Size and sector in the efficiency of mergers involving unlisted companies *

Tamaño y sector en la eficiencia de las fusiones entre compañías no cotizadas

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ABSTRACT Academic research has mainly focused on merger processes undertaken by large companies listed in financial markets, taking in account principally the information provided by the quotation values. This article studies the merger processes of Spanish unlisted companies (SMEs and large) in the years 1999-2005 through the economic-financial analysis of their accounting data, that provides a better understanding of the variation experienced by companies in terms of efficiency, and explains the reasons that generate value-creation for their owners. From a counterfactual perspective the study compares performances of five indicators in a time span before and after the merger, according to size and sector aggregates. The main results drawn allow us to confirm that those companies resulting from merger processes have improved, or at least not worsened their efficiency and value creation, although the impact is different depending on size and sector. These evidences should have an effect on merger public policies.

KEYWORDS Mergers and Acquisitions (M&A); Unlisted Companies; SME; Efficiency

RESUMEN En el campo de las fusiones empresariales, la investigación ha centrado su atención en los procesos referidos a grandes empresas cotizadas en los mercados mediante el empleo de datos extraídos de la información bursátil. Este artículo estudia los procesos de F&A de las empresas españolas no cotizadas (Pymes y grandes), fusionadas en el período 1999-2005, a través del análisis de indicadores económico-financieros, lo que permite una mejor compresión de la variación experimentada por las empresas en términos de eficiencia y explica las razones que generan valor añadido para sus propietarios. Desde una perspectiva contrafactual, el estudio compara la evolución de cinco indicadores antes y después del proceso de fusión, distinguiendo entre tamaños y sectores. Los resultados confirman que las empresas resultantes han mejorado, o al menos no empeorado, su eficiencia y creación de valor, aunque el impacto es distinto según tamaño y sector al que pertenecen. Tales evidencias podrían tener efecto en nuevas políticas públicas en este campo.

PALABRAS CLAVE Fusiones y adquisiciones; Empresas no cotizadas; Pyme; Eficiencia.

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1. INTRODUCTION

Academic research has mainly focused on merger and acquisition processes undertaken by large companies listed in financial markets. This research has been based principally on the information provided by the quotation values of the participating and resulting enterprises and, to a lesser extent, the accounting data of such enterprises. The economic-financial method provides a better understanding of the variation experienced by companies in terms of efficiency and performance, and explains the reasons that generate value-creation or reduction for their owners. The study of efficiency of merger results is essential in order to achieve an enhanced understanding of these processes, as improvement is the main reason for firms to concentrate (Demsetz, 1973), and this is also subject to discussion in academic literature (De Bondt and Thompson, 1992).

Moreover, the focus of this kind of research is microeconomic, based on the study of specific cases where complete information is available. On the contrary, the aggregate economic analysis —by sectors and sizes— of merger processes from the registered accounting information of unlisted enterprises, mainly small- and medium-sized (SMEs), has been a scarcely explored field of research. Some limited research has occasionally been focused on the concentration phenomenon of small firms.

More specifically, Aiginger and Tichy (1991, p. 91) offer the theoretical foundations to study the mergers involving SMEs, exploring the possible optimisation of their organisation and improvement of their performance. These authors state that «Merger research… does not explicitly deal with the question of efficiency differences between size classes. Due to the limited availability of statistics most research concentrates on takeovers among the largest size classes», which continues to be valid after almost twenty years. More recently, Bonardo *et al.* (2009, p. 2) point out that the relationship between (innovative) SMEs and their involvement in merger and acquisition processes is particularly interesting for analysing their dynamics, but «…it is rarely addressed in the literature».

In recent years, the availability of new databases with detailed business information (including small- and medium-sized enterprises) allows the analysis of time series and, therefore, of the concentration processes of SMEs, which starts to fill the gap existing in literature to date. Additionally, the study of SMEs has been consolidated in the academic, social and public policy spheres since the 1980's, when outstanding empirical evidence acquired by smaller companies in the economic activity started to be systematically proven (Verheul *et al.*, 2001). In the Spanish case, small- and medium-sized enterprises in 2008 accounted for 99.86 percent of the total business census and yielded higher wealth and employment than the group of large enterprises (DGPyme, 2009), as well as becoming the base of greater social cohesion.

However, the reduced business size characterising the majority of the Spanish enterprises diminishes their competitive capacity, as this hinders not only the exploitation of scale economies in production, but also the innovation and internationalisation of their activities. Unfortunately, according to data from the Directorio Central de Empresas [Cen-

tral Directory of Companies] (INE-DIRCE, 2010), the evolution of the Spanish business structure in the last decade is far from showing a tendency to reduce the problem, due to the fact that, in relative terms, the percentage of small-sized enterprises is progressively increasing against medium- and large-sized firms. Moreover, data extracted from the panel of the Encuesta de Estrategias Empresariales [Survey of Business Strategies] (Fundación SEPI, 2010) demonstrate that there is a direct relationship between size and variables that are essential for growth such as, in macroeconomic terms, productivity, professional qualification, technological effort, balance of the relative commerce (propensity to export less importing intensity) and the direct participation in foreign companies; and, in microeconomic terms, the measurement of efficiency regarding profitability and value generation.

In other words, the competitiveness of small-sized enterprises depends to a large extent on their growth and expansion capacity, so the analysis of merger processes between them has increasing importance and can be used as a motive for carrying out this research.

This article analyses the merger processes of Spanish SMEs and large enterprises through the economic-financial analysis of their accounting data. The objective is to contrast that merger processes of unlisted companies in Spain in the years 2001, 2002 and 2003 had a positive impact regarding results, efficiency and value creation of the companies involved in such processes, compared to those of non-merging companies. From a counterfactual perspective, the study takes into consideration the period between 1999 and 2005 in order to allow the comparison of performances of the indicators employed in a time span before and after the merger, according to size and sector aggregates. The results help us to establish a first reference framework regarding the incidence of merger processes of unlisted companies in the economy, although this could be supported or refuted by other future works.

The present research intends to contribute to the understanding of the dynamics of business mergers and, as a novel addition, it includes the aggregate analysis of the large group comprised of unlisted SMEs. This contribution could be useful not only for a better economic understanding of the behaviour of these smaller enterprises, but also for the design of public policies by policymakers. In line with the aforementioned, such policies are being implemented at a national and regional level by small- and medium-sized enterprises in order to promote and provide incentives for merger processes as a strategy for growth, optimisation of resources and strengthening of competitive advantages of the business fabric [(1)].

(1) Particularly, we could mention the specific regulations of the autonomous regions of Andalusia (Order of May 24, 2005) and Murcia (Order of December 28, 2005). In both cases, the merger processes of small-and medium-sized enterprises are encouraged. Furthermore, the Empresa Nacional de Innovación [National Innovation Enterprise] (ENISA), attached to the Spanish Ministry of Industry, Tourism and Trade, has launched a 'line of financing for the acquisition and merger of SMEs'. These national and regional regulations are in keeping with the development of the European Commission Directive on cross-border mergers of limited liability companies, which derives from the fragmented business structure between the different national markets and regions. This situation indicates a weakness in the business structure concerning competitive strategies suggested by non-European companies or areas, sometimes from emerging countries. The Directive includes small- and medium-sized enterprises as users of this type of business operations as a competitive and growth strategy,

The main results drawn from this piece of work allow us to confirm that those companies resulting from merger processes (SMEs and unlisted large companies) adopted in recent years have improved, or at least not worsened, their efficiency and value creation, although the impact is different depending on size and sector. More specifically, small and medium companies of the industrial and services sectors register clearly positive values, against large and microenterprises, where the effects are not so obvious, and this is also applicable to the rest of sectors.

Apparently, these results should have an effect on public policies, not only at a national level, but also in regional regulations. The reason for this is that, in the near future, new rules developing the EC Directive (2005/56/EC) on cross-border mergers of limited liability companies are foreseen. This circumstance should be more significant due to the negative effects generated in the business fabric since the beginning of the crisis in 2007 and more so, when coming out of this crisis, due to the consequences derived from the new coordinates on which international competitiveness will be based on.

In this sense, the promotion of business competitiveness from the concentration of small-sized enterprises (which supports their growth), should be aimed not at the whole group of SMEs but at specific companies belonging to business sectors or sizes where these corporative operations seem to contribute more to achieve a higher economic efficiency and to optimise the use of public resources.

The present article, taking into consideration this starting point, consists of this introduction and five more sections. The second section presents a theory and empirical studies concerning merger processes. In the third section, the data sources and methodology are specified. The fourth section develops the empirical study of dynamics and efficiency of concentration processes of Spanish unlisted companies. And the fifth section presents a statistical analysis which aims to reinforce the results of the empirical analysis. Finally, the main conclusions are drawn in the last section.

2. THEORY AND EMPIRICAL STUDIES CONCERNING MERGER PROCESSES AND RESEARCH HYPOTHESES

The past twenty five years have witnessed a strong launch of business concentration processes, which have affected the different company sizes, sectors and geographical areas in different ways. Specialised literature has dealt with the explanation of waves of mergers in the past (Andrade *et al.,* 2001), including their causes and determining factors (Kleinert and Klodt, 2002; and Gugler *et al*., 2006) and their explanatory models (Shleifer and Vishny, 2003; and Rhodes-Kropf and Viswanathan, 2004).

Academic research has focused on mergers and acquisitions undertaken by listed companies and, for this reason, the focus of their attention has been on the different effects of their quotation value in the markets. The market value is highly influenced by the stage of the economic cycle and by the shocks originated in financial markets.

Due to this, another less extensive approach to the analysis has been carried out using empirical studies that take as a basis the accounting data of those companies undertak-

ing these business operations. This perspective is applicable not only to listed but also to unlisted companies (including the generality of smaller companies), where the only possible analysis is the accounting analysis of the operations (Grinblatt and Sherindan, 2003, p. 559). For this kind of studies, it is necessary to establish control groups in order to minimize the bias characteristics of accounting data as well as to isolate the effects derived from the economic cycle.

2.1. Theoretical and empirical studies

in order to aid the follow-up and understanding of this section, Table I shows the authors under analysis and the most relevant conclusions obtained from their researches, concerning the following subjects: 1. general aspects and researches based on market data; 2. small- and medium-sized enterprises; 3. use of economic-financial ratios; 4. limitations and caution in the use of accounting data; 5. counterfactual analysis, control groups, ratios and results, and 6. types of economic-financial ratios used in this study.

The use of economic-financial ratios to characterise those companies undertaking a merger is frequent in literature. Some authors mention several studies where this methodology has been used for companies during the 1950's, 1960's, 1970's and 1980's. Sorensen (2000) analyses the mergers undertaken in the United States in the year 1996 (excluding banks, insurance companies and real estate companies) for which 22 ratios of each company are calculated and univariate and multivariate statistical techniques and logic regression are used. His conclusions are that the ratios used to assess profitability are those that best explain the differences between those companies intervening in a merger and those that do not.

Mueller (1997), in turn, brings together the most significant works regarding the effect mergers have on profitability, market share, growth, productivity and sale prices. More specifically, he re-examines twenty studies on the effect mergers have on profitability, which is measured in different ways (before tax profit/assets or total assets, after tax profit/assets or total assets, before tax cash flow assets, value added per worker/shipments). Bonardo *et al.* (2009) consider that the effects of mergers and acquisitions involving innovative SMEs should be principally evidenced by the improvement of productivity and the maximization of financial profitability.

