiency, and of the inclination to pay dividends; however, no significant decrease of the number of the employees and of the debt ratio comes out. Investment policy indicators seem to show a reduction of investment effort but the evidence appears to be weak so that it does not allow us to draw any reliable conclusion.

4.4.2 Comparison between the 3rd year before and the 3rd year after the privatization

With reference to the comparison between the 3rd year before and the 3rd year after the privatization (-3 vs. +3), the results reported in Table 4 do not show qualitatively significant differences with respect to the comparison between the average of financial indicators in the three years before and after the privatization. The only relevant difference is that ROA, in addition to ROS, turns to be significant. Indeed, after the privatization, return on assets increases from an average (median) value of 4.10% (3.81%) to an average (median) value of 5.75% (5.09%). We may therefore state that private ownership has produced a significant increase of efficiency, profitability, sales and dividends.

4.4.3 Comparison between the 3rd year before the privatization and the year of privatization (pre-privatization period) and comparison between the year of privatization and the 3rd year after the privatization (post-privatization period)

Table 5 shows the comparison between the financial indicators measured in the 3rd year before the privatization and those measured in the year of privatization (-3 vs. 0, pre-privatization period), as well as the comparison between the financial indicators measured in the year of privatization and those measured in the 3rd year after the privatization (0 vs. +3, post-privatization period).

The pre-privatization period analysis shows an increase of the median value of all the profitability ratios, although the change is never statistically significant. A significant increase of sales, efficiency and dividend indices also comes out. Moreover, the analysis points out a decrease of the mean value of both capital invested indicators but only the net fixed assets to sales ratio experiences a significant drop. Such improvements may be the consequence of some early initiatives taken by the government that, in expectation of selling the firm to private investors, attempted to reorganize the business of those firms that were intended to be privatized in the following years, by increasing their operational efficiency, by cutting unprofitable investments, etc., so as to make them more appealing to potential buyers and, consequently, to fetch a better selling price.

The same trend may be observed in the post-privatization period. Even after the date of privatization, profitability ratios keep increasing, although the change is not statistically significant; we also find a significant increase of sales, deflated dividends and efficiency indicators, except the net income per employee ratio, which decreases. The indicators of invested capital do not experience any significant change as well as the number of employees.

Based on these results, we can state that, even before the privatization, some performance improvement seems to appear, especially in terms of sales and efficiency. This could mean that the government restructured and reorganized some state-owned firms even before the privatization date, in order to sell their shares at a higher price and to attract more investors. Performance gains keep going also after the disposal of the stake. The analysis therefore suggests that the effects of the Italian privatization process took place gradually during the seven years under investigation.

4.5 Multivariate analysis

The before-after analysis does not take into account the fact that performance and efficiency improvements as well as the changes of other variables may not be due to the privatization itself, but rather to other influencing factors such as the timing of divestment, the economic conditions that prevailed before, during and after privatization, the size and industry of the firm, etc..

In order to incorporate these issues in our study, we also perform a multivariate analysis by a fixed effects model in which the dependent variable is the variable whose change, before and after the privatization, is of our interest (ROS, ROA, ROE, etc.), and the independent variable (*privatization*) is a dummy variable that takes value 1 in every year after the privatization and value 0 in every year before the privatization for each firm. We also include a number of control variables such as the Italian GDP annual growth rate, the firm size measured by the number of employees, and firm- and year-fixed effects.

Table 5. Before-after methodology: comparison between the 3rd year before privatization with the year of privatization and comparison between the year of privatization with the 3rd year after privatization

Variable name	Firms	Pre-privatization period (-3 vs. 0)					Post-privatization period (0 vs. +3)				
		Mean -3	Mean 0	Median -3	Median 0	Wilcoxon signed-rank test	Mean 0	Mean +3	Median 0	Median +3	Wilcoxon signed-rank test
ROS	47	6.77%	10.15%	6.79%	9.00%	1.069	10.15%	12.97%	9.00%	8.77%	1.291
ROA	47	4.10%	4.03%	3.81%	4.79%	1.333	4.03%	5.75%	4.79%	5.09%	0.794
ROE	45	-0.29%	-0.51%	6.53%	8.43%	0.604	-0.51%	6.54%	8.43%	5.93%	0.322
SALES (thousand euros)	47	13,378	13,755	2,034	2,294	2.720***	13,755	15,480	2,294	2,595	1.937*
EFFICIENCY_1	47	2.65	3.79	2.16	2.59	3.048***	3.79	4.33	2.59	2.81	2.005**
EFFICIENCY_2	47	0.21	0.29	0.06	0.11	2.011**	0.29	0.51	0.11	0.06	1.915*
EFFICIENCY_3	47	10.84	14.29	3.50	4.03	1.037	14.29	13.80	4.03	4.88	3.852***
INVESTED_1 (thousand euros)	46	16,470	14,864	682	756	1.000	14,864	14,233	756	843	0.989
INVESTED_2	46	115.92%	82.69%	48.10%	28.17%	3.349***	82.69%	80.85%	28.17%	54.78%	0.279
CAPITAL_1	40	46.78%	44.77%	43.44%	41.72%	0.793	44.77%	47.81%	41.72%	50.03%	1.667*
CAPITAL_2	40	24.43%	22.28%	21.28%	20.18%	1.183	22.28%	25.42%	20.18%	25.56%	1.438
CAPITAL_3	40	11.44%	12.12%	5.29%	7.54%	0.833	12.12%	12.43%	7.54%	7.37%	0.109
CAPITAL_4	39	435.84%	262.62%	178.40%	176.93%	0.573	262.62%	135.88%	176.93%	96.30%	1.214
DIVIDEND_1	23	1.05%	3.19%	0.00%	2.55%	3.010***	3.19%	4.43%	2.55%	2.85%	1.241
DIVIDEND_2 (thousand euros)	24	59	921	0	58	3.051***	921	1,630	58	89	2.374**
EMPLOYEES	47	11,165	9,636	1,545	1,608	1.407	9,636	9,393	1,608	1,724	0.995

