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Article

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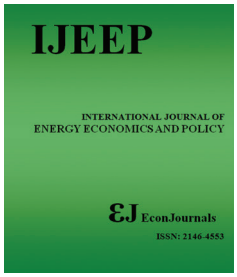

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Understanding How the Strategic Similarities between Energy Companies Influence the Post-mergers and Acquisitions Performances

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ABSTRACT

The energy sector has experienced rapid evolution in recent years, following the liberalization of the electricity and natural gas markets, driven by the European Union. These developments have led to a certain level of dynamism in Italy, particularly as concerns mergers and acquisitions (M&As) within the sector. This article examines the influence of strategic similarities between the target and bidder companies on their post-M&A performances. The model used involves a hierarchical regression relating the indexes of similarity between the merging companies, regarding their economic-financial management. The results reveal the influence of the strategic similarities and differences on the post-M&A performances of the companies, showing how the positive or negative effect depends on certain characteristics, such as their structure of share capital, business segments and size. The study evidences the strategic variables that should be considered in choosing the optimal target companies.

Keywords: Liberalization of Energy Sectors, Mergers and Acquisitions, Company Performance Evaluation, Strategic Similarity Index, Target Company's Characteristics
JEL Classifications: G34, L25, L98, Q43, Q48

1. INTRODUCTION

The European energy-utilities sector has seen profound change over the past 15 years, following the activation of the EU directives for liberalization of the internal market. The directives pursue the principles of a free market and the introduction of competition (European Parliament and Council, 1996; 1998), and the legislation introduced has been the primary motive behind a round of merger and acquisition activity that initiated in the 1990s (Andrade et al., 2001). The purposes of these actions are to gain corporate economies of scale, diversity in assets, and increased customer bases.

In Italy the process of liberalization began sometime after the passage of the EC directives, and has followed different timing and patterns in the electricity and natural gas segments.

The Italian Government actuated EU Directive 96/92/CE (European Parliament and Council, 1996) for the liberalization of the electricity sector by means of the legislative decree No 79 of 16 March 1999, the so-called "Bersani Decree" (Italian Parliament, 1999). The liberalization of the gas market was initiated by a separate act, the legislative decree No 164 of 23 May 2000, known as the "Letta Decree" (Ministry of Economic Development, 2000), which laid out the conditions for definition of eligible customers, competition, and conditions of reciprocity. In both sectors, the liberalization involved the unbundling of the distribution companies from those in retail, allowing the latter to operate in a more competitive market. Since the opening of the liberalization process, the energy companies have pursued various strategies to exploit the new opportunities. Among these, mergers and acquisitions (M&As) play an important role. In particular, companies have tried to exploit the potential for synergies in business diversification, by carrying out mainly horizontal or conglomerate M&As. Indeed vertical integration at the national level is prohibited by the European directives, since this strategy would be contrary to the principles of

unbundling (Capece et al., 2013). There are two main reasons for the phenomenon of diversification, in turn driving the M&As. The first is the increasing intersection of the markets involved in the different energy industries. In the production phase, the electrical companies aim to obtain economic advantages and higher security of supply in the purchase of natural gas for thermal plants; on the other hand the gas companies aim to obtain access to electricity market and so to increase their pool of demand and reduce uncertainty, while better responding to take or pay clauses in their own import contracts (Verde, 2008). The second reason for diversification through M&As lies in the opportunity for economies to be gained by reducing duplication in the downstream costs of the joined companies: Following the deregulation of retail activities, the merged company can offer a wide range of joint services to users, for example by promoting bundled "dual fuel" offers, and therefore reduce the marginal costs.

The aim of this paper is to analyze the ongoing surge in M&As through the measurement of the change in the bidder company's performance following process of integration, assuming that these performances derive from the strategies of the individual companies prior to the merger or acquisition event. This study addresses the following research questions. First, what is the performance change for the bidder companies, post-M&A? Second, what are the similarities in strategy between bidder and target, which positively or negatively influence the post M&A performance of the joint company? Finally, for successful results from an M&A operation, what characteristics should the target company have?

To answer the research questions, the analysis examines those M&As implemented during a 6 year period following the onset of liberalization of the Italian market, which were subject to authorization by the Italian Competition Authority Autorità Garante della Concorrenza e del Mercato (AGCM). The sample considered thus involves 99 companies, operating in the electrical energy, natural gas or water segments, or as multi-businesses in the overall sector. The start of the period is chosen as 2008, which was the first year following the liberalization of the electricity segment, which was opened on 1st July 2007. This important step in the liberalization of the overall sector followed on the earlier opening of the gas sector, where clients have been free to choose their supplier since 2003. The year 2013 is chosen as the closing year for the analysis. This allows the examination to cover the 2 years of the joint company emerging from each M&A event, with access to the financial statements released up to the end of 2015.

The study applies a hierarchical regression analysis to examine the impact of the independent variables on changes in the bidding company's post-M&A performance (performance change). The variables considered are divided in two groups. The first group are the control variables: Specifically the relative sizes of the two companies involved, and the bidder's performance prior to the merger or acquisition. The second group are the variables concerning the strategies of the two companies involved: Such as their liquidity, efficiency, capitalization, debt and solvency, diversity of income, and investment in innovation. Indicators of similarity are calculated, considering the main financial and profit indicators describing these variables, for both companies involved in the M&As. These are then inserted in the hierarchical regression.

The purpose of the model is to reveal how the similarities or differences between the two companies in an M&A event exert a positive or negative influence on the performance of the bidder during the following 2 years of the integration process. To carry out the examination, the sample of M&As is subdivided according to the characteristics of the companies: By business segment (the particular segment, or multi-business), by company size, and by whether or not the bidder is publicly listed.

2. LIBERALIZATION OF THE ENERGY SECTOR

This section describes the liberalization of the Italian energy sector, in the electricity, natural gas and water services segments.