In a recent work on mergers of Spanish listed companies in non-financial sectors (Colarte and Rodríguez, 2006), economic return and cash flow were considered to be the ratios most frequently used in order to assess the results of a merger. Moreover, the advantages and disadvantages of using these ratios were identified, as well as a general presentation of the previous studies regarding this subject matter. In this sense, the research carried out by Sierra and Monterrey (1991) is particularly interesting as it demonstrates in detail the limitations of profitability and cash flow ratios when exploring the impacts of merger processes. Such limitations are stated in section 3.1.

Table I

Authors and subjects studied regarding mergers

General aspects and researches based on market data:	
Demsetz, 1973	It is essential to analyse efficiency in mergers
De Bondt and Thomson, 1992	The efficiency analysis in the academic debate
Andrade *et al*., 2001	Study of waves of mergers in past decades
Kleiner and Klodt, 2002 Gugler *et al*., 2006	Causes and effects of the stages of waves of mergers
Shleifer and Vishny, 2003 Rhodes-Kropf and Viswanathan, 2004	Explanatory models of the waves
Jessen, 1984 Bradley *et al*., 1988 Fernández and Gómez Ansón, 1999 Fdez. Blanco and García Marín, 2000 Lozano *et al*., 2003	In general, positive effects for adquired and negative effects for acquiring companies; value generation for shareholders
Scherer, 1991	Using market information, USA mergers in the 1960's and 1970's «were a managerial disaster...»
Small- and medium-sized enterprises:	
Verheul *et al*., 2001	Great importance of SMEs in economic activity
European Commission, 2005	Policies regarding the promotion of mergers among SMEs
D.G. PYME, Gob. España, 2009	Importance of SMEs and business concentration to reach a size
Aiginger y Tichy, 1991	Research focused on large enterprises
Grinblatt and Sheridan, 2003	For non-listed companies (mostly SMEs), only the analysis with accounting data is applicable
Gugler *et al*., 2003	They generally found a reduction in profits and efficiency in large enterprises, and an increase in SMEs.
Bonardo *et al*., 2009	The study of mergers among (innovative) SMEs is rare . The use of accounting ratios is very useful in this case
Use of economic-financial data and results:	
Mueller, 1997	Review of 20 studies using ratios (mainly from USA and UK) between 1950 and 1980. Effects on profitability
Sorensen, 2000	Mergers in USA 1996, use of 22 ratios. Profitability ratios are the most explanatory ones
Andrade *et al*., 2001	Study 1980-2000. Profits and cash-flow. Positive results after the merger
Alcalde and Espeitia, 2002	No improvements in performance after the merger, but only sometimes in companies within the same sector
Colarte and Rodríguez, 2006	Economic profitability and cash-flow. No favourable effects on efficiency
Bonardo *et al*., 2009	Productivity and profitability are the main indicators in the case of SMEs
Muscarella and Vetsuypens, 1990 Opler, 1993	Productivity and cash flow generation in LBO operations have positive effects on acquired companies
Smith, 1990	Working capital. Improvements after LBO operations
Limitations and cautions in the use of accounting data:	
Meeks and Meeks, 1981	Sensitivity of ratios to factors influencing mergers, mainly profitability. Excluding the year of merger
Kennedy, 1995	Taking into consideration the method of accounting of goodwill after the merger
Apellániz *et al*., 1996	Study on mergers in the Spanish insurance sector. Excluding the year of merger
Serra *et al*., 2001	Study on mergers in the Spanish insurance sector. Excluding the year of merger
Counterfactural analysis, control groups, ratios and results:	
Ravencraft and Scherer, 1987	Profitability. Worsens after the mergerRavencraft, seifitaR1991 the previous result
Healy *et al*., 1992	Cash-flow. Positive results after mergers
Apellániz *et al*., 1996	Cost-savings and technical efficiency. Improvements after the merger
Mueller, 1997	Compares profitability ratio before and after the merger and control group of non-merged firms. Higher probability of worse profitability
Lichtenberg, 1988 Benfratello, 2002	Productivity and technical efficiency. Improvements after the merger
Serra *et al*., 2001	Profitability, management indicators, profits and risk distribution. No changes after the merger
Cuesta y Orea, 2002	Cost-saving and technical efficiency. Merged are more efficient than non-merged companies

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TABLE I (CONT.)
AUTHORS AND SUBJECTS STUDIED REGARDING MERGERS

Contreras and Papillón, 2002	Economic profitability, added value, solvency and financial structure. Some improvements after the merger
Gugler *et al.*, 2003	Profitability. Generally, reduction in profits and efficiency in large enterprises and increases in SMEs
Types of economic-financial ratios used in this study:	
Mueller, 1997 Sorensen, 2000	The same as in the present study (and others)
Singh, 1971 Piper and Weiss, 1974 Cable *et al.*, 1981 Contreras and Papillón, 2002	Profitability in UK, USA, Germany and Spain, respectively
Caves and Barton, 1990 Lichtenberg *et al.*, 1987 Lichtenberg, 1988 and 1992 Benfratello, 2002 Bonardo *et al.*, 2009	Productivity (and technical efficiency)
Simkowitz and Monroe, 1971 Harris *et al.*, 1982 Andrade *et al.*, 2001 Colarte and Rodríguez, 2006	Cash-flow (and others)

Source: own elaboration.

However, as stated by Meeks and Meeks (1981), in the use of economic-financial ratios, mainly in the profitability indicators, it is worth considering that, after a merger, the values of the different profitability measures can be affected, among other factors, by: change in bargaining power, inter-participant sales, change in gearing and accounting in the years of the merger. These factors could distort profitability and make it seem to increase, which does not necessarily mean a growth in efficiency mainly due to the first three factors in the case of large firms, and to a lesser extent in the case of smaller companies. These latter companies are precisely the core target of the analysis in the present article. Concerning the fourth factor mentioned, due to the fact that the methodology used is based on accounting data, the year the merger took place is eliminated. Apellániz *et al.* (1996) and Serra *et al.* (2001) also eliminate the year of the merger when they evaluate the results of Spanish business mergers with accounting data in the financial and insurance sectors, respectively.

Apart from this precaution, in order to prevent distorted results, the use of control groups must also be considered in order to compare the performance of companies participating in merger or acquisition processes and that of companies which were not merged or acquired. In this sense, Mueller (1997, p. 664) states that «the proper way to measure the effects of mergers on profitability is to compute the weighted profit rate of the merging firms *before* the merger and… *after*… one should also control for this factor by comparing the change in profits of the merged firms with a control group of otherwise similar non-merged firms».

Some of the most significant works using this counterfactual approach are those carried out by Ravenscraft and Scherer (1987, chap. 3); Gugler *et al.* (2003); Healy *et al.* (1992);

Lichtenberg (1988), Benfratello (2002) and, in the Spanish case, Cuesta y Orea (2002), Apellániz *et al*. (1996), Serra *et al.* (2001) and Contreras y Papillón (2002).

Ravenscraft and Scherer (1987) assessed the incidence of merger operations on the profitability of merged companies during the third quarter of the twentieth century. From a counterfactual approach and using control groups, they compared the results obtained to those of the companies of the same sector not involved in merger processes. The results of this study indicate that, after the merger, the profitability of the companies involved register a significant reduction. This finding was later ratified by Ravenscraft (1991). Likewise, Mueller (1997), in the aforementioned review of twenty works, comes to the conclusion that, in the United States and the United Kingdom —where the majority of the studies have been carried out— evidence does not seem to indicate an increase in profitability and a decrease is more probable for companies after the merger, and also that in other countries being considered, the evidence follows the same line. In the Spanish case, Colarte and Rodríguez (2006) reach similar conclusions regarding the enterprises under analysis —generally large-sized listed enterprises—, i.e.: non-existence of favourable effects in efficiency, business profitability and productivity. Alcalde and Espitia (2002) came to the same conclusion in a study of 33 non-financial listed enterprises, as they proved that the performances of acquired companies do not improve and only an improvement in the operative performance is registered when the companies involved belong to the same sector.

The conclusions from the previous works have been questioned in other researches where accounting data was also used. Among these, it is worth highlighting those carried out by Healy *et al.* (1992) and Andrade *et al.* (2001), which offer positive results concerning earnings and operating cash flow for companies involved in merger processes in the last two decades of the twentieth century.

These disparate results are also demonstrated in the extensive work carried out by Gugler *et al*. (2003), who consider the effects of mergers around the world between the mid-1980's and the year 2000. In most of the cases —which generally coincide with large firms— a reduction in profits and efficiency occurs, although some mergers result in an increase in profits, either due to an increase in market power or efficiency, which mainly corresponds to small-sized enterprises. No great differences are found by these authors concerning the effects of mergers carried out in the services and industry sectors, although mergers within the industrial sector seem to be less profitable than those of the services sector.

Lichtenberg (1988) and Benfratello (2002), when focusing on productivity and technical efficiency respectively, conclude that acquired companies experience an increase in their productivity and technical efficiency, which evolves from being lower than the control group to become equal or even higher. This demonstrates that changes in ownership of acquired companies imply a better use of resources and, therefore, an increase in the total factor productivity and savings in costs.

Cuesta y Orea (2002) test whether merged and non-merged firms have different levels and temporal patterns of technical efficiency in Spanish saving banks, using a stochastic

distance function approach. They conclude that merged and non-merged firms have different patterns of technical efficiency change and, more specifically, that merged firms will be more efficient than non-merged firms.

Apellániz *et al.* (1996), Contreras and Papillón (2002) and Serra *et al.* (2001) also use the counterfactual methodology and, in the first two researches, they come to the conclusion that the group of saving banks under analysis which undertook a merger, experience some improvements regarding profitability and productivity or operational efficiency. In the case of the third analysis, they conclude that in merged insurance entities, no changes are registered in most of the indicators considered.

In the analysis of business acquiring processes, and more specifically in Leveraged Buy-out's (LBO), accounting data of the acquired company has also been used in order to measure the result of the operation. For example, productivity and cash-flow generation capacity indicators compared to the company turnover are used (Muscarella and Vetsuypens, 1990; and Opler, 1993, or indicators related to the working capital (Smith, 1990). These studies demonstrate that, after the acquisition, the evolution of the indicated ratios allows us to conclude that these operations positively affect the efficiency of the acquired company.

Therefore, from the existing evidence regarding the analysis of business mergers with accounting data, unfinished results are obtained regarding the effects on efficiency and value creation according to the different works carried out, their periods and authors. In other words, the only clear conclusion is that, on a general basis, merger processes can´t be stated to result in a global improvement compared to the previous situation.

Nevertheless, when stock market data are used in the analyses, the conclusion is different. Generally speaking, these studies, according to the financial theory, conclude that mergers generate value for the shareholders as they take into consideration both the usual positive effect on the acquireed company and the usual negative effect on the acquiring company. Among some of the most prominent international researches, we can cite those by Jensen (1984) and Bradley *et al.* (1988); and in Spain, Fernández and Gómez-Ansón (1999), Fernández Blanco and García Martín (2000) and Lozano *et al.* (2003). However, to this respect and as stated by Scherer (1997, p. 688), there is also evidence that empirical researches have been carried out in the United States referring to mergers undertaken in the 1960's and 1970's where, using market information, they conclude that these «were a managerial disaster that had to be undone by a new wave of bust-up takeovers».

All in all, the results obtained from the merger processes using accounting data or market information seem to confirm that which was already observed by Aiginger and Tichy (1991, p. 96) that «…In the majority of cases takeovers neither increase profits nor growth nor efficiency… The most important reason for the somewhat inclusive results is the *high dispersion* of all the indicators around their means…».