Note: *, **, and *** denote a statistical significance, respectively, of 10%, 5%, and 1%

Table 6. The effect of privatization: regression analysis

Dependent variable	model	constant	SE	privatization	SE	employees	SE	GDP_growth	SE	time dummy	R^2	observations	cross-sectional units
ROS	1	0.253**	*0.115*	0.044***	*0.009*	-0.025	*0.015*	0.354	*0.425*	NO	0.722	444	53
	2	0.337**	*0.134*	-0.007	*0.016*	-0.031**	*0.015*			YES	0.747	444	53
ROA	3	-0.001	*0.072*	0.007	*0.006*	0.005	*0.009*	0.705**	*0.276*	NO	0.738	449	53
	4	0.125	*0.086*	0.002	*0.010*	0.000	*0.009*			YES	0.750	449	53
ROE	5	0.539*	*0.321*	0.045*	*0.027*	-0.074*	*0.043*	2.037*	*1.228*	NO	0.453	421	52
	6	0.811**	*0.377*	0.101**	*0.045*	-0.076*	*0.044*			YES	0.498	421	52
EFFICIENCY_1	7	-2.139	*2.864*	0.981***	*0.249*	0.708*	*0.387*	-17.547	*11.273*	NO	0.664	448	53
	8	-2.154	*3.483*	0.898**	*0.432*	0.637	*0.401*			YES	0.676	448	53
EFFICIENCY_2	9	-0.940	*0.678*	0.183***	*0.058*	0.151*	*0.091*	0.331	*2.615*	NO	0.713	449	53
	10	-0.821	*0.818*	0.106	*0.099*	0.148	*0.094*			YES	0.725	449	53
EFFICIENCY_3	11	24.059**	*10.564*	3.393***	*0.900*	-2.079	*1.425*	-59.377	*40.77*	NO	0.917	451	53
	12	29.904**	*11.645*	2.953**	*1.376*	-2.451*	*1.433*			YES	0.923	451	53
INVESTED_2	13	4.699***	*1.140*	0.142	*0.093*	-0.361**	*0.153*	-2.067	*4.217*	NO	0.815	438	52
	14	3.093**	*1.329*	-0.299*	*0.156*	-0.308**	*0.154*			YES	0.833	438	52
CAPITAL_1	15	0.163	*0.155*	0.016	*0.012*	0.041**	*0.021*	-1.115*	*0.572*	NO	0.662	372	49
	16	0.020	*0.192*	0.061**	*0.024*	0.050**	*0.022*			YES	0.683	372	49
CAPITAL_2	17	-0.223	*0.145*	0.020*	*0.012*	0.063***	*0.019*	-1.371**	*0.531*	NO	0.610	373	49
	18	-0.356**	*0.178*	0.046**	*0.022*	0.067***	*0.020*			YES	0.636	373	49
CAPITAL_3	19	-0.479***	*0.103*	0.005	*0.008*	0.079***	*0.014*	0.202	*0.378*	NO	0.698	375	49
	20	-0.398***	*0.125*	0.020	*0.016*	0.073***	*0.014*			YES	0.728	375	49
DIVIDEND_1	21	0.024	*0.090*	0.020***	*0.006*	0.000	*0.011*	-0.273	*0.300*	NO	0.337	210	28
	22	0.049	*0.064*	0.021**	*0.010*	0.003	*0.007*			YES	0.387	210	28

Note: The table reports estimations of a fixed effects regression model. Independent and control variables are as follows: Privatization is a dummy variable taking value 1 in every year after the date of privatization, and 0 in every year before the date of privatization for each firm; Employees is the natural logarithm of a firm's number of employees; GDP_growth is the Italian GDP annual growth rate at constant prices (source: International Monetary Fund). SE is the heteroskedasticity and autocorrelation consistent standard error. The dependent variable is the ratio (e.g., ROS, ROA, ROE, etc.) whose change before and after privatization is under investigation. Each ratio is calculated yearly during a period that includes a number of years before and after privatization. Each regression model includes firm-fixed effects. *, **, and *** denote a statistical significance, respectively, of 10%, 5%, and 1%.

Table 6 shows the results of the regression analysis. ROS and ROE are shown to be significantly higher after privatization while controlling for firm size and business cycle, while ROA, which shows significant improvements in the before-after analysis, does not appear to be affected by significant changes. It is also worth noticing that, for ROS, after introducing time dummies in Model 2, the coefficient of the variable *privatization* is no longer statistically significant. This may indicate that the higher ROS after privatization is less likely to be related to the effect of privatization, but rather to the fact that it was performed in years with favorable economic conditions that resulted in a better ROS in the following years.

All efficiency ratios confirm their significant growth after privatization. These results appear to be robust to all specifications and controls. Efficiency enhancements seem to be the major effect of privatization.

With reference to other variables, in accordance to the before-after analysis, capital invested in relation to sales (INVESTED_2) has significantly decreased after privatization. Although this evidence may appear in contrast with our assumptions, we may find it quite reasonable. In fact, net fixed assets to sales ratio is no more than the reciprocal of the net fixed assets turnover, a measure of the efficiency of a company's use of its assets in generating sales. This result therefore further strengthens the efficiency gains already shown. More interestingly, capital structure variables, which in the before-after analysis do not seem to offer any insightful evidence, now point out that, after privatization, firms tend to increase their leverage ratio. The increase in debt ratio is not consistent with the common international evidence that finds that privatization, among other things, allows firms to access a larger set of financing sources that enable them to rebalance their capital structure. However, the Italian context may be different in what it is characterized by a clear prevalence of bank-financed firms, with private and public equity markets playing a negligible role. As a consequence, the supposed improved access to liquidity sources may result in raising new debt financing. However, long-term debt does not experience a significant growth. Finally, as expected and found in the before-after analysis, privatized firms tend to distribute more cash to shareholders as dividend payments after they have been privatized.