2.1. Electricity Segment

The development of a single EU energy market through the liberalization and opening up of the national markets began in 1996, with the First Energy Package, by means of the Directive n. 96/92/CE (European Parliament and Council, 1996). The aim of this directive was the development of a competitive electrical energy market, with the free circulation of electrical energy within the entire European market.

The directive imposed several fundamental measures: (i) A prohibition against granting exclusive rights for the production, import or export of electricity, or for exclusivity in the construction and use of transmission lines, (ii) freedom of access to transmission networks, (iii) the gradual opening of the market, meaning that customers are free to choose their supplier.

The directive was transposed in Italian law in 1999, by legislative decree No. 79/99, which rejuvenated the national regulatory and institutional framework. The decree resulted in the reorganization of the Italian electricity industry, but with a distinction in the production phases. In particular, the phases of generation, import, export and sale have become competitive and liberalized, however transmission and dispatching remain under national monopoly, and the distribution is entrusted to the exclusive management of the Ministry of Economic Development. Although the decree for liberalization was passed in 1999 the actual opening of the domestic market occurred only in 2007, the year in which all end users became free to choose their suppliers.

Following the First Energy Package, the EU passed additional legislation for the further development of an integrated internal energy market. In 2003, the European Parliament and Council introduced the Second Energy Package, in the form of Directive 2003/54/EC, which enabled new gas and electricity suppliers to enter member states' markets and consumers to choose their own gas and electricity suppliers (European Parliament and Council, 2003a). The 2003 directive was activated in Italy by legislative decree No. 73/2007 (Italian Parliament, 2007). Effective 1 July 2007, this decree provided for the freedom of residential customers

to recede from binding contracts with their existing electricity supplier, and to choose a different supplier. The procedures for these actions are established by the Italian Regulatory Authority for electricity gas and water Autorità per l'Energia Elettrica il Gas e il Sistema Idrico (AEEGSI). The decree also establishes a regime of greater protection for residential customers and small and medium enterprises (SMEs) who do not choose a new supplier. In this case the protection consists of guarantees of continuity of supply, and the creation of a state-owned Single Buyer to perform the function of supplier of last resort.

The second energy package was then further modified in 2009, by the adoption of the third energy package, through the directive 2009/72/EC (European Parliament and Council, 2009a). This directive regulates the ownership of transmission networks, guaranteeing the clear separation of supply and production from the network operation activities. The directive also ensures more effective regulatory oversight, on the part of truly independent national energy regulatory agencies. In this regard, it strengthens the independence and competencies of the agencies, so as to allow effective and non-discriminatory access to the transmission networks. Finally, the directive includes further measures that strengthen the protection of consumers, including vulnerable customers. Among these is the supplier's obligation to provide the consumer with adequate communication of any modifications in the contract, and of the right to withdraw from the contract.

Directive 2009/72/EC was activated by legislative decree No. 93/2011 (Italian Parliament, 2011a). The most significant aspects of the Italian decree were the greater protection of residential customers and SMEs, specifically requiring the monitoring of market trends and competition conditions at intervals of not more than 2 years, as well as the adoption by the AEEGSI of measures for facilitating the switch of supplier. The decree also developed greater security in supplies, by facilitating international exchanges and strengthening the cooperation between Terna S.p.A. (operator of the national distribution grid) and the grid managers of other EU member states. Finally, the decree strengthened the development of the transmission grid by requiring Terna to provide regular 10 year investment plans.

2.2. Natural Gas Segment

In the natural gas sector, the intention of the EU legislation was to overcome the existing monopoly systems and move towards the creation of an open energy market. The first move in this sense consisted of Directive 98/30/EC, which established common rules for the transport, distribution, storage and distribution of natural gas (European Parliament and Council, 1998). The directive defined the regime concerning the organization of the natural gas sector, including liquefied natural gas (LNG), concerning the specific areas of market access, management systems, and the procedures for authorization of transport, distribution, storage and provision (Article 1 of the directive).

In Italy, the process of liberalization was initiated by the legislative decree 164/00, known as the Letta Decree (Ministry of Economic Development, 2000), for transposition of the European directive. The decree permitted the free choice of supplier in a first step to the distributing companies and to all customers with consumption >200,000 m^3/year, and from 1 January 2003 to all customers (both industrial and residential). Prior to the liberalization process, all the management stages of the Italian natural gas sector were under the monopoly control of the Ente Nazionale Idrocarburi and its subsidiaries.

The second European legislative package consisted of Directive 03/55/CE, enacted in 2003 (European Parliament and Council, 2003b). The objective was to resolve the gaps left by the preceding directive, giving new stimulus to the process begun 5 years earlier and establishing firm dates for the complete opening of all of the member states' energy markets.

The third legislative package for the natural gas sector was implement by directive 2009/73/CE (European Parliament and Council, 2009b). This concerned two fundamental aspects of liberalization: First, access by third parties to stored gas and LNG plants; second, the promotion of regional solidarity. For this second issue, the EU member states were asked to cooperate in cases of serious disturbance in provision, by developing interconnections in their gas grids and by coordinating measures for national emergencies.

2.3. Water Services Segment

The path for liberalization of the Italian water services segment has been different the cases of electricity and natural gas. For water services the choice has been in favor of competition for the market, rather than unbundling. As in many other countries, the strategy of "vertical separation" has been avoided, because of the risks to the principles of integrated river basin management.

The liberalization process began in 2009, with decree law No. 135/2009, also known as the Ronchi Decree (Italian Parliament, 2009). This law accomplished the activation of EC legislation on issued of local public services of economic importance. Under this law, the awarding of such services normally takes place by one of two pathways: (i) By public tender, open to all qualified enterprises, (ii) by the entrustment to a mixed public-private company, where the private partner is selected by a tender double object, concerning both the company qualifications and its specific roles in the management of the water service. In exceptional cases the standard procedures can be waived, in favor of an in-house company of entirely public share capital. The conditions for such exceptions are described as "unusual economic, social, environmental or geomorphological aspects in the specific territorial context, which prevent useful and effective resort to the market."