2.2. Research hypotheses

On the basis of the objective of this work and the evidence obtained from literature, the following research hypotheses can be formulated:

1. The business decision of tackling a merger is highly significant for all those involved and means taking on new risks and uncertainties, which should be compensated with the results expected. If this circumstance is of particular relevance in the case of large listed enterprises, it is also relevant for SMEs which lack the transparent information provided and required by the markets. In fact, as in the case of any other business decision, the objective of the merger will be to contribute positively to the value increase of the ownership or the shareholder.

   Thus, the first hypothesis (H.1) is: *Merger processes of unlisted companies in Spain have a positive impact on results, efficiency and value creation.*

2. SMEs are naturally different, as is their structural configuration, from large enterprises, particularly those listed in financial markets. Their smaller size and the activity branches where these operate make them different, in general, regarding their market organisation, which affects their dynamics and results. Equally, it seems reasonable to state that, the more aggregated the fields of analysis are regarding sizes and sectors, the less probable it is to obtain significant conclusions. On the other hand, data offered by microenterprises (less than 10 employees) present a great dispersion, higher than that of the data offered by small and medium-sized enterprises and although these still have differences between them, are also far from the objectives and behaviours of large companies. It can be expected that the effects generated as a consequence of concentration processes among them are varied according to their sizes and activity branches. The results are also expected to be different depending on the strategy adopted in a merger process, which could be directed to increase the value of ownership or to maintain this in other cases or, sometimes, to lessen the negative effects which could be related to a loss of competitiveness derived from being of a smaller size.

   Therefore, the second hypothesis can be stated (H.2): *The impact of merger processes is affected by differences in firm sector and size.*

3. METHODOLOGY, SOURCES AND DATA

In order to assess the economic impact of mergers, a counterfactual methodology is used, which allows us to compare the situation of the merged company before and after the merger process, showing the difference between companies of different sectors and sizes. To this purpose, three types of economic-financial ratios are used as indicators of results, efficiency and value creation.

Two sources of information are used: the trade section of the Spanish Official Gazette (Official Gazette of the Register of Companies – BORME) and the database of the Sistema de Balances Ibéricos (SABI), both providing information in order to identify the merger processes and obtain the accounting data of the companies involved.

3.1. Economic-financial indicators and their limitations

Three types of indicator have been taken into consideration. The first indicators are used to measure business profitability and technical efficiency: Economic profitability, Financial profitability and Productivity. The second, to measure the cash-flow generation capacity or liquidity of the business activity, which directly affects the value of the company: EBITDA/Total assets and EBITDA/Turnover. These two types of indicators were already stated by Aiginger and Tichy (1991) as measures for economic, technical and profitability efficiency. Moreover, such indicators have been greatly used in literature, as can be seen in the broad list of works compiled by Sorensen (2000) and Mueller (1997), referred to in section 2 of the present article. Among these works, it is worth mentioning those analysing the effects of mergers on profitability: Piper and Weiss (1974) in the United States; Singh (1971) in the United Kingdom, and Cable *et al.* (1980) in Germany; on productivity: Caves and Barton (1990) and Lichtenberg (1992); and on liquidity together with the other ratios: Harris *et al.* (1982).

And the third indicators characterise the cost management and the investment and financial structure of the company: Operating costs, Personnel costs and Financial cost, the three of which relative to Turnover, and Current assets/Fixed assets and Permanent financing/Total fixed assets.

The ratios of economic and financial profitability indicate, respectively, the efficiency of the action of the entrepreneur and the corresponding remuneration. Contreras and Papillón (2002, p. 105) state that: «The interest of owners lies on the principle of maximization of profits, as the more efficient a company is, the lower the output costs per unit and, therefore, the higher its profits». The economic profitability reflects the appropriate use of physical investment in fixed and current assets through the quotient between the earnings before interests and taxes and the total annual average assets of the company. The financial profitability, defined as the relationship between the net income of the company and the stockholders' equity employed, indicates the surplus available to the entrepreneur as a reward for the risk taken.

Productivity, which measures the added value obtained by the employee, indicates that the adequate combination of the human factor and the technical structure has an impact on the enterprises' production generation.

On the other hand, EBITDA (*Earnings Before Interests, Taxes, Depreciation and Amortization*) is the closest indicator for liquid funds generated by a company. This ratio is neither subject to a different application of accounting criteria attributable to amortizations and depreciations or tax criteria, nor to the election of the binomial equity financing-debt financing in the financial structure of the company. In this study, we have taken into consideration both the generation of liquidity with respect to the total investment of the company and to the earnings obtained, as this relative allows us to compare between periods of time and companies analysed. After the merger, the updated value of the variations of EBITDA in the consecutive periods will be indicative of the creation or destruction of value for the owner.

The ratios characterising the cost management and the investment and financing structure of the company allow us to interpret their efficiency gained by reducing costs and optimising the economic-financial structure, which naturally affects and contributes to the explanation of the behaviour of the previous ratios.

The ratios to measure business profitability, technical efficiency and the cash flow generation have been selected according to the more generalised literature to this respect. However, in line with such literature, these ratios show certain limitations. Sierra and Monterrey (1991, p. 952) indicate that «a fully satisfactory measure to analyse the result of mergers and acquisitions does not exist, as each of them… have problems of a conceptual or interpretative nature». These authors, for example, point out that the use of economic profitability presents some difficulties when comparing the values before and after the merger due to the impact of the revalorisation of assets on the profit and loss account due to the amortization and provisions and the ratio denominator itself, as well as the incidence of the chosen method of accounting of goodwill on the results of the enterprise.

Likewise, the ratios used on the basis of the cash flow (EBITDA in this article) have the advantage of not being influenced by the effect of the amortization of assets and goodwill, but these do not reflect the cost corresponding to the financing of the merger operation and the consequent tax effect depending on the financing structure adopted. In this sense, selecting the magnitude with respect to which the EBITDA must be relative is a significant matter and this is the reason why we have opted for two magnitudes in this work: total assets and turnover. The first option presents us with a problem resulting from the revalorisation of assets, although this hitch is eliminated in the case of turnover.

Due to these limitations, Sierra and Monterrey (1991, p. 958) defend that the net profit per share is «the best instrument of analysis to reflect the fulfillment of objectives of these operations, or at least it is the less imperfect». For this reason, we have also taken into consideration in the present article the ratio of financial profitability, which relatives the net profit with respect to the equity contributed by shareholders instead of the number of shareholders, because, due to the aggregated nature of the research, we do not have available the number of shares of each of the companies involved in the merger operations.

The productivity ratio —added value per worker— has been used by several authors, as established in section 2, in order to measure technical efficiency. This indicator is significant in merger processes as an improvement is expected in the resulting enterprise, with the limitation that such change could take a long time to appear due to the adjustments that must be carried out because of the concentration process. Benfratello (2002) and Lichtenberg *et al*. (1987) evidence increases in technical efficiency, which do not appear immediately, but through a period of six or seven years, respectively.

This delay in the effects on productivity is registered, to a more or less extent, in the rest of ratios analysed, as the incidence of concentration reflects with different intensity and in different times on the various functional areas of the enterprise. Therefore, in this work, of an aggregate nature, we have employed the aforementioned indicators of cost

management and the investment and financial structure, which allow us to interpret the results regarding profitability, technical efficiency and cash flow.

The use of this wide range of indicators, despite their limitations and imperfections, allows us to reach more precise conclusions considering the effect of the sign of each indicator after the merger compared to the rest of indicators.

3.2. Counterfactual methodological approach

The analysis of the effects of mergers on the efficiency of the involved companies requires the availability of data before and after the concentration processes. Therefore, adopting a counterfactual approach is necessary, following the assessment methodology of projects by EuropeAid (European Commission, 2006). This approach is necessary due to the fact that the values adopted by the three types of indicators mentioned depend not only on the management of the company, but also on the specific stage of the economic cycle.

In order to eliminate this cyclical effect, the values of each indicator are relative by using a quotient and obtaining a new indicator resulting from dividing the value of the median of the distribution of values of each ratio for each year and stratum (size and sector) by the value of the median of its corresponding control group of non-merged companies. In order to find the numerator of the quotient up until the moment when the merger took place (2001, 2002 or 2003), we take into consideration the values of the statistics of the enterprises participating in the merger processes and, after these, the values of the resulting companies. For the denominator both up to and after the merger, we take into consideration the values of the statistics of non-merged enterprises.

In order to avoid the influence of extreme data, the values are taken in terms of median statistics regarding the treatment of information. Moreover, the value of such indicators has been calculated for the corresponding 16 control groups (four sectors by four sizes), each made up of 100 representative companies according to their size and sector, i.e. for a total of 1,600 non-merged companies.

As a result of the quotient of this relative, three types of magnitudes are obtained: lower than 1, equal to 1 or higher than 1: a result equal to 1 means that the value of the indicator of merged companies is equal to the group of non-merged companies, but higher or lower than 1 indicates values which are, respectively, greater or lesser to the group of non-merged companies by size or sector.

Due to this procedure, the assessment of mergers at an aggregate level is relative with respect to a specific control group, which allows us not to have to make a direct comparison between the values taken by the economic-financial indicators before and after the merger (Apellániz *et al.*, 1996) and, moreover, also reduces the effect generated by the limitations implied by the use of accounting data.

Once this counterfactual analysis was finalised, and contrasting the different behaviours in the various sizes and sectors at a statistical level, it was confirmed by another analysis (Confirmatory analysis, according to counterfactual methodology) which was carried

out based on the results obtained from the Kruskal-Wallis test at a significance level of 1 and 5 percent. As a non-parametric version of the *F test* resulting from the variance, this test was chosen due to the heteroscedasticity and abnormality of the values of the variables under analysis. This test allows us to contrast the existence or non-existence of differences between the values taken for each indicator by the companies before and after the merger process. For this purpose and in order to get a better differentiation of the situation before and after the merger and to avoid distorted results, the values of the indicators corresponding to 2001, 2002 and 2003 for the companies merged in each of these years have been eliminated.

Moreover, in order to determine the importance of the business size or the activity sector as explanatory variables of the success of a merger process, an AID (Analysis Interaction Detection) multivariate analysis has been carried out. For a specific minimum contribution to the proportion of the explained variance, such analysis allows us to sequentially obtain which divisions are those which most discriminate the average of each group according to a base criterion. In this case, the criterion is the improvement of each of the efficiency indicators used (relative to profitability, productivity and EBITDA). The variables used to create the different divisions (explanatory variables) are size and activity sector. Thus, where the company registers an improvement, the dependent variable takes on a value of 1; on the contrary (the company does not improve after the merger), the dependent variable takes on a value of 0.

3.3. Databases and period of analysis

Due to this research being so new, we have used primary sources including all merger operations being carried out in Spain in recent years. Since the late 1990's, the BORME publishes the announcements of business concentration operations for the purpose of public information (www.boe.es/g/es/borme/). This allows us to identify the companies involved in each merger process, as well as the resulting company.

Also, the database SABI, commercialised by Bureau Van Dijk, offers access to balances and profit and loss accounts of the majority of trade companies, so that the economic-financial indicators of the companies identified in the BORME can be obtained.

Both databases have provided us with information concerning the merger processes carried out between 1999 and 2005 disaggregated by sizes [(2)] (micro-, small-, medium- and unlisted large-sized enterprises) and sectors [(3)] (industrial, commercial distribution, rest of services and construction). This size criterion has been adopted based on the definition of SME according to the European Commission (2003), which differentiates between microenterprises, small, medium-sized and large enterprises. This is binding

(2) The following segmentation criteria have been chosen by *size* according to the number of employees: microenterprises, with less than 10 employees; small-sized enterprises, with 10 to 49 employees; medium-sized, between 50 and 249; large enterprises, over 249.