4.6 Do industrial sector, government's influence after privatization, and foreign ownership of privatized firms affect their financial indicators?

4.6.1 Univariate analysis

In order to get some first evidence about the potential determinants of the privatization's impact on financial indicators, we divide our whole sample into subsamples according to the variables that are supposed to affect the change of financial indicators after the privatization. Our primary goal is therefore to understand better the sources of these changes. We consider three grouping variables according to which the entire sample is broken down:

a) firms acting in protected sectors vs. companies acting in fully competitive sectors (19 companies vs. 34);

b) firms still controlled by the state after the privatization (i.e., partial privatization) vs. companies whose controlling interest is transferred to private owners (i.e., full privatization) (23 companies vs. 30);

c) firms controlled by foreign investors after privatization vs. companies controlled by domestic investors (11 companies vs. 42).

4.6.1.1 Protected vs. competitive sectors

Megginson et al. (1994) argue that efficiency gains appear to be higher in firms operating in competitive sectors. A competitive sector could be distinguished depending on whether or not a well-established, active regulatory authority assures a fair competition inside the unregulated industry. Unfortunately, this approach is not applicable to the Italian framework because regulation is not yet a consolidated part of the country's culture and the existence of an active authority often results from lacking competition. Indeed, it is worth noticing that in Italy several authorities have been established in sectors characterized by the presence of a monopolist or a dominant player. The setting-up of such authorities is often due to the absolute need to establish several basic rules in a sector which is not competitive at all, just in view of the privatization of the unique or main state-owned player. Consequently, we have included in protected industries those firms benefiting from operating in sheltered fields such as municipal utilities, large companies in the energy sector, Autostrade SpA, that is, the leading European concessionaire for toll motorway construction and management and for related transport services, the three Italian airport operators, and Telecom Italia SpA, that is, the ex-monopolist in telecommunication industry[15].

Table 7 shows the comparison between the average value of financial indicators in the three years before the privatization and that calculated in the three years after the privatization for both samples (protected vs. competitive sectors). First, as one can expect, firms operating in protected markets are characterized by profitability and sales levels far higher than those of their counterparts operating in

[15] Wind Telecomunicazioni SpA, another large telecommunication operator, was not considered since at the date of its privatization (2005) the telecommunication sector was characterized by a certain degree of competition among a sufficient number of companies as a result of the end of the monopoly dating back to 1998.

competitive markets. The increase of profitability, which normally emerges after the privatization, appears in both samples, however, such increase is not statistically significant neither in the companies belonging to regulated markets, nor in those belonging to competitive markets. However, it is worth noticing that the average of profitability ratios of the firms acting in competitive markets increase conspicuously after the privatization, especially ROS and ROE increase from an average value of, respectively, 2.08% and -15.51% to an average value of, respectively, 6.22% and 2.45%. In both samples, sales significantly increase after the privatization. More importantly, and in contrast with the common international evidence, firms acting in protected sectors experience a significant increase of all efficiency indicators; differently, in companies acting in competitive sectors such increase is statistically significant only with respect to the sales per employee ratio. We can therefore state that in Italy, the greatest efficiency improvements come out in firms acting in protected fields. Finally, the payout indicators experience a remarkable and statistically significant increase only in firms operating in protected markets.

4.6.1.2 Full vs. partial privatizations

One of the distinctive aspects of the Italian privatizations is that the state has the inclination to preserve the control of a large number of privatized firms. This creates the fruitful ground to examine whether full privatizations fare better or worse than their partial counterparts. If the hypothesis about the beneficial effects of privatizations should be confirmed, we would expect better efficiency improvements in full privatizations, that is, when the state surrenders completely the controlling interest.

Table 8 shows the "before-after" analysis for both samples (full vs. partial privatizations). First, we can observe that companies in which the state still holds its controlling stake have profitability ratios and sales far higher than those resulting in fully privatized companies; this means that the state has retained the control of the most profitable and largest companies. Second, with regard to profitability indicators, they remain unchanged for those companies which are still under the state control. On the contrary, they seem to increase on average in fully privatized firms; however, this increase is not statistically significant according to the Wilcoxon's test. Third, efficiency ratios and sales experience, on average, a positive and statistically significant change in both samples. This does not allow us to state that full privatizations perform better than partial privatizations. Finally, the maintenance of the state control is characterized by a statistically significant increase of dividends: deflated dividends and dividends to sales ratio increase from an average (median) value of, respectively, 270 (16) and 2.09% (1.41%), before the privatization, to an average (median) value of, respectively, 1,615 (112) and 4.53% (3.80%), after the privatization. This effect is not found for the companies which are no longer under the state control.

4.6.1.3 Control by foreign investors vs. control by domestic owners

The empirical literature points out a significantly positive relationship between foreign ownership and efficiency gains after the privatization; indeed, foreign owners may introduce managerial and technical knowledge and allow the companies to have access to new markets and new sources of capital. In this analysis, foreign investors are assumed to be controlling owners when they hold, directly and/or indirectly (only in the case of Ilva Servizi Energetici, we have encountered foreign owners exerting control through subsidiaries), more than 50% of the voting capital.