The process of liberalization continued with the decree law No. 201/2011, the so-called "Save Italy" (Italian Parliament, 2011b). This delegated the AEEGSI as the agency responsible for the regulation and oversight of water services, which had previously been under the Italian Agency for the Regulation and Control of Water Services. The AEEGSI is thus responsible for a range of issues in integrated water services, including: The identification of the admissible costs, and the criteria for determining the rates covering these costs; the competencies of

the different parties in ensuring quality of service; the evaluation of plans and the provision of "type agreements" for the awarding of services (AEEGSI, 2015).

3. METHODOLOGY

In theory, a company can increase its performance through M&As for a number of reasons, including synergies (Larsson and Finkelstein, 1999), economies of scope and scale (Pangarkar and Lim, 2003), and greater market power (Ikeda and Doi, 1983; Lubatkin, 1983; Sharma and Ho, 2002; Devos et al., 2009), eventually leading to the development of "national champion" companies (Domanico, 2007; Verde, 2008). Another fundamental reason for M&As is market diversification, in which the indirect acquisition of the new customers is more cost-efficient and successful than it would be through direct acquisition (Muller et al., 2008; Estrella, 2001). In reality many companies actually suffer a decrease in performance from M&As, due to several obstacles that can prevent the achievement of the anticipated benefits (Ivancevich et al., 1987; Nahavandi and Malekzadeh, 1988; Chakrabarti, 1990; Schweiger and Denisi, 1991; Fang et al., 2004). Such obstacles often emerge at the levels of people and process (Schweiger and Denisi, 1991; Fang et al., 2004). Indeed, the increased formalization of resource allocation and other areas of management decision-making in the larger company can adversely affect performance, and similar challenges emerge at the level of strategic capabilities (Chakrabarti, 1990). Even the managers directly involved in the M&A process cannot identify all the issues that are likely to emerge during the integration phases (Very and Schweiger, 2001; Schoenberg, 2006; Slangen, 2006). Zollo and Meier (2008) and Papadakis and Thanos (2010; 2012), focusing on the integration phases, have reviewed the works on accounting performance after an M&A. Moreover, the questions concerning post-M&A improvements in operating performance have been addressed by many researchers over recent decades (Seth, 1990; Healy et al., 1992; Tuch and O'Sullivan, 2007; Papadakis and Thanos, 2010).

Altunbas and Marqués (2008) apply a multiple regression analysis for the study of post-M&A improvements in operating performance, using a series of economic-financial indicators that reflect the company's strategic management (Dess and Davis, 1984; Zajac and Shortell, 1989) and the energy management (Iazzolino and Gabriele, 2016). The Altunbas-Marqués model focuses on the strategic similarities between the two companies involved, particularly on their decisions concerning allocation of resources, considering that this is one of the most important strategic directions. The base hypothesis is that companies that have similar models of resource allocation, as measured by the principle economic-financial indicators, can be considered to be strategically similar (Harrison et al., 1991).

Although there are numerous studies on the measurement of post-M&A performance, few of these deal specifically with the energy sector. Our study is intended to respond to this gap, carrying out the measurement of post-M&A performance in the Italian energy sector. We apply the Altunbas and Marqués (2008) model as the starting point, adapting it to the energy sector. In particular, we identify the economic-financial indicators that best describe the energy sector (Capece et al., 2009; 2012) and analyze the M&As in relation to certain characteristics of the merging companies: Their size; the market segment concerned (electricity, gas, water, or multi-business); whether they are publicly listed. The consideration of these characteristics is based on the extant literature, which suggests the ideal features for M&As and the impact of these features on the performance of the merging companies, particularly as concerns industry relatedness (Jensen, 1988; Healy et al., 1992; Ghosh, 2001; Powell and Stark, 2005; Kruse et al., 2007; Martynova et al., 2007), and the target company's size (Fowler and Schmidt, 1989; Chatterjee, 2000; Sharma and Ho, 2002; Powell and Stark, 2005; Martynova et al., 2007).

For the implementation of the model we select the indicators that are best suited to describing the performance of bidder and target companies in the energy sector. In addition, to measure the strategic similarity between the companies involved, we use an index of similarity containing the economic and financial characteristics for each strategic variable, in every individual M&A event:

$$SI_{i,k} = \sqrt{\left(X_{B,i,k} - X_{T,i,k}\right)^2} \quad (1)$$

Where $SI_{i,k}$ is the index of similarity for the k^{th} variable of the i^{th} M&A, and $X_{B,i,k}$ and $X_{T,i,k}$ are the values of the target company (T) and the bidder company (B) for the k^{th} variable and the i^{th} M&A.

Following the calculation of the index of similarity, the next step is to carry out the hierarchical regression, according to the following formula:

$$\sum_{i=1}^{n} \Delta ROE_i = \sum_{i=1}^{n} (PREROE\_B_i + RSIZE_i) + \sum_{i=1}^{n} (LIQ_i + \frac{COST}{INC_i} + \frac{SHAREFUN}{TA_i} + \frac{LOAN}{TA_i} + \frac{OR}{TA_i} + TECH_i + SOLV_i + GEAR_i) \quad (2)$$

The dependent variable of the hierarchical regression is the performance change, which is measured as the difference between the acquiring company's return on equity (ROE) in the 2 years following the merger or acquisition, with respect to the 2 years preceding. The indices of similarity ($SI_{i,k}$) include the following economic-financial indicators: The measures of the financial performances of the two companies, their capital structures, liquidity, exposure to risk, profitability, financial innovation and efficiency. Finally, the following control variables ($X_{i,j}$) are analyzed: The relative size of the bidder to target, and the performance of the bidding company prior to the merger or acquisition (bidder performance).

Table 1 describes the economic-financial indicators included in the hierarchical regression.