(3) The criteria chosen by *sector* according to the groups of economic activities, NACE-93: Industry (Extractive industries, energy and water: 10 to 14 and 40 to 41; Traditional manufacturing: 15 to 23, 26 to 28 and 36 to 37;and Intermediate and advanced manufacturing: 24 to 25 and 29 to 35), Construction (45), Commercial distribution (50 to 52), Other services (55 to 93).

on all Member States with respect to national aids and EC programs. Since 2005, several policies have promoted the concentration of micro, small and medium-sized enterprises. This de-aggregation allows us to be more precise in the results, as each of these sectors and business sizes shows a high heterogeneity and dispersion regarding behaviours and data due to the different nature of those firms operating in the same sector and having the same size.

As previously indicated, the analysis of the effects of mergers requires the availability of data before and after the concentration processes. This is the reason why the only merger operations taken into consideration have been those carried out in 2001, 2002 and 2003, as these allow us to compare their performances, through economic-financial indicators, with respect to two or three years before (participating companies) and after the merger (resulting companies). More specifically, for companies merged in 2002, the data available corresponds to three years before and three years after the process; for those merged in 2001, two years before and four years after; and for companies merged in 2003, four years before and two years after.

3.4. Identification of merger processes

As shown in table 2, 13,399 announcements of mergers were published in the BORME between 2001 and 2003. Regulations require the publishing of three consecutive announcements for each merger process undertaken. For this reason and for the purposes of this work, the merger exercise taken into consideration has been that corresponding to the year of the first announcement, except in the case of mergers carried out at the end of the year 2000, whose first announcement was published in 2001 and have been excluded. However, we have included those mergers carried out at the end of 2003, which published their first announcement in January, 2004. Therefore, although 4,466 (13,399/3) merger operations would correspond to the 13,399 announcements due to the aforementioned adjustments and some inevitable errors resulting from their manual operation, the number of processes identified or resulting companies is 4,238. From these resulting enterprises, the SABI database provides accounting data only for 3,204. This last figure has been improved by eliminating 374 cases with no accounting information in the SABI after the concentration process. In total, there are 2,830 (3,204 – 374) resulting companies with SABI data.

Table II
Mergers of companies in Spain, 2001-2003

Year of merger	***2001***	***2002***	***2003***	***Total***
Announcements in the BORME	4,662	4,467	4,270	13,399
Resulting enterprises	1,533	1,380	1,325	4,238
Resulting enterprises with SABI data	1,162	1,056	986	3,204
Resulting enterprises with SABI data after the merger	1,083	945	802	2,830
Resulting enterprises with SABI data after the merger and with SABI data for participating enterprises	847	731	674	2,252

Overall, these 2,830 enterprises have been classified into 16 groups according to the sizes and sectors being analysed (4 sizes for 4 sectors). After this segmentation, each resulting enterprise has been associated with the participating companies in its merger process. Such groups of companies have again been improved by eliminating the cases with no existing SABI data for the participating companies, although, given the aggregate nature of the present study, these are not eliminated when accounting data is available for some of them.

After all these processes of data debugging, which implies the elimination of 578 cases, the companies under study by sizes and sectors in these three years goes from 2,830 to 2,252. Therefore, the final group of companies, which are the subject of this analysis, comprises these 2,252 resulting companies and 3,274 companies involved in the same merger processes.

TABLE III

RESULTING AND PARTICIPATING ENTERPRISES IN MERGERS, BY PRODUCTIVE SECTORS AND BUSINESS SIZES, 2001-2003

Productive sectors and business sizes		*F&A companies*	*Years*		
			2001	*2002*	*2003*
Industrial		Resulting	173	137	134
		Participating	212	177	179
Construction		Resulting	49	32	31
		Participating	74	42	48
Commercial distribution		Resulting	138	152	139
		Participating	207	229	209
Services (Non-commercial)		Resulting	487	410	370
		Participating	762	595	540
Total	*Resulting*	*2.252*	*847*	*731*	*674*
	Participating	*3.274*	*1,255*	*1,043*	*976*
Microenterprises		Resulting	273	237	188
		Participating	361	306	259
Small-sized enterprises		Resulting	206	190	179
		Participating	300	224	220
Medium-sized enterprises		Resulting	196	180	182
		Participating	297	269	263
Large-sized enterprises		Resulting	172	124	125
		Participating	297	244	234
Total	*Resulting*	*2.252*	*847*	*731*	*674*
	Participating	*3.274*	*1,255*	*1,043*	*976*

4. DYNAMICS AND EFFICIENCY OF MERGER PROCESSES OF SPANISH UNLISTED COMPANIES

In this section, we analyse the behaviour from 1999 to 2005 of those companies that carried out merger operations between 2001 and 2003 in order to verify the resulting efficiency of these operations. The sectorial analysis starts with that or those sizes for which the most defined effects derived from the merger operations are observed, although afterwards some clarifications were made from the contrasting statistics.

In order to simplify and provide a practical purpose of the detailed empirical analysis, the core of the article includes just one of the tables of the indicators analysed by sector and business size (table IV: Efficiency indicators of small- and medium-sized enterprises of the industrial sector). The rest of the tables regarding the other sectors and sizes are presented in appendixes 1 to 5 of the present article. These tables provided for the different sectors include data for the sizes and indicators where some differences are observed in the results before and after the merger. Those cases where the counterfactual and confirmatory analyses do not show significant differences are eliminated.

4.1. Industrial sector

During the period under analysis (1999-2005), *small- and medium-sized* industrial companies which undertook merger processes between 2001 and 2003 present similar values amid themselves in the ten indicators calculated, and near to the comparison control group of non-merged companies corresponding to such sizes (table 4).

Until the moment of the merger, the permanent financing ratio between total fixed assets for small-sized firms is similar (near 1) between those carrying out a merger and those of the control group. This is shown in Table IV, where companies merged in 2003 give values between 0.98 and 1.10 in the four-year period between 1999 and 2002; those merged in 2002 register values ranging from 0.93 and 1.10 between 1999 and 2001; and the values of the companies merged in 2001 are between 1.00 and 1.04 in the period from 1999 to 2000.

After the merger, the resulting companies register values slightly lower than those of the control group for this same ratio, which is also shown in Table IV: companies merged in the year 2001 present values between 0.82 and 0.89 in the four-year period 2002-2005; companies merged in 2002 register values between 0.93 and 1.03 in the three-year period 2003-2005; and those merged in 2003 register values ranging from 0.83 to 0.85 between 2004 and 2005.

On the contrary, for medium-sized enterprises before the merger, the ratio gives lower values than those of the control group (ranging from 0.81 and 0.95) and, after the merger, these are concentrated around the control values (between 0.90 and 1.15, although the rest of values are near 1.00).

In the case of small firms, these behaviours indicate a reduction in working capital, and in the case of medium-sized enterprises, a slight increase in working capital. The

TABLE IV

EFFICIENCY INDICATORS OF SMALL- AND MEDIUM-SIZED ENTERPRISES OF THE INDUSTRIAL SECTOR MERGED IN 2001, 2002 AND 2003 (relative to non-merged sample companies of the same sizes) *

Indicators	*M&A*	*Small-sized enterprises*							*Medium-sized enterprises*						
	Year	*1999*	*2000*	*2001*	*2002*	*2003*	*2004*	*2005*	*1999*	*2000*	*2001*	*2002*	*2003*	*2004*	*2005*
CURRENT ASSETS / FIXED ASSETS	2001	1.08	1.11	0.52	0.62	0.90	0.79	0.99	0.89	1.10	0.81	0.90	1.03	0.90	0.90
	2002	1.00	0.93	0.90	0.80	1.07	0.90	1.07	0.92	1.00	0.98	1.06	1.11	1.03	1.05
	2003	0.59	0.59	0.61	0.80	0.73	0.74	0.76	0.94	0.95	1.02	0.76	0.86	0.73	0.76
PERMANENT FINANCING / TOT. FIXED ASSETS	2001	1.00	1.04	0.91	0.84	0.82	0.89	0.85	0.87	0.85	0.87	0.90	1.02	1.01	1.08
	2002	1.10	0.93	0.97	0.90	0.93	0.95	1.03	0.92	0.95	0.91	0.95	1.06	1.02	1.03
	2003	1.10	1.00	0.98	1.06	0.75	0.85	0.83	0.89	0.81	0.85	0.87	1.06	1.03	1.15
OPERATING COSTS / TURNOVER	2001	1.06	0.98	1.07	1.05	1.08	1.07	1.06	1.04	0.95	1.11	1.14	1.13	1.18	1.07
	2002	0.94	1.02	0.97	1.11	1.16	1.18	1.16	0.99	1.00	1.03	1.06	1.10	1.14	1.08
	2003	0.85	0.88	0.88	0.95	1.19	1.15	1.09	0.97	1.00	0.98	0.92	1.06	1.07	1.03
FINANCIAL COSTS / TURNOVER	2001	1.18	1.25	2.08	1.63	1.41	1.27	1.15	1.16	0.87	1.36	1.30	1.15	0.95	0.69
	2002	0.99	0.68	0.70	1.46	0.93	1.40	1.15	0.70	0.80	0.51	1.27	1.06	1.12	0.80
	2003	0.73	0.96	0.59	0.29	1.11	1.11	1.33	0.40	0.71	0.63	0.42	0.79	0.74	0.65
PERSONNEL COSTS / TURNOVER	2001	0.76	0.55	0.89	0.86	0.79	0.83	0.85	0.77	1.13	0.88	0.77	0.83	0.69	0.81
	2002	0.65	0.60	0.70	0.77	0.68	0.70	0.64	0.56	0.53	0.67	0.78	0.79	0.73	0.74
	2003	0.65	0.61	0.57	0.87	0.64	0.73	0.66	0.65	0.75	0.52	0.54	0.83	0.81	0.76
FINANCIAL PROFITABILITY	2001	0.58	0.19	0.78	0.58	1.07	0.73	0.80	1.14	0.85	0.67	0.59	0.76	0.60	0.65
	2002	0.77	0.25	0.38	0.81	1.13	0.92	1.37	0.67	0.91	1.11	1.38	1.30	0.87	0.66
	2003	0.44	0.11	0.33	0.04	1.37	0.96	1.68	0.82	0.75	1.64	1.34	1.55	1.08	0.79
ECONOMIC PROFITABILITY	2001	0.66	0.48	0.75	0.86	0.89	0.80	1.19	0.83	0.79	0.78	0.78	0.97	0.75	0.74
	2002	0.89	0.36	0.44	0.79	0.95	1.03	1.74	0.64	0.83	0.74	1.34	1.13	0.93	0.92
	2003	0.76	0.22	0.41	0.15	1.22	0.92	0.97	0.72	0.68	1.10	1.04	1.52	1.20	1.18
PRODUCTIVITY	2001	1.21	1.30	1.36	1.37	1.24	1.18	1.20	0.95	1.00	1.04	1.07	1.02	0.96	0.99
	2002	1.21	1.26	1.19	1.36	1.41	1.37	1.31	1.02	1.02	0.93	1.15	1.11	1.06	1.08
	2003	1.38	1.27	1.16	1.25	1.43	1.44	1.31	1.14	1.08	1.06	1.23	1.25	1.11	1.11
EBITDA / TOTAL ASSETS	2001	0.64	0.50	0.72	0.86	1.03	1.12	1.33	0.92	0.85	0.81	0.80	0.93	0.79	0.90
	2002	0.88	0.43	0.58	0.73	0.94	0.77	1.51	0.44	0.71	0.69	0.95	1.01	0.84	0.83
	2003	1.03	0.36	0.42	0.42	1.17	0.84	1.37	0.89	0.73	0.73	0.26	1.21	1.11	1.25
EBITDA/NET AMOUNT TURNOVER	2001	0.75	1.00	0.86	0.88	1.50	1.33	1.60	0.89	1.11	1.00	1.17	1.14	0.88	0.67
	2002	1.38	0.75	1.43	1.00	1.33	1.17	1.60	0.78	0.78	0.88	1.83	1.14	1.00	0.78
	2003	1.38	0.88	1.00	0.63	1.50	1.33	2.20	1.00	0.67	0.75	1.00	1.57	1.25	1.00

* The values of this table result from dividing the value of the median of the distribution of values of each ratio for each year and stratum (size and sector) by the value of the median of its corresponding control group of non-merged companies. Until the moment the merger took place (2001, 2002 or 2003) we take into consideration the values of the enterprises participating in the merger processes and, after these, the values of the resulting companies. As specified in the text and as an example, the values corresponding to the years when the mergers were carried out are shown in a box and delimit the values of each indicator for the periods before and after the merger.

reduction of working capital in the case of small companies could be due to a decrease in solvency, but also due to a more efficient use of the financial resources invested in the technical structure of the enterprise. This latter alternative seems to be more probable, as the working capital increases the proportion of long-term investment within current assets, as indicated in general terms by the analysis of the ratio Current assets/Fixed assets.