Table 9 shows that all financial indicators, except the number of employees, do not experience any statistically significant change after the privatization when the control is transferred to foreign investors. Unlike the results emerging in D'Souza et al. (2005 and 2007), foreign ownership does not seem to be associated with a significant improvement in profitability and efficiency. However, the number of employees scores a weakly significant decrease, from an average (median) value of 2,262 (575), prior to the privatization, to an average (median) value of 1,860 (499) after the privatization. This decrease is consistent with prior works and hypotheses. Unfortunately, we were unable to find data regarding the payout policy of these companies. On the contrary, the sample of firms that are not controlled by foreign investors shows more interesting results. It emerges a significant increase of sales, efficiency and payout indicators. The profitability ratios increase too, although such increase is not shown to be statistically significant. Investment policy is characterized by a decrease of the net fixed assets to sales ratio. In sum, the companies whose control was acquired by foreign investors after the privatization do not significantly improve their performance and efficiency. Differently, companies without any involvement of a foreign controlling interest show significant improvements in terms of profitability, sales, efficiency, and dividends. Therefore, we can say that in Italy the control by foreign investors does not seem to have brought particular benefits to the privatized enterprises, at least during the three years following the privatization. However, the sample of firms controlled by foreign investors is formed of a very small number of companies with the effect that the reliability of results may have been undermined.

Table 7. Protected vs. competitive sectors: comparison between three years before and three years after the date of privatization (average from -3 to -1 vs. average from +1 to +3)

	Protected sectors (19 firms)					Competitive sectors (34 firms)				
Variable name	Mean Before	Mean After	Median Before	Median After	Wilcoxon signed-rank test	Mean Before	Mean After	Median Before	Median After	Wilcoxon signed-rank test
ROS	18.78%	20.57%	15.18%	14.14%	1.127	2.08%	6.22%	3.56%	3.45%	1.581
ROA	7.29%	8.01%	7.01%	6.84%	0.966	3.06%	3.93%	3.50%	2.79%	0.761
ROE	10.14%	12.59%	7.41%	9.79%	1.127	-15.51%	2.45%	6.93%	1.96%	0.224
SALES (thousand euros)	25,461	29,430	3,456	4,761	2.897***	4,854	5,397	1,294	1,395	1.992**
EFFICIENCY_1	2.83	4.08	2.38	3.06	3.783***	2.89	3.99	2.33	2.56	1.855*
EFFICIENCY_2	0.34	0.67	0.23	0.40	2.656***	0.15	0.27	0.04	0.02	1.171
EFFICIENCY_3	9.12	11.09	6.20	7.74	3.461***	9.47	13.12	3.02	3.02	1.547
INVESTED_1 (thousand euros)	36,643	32,835	2,793	6,834	0.402	1,755	1,896	453	517	0.06
INVESTED_2	188.54 %	159.35 %	141.71 %	133.42 %	2.374**	48.30%	44.10%	23.59%	22.73%	0.282
CAPITAL_1	36.31%	41.72%	35.28%	41.89%	0.966	47.89%	47.73%	44.25%	46.78%	0.009
CAPITAL_2	25.48%	30.15%	23.78%	30.05%	0.966	21.52%	21.56%	17.67%	18.22%	0.128
CAPITAL_3	16.39%	20.61%	15.88%	18.44%	0.909	8.77%	8.97%	4.32%	4.90%	0.58
CAPITAL_4	67.76%	80.68%	48.71%	77.46%	0.966	355.30 %	108.48 %	100.86 %	75.05%	1.438
DIVIDEND_1	2.53%	5.68%	1.70%	4.45%	3.351***	0.81%	2.60%	0.00%	0.74%	1.481
DIVIDEND_2 (thousand euros)	340	2,076	18	124	3.408***	46	145	0	30	0.415
EMPLOYEES	19,064	16,563	2,701	2,416	0.362	4,469	4,244	770	885	0.744

Note: *, **, and *** denote a statistical significance, respectively, of 10%, 5%, and 1%

Table 8. Full vs. partial privatization: comparison between three years before and three years after the date of privatization (average from -3 to -1 vs. average from +1 to +3)

	Full privatizations (30 firms)					Partial privatizations (23 firms)				
Variable name	Mean Before	Mean After	Median Before	Median After	Wilcoxon signed-rank test	Mean Before	Mean After	Median Before	Median After	Wilcoxon signed-rank test
ROS	1.93%	6.71%	3.20%	2.99%	1.656*	16.07%	17.45%	13.49%	13.08%	1.156
ROA	2.59%	3.92%	3.50%	2.79%	1.018	7.18%	7.30%	7.20%	6.84%	0.426
ROE	-20.98%	2.43%	4.93%	1.87%	0.934	12.34%	10.86%	8.83%	9.64%	0.243
SALES (thousand euros)	3,630	4,139	947	1,131	1.697*	23,473	26,891	3,584	5,797	3.133***
EFFICIENCY_1	3.23	4.80	2.41	2.61	2.129**	2.39	3.01	2.11	2.65	3.650***
EFFICIENCY_2	0.18	0.43	0.04	0.02	1.573	0.27	0.39	0.21	0.18	2.099**
EFFICIENCY_3	11.20	15.43	3.02	3.02	1.142	6.92	8.43	5.57	6.30	3.771***
INVESTED_1 (thousand euros)	1,481	1,644	421	490	0.216	30,934	27,784	2,793	6,834	0.517
INVESTED_2	58.14%	49.97%	26.26%	24.39%	0.977	151.32 %	131.66 %	116.98 %	109.16 %	1.825*
CAPITAL_1	45.50%	46.61%	42.77%	46.76%	0.298	42.51%	44.77%	37.84%	45.46%	0.805
CAPITAL_2	23.01%	23.57%	17.67%	18.34%	0.134	22.29%	25.16%	21.14%	27.41%	0.845
CAPITAL_3	9.25%	11.06%	4.32%	5.42%	0.911	14.03%	14.86%	13.91%	12.81%	0.362
CAPITAL_4	383.37 %	118.01 %	100.86 %	81.00%	1.222	85.46%	71.98%	60.56%	73.34%	0.322
DIVIDEND_1	0.92%	4.05%	0.00%	0.86%	1.214	2.09%	4.53%	1.41%	3.80%	3.541***
DIVIDEND_2 (thousand euros)	45	147	0	33	0.135	270	1,615	16	112	3.582***
EMPLOYEES	2,675	2,429	676	679	1.450	18,865	16,788	3,104	3,351	0.000