As indicated in the table, the liquidity of a company is calculated as the ratio between its current assets and current liabilities. As

with other indicators of liquidity, this one examines the capacity of the company to remain solvent over time, and so to respect the timeframes imposed by its creditors. The higher this indicator, the more positive is the company's short-term financial situation. If the index is >1, then the company currently has sufficient liquid resources to pay all its suppliers and short-term debts, meaning those due within the next 12 months.

The company's efficiency is calculated as the ratio between its total costs and the net income produced in the financial year. The ratio provides a clear view of the efficiency of the company's management: The lower the value of the indicator, the more profitable is the company. A rise in the index shows that the costs are increasing much more rapidly than the income, meaning that the composition of the company is poorly balanced.

The indicator of capitalization is calculated as the ratio between the net equity and the total assets. This ratio shows the shareholders' own weight in the financing of the company activities. High values of the indicator indicate greater capitalization of the company, and can therefore be considered as a signal of structurally soundness.

The loan ratio measures the indebtedness of a company, and is calculated as the ratio between the short-term loans (<12 months) and the total assets. This index shows the weight of short-term third-party financing with respect to the total of company investments. A value that is excessively high compared to the average of the sector could therefore indicate an anomaly in the company's structure and an excessive burden of financial obligations.

The diversity of earnings is calculated as the ratio between non-operating revenues and total assets, and therefore serves to indicate the extent of diversification of the company's income.

The calculation of other expenses (technology) begins from the hypothesis that all of the company's non-operational expenses are for investments in technological innovations (Altunbas and Marques, 2008). The indicator is calculated as the ratio between non-operational expenses and total assets, and therefore shows the company's strategy in terms of technology and innovation.

Table 1: Definition of the strategic variables

Variable	Formula
Performance change	ΔROE=post-merger ROE - pre-merger ROE
Bidder performance	ROE of bidder (pre-merger)
Relative size	Total assets of target/total assets of bidder
Liquidity	Liquid assets/current liabilities
Efficiency	Total costs/net income
Capitalization	Shareholder funds/total assets
Loan ratio	Loans/total assets
Diversity of earning	Other revenues/total assets
Other expenses (technology)	Other expenses/total assets
Solvency ratio (liability based)	Shareholder funds/(non-current liabilities+current liabilities)
Gearing	(Non-current liabilities+Loans)/Shareholder funds

ROE: Return on equity

The solvency ratio, which measures the company's capacity to address its debts and liabilities with its own resources, is calculated as the ratio between net equity and the sum of current and non-current liabilities. The lower the value of the ratio, the greater is the risk that the company will not succeed in meeting its debts.

Finally, gearing measures the ratio of indebtedness, and is calculated as the sum of the company's non-current liabilities and short-term bank loans, divided by the company's own equity. This means that unlike the solvency ratio, the indicator does not consider the short-term debts to suppliers, but only the financial debts. A high value of the indicator indicates a structural problem in the company capitalization, since the value expresses the balance between the share capital and the debts.

4. DATA

The sample considered in the analysis consists of 99 companies with authorization from the Ministry of Economic Development for the sale of electricity, natural gas or water services, which participated in a merger or acquisition in the period 2008-2013. The 99 companies participated in a total of 60 M&As, as reported to the Italian Competition Authority (AGCM).

Under Article 16 of Law no 287/90, all M&As that exceed a specified threshold of turnover, which is updated annually on the basis of a gross domestic product (GDP) deflator, must be reported to the AGCM. The threshold levels for the period under examination are shown in Table 2. Here, the first column presents the threshold level of turnover within Italy for the combination of companies participating in the merger or acquisition, and the second column refers only to the turnover thresholds within Italy for a given target company.

Among the many M&As occurring in the 6 years analyzed, acquisitions were much more numerous than mergers, since the latter are more complex operations that involve profound changes in the company's legal structure.

The calculation of the economic-financial measures for the companies participating in the M&As derives from two databases: (i) The Italian Chamber of Commerce Register of Companies, (ii) Amadeus, a database of information on European companies.

To better understand the consequences of a merger or acquisition on their performances, the companies were classified according to:

Table 2: Turnover thresholds requiring advance notification of an M&A operation

Year	Total turnover of the companies (M €)	Turnover of the target company (M €)
2008	448	45
2009	461	46
2010	472	47
2011	468	47
2012	474	47
2013	482	48

M&A: Mergers and acquisitions

- Size (small, medium, large, very large)
- Market segment (electricity, gas, water, multi-business)
- Holding of shares (publicly listed, not listed).

The categorization by size reveals that there were 35 M&As between companies of very large and of small size, 12 M&As between companies of very large of medium size, and 13 M&As between companies in other combinations of sizes.

The categorization by market segment reveals 20 M&As between multi-business companies, 11 M&As between companies operating in the electricity segment, and 29 M&As between companies operating in other combinations of segments.

Finally, concerning the listing of the bidder, there were 21 M&As where the bidder company was publicly listed but the target company was not, and 39 M&As in which neither of the companies was listed.

5. RESULTS

This section presents the results of the analyses, in which the sample is first categorized according to business segment, then by size and by holding of shares. There are two types of analysis for each grouping of categories: First, the presentation and examination of the descriptive statistics; second, the examination of the hierarchical regression coefficients.

5.1. Categorization of the Sample by the Companies' Business Segment

Table 3 permits the analysis of the descriptive statistics for the M&As of the sample, showing the dependent variable, the control variables, and those for strategic relatedness (the indices of similarity between the two companies, for each of the variables).

The table shows that in all three types of M&As, as divided by business segment, there is a slight worsening in the performance (ΔROE) of the new joint entity, compared to the preceding performance of the bidder.

The median and the mean in Table 3 could be interpreted as a measure of the dispersion between the merging partners in the units of the underling variable, expressed as percentages.

From the analysis of the average and mean of the strategic variables, we observe that within each of the three categories of M&As, the companies involved are very similar concerning their investments in innovation and their short-term debt.