The values taken by this ratio before and after the merger, not only for small, but also for medium-sized firms, are generally below 1 or occasionally just slightly higher than the unit, which in average terms reflects a higher efficiency of those companies which decided to merge against non-merging companies, as the first have less short-term implicit investment costs in their asset structure.

Moreover, up until the process is carried out, the proportion represented by operating costs compared to turnover is similar between the control group and small- and medium-sized companies that are to be merged, while after the merger this is higher for resulting companies. On the other hand, the proportion corresponding to financial costs over turnover maintains a similar configuration to that of the previous ratio in the case of small firms, while for medium-sized firms financial costs experience a significant increase after the merger, although these are reduced afterwards to a figure below that of the comparison groups, exactly as before the merger. In the case of small- and medium-sized companies, the proportion represented by personnel costs over turnover is lower in the participating and resulting firms than in those integrating the control group, which means that those companies which decide to concentrate are more efficient than the average when considering personnel costs, maintaining this behaviour after the merger. This efficiency concerning labour costs leads to an increase in global efficiency over the whole management of any of the three abovementioned costs.

The fact that personnel costs with respect to turnover are lower in the resulting firms than in the control groups indicates that the level of efficiency is maintained in the use of the labour factor, which needs to be reflected also in the maintenance of productivity, as generally confirmed with the values adopted by the productivity ratio.

Moreover, a higher efficiency in cost management helps the economic and financial profitability of resulting companies register a more favourable evolution than control groups. This is also confirmed by the analysis of profitability, although to a lesser extent in the case of medium-sized enterprises. Regarding both profitability in small firms, the control group before the concentration processes registers higher values than the companies to be merged, while after the merger, these values converge and even increase slightly. This configuration is reproduced when we analyse the cash-flow generation capacity by companies, through the EBITDA indicator, relative to respect to total assets and turnover. This shows the increase in value experienced by small firms when undertaking a merger, or at least the value maintenance by medium-sized companies.

The other two size groups, *micro- and large enterprises*, show that the proportion of current assets with respect to fixed assets is generally lower in participating and resulting companies in and from concentration processes than in those belonging to the

comparative control group. Therefore, it is reasonable to conclude that those companies undertaking these kinds of processes have a more efficient technical structure as a lower current asset investment is needed for fixed investment to work.

Microenterprises with heterogeneous behaviour before the concentration processes offer a financial structure of their fixed assets after the merger similar to those integrating the control groups. However, generally speaking, large enterprises have a lower working capital than the control group before and after the merger. This means, as in the case of small firms, a higher efficiency in the use of financial resources, which is accompanied by lower implicit costs due to a lower proportion in short-term investment.

These business decisions with respect to the company's investment structure and financing tend to reduce implicit costs and could result in an improvement in cash flow (measured by EBITDA) and, therefore, in the company value.

The consequences derived from the analysis of representative ratios of management costs relative to turnover are that large and microenterprises increase their financial costs after the merger: a significant increase is registered in large firms, while this is lesser so in the case of microenterprises. In the case of large companies, such costs before the merger are observed to be lower than those of the control group and higher after the merger. However, in microenterprises, despite the increase of the ratio proportion after the merger, this could be either higher or lower than the control group. Concerning operating costs, in both cases (for micro- and large enterprises) these are similar to those in the comparison groups, although slightly different before the merger and, after this, significantly higher in microenterprises. Thus, we could state that certain inefficiencies could be initially generated from the merger process. Finally, personnel costs over turnover in the case of large companies occasionally are far higher than the control group and, on other occasions, nearly approach this. In the case of microenterprises, the poor data quality hinders an accurate diagnosis, although it seems that those companies undertaking a merger have lower personnel costs than comparison groups, both before and after the process.

Therefore, after analysing these three ratios we cannot conclude that the concentrating process of large and microenterprises generate clear efficiencies regarding costs. In fact, in the case of large firms, economic and financial profitability are not affected by the concentrating process, so their position with respect to the control group is the same as before the merger. On the other hand, this statement is confirmed when the evolution of the productivity ratio is observed, which does not undergo a significant improvement. Even so, the improvement of EBITDA over total assets and the slight worsening of EBITDA over turnover registered by these large industrial companies allows us to conclude that the merger process is not globally unfavourable, as these maintain their cash-flow generation capacity and, therefore, their value.

In the case of microenterprises, it could be stated that those companies deciding to undertake a concentration process register lower performances regarding the two profitability ratios with respect to the comparison group before and after the merger, although this conclusion could be conditioned by the poor quality of accounting data registered

in the database used. What also emerges from this data is that their productivity experiences a significant improvement after the merger and that relative EBITDA with respect to total assets or to turnover offer important improvements for those enterprises merged in 2001 and 2003 in the first case, and in 2001 and 2002 in the second case. However, as in the case of profitability ratios, the value of EBITDA over total assets is lower than the control group, but does approach this. Therefore, it is to be expected that, some years after the merger process, this reaches or even exceeds the control group, as in the case of EBITDA over turnover of those companies merged in the first two years of the triennium under consideration.

4.2. Commercial distribution services

Medium-sized enterprises of the commercial sector which decide to concentrate register a clear inefficiency in their asset structure, which materialises in a high relationship between current assets and fixed assets with respect to the average of equivalent companies. Due to the merger process, they virtually converge, and this is also evident —although undergoing less important changes— in their liability structure when analysing the ratio of permanent financing with respect to total fixed assets.

This convergence indicates an improvement in efficiency and is also reflected in the indicators of productivity performance, (economic and financial) profitability and relative EBITDA. The economic profitability of the firms before the merger is significantly lower when compared with the control group and, after the merger, both converge. Financial profitability registers heterogeneous behaviours before the merger depending on their starting year, although both also converge after the process. EBITDA with respect to total assets reveals that the cash-flow generation capacity when companies merge, is significantly lower than the comparison group, but after the concentration process, the convergence is almost absolute. EBITDA with respect to turnover shows that at least this cash-flow generation capacity is maintained and is comparable to the control group. Therefore, the conclusion drawn is that those companies involved in concentration processes increase their value and are more level with the average.

The generalised convergence process towards the comparison group is reproduced, quite heterogeneously, when analysing the representative ratios of cost management.

As in the case of medium-sized firms, an efficiency improvement is observed for *large-sized enterprises* due to a positive incidence of the concentration process on those indicators under consideration related to the economic and financial structure. Moreover, the productive structure experiences a non-significant reduction in operating costs after the merger, putting these on the same level as the control group; on the contrary, the financial costs experience a significant increase and personnel costs a slight increase. These behaviours seem to compensate each other to the extent that the economic and financial profitability do not offer significant improvements, and therefore these performance indicators generally maintain lower levels than comparison groups, both before and after the merger.

On the contrary, relative EBITDA to total assets and, generally productivity, register better values as a consequence of the concentration process. The productivity of participating companies in the merger process is near the average, while after the process, this generally increases slightly. Before the merger, the aforementioned EBITDA clearly shows that those companies to undertake a merger generate less cash-flow and, afterwards, this increases and converges with the control group. Nevertheless, EBITDA with respect to turnover indicates that those companies involved in a concentration process have a cash-flow generation capacity that is higher than the average, and this later undergoes a slight decline after the merger, although it is significantly higher than that of their comparison groups. Thus, as a result of the merger process, the resulting companies increase or maintain their value.

Regarding *microenterprises and small companies* belonging to the commercial sector, we do not have evidence that the concentration processes these are involved in have positive effects in terms of efficiency. Their operating costs are slightly higher after the merger and no improvements are observed in any of the performance indicators, except for productivity, that shows an increase and higher values than the control group before and after the merger. To conclude, small and microenterprises undertaking mergers have profitability and cash-flow generation capacity below the average, and do not improve after the concentration process. All this indicates a potential productive inefficiency.

4.3. Services sector (non-commercial branches)

The analysis of *medium-sized enterprises* of the services sector (non-commercial) reveals that those companies that decide to merge are in a situation below the comparison average regarding their profitability and cash-flow generation capacity (measured using EBITDA over total assets). However, their productivity and EBITDA over turnover are higher. After the merger has been carried out, the first performance indicators mentioned register an improvement and converge, and occasionally, these exceed the comparative average in the last year under study; the second type of indicators generally improve and show an increase with respect to the average. This implies a positive effect in terms of efficiency with the resulting companies becoming more competitive. However, except for financial profitability, these increases in the performance indicators cannot be considered statistically significant due to the fact that, after the merger, their improvement is considerable only in the last year under study, which seems to indicate that the positive effect of concentration in medium-sized service companies appears after various years.

This indication of an increase in competitiveness can be justified by improvements in investment structure, where the proportion represented by current assets over total assets significantly decreases in merged companies, and also by the slight decrease of operating costs, which compensates the significant increase in personnel costs and growth in financial costs, which usually implies the necessary financing of a concentration process.

Large firms carrying out concentration processes do not register important effects in the majority of business performance indicators. No significant changes are appreciated in the period under analysis regarding productivity, financial profitability or EBITDA

over total assets, the three of which maintain their values near to the control group. This lack of effect is in keeping with the fact that no variations are distinguished, except for the increase of financial costs, in the explanatory ratios of the economic, financial and cost structure of the companies involved. Therefore, the reason for merging could be explained by the need for growth and mainly of gaining market share against other competitors, and as a consequence, the companies involved would gain market power and would increase the thresholds of entry barriers in the sector. This fact has resulted in mergers within this group of companies increasing the economic profitability and the cash-flow generation capacity (measured by EBITDA with respect to turnover), which has a positive effect on the value of the resulting companies.

In the case of *small firms*, both participating in and resulting from merger processes, their (economic and financial) profitability and EBITDA relative to the total assets are observed to be below that of the comparison group, quite the opposite of EBITDA relative to turnover, which registers small increases with respect to the control group. After the merger, except for financial profitability, which does not register any significant change, the first indicators start to approach the control group, which in relative and future terms is translated into an efficiency improvement, also manifested in the indicator EBITDA with respect to turnover. This growth in efficiency becomes more evident in the productivity indicator. Participating and resulting enterprises have higher productivity levels than the rest and experience higher increases after merging.