Note: *, **, and *** denote a statistical significance, respectively, of 10%, 5%, and 1%

4.6.2 Regression analysis

In order to strengthen the above results, we have also carried out a regression analysis aimed at identifying potential factors that may affect changes in financial indicators of the privatized firms. In each regression model, the *dependent variable* is the change of the financial indicator under investigation, that is, the relative difference between its mean value during the three years after the privatization and its mean value during the three years before the privatization. The choice of the dependent variables reflects a subset of the financial indicators employed in the "before-after" analysis and used in multivariate analysis due to space constraints:

- ROS and ROE as proxies for profitability;
- deflated sales;
- net income per employee ratio and deflated assets per employee ratio as proxies for efficiency;
- deflated net fixed assets and net fixed assets to sales ratio as proxies for investment policy;
- total debt to total assets ratio and interest-bearing debt to total assets ratio as proxies for capital structure;
- dividends to sales ratio as proxy for dividend policy;

- number of employees.

The *independent variables* are the factors that theory and empirical literature identify as potential determinants of the changes of financial indicators after the privatization. They reflect the subsamples constructed in the univariate analysis as follows:

- PROTECTED is a variable that takes value 1 if the firm belongs to protected sectors, 0 otherwise;
- FULL is a variable that takes value 1 in case of full privatization, 0 otherwise;
- FOREIGN is a variable that takes value 1 if foreign investors have acquired the control of the privatized company, 0 otherwise.

We also include some control variables such as the natural logarithm of a firm's assets as a proxy for the firm size (ASSET) and a set of 13 (14-1) industry dummies to control for whether the change of financial indicators depends on the specific industry in which the privatization took place. The industrial classification used to construct the industry dummies is contained in the publication "*Le privatizzazioni in Italia dal 1992*", commissioned by the Chamber of Deputies to the research department of Mediobanca (Mediobanca, 2001). We control for the following sectors: airports and transportation; food production; distribution and catering; aluminum production; cement and glass; chemical products; heavy construction; publishing; mechanical and electronic industries; iron and steel production; telecommunications; textile goods; utilities; service industries not elsewhere classified[16].

Table 10 shows the results of the regression analysis. With reference to *profitability ratios*, the full transfer of control to private investors is the most significant determinant of the changes of profitability (ROS) after the privatization. This result confirms the hypothesis that full privatizations should result in profitability improvements higher than those of partial privatizations. The evidence is in line with the univariate analysis that pointed out better average improvements after the privatization in the subsample of fully privatized companies. The relationship between independent variables and *sales* is never statistically significant. This result may be explained by the fact that, as found in the univariate analysis, the privatization is always associated with an increase in sales, regardless of the fact that the firm was operating in competitive or protected sectors, was totally or partially privatized, or was acquired by foreign investors. According to our expectations, Table 10 points out a positive and statistically significant relationship between *efficiency ratios* and the full transfer of control. This may be due to the fact that without any state interference in the firm's management, it is easier for private investors to put in place restructuring actions so as to enhance the firm's efficiency. Likewise, the control by private investors may allow the firm to establish more effective corporate governance mechanisms, especially when the privatized firm is listed on the stock market, that result in higher efficiency and profitability gains. Although the univariate analysis shows higher efficiency improvements for firms operating in protected sectors, in the regression analysis efficiency gains do not seem to be influenced by the circumstance that the privatized firm belongs to protected or competitive sectors. Moreover, the analysis also points out that the greater the firm size, the higher the efficiency improvements appear to be. This could be due to the fact that, prior to the privatization, larger firms were less efficient than their smaller counterparts, therefore providing larger firms' managers with more room for improving. According to the univariate analysis, *capital structure*, *investment policy* and *the number of employees* do not show any statistically significant link with the independent variables. With reference to *dividends*, according to the univariate analysis, the complete transfer of control to private investors has a negative and statistically significant effect on the distribution of dividends: the state seems to be particularly eager to receive liquidity, probably to help cover the huge debt service. Finally, it is worthwhile to note that, differently from the univariate analysis, the increase of dividends is not significantly influenced by the fact that privatized firms belong to protected sectors.

4.6.3 Robustness tests: PLS regression

We have also carried out the regression analysis based on the Partial Least Squares (PLS) approach, in order to further strengthen the results of the univariate analysis and to confirm the results of OLS regressions. PLS regression is a recent technique that generalizes and combines features from principal component analysis and multiple regression (Vinzi et al., 2010). PLS regression is a robust regression method in the sense that it ensures reliable results even when the predictors are highly correlated with each other, the data are not normally distributed and, especially, the number of independent variables is disproportionately large compared to the number of observations. In fact, our sample is composed of 53 observations (their number drops to 27 when the dependent variable is the dividends to sales ratio) and we have 17 independent and control variables. Therefore, this technique is shown to be suitable in our framework. Specifically, we use the PLS regression algorithm and the bootstrapping re-sampling method performed by WarpPLS statistical software.

Table 11 shows the results of the PLS regression analysis. For each independent variable we report the value of the regression coefficient and, in parentheses, its p-value. The results are qualitatively similar to those obtained by OLS regressions with some noteworthy differences. Full privatizations continue to be the most influencing independent variable. The complete transfer of control to private investors affects positively profitability and efficiency ratios, and negatively the indicator related to dividends. Unlike OLS regressions, fully privatized firms experience better performance improvements not only in terms of ROS, but also in terms of ROE. Full privatizations also have a negative impact on investment policy measured by the net fixed assets to sales ratio. This last finding may be explained by the fact that private individuals, who are more interested in profit-making and value-creating actions, tend to successfully cut unprofitable investments.