Concerning the median of the relative company sizes, we observe that the size of the target is on average 2.4% of the size of the bidder in the M&As between multi-business companies; 5.2% in M&As between companies in the electricity segment, and 1.1% for those from differing segments. Regarding the median for Performance change, we can see that performance decreases by 2% for the bidders in the M&As between multi-business companies, by 1% for bidders in the electrical sector M&As, and by 0.2% in the case of bidders in mixed-segment M&As. Finally, the variable of bidder performance, meaning the bidder's ROE in the 2 years prior to the M&A, results as being on average 6% for the bidders in the multi-business M&As, 8% for the bidder in electricity M&As, and 5.5% for the bidder in mixed-segment M&As.

The second analysis concerns the hierarchical regression, showing the impact of the strategic variables on post-merger performances (Table 4).

Before beginning the analysis, it is useful to clarify the beta values reported in the table. These are the partial regression coefficients calculated on the standardized variables. The standardization of the predictors and the criteria implies that all the measures are

Table 3: Descriptive statistics of the main determinants of performance where the M&As are categorized by the business segment of companies involved

Variables	M&As between multi-business companies			M&As between companies operating in the electricity segment			M&As between companies operating in other combinations of segments		
	Mean	Median	S.D.	Mean	Median	S.D.	Mean	Median	S.D.
Dependent variable									
Performance change	−0.05	−0.02	0.09	−0.01	−0.01	0.20	−0.01	−0.01	0.13
Control variables									
Relative size	0.067	0.02	0.12	0.10	0.05	0.16	0.03	0.01	0.06
Bidder performance	0.07	0.06	0.06	0.07	0.08	0.21	0.05	0.05	0.13
Strategic relatedness									
Liquidity	0.35	0.27	0.30	0.34	0.16	0.35	0.79	0.55	0.73
Efficiency	67.46	63.91	52.93	34.93	16.02	49.36	45.44	20.50	53.02
Capitalisation	0.24	0.23	0.18	0.20	0.23	0.10	0.36	0.37	0.20
Loan ratio	0.11	0.08	0.07	0.10	0.02	0.13	0.18	0.11	0.24
Diversity of earnings	0.01	0.03	0.02	0.07	0.01	0.22	0.03	0.01	0.07
Other expenses	0.04	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.01
Solvency ratio	0.65	0.59	0.53	0.54	0.57	0.37	0.59	0.41	0.55
Gearing	2.47	0.87	2.66	1.37	0.69	2.58	1.60	1.14	1.60

M&A: Mergers and acquisitions, SD: Standard deviation

Table 4: Results of the hierarchical regression analysis in the case of categorization by the business segment of companies involved in the M&As

Variables	M&As between multi-business companies	M&As between companies operating in the electricity segment	M&As between companies operating in other combinations of segments
Bidder performance	−0.173*** (0.568)	−0.911* (0.000)	−0.174* (0.832)
Relative size	0.223*** (0.011)	−0.717* (0.000)	−0.788** (0.016)
Liquidity	0.164*** (0.031)	2.972* (0.000)	0.111*** (0.001)
Efficiency	0.344** (0.000)	−0.161* (0.000)	0.001*** (0.001)
Capitalisation	0.126*** (0.483)	0.062* (0.000)	−0.007*** (0.336)
Loan ratio	0.177*** (0.488)	−0.148* (0.000)	0.112*** (0.358)
Diversity of earnings	0.091*** (2.230)	−0.021* (0.000)	0.08*** (1.097)
Other expenses	0.187*** (5.832)	−0.049* (0.000)	0.053*** (8.663)
Solvency ratio	0.037*** (0.159)	−3.055* (0.000)	−0.079*** (0.000)
Gearing	−0.142*** (0.004)	−0.241* (0.000)	0.092*** (0.008)
R^2-adjusted	0.413	1	0.709

M&A: Mergers and acquisitions. (*), (**), (***) significant at the 1%, 5% and 10% levels, respectively. The standard errors of the coefficients are in parenthesis

brought into the same scale, where the average is zero and the standard deviation is 1, and as a result the intercept is zero. This does not imply the standardization of the coefficients of regression, therefore the beta coefficients can be >|1.0|.

From Table 4, it can be seen that coefficients of regression show similar values within each type of M&A. In fact concerning the M&As between multi-business companies, the coefficients of regression are almost all positive, which is an indication that within this category of companies, the occurrence of differences in the strategies of the merging partners has a positive influence on the post-M&A performances. In particular, the variable of relative size has a positive coefficient, with the reason being that the multi-business have a greater capacity for diversification of risk between their various activities, including when they acquire large-sized companies (Bonacchi, 2004). The coefficient concerning efficiency is also positive, because the multi-business have a greater subdivision of costs, and therefore greater possibilities of reduction of costs due to the creation of synergies, for the achievement of economies of scale, scope and range. One of the coefficients that does not follow the pattern is that concerning the bidder performance, which results as negative. This is because in all M&As, the acquiring company generally has a greater performance than the one acquired, inevitably leading to a balancing of performance after the merger or acquisition (Altunbas and Marqués, 2008).

Concerning the M&As between companies operating in the electricity segment, the hierarchical regression coefficients reported in the table are almost all negative. Therefore to achieve effective integration of M&As within this segment, the companies involved should be similar between each other, since the more the companies differ in their strategic decisions, the worse is the post-M&A performance of the bidder. Analyzing the coefficient of the relative size variable, we see that this is negative, because the companies in the M&As are both mono-business, and unlike multi-business, these have less opportunity to distribute risks and diversify their activities. Further, analyzing the indicator for other expenses, which measures the strategic area of investment in technological innovation, we note that the coefficient is negative, due to the fact that a difference in technologies between the combining companies leads to problems of integration.

Finally, concerning the mixed-segment M&As, most of the coefficients are positive, meaning that if the companies that take part in the M&As are strategically different, the performances are positively influenced. The coefficient for relative size provides an exception to the pattern, being negative. This is due to the fact that, in the case of a mixed-segment M&A, the original mono-business company becomes a multi-business, broadening its portfolio of activities. If the target is much larger than the bidder there could be problems in corporate integration and in management of risk, without ready resolution in the two post-M&A years, which is the period examined in our analysis.