As a consequence of concentrations, the cost structure of resulting companies registers a slight increase in personnel costs and particularly financial costs. Only the latter are above the control group average, while personnel costs increase and start to approach the control group. For this reason, the improvements in efficiency of these enterprises could come from the aforementioned productivity growth and the higher implicit cost savings, which could be derived from the decrease in the values of the ratio of current assets to fixed assets after the merger.

To conclude, small firms of the services sector undertaking a merger process are generally based on lower performances than the whole group of the same size and sector. However, the companies resulting from a concentration maintain their economic and financial profitability (of their size and sector) in a generally declining situation, and improve their cash-flow generation capacity and productivity, which would lead them to maintain or increase their value in the future.

Microenterprises involved in business concentration processes have the capacity to obtain profitability significantly lower than the average, and these usually do not increase even after the merger. This type of enterprise registers an improved productivity and increase in the value of the ratio EBITDA with respect to turnover.

4.4. Construction sector

In general, as regards to the indicators under analysis corresponding to *large firms* of the construction sector carrying out merger processes, no regular and differentiated

behavioural patterns are detected in comparison with their control group. The values of these indicators show an important dispersion with a quite erratic evolution, which oscillates both above and below the average. This is similar in the cases of *medium-, small-sized and microenterprises*, although slightly tempered mainly regarding performance ratios. The ratios of economic and financial profitability of medium-, small-sized and microenterprises before the merger generally take lower values than their comparison average, and after the merger, these evolve approaching the average or approximating this, but with a high variability. This allows us to consider those not significant, except in the case of medium-sized. However, EBITDA with respect to total assets implies various differences among medium, small and microenterprises. In the case of medium-sized companies, this ratio shows the same performance as the profitability, while regarding small and microenterprises, their values are clearly lower than the control group before, and in general also after, the merger. Nevertheless, it cannot be stated that their cash-flow generation capacity becomes modified in any of the three sizes. On the contrary, EBITDA over turnover seems to indicate that one of the reasons for small and microenterprises to merge could be the fact that these generate a cash flow with respect to earnings which is higher than their average.

Finally, as regards to the productivity ratio, merged medium, small and microenterprises experience more improvements than the average as a consequence of the concentration process, although this cannot be statistically confirmed.

5. STATISTICAL CONFIRMATORY ANALYSIS (UNIVARIATE AND MULTIVARIATE RESULTS)

Firstly, the non-parametric Kruskal-Wallis test allows us to observe whether significant changes occur in the values of relative indicators adopted by the companies of the different sizes and sectors before and after the merger. Secondly, the multivariate analysis (Analysis Interaction Detection) allows us to discriminate, depending on the variable under analysis, the relevance of the sector or the business size in the improvement in results of the companies undertaking a merger process.

Table 5 shows the results of this comparison confirming the results obtained from the previous counterfactual analysis, not only for efficiency, but also for management and economic-financial structure indicators. The probabilities linked to the Kruskal-Wallis test shown in this table have been calculated on the basis of the nine values reached for each indicator in the years before the merger and the nine values obtained in the years after the merger corresponding to each indicator. In other words, the values of the years before the merger for those companies merged in 2001 were the values from 1999 to 2000; for those merged in 2002, the values of the period 1999-2001; and for those merged in 2003 the values of the period 1999-2002. And the values after the merger for those companies merged in 2001 were those of the period 2002-2005; for those merged in 2002, the values of the period 2003-2005; and for those merged in 2003, the values of the period 2004-2005.

TABLE V

KRUSKAL-WALLIS TEST TO DETECT SIGNIFICANT CHANGES BY MERGERS

Indicators	*Industrial sector*				*Commercial d. sector*		*Services sector (non-commercial)*			*Construction sector*		
	Micro	*Small*	*Medium*	*Large*	*Medium*	*Large*	*Small*	*Medium*	*Large*	*Micro*	*Small*	*Medium*
CURRENT ASSETS / FIXED ASSETS	0.52	0.52	1.00	0.09	0.01††	0.05†	0.01††	0.02†	0.52			
PERMANENT FINANCING / TOT. FIXED	0.94	0.02†	0.00††	0.48	0.36	0.03†						
OPERATING COSTS / TURNOVER	0.01††	0.01††	0.00††	0.39	0.91	0.29	0.39	0.97	0.13			
FINANCIAL COSTS / TURNOVER	0.00††	0.06	0.29	0.00††	0.43	0.00††	0.00††	0.00††	0.01††			
PERSONNEL COSTS / TURNOVER	0.72	0.15	0.29	0.01††	0.20	0.08	0.00††	0.00††	0.67			
FINANCIAL PROFITABILITY	0.94	0.01††	0.04†	0.48	0.02†	0.20	0.16	0.05†	0.10	1.00	0.67	0.02†
ECONOMIC PROFITABILITY	0.23	0.00††	0.43	0.72	0.01††	0.39	0.00††	0.08	0.03†	0.89	0.26	0.01††
PRODUCTIVITY	0.00††	0.39	0.94	0.02	0.05†	0.18	0.04†	0.15	0.21	0.08	0.13	0.78
EBITDA / TOTAL ASSETS	0.12	0.00††	0.08	0.32	0.00††	0.00††	0.00††	0.67	0.70	0.78	0.83	0.06
EBITDA / NET AMOUNT TURNOVER	0.01††	0.03†	0.50	0.78†	0.03†	0.15	0.02†	0.13	0.00††	0.89	0.80	0.50

† Statistically significant change in relative indicators at a significance level of 0.05 ($p \leq 0.05$)
†† Statistically significant change in relative indicators at a significance level of 0.01 ($p \leq 0.01$)

More specifically and, regarding the efficiency indicators as shown, in the industrial sector, merger processes are confirmed to have significant effects on the economic and financial profitability (which give probabilities of 0.00 and 0.01, respectively, that is to say, p≤0.01 and p≤0.01) and on EBITDA over total assets and turnover (p≤0.01 and p≤0.05, respectively) of small companies and, in the case of medium-sized enterprises, only on financial profitability $p \leq 0.05$. Microenterprises in this sector experience a statistically significant change regarding productivity indicator (p≤0.01) and EBITDA over turnover (p≤0.01).

Regarding the commercial distribution sector, medium-sized enterprises undertaking a merge show significant changes in all efficiency indicators (financial profitability: p≤0.05; economic profitability: p≤0.01; productivity: $p \leq 0.05$; EBITDA over total assets: p≤0.01, and EBITDA over turnover: $p \leq 0.05$) and large companies only in EBITDA over total assets (p≤0.01).

Small companies of non-commercial services show significant changes in their economic profitability (p≤0.01), productivity (p≤0.05) and EBITDA over total assets (p≤0.01) and over turnover (p≤0.05). Large-sized enterprises improve in economic profitability (p≤0.05) and EBITDA over turnover (p≤0.01), and medium-sized companies only in financial profitability (p≤0.05).

In the construction sector, significant changes are only observed in economic and financial profitability ($p \leq 0.01$ and, $p \leq 0.05$ respectively) of medium-sized enterprises.

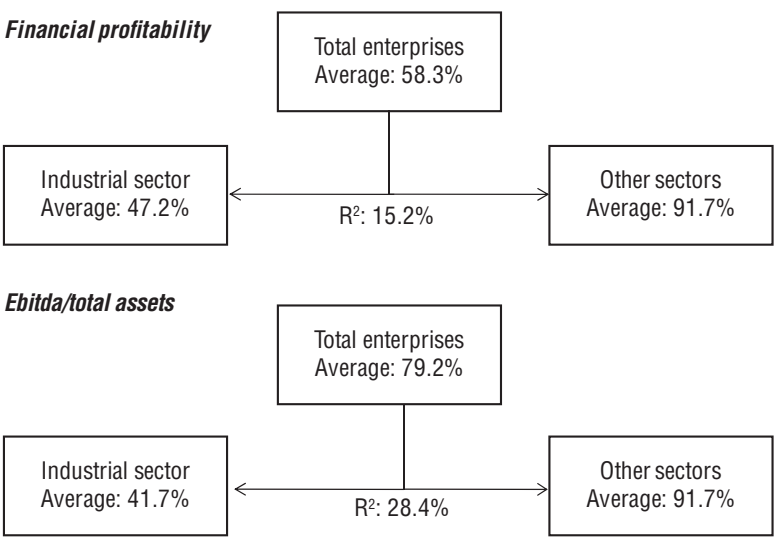
On the other hand, the multivariate analysis has an effect on the importance that the business size or activity sector have on the final results of mergers. Figure 1 illustrates the Analysis Interaction Detection for each efficiency indicator taken into consideration in this work. This demonstrates not only whether it is the sector or the size that is the variable explaining the highest proportion of the success of the merger process, but also which sectors or sizes are above or below (in percentage) the average in successful terms of the group of merged companies.

For a minimum contribution of the explained variance of 15 percent, the activity sector has a certain explanatory power with respect to the success of the merger only in the indicators of financial profitability and EBITDA over total assets. Regarding the first of these indicators, only the sector of non-commercial services stands out over the rest; as far as the second indicator is concerned, it is the industrial sector which stands out over the rest of sectors. For the rest of indicators, the AID does not show sectorial differences. Likewise, we can infer from the analysis that business size does not discriminate in the merger processes, due to the fact that the minimum contribution to the proportion of the explained variance is below 15 percent in the multivariate divisions of the five efficiency indicators.

On the basis of these results, it is impossible to conclude that belonging to a specific sector or business size provides a higher probability of success in terms of efficiency in merger processes.

Figure 1

AID analysis of efficiency indicators in merger processes



(*) If the R^2 (total proportion of the explained variance) obtained is higher than 15%, it is considered there is the existence of a contribution to the explanation of the variance of the variable-criterion.

The heterogeneous results obtained from analysis confirm the high dispersion adopted by the values of the indicators under study, in line with the arguments by Aiginger and Tichy (1991, p. 96) and the reasons exposed by such authors: «… Some large firms are very profitable, others not at all, some small ones employ additional workers, some stagnate, some takeovers improve efficiency radically, others fail completely. The success of a firm or a merger depends on the quality of the management or the owner, the type of the product, the efficiency or R&D, the business-cycle stage, especially in the way the several constituent elements match to each other's, or good luck… *Small and large firms fit different purposes*…».

These reasons, as well as the aggregate nature of this research and its division by sizes —particularly smaller ones— and sectors, make it difficult to compare the results obtained and evidence in the literature and this is particularly limited in the field of small- and medium-sized enterprises. Therefore, only some of such results can be ratified.

Nevertheless, even considering the nature and heterogeneity of the research, the results are in line with the international studies carried out by Gugler *et al.* (2003) in the sense that the positive effects become more evident in smaller than in larger companies and that, despite no significant differences are appreciated between mergers undertaken by industrial and services companies, some favourable effects are observed in large services enterprises, but not in those of the industrial sector. This also coincides with the Spanish analysis regarding the mergers of large non-financial companies, for which Colarte and Rodríguez (2006) conclude that no positive effects are evidenced. These arguments are in the same line as Mueller (1997) in his review of more than twenty researches mainly regarding large enterprises, which concludes with no evidence of positive effects on profitability.

The results also seem to partially confirm what was stated by Bonardo *et al*. (2009), who referred to one of the scarce studies on mergers and acquisitions among SMEs suggesting that the effects are principally evidenced in productivity and financial profitability. Therefore, significant effects are proven regarding financial profitability in medium-sized enterprises of the different sizes under analysis, although not in the rest of SMEs sizes, except for small enterprises in the industrial sector. However, only positive effects are registered with respect to productivity in smaller sizes by sectors, which does neither confirm nor contradict what was stated by Lichtenberg (1988) and Benfratello (2002) regarding the improvement in productivity and technical efficiency after the merger.