[16] Due to space constraints, we have omitted the coefficients of the industry dummies from the regression tables. They are available on request.

Table 9. Foreign vs. domestic private investors: comparison between three years before and three years after the date of privatization (average from -3 to -1 vs. average from +1 to +3)

	Control by foreign investors (11 firms)					Control by domestic investors (42 firms)				
Variable name	Mean Before	Mean After	Median Before	Median After	Wilcoxon signed-rank test	Mean Before	Mean After	Median Before	Median After	Wilcoxon signed-rank test
ROS	6.71%	10.14%	4.05%	4.40%	0.978	8.42%	11.69%	9.60%	10.00%	1.482
ROA	6.18%	7.22%	2.59%	2.99%	1.067	4.16%	4.91%	5.39%	5.75%	0.394
ROE	-31.96%	0.67%	3.79%	0.99%	1.070	0.39%	7.59%	8.64%	8.28%	0.305
SALES (thousand euros)	3,528	4,123	1,004	1,255	0.800	14,524	16,602	2,614	3,043	3.620***
EFFICIENCY_1	3.71	4.64	2.44	2.57	0.889	2.65	3.86	2.30	2.64	4.107***
EFFICIENCY_2	0.08	0.40	0.00	0.00	1.423	0.26	0.42	0.08	0.10	1.932*
EFFICIENCY_3	6.95	7.78	3.45	2.80	0.533	9.97	13.60	3.94	4.79	3.782***
INVESTED_1 (thousand euros)	2,202	1,962	442	510	0.356	17,421	15,876	889	1,201	0.381
INVESTED_2	56.77%	52.56%	42.54%	38.36%	0.533	109.52%	94.02%	39.11%	38.42%	2.094**
CAPITAL_1	48.17%	45.93%	41.22%	45.42%	0.445	43.24%	45.88%	39.46%	45.66%	1.080
CAPITAL_2	31.60%	27.65%	19.86%	31.60%	0.800	20.17%	23.19%	18.67%	22.73%	1.312
CAPITAL_3	14.22%	13.17%	4.71%	5.00%	0.178	10.20%	12.35%	6.47%	11.56%	1.084
CAPITAL_4	661.36%	167.90%	73.53%	75.64%	0.764	161.26%	81.87%	65.47%	76.25%	0.631
DIVIDEND_1						1.83%	4.42%	0.91%	3.46%	3.829***
DIVIDEND_2 (thousand euros)						214	1,248	10	67	3.314***
EMPLOYEES	2,262	1,860	575	499	1.511	11,649	10,441	1,604	1,900	0.250

Note: *, **, and *** denote a statistical significance, respectively, of 10%, 5%, and 1%.

5 Discussion and conclusion

The ownership transfer of public enterprises to private individuals is characterized by the transition from a situation of soft budget constraint to a situation of strict budget constraint. In addition, state-owned firms show a more complex principal-agent relationship; corrective actions and governance mechanisms, able to align the goals of the agents with those of the principals, are more difficult to implement.

Our study, through univariate and multivariate analyses, compares a number of financial ratios before and after privatization and examines the potential factors that influence performance changes of privatized firms in Italy. Consistently with the prevalent literature, we show a significant increase in all ratios related to efficiency and sales, as well as an average increase in ROS, ROA (not in the regression analysis), and ROE (not in the before-after analysis). Privatized companies achieve these gains without significant decreases in the number of employees. The payout rate significantly increases as many state-owned companies did not pay dividends at all. In contrast to the prevalent literature, privatized firms significantly increase their debt ratio after privatization. This result may be highly country-specific in the sense that Italian firms that move from state ownership to private ownership may improve their access to financing sources which are largely represented by bank debt. Public and private equity issuances are rare and private investors, in Italy, may want to acquire and retain corporate control, while spurring firm growth, by minimizing the amount of their own funds invested in the firm. As a consequence, debt allows firms to grow while avoiding the private investors to infuse their own personal wealth and to risk of losing control. Finally, invested capital in relation to sales seems to have experienced a decline after privatization. However, this result may be seen in terms of improved efficiency of privatized firms because invested capital variable is the reciprocal of asset turnover; the higher the asset turnover, the more efficient the firm is in the use of its assets for generating sales.

By relying on the analysis on sub-samples and the regression analysis, we find that the full transfer of control of public enterprises to private entrepreneurs is the most significant determinant of performance changes; it significantly affects profitability, efficiency and dividends. However, although the evidence from this study confirms the theories in favor of the privatization process, our results do not appear to be fully convincing compared to those resulting from international studies. In fact, privatized firms did not undertake any deleveraging process and the growth of profitability ratios seems to be somehow weak. The weaker evidence may be due to the fact that the privatization process was triggered by the need to cope with the economic and financial crisis of the early 1990s, which entailed the need to decrease public debt, to regain credibility on international markets, and to respond to the pressures coming from the European institutions that were pushing Italy towards liberalizations. The divestment process has therefore taken place in Italy in a sub-optimal way since it did not pursue, as its main goal, the improvement of some of the major Italian firms. The aim to privatize in view of reforming the Italian economy has never managed to become, beyond good intentions, an actual and concrete priority of the Italian economic policy (De Nardis, 2000). The strong opposition raised by the old monopoly positions that have hindered the separation of the activities of the main public groups and a contradictory takeoff of regulatory authorities have effectively weakened the potential of the Italian liberalization process. The recent financial crisis could therefore put the government in contingency conditions that may negatively affect the performance of a new privatization process. Based on the past experience, we therefore wonder if a growth-oriented privatization could be undertaken in place of divestments primarily moved by the need to raise money as quickly as possible.