5.2. Categorization by the Size of the Companies

Table 5 presents the descriptive statistics for the variables analyzed in the case where the M&As are categorized by the size of companies involved. The table presents the results for the dependent, control and strategic variables, with the latter being the indices of similarity between the companies taking part in the M&A event.

The table shows that in the M&As between very large (XL) and small (S) companies the performances (ΔROE) result as slightly improved, while in the M&As between very large and medium (M) companies, and in those between companies of other sizes, the performances of the new joint entity are slightly worsened.

Observing the values of the strategic variables, we note that within each of the three categories of the M&As in our sample, the companies taking part in the actions are very similar between themselves in terms of the use of non-operating profits, in investments in technological innovation, and in short-term debt.

Concerning the relative size of the companies, we note that the size of the target company is on average 0.8% of the size of the bidder in the M&As between XL and S companies; 3% in those between XL and M companies, and 9% in the operations between other sizes of companies. Analyzing the variable of performance change, we observe that the performances decreases by an average of 0.4% in the case of M&As between XL and S companies, by 6% in those between XL and M companies, and by 0.05% in cases of combinations of other sizes. Finally, the variable of bidder performance (ROE prior to M&A) is on average 5% for

the bidder in M&As between XL and S companies; 7% for the bidder in XL-M M&As, and 6% for the bidder in M&As between companies in other combinations of sizes.

The second analysis, concerning the hierarchical regressions, examines the impact of the control and strategic variables on the companies' post-merger performances (Table 6).

From Table 6, it is apparent that also in this case the coefficients of regression assume very similar values within each category of M&A. In fact for the M&As between XL and S companies, most of the coefficients are positive, indicating that the occurrence of structural differences, due to the differing size of the merging partners, has a positive influence on post-M&A performances. In general, the reason for this is that the operations for concentration of XL and S companies are less complex than those where the two companies are of similar size. In particular, the efficiency indicator is positive, since the large size companies can effectively incorporate the small ones by exploiting economies of scale and minimizing operating costs. The coefficient for other expenses (investments in technological innovation) is negative. This is because the XL companies invest a greater percentage of their gross invoices in R&D compared to small ones, and this difference in scale prevents the accrual of any benefits from the investments made by the acquired company. The coefficient for bidder performance (ROE prior to M&A) is also negative, because in general, for the M&As analyzed, the bidders have higher performance levels than the targets. After the merger, the performance of the bidder is then likely to decline due to the balancing of performance with the target (Altunbas and Marqués, 2008).

In contrast, concerning the M&As between XL and M companies, the table reports coefficients of hierarchical regression that are almost all negative. Therefore, within this category, the occurrence of strategic differences between the bidders and targets causes a decrease in the post-M&A performances. Regarding the indicator of bidder performance, we observe that, as for the case of XL and S companies, the negative coefficient is due to a balancing of post-M&A performances. The coefficient for other expenses is also negative, because the innovation strategies of the merging companies are very different, and in some cases even totally incompatible.

Finally, concerning the M&As for other combinations of company sizes, we observe that most of the coefficients are negative. The

Table 5: Descriptive statistics of the main determinants of performance where the M&As are categorized by the size of companies involved

Variables	M&As between XL and S companies			M&As between XL and M companies			M&As between companies of other sizes		
	Mean	Median	S.D.	Mean	Median	S.D.	Mean	Median	S.D.
Dependent variable									
Performance change	0.01	−0.01	0.13	−0.05	−0.06	0.05	−0.04	−0.01	0.15
Control variables									
Relative size	0.04	0.01	0.09	0.06	0.03	0.07	0.27	0.09	0.36
Bidder performance	0.03	0.05	0.10	0.07	0.07	0.04	0.11	0.06	0.18
Strategic relatedness									
Liquidity	0.57	0.44	0.64	0.28	0.24	0.23	0.57	0.53	0.42
Efficiency	36.43	20.42	47.27	94.35	93.99	47.05	41.08	23.86	48.82
Capitalisation	0.36	0.27	0.31	0.20	0.21	0.15	0.29	0.37	0.21
Loan ratio	0.13	0.09	0.15	0.08	0.08	0.09	0.21	0.11	0.27
Diversity of earnings	0.04	0.01	0.13	0.01	0.01	0.01	0.01	0.00	0.02
Other expenses	0.01	0.01	0.01	0.01	0.00	0.01	0.01	0.00	0.01
Solvency ratio	0.69	0.49	0.58	0.42	0.47	0.33	0.47	0.33	0.41
Gearing	1.44	0.90	1.73	3.77	3.91	3.41	2.09	1.36	1.93

M&A: Mergers and acquisitions, SD: Standard deviation

Table 6: Results of the hierarchical regression analysis in the case of categorization by the size of companies involved in the M&As

Variables	M&As between XL and S companies	M&As between XL and M companies	M&As between companies of other sizes
Bidder performance	−0.420* (0,637)	−2.506** (1.931)	0.201** (0.207)
Relative size	−0.810* (0.014)	−3.624** (6.115)	−0.036*** (0.004)
Liquidity	0.286 ** (0.003)	−1.998** (0.217)	0.436** (0.000)
Efficiency	0.009*** (0.000)	−2.199** (0.001)	−0.123*** (0.000)
Capitalisation	0.089*** (0.353)	−3.353** (3.554)	0.027*** (0.218)
Loan ratio	0.208** (0.495)	−2.036*** (5.366)	−0.504** (0.126)
Diversity of earnings	0.012*** (0.418)	1.343*** (5.303)	−0.449** (2.162)
Other expenses	−0.022*** (0.527)	−2.539*** (7.657)	1.224* (3.563)
Solvency ratio	−0.416** (0.001)	1.264*** (0.928)	−0.955* (0.000)
Gearing	0.18** (0.011)	−0.455*** (0.008)	−0.684** (0.007)
R^2-adjusted	0.668	0.922	0.985