6. CONCLUSIONS

The main objective of a merger process should be to increase the value of the resulting company with respect to those participating in the concentration. Such an increase can be achieved if the cash-flow generation capacity increases, which should occur when profitability increases and the economic-financial and cost structures of the participating companies adjust to a more efficient situation in the resulting company.

Following a well-known research path, the empirical development of this article is based on the analysis of accounting data —in line with the mentioned works by the national and international literature— of those companies involved in these business operations,

establishing efficiency and value indicators and comparing these with those obtained by non-merged companies. In the analysis, the merger processes of unlisted SMEs and large enterprises have been divided into four business sizes and four productive sectors, which has allowed us to go into a new field of knowledge in more depth.

The mergers of companies belonging to the industrial sector register favourable effects on small-sized enterprises, which result in an improvement in profitability and value for the resulting company. For micro- and large enterprises, their profitability and value are maintained. Medium-sized enterprises register only improvement on financial profitability. From this we can infer that the reasons to carry out a concentration are varied: in the first case, the possibility to improve the performance of the resulting company is used in order to beat their equivalent non-merging companies; and in the rest of sizes, the companies are trying to avoid a decrease in efficiency and value.

In the commercial distribution sector, medium- and large-sized companies generate a value increase when undertaking concentration processes. As a consequence, medium-sized firms improve their efficiency: before carrying out the merger, their profitability and cash-flow generation are lower and, after the concentration, these indicators show an improvement, equalling or even exceeding them. Large firms only increase the value of the indicator EBITDA over total assets and maintain the value of EBITDA over turnover. The concentrating strategy is therefore an essential decision to stay competitive in the market.

Micro- and small enterprises of the commercial distribution sector involved in a merger register lower profitability and EBITDA than those which do not merge and does not improve the relative inefficiency of the companies involved.

On the other hand, small companies in the services sector (non-commercial branches) which mainly show lower performance values before undertaking a merger maintained their profitability despite the general decline shown in their control group and these improve their productivity and EBITDA after merging. Therefore, these maintain or improve their value in the future.

Large-sized enterprises belonging to the services sector involved in concentrating processes increase their value as a consequence of the positive effect of the merger. In the case of medium-sized firms, only the value corresponding to the financial profitability register a notable improvement.

Finally, in the construction sector, the profitability of all business sizes involved in mergers improve until they approach the average of non-merged companies. Nevertheless, a significant heterogeneity and variability is always observed in the values of the different indicators, which hinders the drawing of clear conclusions. Only medium-sized enterprises show a clear improvement in their profitability.

To conclude, this empirical work demonstrates the first hypothesis globally, as it is contrasted by the existence of a positive, or at least not negative, effect of efficiency and value creation results in the companies involved in the merger processes. This impact becomes evident in different ways depending on the size and sector to which companies belong, as established by the second hypothesis. More specifically, after the merger, those companies

showing significant positive effects regarding efficiency and value creation are medium-sized companies included in the sector of commercial distribution and small firms of the industrial sector and the non-commercial branches of services. Medium-sized companies belonging to these two sectors only register significant improvements in financial profitability. On the contrary, microenterprises and large-sized firms of the different sectors register only limited or no effects in the majority of indicators under study. Only large-sized enterprises of the services sector register increases in cash flow (with respect to turnover) and, in the case companies of non-commercial branches, those increases also affect economic profitability.

These results demonstrate that mergers of companies of the industrial or the services sectors do not reduce their efficiency or value, and that the positive effects are mostly shown in small and medium companies than in micro and large firms. Only large enterprises of the services sector show some favourable, although not conclusive, indicators compared to their counterparts in the other sectors.

On the other hand, on the basis of the multivariate analysis carried out, we can conclude that the activity sector and the business size are not relevant to explain the improvement in the results of companies undertaking a merger process. Only the sector variable produces some influence on financial profitability and the EBITDA over total assets, although not categorically.

These results confirm that only approximate conclusions can be drawn, as anticipated by the literature review. These are more useful as a reference for new researches than as a general evidence for all mergers of smaller enterprises and of the sectors under analysis.

Taking all this into consideration, this article suggests at least two future lines of research. On the one hand, it provides a reference framework for the design of public policies of sectorial or territorial strategy. These public strategies are orientated towards favouring corporative decision-making materialising in an increase of the business dimension, which would have a bearing on financial strengthening of productive units and on the improvement of productivity, technological escalation and competitiveness of Spanish enterprises and economy. The design and implementation of such policies should be assessed using new researches in order to understand whether economic profits derived from the implementation of measures exceed the costs of public intervention.

On the other hand, this breaks new ground for further researches regarding the behaviour of unlisted SMEs and large enterprises in the field of mergers, restricting them to sectors, activity branches and sizes for which complete information is available, or even to analyses of intersectorial, regional or cross-border processes. Likewise, this article suggests carrying out comparative studies concerning the reality of these processes in countries of a similar economic environment.

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APPENDIX 1

EFFICIENCY INDICATORS OF MICRO AND LARGE ENTERPRISES OF THE INDUSTRIAL SECTOR MERGED IN 2001, 2002 AND 2003
(relative to respect to non-merged sample companies of the same sizes)

Indicators	*M&A*	*Microenterprises*							*Large-sized enterprises*						
	Year	*1999*	*2000*	*2001*	*2002*	*2003*	*2004*	*2005*	*1999*	*2000*	*2001*	*2002*	*2003*	*2004*	*2005*
CURRENT ASSETS / FIXED ASSETS	2001	0.62	0.63	0.67	0.65	0.16	1.14	0.85	0.94	0.83	0.38	0.32	0.29	0.34	0.35
	2002	0.08	0.12	0.13	0.40	0.35	0.25	0.43	0.93	1.19	0.61	0.78	0.67	0.74	0.74
	2003	0.00	0.00	1.50	2.94	0.97	0.93	0.48	0.62	0.64	0.49	0.39	0.62	0.64	0.53
PERMANENT FINANCING / TOT. FIXED ASSETS	2001	1.38	1.35	1.05	1.17	0.73	1.05	0.96	0.89	0.77	0.76	0.81	0.77	0.79	0.82
	2002	0.48	0.88	0.97	1.08	0.92	0.87	0.91	1.05	1.02	0.83	0.79	0.87	0.98	0.88
	2003	0.00	0.00	0.53	2.98	1.15	1.25	1.02	0.89	0.77	0.77	0.76	0.80	0.83	0.81
OPERATING COSTS / TURNOVER	2001	1.05	0.86	1.06	1.01	1.03	0.97	0.95	0.53	0.57	0.89	0.86	0.82	0.81	0.77
	2002	1.02	0.78	0.04	0.69	1.18	1.06	1.07	0.94	0.89	0.84	1.02	1.01	1.04	1.04
	2003	0.00	0.00	0.50	1.05	1.06	1.13	1.31	0.84	0.91	0.93	0.81	0.93	0.94	0.90
FINANCIAL COSTS / TURNOVER	2001	1.27	0.76	0.00	5.25	4.41	3.64	1.52	0.31	0.49	1.51	1.71	1.80	1.36	1.84
	2002	0.23	0.00	0.00	0.79	0.92	0.50	0.25	0.93	0.73	0.41	1.28	1.19	1.01	0.99
	2003	0.00	0.00	0.00	0.88	0.51	0.47	0.93	0.80	0.75	0.83	0.48	1.31	1.38	1.14
PERSONNEL COSTS / TURNOVER	2001	0.86	0.77	0.00	0.26	0.64	0.40	0.35	1.23	1.21	0.90	1.33	1.62	1.48	1.44
	2002	0.27	0.00	0.00	0.17	0.18	0.00	0.05	0.90	0.87	0.90	0.95	1.08	1.00	0.93
	2003	0.00	0.00	0.08	0.36	0.26	-0.09	0.28	0.84	0.68	0.65	0.59	1.14	1.08	1.06
FINANCIAL PROFITABILITY	2001	1.34	-0.50	-0.76	-0.33	0.42	0.17	0.10	1.48	0.53	0.99	0.83	1.48	0.98	0.74
	2002	0.16	1.87	1.23	1.00	0.74	-0.19	-0.03	1.33	1.44	1.22	1.15	1.08	1.23	1.08
	2003	0.00	0.00	0.37	-0.83	-0.28	0.15	0.25	0.89	1.18	1.09	0.52	0.92	0.92	0.66
ECONOMIC PROFITABILITY	2001	0.49	-0.54	-0.62	-0.20	0.38	0.38	0.46	0.94	0.61	0.83	0.77	1.01	0.74	0.70
	2002	-0.14	-0.32	0.26	0.50	1.24	-0.14	-0.13	0.88	1.16	0.97	1.15	1.04	1.06	1.04
	2003	0.00	0.00	0.59	-2.77	-0.03	0.26	0.46	0.93	0.99	0.82	0.43	1.03	0.75	0.78
PRODUCTIVITY	2001	1.12	1.02	1.28	1.58	1.30	1.18	1.41	0.86	0.88	0.88	0.95	1.00	1.00	1.02
	2002	0.90	1.17	0.00	1.61	2.47	2.56	1.46	1.06	0.99	1.06	1.27	1.31	1.30	1.30
	2003	0.00	0.00	0.00	1.44	1.64	1.78	2.13	0.70	0.83	0.99	0.90	0.94	0.97	0.99
EBITDA / TOTAL ASSETS	2001	0.92	-0.48	0.09	0.13	0.60	0.68	0.83	0.65	0.45	0.58	0.66	0.73	0.72	0.71
	2002	-0.1	-0.43	0.26	0.23	0.16	0.00	-0.24	0.95	0.77	0.81	1.03	0.97	1.05	0.86
	2003	0.00	0.00	0.29	-1.41	0.07	0.11	0.88	1.01	0.84	0.83	0.59	1.06	1.16	1.10
EBITDA/NET AMOUNT TURNOVER	2001	1.00	0.70	0.70	0.89	12.5	1.50	4.88	2.33	2.00	1.20	1.00	0.86	0.71	1.67
	2002	1.00	1.00	0.90	0.89	2.60	10.8	3.25	1.33	-3.5	5.80	3.60	1.71	1.71	2.17
	2003	1.00	1.30	1.20	1.44	19.4	9.90	6.13	1.33	1.75	0.40	-1.8	-2.0	0.71	0.67

APPENDIX 2

Efficiency indicators of medium- and large-sized enterprises of the commercial distribution sector merged in 2001, 2002 and 2003
(relative to respect to non-merged sample companies of the same sizes)