Table 10. Determinants of performance changes: OLS regressions

Independent variables	Dependent variables										
	ROS	ROE	SALES	EFFICIENCY_2	EFFICIENCY_3	INVESTED_1	INVESTED_2	CAPITAL_1	CAPITAL_2	DIVIDEND_1	EMPLOYEES
Constant	-0.147	0.143	-15392.117	-2.110**	-37.720*	29501.407	1.044*	0.005	0.062	-0.052	11774.824**
	(-1.247)	(0.217)	(-1.083)	(-2.109)	(-1.917)	(1.599)	(1.879)	(0.018)	(0.266)	(-0.847)	(2.426)
PROTECTED	-0.026	-0.037	4459.714	0.486	-7.749	-3400.086	-0.24	0.028	-0.093	0.004	-950.777
	(-0.480)	(-0.120)	(0.672)	(1.041)	(-0.844)	(-0.395)	(-0.926)	(0.221)	(-0.812)	(0.144)	(-0.420)
FULL	0.095**	0.388	-1404.523	1.105***	14.074*	784.506	-0.336	0.082	0.054	-0.068**	-535.985
	(1.993)	(1.448)	(-0.243)	(2.711)	(1.756)	(0.104)	(-1.485)	(0.783)	(0.566)	(-2.280)	(-0.271)
FOREIGN	-0.003	0.025	-3143.079	0.092	-2.200	4177.587	0.134	-0.069	-0.029		1292.993
	(-0.097)	(0.130)	(-0.761)	(0.315)	(-0.385)	(0.779)	(0.829)	(-0.844)	(-0.398)		(0.916)
ASSET	0.012	-0.013	1277.772	0.128*	3.239**	-2317.269*	-0.077**	0.004	0.008	0.005	-921.138***
	(1.515)	(-0.289)	(1.310)	(1.862)	(2.399)	(-1.830)	(-2.008)	(0.201)	(0.503)	(1.164)	(-2.766)
Industry dummy	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
R^2	0.492	0.491	0.363	0.327	0.281	0.43	0.274	0.227	0.291	0.455	0.388
Observations	53	51	53	53	53	53	53	49	49	27	53

Note: The table reports OLS regressions. The dependent variable is the relative change of each performance measure, that is, the relative difference between its mean value during the three years after the privatization and its mean value during the three years before the privatization. Independent variables are the potential determinants of this change. t-stats are in parentheses. *, **, and *** denote a statistical significance, respectively, of 10%, 5%, and 1%

Table 11. Determinants of performance changes: PLS regressions

Independent variables	Dependent variables										
	ROS	ROE	SALES	EFFICIENCY_2	EFFICIENCY_3	INVESTED_1	INVESTED_2	CAPITAL_1	CAPITAL_2	DIVIDEND_1	EMPLOYEES
PROTECTED	-0.136	-0.062	0.214	0.248	-0.234	-0.142	-0.286	0.209	-0.110	-0.091	-0.145
	(0.336)	*(0.449)*	*(0.269)*	*(0.309)*	*(0.240)*	*(0.323)*	*(0.161)*	*(0.282)*	*(0.334)*	*(0.453)*	*(0.340)*
FULL	0.374*	0.268*	-0.043	0.604*	0.437*	0.017	-0.356*	0.222	0.211	-0.660**	-0.069
	(0.091)	*(0.082)*	*(0.416)*	*(0.075)*	*(0.053)*	*(0.468)*	*(0.083)*	*(0.219)*	*(0.224)*	*(0.045)*	*(0.395)*
FOREIGN	0.138	0.160	-0.112	0.214	0.002	0.100	0.011	-0.061	-0.125		0.098
	(0.281)	*(0.249)*	*(0.264)*	*(0.229)*	*(0.496)*	*(0.258)*	*(0.454)*	*(0.408)*	*(0.331)*		*(0.282)*
ASSET	0.290*	-0.021	0.259	0.403**	0.514***	-0.377	-0.442**	0.016	0.054	0.245	-0.542**
	(0.094)	*(0.460)*	*(0.222)*	*(0.037)*	*(0.004)*	*(0.145)*	*(0.019)*	*(0.473)*	*(0.408)*	*(0.134)*	*(0.028)*
Industry dummy	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
R2	0.502	0.444	0.360	0.349	0.278	0.313	0.26	0.188	0.258	0.236	0.379
Observations	53	51	53	53	53	53	53	49	49	27	53

The table reports PLS (partial least squares) regressions. The dependent variable is the relative change of each performance measure, that is, the relative difference between its mean value during the three years after the privatization and its mean value during the three years before the privatization. Independent variables are the potential determinants of this change. p-values are in parentheses. *, **, and *** denote a statistical significance, respectively, of 10%, 5%, and 1%

Our study has some limitations that can be summarized as follows. First, we do not know what the performance of privatized firms would have been, if they had not been privatized; second, performance changes of sampled companies that occur outside the examined period are not considered; third, the effects of privatization on consumer and social welfare are not measured. Privatized firms could have achieved their better results after privatization by deteriorating the quality of services and goods provided to consumers.