M&A: Mergers and acquisitions. (*), (**), (***) significant at the 1%, 5% and 10% levels, respectively. The standard errors of the coefficients are in parenthesis

implication is that if the companies taking part in these M&As are strategically different, this has a negative influence on the performances. The indicator for efficiency is a particular example where the coefficient is negative. This is because the M&As are in most cases between companies of different sizes and with different cost structures, meaning that it would be difficult to achieve integration in the short term, such as in the 2 years covered by our study. In contrast, there are two indicators with positive coefficients: Those for the bidder's pre-M&A performance and for the aspect of strategic differences in technological innovation. For the indicator of bidder performance (ROE prior to M&A), the positive result is due to the sizes of the companies taking part in the integration. In fact, in this case, the bidder and the target are either of the same size or the bidder is smaller than the target. Thus there will not be much initial difference in the performances of the merging companies, and neither of them will be penalized following the M&A. The indicator other expenses is also positive, since the companies involved in these mergers are similar in size and so in percentage of gross invoices invested in technological innovation. This similarity then has positive influences on the post-M&A performances of the bidders.

5.3. Categorization by Type of Shareholding

Table 7 presents the statistics for the last categorization of the companies, concerning whether or not the shares in the companies are publicly traded. The table presents the results for the dependent, control and strategic variables, with the latter being the indices of similarity between the companies taking part in the M&A event.

We observe that in the cases of M&As with both publicly listed bidders and non-listed bidders, their performances (ΔROE) worsen slightly following the merger.

Examining the strategic variables, we note that within both categories of our M&As, the companies taking part in the events are very similar in terms of investments in technological innovation and in diversifying their income.

Observing the median of relative size, we see that the target companies are an average 0.5% of the size of the bidder, in the case of M&As by listed companies, and 4% of the bidder's size in the case of M&As by non-listed companies. The dependent variable of performance change shows a decrease in both categories, averaging 1% in the M&As with publicly listed bidders and 0.5% for those with unlisted bidders. Finally the variable of the pre-M&A performance (ROE) results as 7% in the case of listed bidders and 5.2% for unlisted bidders.

The second analysis concerns the examination of the hierarchical regressions, revealing the impact of the control and strategic variables on post-merger performances (Table 8).

The coefficients of regression show similar values within each of the two categories of M&As. For the M&As with listed bidder and unlisted target, the coefficients of regression are almost all negative. This means that with increasing strategic difference between the target and bidder, the latter's post-M&A performance declines. This would be due to the difficulty for the listed company

Table 7: Descriptive statistics of the main determinants of performance where the M&As are categorized by type of shareholding of the bidder company

Variables	M&As with publicly listed bidders			M&As with non-listed bidders		
	Mean	Median	S.D.	Mean	Median	S.D.
Dependent variable						
Performance change	−0.02	−0.01	0.04	−0.03	−0.01	0.18
Control variables						
Relative size	0.07	0.01	0.25	0.10	0.04	0.17
Bidder performance	0.07	0.07	0.05	0.07	0.05	0.17
Strategic relatedness						
Liquidity	0.41	0.48	0.31	0.56	0.39	0.64
Efficiency	45.33	24.50	39.79	50.95	23.49	57.68
Capitalisation	0.31	0.28	0.19	0.31	0.24	0.30
Loan ratio	0.10	0.08	0.09	0.15	0.10	0.20
Diversity of earnings	0.05	0.03	0.15	0.02	0.02	0.05
Other expenses	0.03	0.01	0.01	0.01	0.01	0.01
Solvency ratio	0.69	0.58	0.57	0.478	0.27	0.45
Gearing	1.99	0.94	2.52	1.94	1.07	2.12

M&A: Mergers and acquisitions, SD: Standard deviation

Table 8: Results of the multiple regression analysis in the case of categorization by type of shareholding of bidder company

Variables	M&As with publicly listed bidders	M&As with non-listed bidders
Bidder performance	−0.195** (2.059)	−0.255** (0.348)
Relative size	−0.949* (0.013)	0.254** (0.036)
Liquidity	−0.038*** (0.034)	0.146** (0.000)
Efficiency	−0.070*** (0.000)	0.060*** (0.000)
Capitalisation	−0.260** (0.414)	0.017*** (0.222)
Loan ratio	−0.027*** (1.001)	0.131*** (0.283)
Diversity of earnings	0.007*** (0.478)	0.093*** (0.956)
Other expenses	−0.034*** (12.907)	0.127*** (6.667)
Solvency ratio	0.138*** (0.004)	−0.135*** (0.000)
Gearing	−0.021*** (0.008)	0.051*** (0.006)
R^2-adjusted	0.817	0.248

M&A: Mergers and acquisitions, (*), (**), (***) significant at the 1%, 5% and 10% levels, respectively. The standard errors of the coefficients are in parenthesis

in integrating the unlisted one, above all for reasons of information asymmetry. In this category of M&A, the acquiring company has a history of preparing and publishing regular financial reports and divulging information on its activities and liabilities, whereas the unlisted company has not been required to meet the same standards of transparency (Rigamonti, 2005).

Analyzing the index of the relative size of the merging companies, we see that this is the variable with the greatest impact on the change in the bidders' performances. Therefore, with increasing size of the target company, there is a decrease in the post-M&A performances of the bidders. The coefficient for liquidity is also negative. This result is due to the different liquidity management strategies, in turn deriving from the differing sources of the liquidity: From the market, for the listed companies; from the company itself, in the case of the unlisted firms (Mulazzani,

2006). Finally, we observe that the indicator for bidder pre-M&A performance is also negative. This is because in general, for all the categories of M&As analyzed in the current study, the bidder companies have higher levels of performance than the targets. This implies a rebalancing of performances between the merging partners, since the greater performances of the bidders go in part towards compensating the lesser performance of the targets that are taken over in the M&As (Ramaswamy, 1997).

The results concerning the M&As between two unlisted companies are the opposite of those for the preceding group. In fact the coefficients of regression are almost all positive, since there is greater strategic similarity between the targets and bidders, in part because neither of them has obligations for public transparency. In particular, the indicator for liquidity has a positive coefficient, since both of the participating companies have similar strategies for managing liquidity, drawing on the same sources. This strategic similarity facilitates the post-M&A integration.

One of the results that is common to both categories of M&As concerns the pre-integration performances of the bidders. Indeed, since the bidders tend to have higher performances levels than targets, a certain balancing of performance between bidders and targets is likely to take place following the M&As, resulting in the negative correlations to performance change, as observed (Altunbas and Marqués, 2008).

6. CONCLUSIONS

The current study analyzes the M&As that took place in the Italian energy sector in the period 2008-2013, following market liberalization. The aim is to evaluate whether the strategic and organizational choices of the companies involved in the M&As had an impact on their performances. For our analysis, we propose that the main economic-financial indicators, such as those of efficiency, liquidity and solidity, serve as a reflection of the strategies pursued by the companies. In other words, the companies that are seen to have similar models of resource allocation can be considered as strategically similar.

The sample examined in the analysis consists of 99 companies with authorization from the Ministry of Economic Development for the sale of electricity, natural gas or water services, which participated in a merger or acquisition in the period 2008 to 2013. These 99 companies participated in a total of 60 M&As, as reported to the Italian Competition Authority (AGCM). Under Article 16, Law No. 287/90, all M&As that exceed a specified threshold of turnover, which is updated annually on the basis of a GDP deflator, must be reported to the AGCM.

The first stage of the analyses examined the descriptive statistics for the companies in the M&As; the second stage examined the impact of the independent variables on the changes in the post-M&A performances of the bidders, by means of hierarchical regression analysis. The independent variables were divided in two groups: (i) The control variables, specifically the relative sizes of the companies and the pre-M&A performances of the bidders, (ii) the strategic variables, such as liquidity, efficiency and capitalization. The calculation of the regressions required the insertion of the indexes of similarity between the bidder and target, considering the main financial and income indicators of the two companies. Both of these analyses were conducted on categories of the M&As, grouped on the basis of the companies' business segments, their size, and their type of shareholding (listed or unlisted).

The regressions revealed that for effective integration, the companies in the M&As can be different from the strategic point of view, when the concentration action is between firms operating in different market segments or between multi-business. This result derives from the fact that such companies, operating in various sectors and exploiting economies of scale, have greater possibilities of spreading the risks of merger and of reducing the costs. The indicators for cross-segment M&As are not all positive, however, since in place of the mono-businesses, the merged company now becomes a multi-business. The transition is not immediate, and in the short term the companies involved cannot achieve the full exploitation of the advantages of the broader portfolio of activities. In contrast, in order to avoid negative impact on their performances, the firms involved in the M&As between electricity companies must be as similar as possible in strategy. This is because the merged companies remain a mono-business, and cannot exploit economies of scope or new synergies to offset any risks of the M&As.

The analysis by category of the size of companies in the M&As revealed that in operations between very large and small firms, the companies can be strategically different. This is because such mergers are generally less complex than those in which the merging companies are of similar size. However, for M&As between other combinations of company sizes, the bidder and target should be as similar as possible in strategic terms, to avoid worsening the post-M&A performances. In fact, where companies of similar size follow very different strategies, a merger or acquisition could create problems of integration. Such problems should not arise in the case of integrations of small to very large firms, since the smaller company is readily incorporated in the very large one, regardless of the strategies that were previously followed.

Finally, the analysis by type of shareholding structure showed that in M&As between listed bidders and non-listed targets, the respective companies should be similar in strategic terms, to avoid worsening of the post-M&A performances. Such negative results can emerge from problems in integration, due to the difference in the companies' capital structure and strategic plans. On the contrary, if the bidder and target are both non-listed companies they will share strategic similarities, and neither is obligated to provide public financial reporting. Therefore the merging or acquiring companies can be relatively different in multitude of strategic aspects, from liquidity to capitalization, without negative influence on the performances of the bidders in the 2 years following the M&A action.

A limitation of this study is the time period covered by the analysis, meaning the 2 years following the M&As. This interval was selected to permit examination of a homogenous sample, and to

have access to the companies' financial statements up to the year 2015. For this, the last year of M&A events covered was 2013.

The analyses reveal that the companies' post-M&A performances worsened, however this negative change is very small. This leads to reasonable hopes for positive results over a longer time, considering that the first years of a new joint entity suffer more from the difficulty of integration. In addition, the positive coefficients resulting from some of the regression analyses could again lead us to assume an improvement in the post-integration performances over a longer time.

These considerations could support the "Spending Review" policy (Article 23, Decree law No. 66, April 2014), adopted by the Italian Government with the objectives of incentivizing the aggregation process in the energy sector (Italian Parliament, 2014). The new legislation could lead to an 80-90% reduction in the number of local and municipal companies operating in the gas, electricity, waste and water segments. The objective is to cut waste and reduce inefficiency through the economies of scale offered by corporate concentration. The aspect of public stimulus could results as decisive, particularly in the administrative regions of southern Italy, which has the greatest concentration of small and inefficient companies. The situation is much different in the center-north of the country, where there could be an acceleration in the formation of alliances that has already been going on for some time. Tens of local operators could choose to unite their forces or to join with the existing larger companies.

Under the spending review, the government will launch the new consolidation process by means of incentives, such as through the extension of the time period for concessions. In this regard, our work provides policy indications concerning the characteristics that the merging partners should have to ensure improvement in the post-M&A performances. In particular, provided that the merging partners belong to different segments, or are multi-business, or are both unlisted companies, or if the bidder is very large and the target is small, then the merging companies can have different characteristics and strategies and this will not have negative influence on the post-M&A performances. However in all other cases, the merging partners should be similar from the strategic point of view, to avoid negative influence on the post-M&A performances.

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