References

1. Albouy, M., Obeid, H., 2007. L'impact des privatisations sur la performance des entreprises francaises, *Finance Controle Strategie* 10: 6-37
2. Alexandre, H., Charreaux, G., 2004. Efficiency of French privatizations: A dynamic vision, *Journal of Corporate Finance* 10: 467-494
3. Barucci, E., Pierobon, F., 2010. *Stato e mercato nella seconda repubblica*. Bologna: Il Mulino
4. Barucci, E., Pierobon, F., 2007. *Le privatizzazioni in Italia*. Roma: Carocci editore
5. Bishop, M., Thompson, D., 1992. Regulatory reform and productivity growth in the UK's public utilities, *Applied Economics* 24: 1181-1190
6. Boardman, A., Laurin, C., 1998. *The long-run financial performance of privatized firms: An empirical investigation*, University of British Columbia, Working Paper
7. Boubakri, N., Cosset, J., Guedhami, O., 2005. Liberalization, corporate governance and the performance of privatized firms in developing countries, *Journal of Corporate Finance* 11: 767-790
8. Boubakri, N., Cosset, J., 1998. The financial and operating performance of newly privatized firms: Evidence from developing countries, *Journal of Finance* 54: 1081-1110
9. Burns, P., Weyman-Jones, T., 1994. *Regulatory incentives, privatization and productivity growth in UK electricity distribution*, CRI Technical Paper 1, Centre for the study of Regulated Industries, Chartered Institute of Public Finance and Accountancy, London
10. Cox, A., Harris, L., Parker, D., 1999. *Privatization and supply chain management: On the effective alignment of purchasing and supply after privatization*, London: Routledge
11. De Nardis, S., 2000. Privatizzazioni, sviluppo: Introduzione e sintesi. In: De Nardis, S., (ed.), *Le privatizzazioni italiane*, Ricerca del Centro Studi Confindustria, Il Mulino, Bologna, pp. 9-41
12. Dewenter, K., Malatesta, P.H., 2001. State-owned and privately owned firms. An empirical analysis of profitability, leverage, and labor intensity, *American Economic Review* 91: 320-334
13. Dixit, A., 1996. *The making of economic policy*. Cambridge: The MIT Press
14. Dixit, A., 1997. Power of incentives in private versus public organizations, *American Economic Review* 87: 378-382
15. D'Souza, J., Megginson, W., Nash, R.C., 2005. Effect of institutional and firm-specific characteristics on post-privatization performance: Evidence from developed countries, *Journal of Corporate Finance* 11: 747-766
16. D'Souza, J., Megginson, W., Nash, R.C., 2007. The effect of changes in corporate governance and restructurings on operating performance: Evidence from privatizations, *Global Finance Journal* 18: 157-184
17. Farinos, J.E., Garcia, C.J., Ibanez, A.M., 2007. Operating and stock market performance of state-owned enterprise privatizations: The Spanish experience, *International Review of Financial Analysis* 16: 367-389
18. Florio, M., 2004. *The great divestiture: Evaluating the welfare impact of the British privatizations, 1979-1997*, Cambridge: The MIT Press
19. Gallo, R., 2005. *The economic and structural effects of privatization on enterprises in Italy*, Financial Management Association European Meeting, Siena
20. Garcia, L.C., Anson S.G., 2007. Governance and performance of Spanish privatized firms, *Corporate Governance: An International Review* 15: 503-519
21. Goldstein, A., 2003. Privatization in Italy 1993-2002: Goals, institutions, outcomes, and outstanding issues, *CESifo Working Paper Series n. 912*
22. Grossman, S., Hart, O., 1982. Corporate financial structure and managerial incentives. In: J.J., McCall, (Ed.), *The economics of information and uncertainty*, Chicago: University of Chicago Press, pp. 107-140
23. Harris, L., Parker, D., Cox, C., 1998. UK privatization: Its impact on procurement, *British Journal of Management* 9: 13-26
24. Harris, M., Raviv, A., 1990. Capital structure and the informational role of debt, *Journal of Finance* 45(2): 321-349
25. Hart, O., Moore, J., 1995. Debt and seniority: An analysis of the role of hard claims in constraining management, *American Economic Review* 85: 567-585
26. Haskel, J., Szymanski, S., 1993. The effects of privatization, restructuring and competition on productivity growth in UK public corporations, *Department of Economics Working Paper n. 286*, Queen Mary and Westfield College, London
27. Hutchinson, G., 1991. Efficiency gains through privatization of UK industries, in: Hartley, K., Ott, A.F., (eds.), *Privatization and economic efficiency: A comparative analysis of developed and developing countries*, Aldershot: Edward Elgar
28. Jensen, M.C., 1986. Agency costs of free cash flow, corporate finance and takeover, *American Economic Review* 76: 323-329
29. Jensen, M.C., Meckling, W.H., 1976. Theory of the firm: managerial behavior, agency costs and ownership structure, *Journal of Financial Economics* 3: 305-360
30. Leibenstein, H., 1978. *General X-efficiency theory and economic development*. Oxford: Oxford University Press
31. Martimort, D., 1996. The multiprincipal nature of government, *European Economic Review* 40: 673-685
32. Martin, S., Parker, D., 1997. *The impact of privatization: Ownership and corporate performance in the UK*, London: Routledge
33. Mediobanca, 2001. *Le privatizzazioni in Italia dal 1992*, Camera dei Deputati, Il sistema paese di fronte alle sfide della moneta unica e della globalizzazione dell'economia, vol. 3
34. Megginson, W., Nash, R.C., Van Randenborgh, M., 1994. The financial and operating performance of

newly privatized firms: An international empirical analysis, *Journal of Finance* 49: 403-452
35. Mikkelson, W., Partch, M., 1997. The decline of takeover and disciplinary managerial turnover, *Journal of Financial Economics* 42 (2): 205-228
36. Newbery, D., Pollitt, M.G., 1997. The restructuring and privatization of Britain's CEGB - Was it worth it?, *Journal of Industrial Economics* 45: 269-303
37. Parker, D., 2003. *The UK's privatization experiment: The passage of time permits a sober assessment*, CESifo Working Paper Series 1126
38. Perotti, E.C., Spier, K.E., 1993. Capital structure as a bargaining tool: The role of leverage in contract renegotiation, *American Economic Review* 83: 1131-1141
39. Shleifer, A., 1998. State versus private ownership, *Journal of Economic Perspectives* 12: 133-150
40. Vickers, J., Yarrow, G., 1991. Economic perspectives on privatization, *Journal of Economic Perspectives* 5: 111-132
41. Vinzi, V.E., Chin, W.W., Henseler, J., Wang, H., (eds.). 2010. *Handbook of Partial Least Squares*, Heidelberg: Springer-Verlag