Indicators	*M&A*	*Medium-sized enterprises*							*Large-sized enterprises*						
	Year	*1999*	*2000*	*2001*	*2002*	*2003*	*2004*	*2005*	*1999*	*2000*	*2001*	*2002*	*2003*	*2004*	*2005*
CURRENT ASSETS / FIXED ASSETS	2001	1.70	1.77	0.97	1.09	0.99	1.21	1.21	0.70	1.07	0.93	0.79	0.44	0.87	0.93
	2002	2.56	1.75	2.60	1.04	1.17	1.13	1.16	0.83	1.25	1.27	0.61	0.51	0.68	0.67
	2003	1.83	1.84	1.85	1.85	1.29	1.13	1.02	0.87	1.59	1.53	1.72	0.46	0.79	0.96
PERMANENT FINANCING / TOT. FIXED ASSETS	2001	0.95	1.13	0.86	0.96	0.94	0.91	1.12	1.40	1.52	1.12	0.89	0.88	1.03	1.17
	2002	1.42	1.22	1.32	1.14	1.18	1.20	1.38	1.71	0.77	1.14	0.80	0.75	0.84	0.73
	2003	1.12	1.40	1.17	1.09	1.03	1.02	1.11	1.03	1.00	1.29	1.09	0.98	0.97	1.02
OPERATING COSTS / TURNOVER	2001	0.96	0.99	0.99	1.00	1.00	0.98	0.98	1.06	1.03	1.04	1.00	1.04	1.02	0.99
	2002	0.99	0.98	1.05	1.02	1.01	1.03	1.04	1.04	1.02	1.00	0.98	0.98	0.98	0.98
	2003	1.03	1.03	1.02	1.00	1.00	0.99	1.00	1.03	1.01	0.99	0.99	0.88	1.00	0.99
FINANCIAL COSTS / TURNOVER	2001	0.95	0.79	1.29	1.26	1.14	0.96	1.04	0.88	0.61	1.51	1.91	1.85	2.86	2.10
	2002	0.64	0.95	0.81	1.20	1.47	1.23	1.19	1.18	1.48	0.70	1.60	2.15	2.64	1.90
	2003	1.19	1.08	1.69	1.24	1.19	1.07	1.19	0.65	0.70	0.83	0.87	1.40	1.71	1.03
PERSONNEL COSTS / TURNOVER	2001	0.97	0.83	0.99	0.88	1.01	1.09	1.21	0.83	0.70	0.95	0.90	0.86	0.89	0.92
	2002	0.90	0.89	0.60	0.75	0.79	0.82	0.81	0.73	0.84	0.93	0.98	1.00	1.07	1.08
	2003	0.70	0.69	0.84	0.66	0.86	0.83	0.84	0.67	0.81	0.84	0.86	1.27	1.26	0.78
FINANCIAL PROFITABILITY	2001	1.13	0.99	0.85	0.83	1.10	1.13	1.00	0.88	0.20	1.13	1.01	0.71	0.81	0.86
	2002	1.03	0.47	0.57	0.68	1.07	0.73	1.00	0.87	0.50	1.05	1.09	0.63	0.46	0.86
	2003	0.63	0.44	0.12	0.39	1.11	1.41	1.20	1.16	0.95	1.45	0.56	0.56	0.60	0.72
ECONOMIC PROFITABILITY	2001	0.83	0.60	0.78	1.09	0.94	0.94	0.79	0.80	0.25	1.14	0.90	0.72	0.91	0.91
	2002	0.81	0.62	0.16	1.02	1.02	0.78	1.02	0.68	0.57	0.85	1.04	0.57	0.46	0.72
	2003	0.69	0.47	0.52	0.00	1.06	1.11	1.18	1.04	0.90	0.92	0.13	0.69	0.39	0.50
PRODUCTIVITY	2001	0.62	0.66	0.83	0.87	0.83	0.82	0.84	0.89	0.96	1.45	1.38	1.16	1.28	1.50
	2002	0.89	0.75	0.87	1.33	1.19	1.25	1.16	0.93	0.96	0.94	1.18	0.93	0.90	0.90
	2003	0.58	0.60	0.70	0.71	0.85	0.85	0.79	0.81	0.97	0.90	1.05	1.02	1.15	1.16
EBITDA / TOTAL ASSETS	2001	0.82	0.91	0.94	0.91	1.11	0.91	1.07	0.88	0.52	0.72	0.92	0.90	0.93	0.97
	2002	0.67	0.77	0.14	0.84	1.13	1.05	1.02	0.79	0.71	0.72	0.86	0.95	0.95	0.93
	2003	0.64	0.49	0.56	0.04	0.91	1.27	1.03	0.73	0.88	0.60	0.28	0.92	0.94	0.96
EBITDA/NET AMOUNT TURNOVER	2001	1.33	1.00	1.00	1.00	1.25	1.33	1.25	2.40	2.40	2.00	2.00	1.80	1.60	2.50
	2002	1.33	1.00	0.25	1.00	1.00	1.33	1.00	2.60	2.20	2.80	2.20	2.20	2.20	2.50
	2003	1.00	0.75	0.50	0.25	1.00	1.67	1.00	2.80	2.80	2.20	2.60	2.40	2.20	3.25

APPENDIX 3

EFFICIENCY INDICATORS OF MEDIUM- AND LARGE-SIZED COMPANIES OF THE SERVICES SECTOR (NON-COMMERCIAL BRANCHES) MERGED IN 2001, 2002 AND 2003
(relative to respect to non-merged sample companies of the same sizes)

Indicators	*M&A*	*Medium-sized enterprises*							*Large-sized enterprises*						
	Year	*1999*	*2000*	*2001*	*2002*	*2003*	*2004*	*2005*	*1999*	*2000*	*2001*	*2002*	*2003*	*2004*	*2005*
CURRENT ASSETS / FIXED ASSETS	2001	0.66	0.34	0.50	0.49	0.41	0.32	0.24	0.64	0.71	0.85	0.82	0.54	0.68	0.18
	2002	0.95	0.90	0.37	0.58	0.52	0.63	0.34	0.78	0.60	0.64	0.59	0.45	0.49	0.84
	2003	0.46	0.52	0.34	0.39	0.47	0.39	0.39	0.23	0.01	0.04	0.96	0.66	0.72	0.00
OPERATING COSTS / TURNOVER	2001	0.38	0.04	0.36	0.30	0.16	0.13	0.15	0.90	0.69	0.85	0.68	0.71	0.79	0.95
	2002	0.56	0.23	0.39	0.36	0.29	0.22	0.23	0.39	0.15	0.19	0.17	0.14	0.36	0.42
	2003	0.32	0.00	0.14	0.06	0.07	0.13	0.19	0.30	0.05	0.84	0.03	0.14	0.22	0.29
FINANCIAL COSTS / TURNOVER	2001	0.40	0.16	0.61	0.89	0.74	2.15	2.01	0.54	0.45	0.62	0.37	0.66	2.33	2.52
	2002	0.37	0.48	0.36	0.30	0.57	0.17	0.54	0.50	0.37	0.59	0.71	0.25	0.71	0.60
	2003	0.85	0.59	0.86	0.40	2.32	2.38	2.38	0.19	0.51	0.23	0.57	0.80	0.24	0.48
PERSONNEL COSTS / TURNOVER	2001	0.28	0.27	0.52	0.59	0.59	0.67	0.63	0.28	0.28	0.37	0.39	0.42	0.37	0.35
	2002	0.37	0.34	0.25	0.47	0.52	0.60	0.55	0.57	0.56	0.63	0.74	0.71	0.65	0.58
	2003	0.46	0.36	0.31	0.25	0.54	0.63	0.65	0.57	0.43	0.43	0.36	0.73	0.63	0.57
FINANCIAL PROFITABILITY	2001	0.72	0.34	0.86	0.29	0.53	0.84	0.14	0.96	0.56	0.02	0.98	0.27	0.15	0.28
	2002	0.50	0.65	0.92	0.76	0.98	0.05	0.58	0.46	0.01	0.67	0.47	0.02	0.15	0.08
	2003	0.65	0.03	0.12	0.55	0.02	0.14	0.26	0.01	0.02	0.33	0.78	0.36	0.01	0.83
ECONOMIC PROFITABILITY	2001	0.62	0.84	0.79	0.34	0.54	0.67	0.21	0.07	0.97	0.72	0.85	0.82	0.12	0.17
	2002	0.56	0.67	0.74	0.79	0.77	0.86	0.40	0.96	0.78	0.47	0.71	0.99	0.01	0.01
	2003	0.47	0.73	0.37	0.30	0.68	0.91	0.35	0.92	0.73	0.34	0.52	0.17	0.09	0.87
PRODUCTIVITY	2001	0.39	0.26	0.26	0.45	0.26	0.33	0.21	0.02	0.13	0.24	0.42	0.29	0.33	0.25
	2002	0.53	0.50	0.64	0.61	0.48	0.47	0.25	0.79	0.97	0.89	0.04	0.97	0.92	0.83
	2003	0.21	0.15	0.27	0.38	0.47	0.42	0.22	0.70	0.94	0.79	0.89	0.86	0.88	0.85
EBITDA / TOTAL ASSETS	2001	0.76	0.80	0.78	0.61	0.65	0.74	0.02	0.14	0.11	0.98	0.91	0.92	0.02	0.88
	2002	0.68	0.66	0.67	0.62	0.63	0.71	0.06	0.93	0.93	0.49	0.78	0.89	0.83	0.83
	2003	0.74	0.85	0.68	0.44	0.70	0.71	0.78	0.90	0.92	0.18	0.48	0.85	0.80	0.83
EBITDA/NET AMOUNT TURNOVER	2001	4.33	4.00	3.25	3.00	3.00	4.67	3.25	2.20	0.80	2.40	2.40	2.40	2.20	3.00
	2002	2.33	2.00	2.75	3.25	3.25	4.67	3.50	0.80	2.20	0.80	2.60	2.60	2.20	3.00
	2003	3.67	2.50	2.75	3.25	5.00	5.33	4.25	0.60	2.00	0.40	0.40	0.60	2.00	2.75

APPENDIX 4

EFFICIENCY INDICATORS OF SMALL-SIZED ENTERPRISES OF THE SERVICES SECTOR (NON-COMMERCIAL BRANCHES) MERGED IN 2001, 2002 AND 2003
(relative to respect to non-merged sample companies of the same sizes)

Indicators	*M&A*	*Small-sized enterprises*						
	Year	*1999*	*2000*	*2001*	*2002*	*2003*	*2004*	*2005*
CURRENT ASSETS / FIXED ASSETS	2001	1.33	1.21	0.60	0.53	0.47	0.56	0.59
	2002	1.03	1.04	0.76	0.80	0.62	0.68	0.74
	2003	0.70	0.90	0.73	0.49	0.53	0.45	0.56
OPERATING COSTS / TURNOVER	2001	1.02	1.02	1.26	1.15	0.98	1.02	0.91
	2002	0.82	0.88	0.93	1.05	0.99	1.01	0.89
	2003	0.59	0.59	0.41	0.46	0.80	0.73	0.77
FINANCIAL COSTS / TURNOVER	2001	0.55	0.20	3.32	3.55	2.41	1.97	2.73
	2002	0.41	0.40	0.06	3.70	2.01	2.20	2.68
	2003	0.00	0.00	0.00	0.00	2.32	3.88	3.22
PERSONNEL COSTS / TURNOVER	2001	0.29	0.49	0.42	0.62	0.83	0.78	0.74
	2002	0.34	0.13	0.02	0.43	0.41	0.54	0.56
	2003	0.00	0.00	0.00	0.00	0.22	0.32	0.38
FINANCIAL PROFITABILITY	2001	0.41	0.17	0.65	0.62	1.26	0.72	0.57
	2002	0.27	0.15	0.39	0.14	0.51	0.39	0.34
	2003	0.06	0.06	0.07	0.15	0.42	0.27	0.22
ECONOMIC PROFITABILITY	2001	0.67	0.41	0.80	0.83	1.28	0.83	0.90
	2002	0.55	0.24	0.44	0.49	0.60	0.68	0.76
	2003	0.21	0.18	0.20	0.33	0.79	0.59	0.61
PRODUCTIVITY	2001	1.28	1.48	1.48	1.72	1.59	1.54	1.53
	2002	1.57	1.38	1.29	1.67	1.40	1.39	1.57
	2003	0.96	1.09	1.21	1.28	1.61	1.54	1.58
EBITDA / TOTAL ASSETS	2001	0.67	0.58	0.54	0.67	0.70	0.81	0.90
	2002	0.24	0.15	0.11	0.36	0.40	0.50	0.77
	2003	0.05	0.00	0.05	0.08	0.12	0.25	0.30
EBITDA/NET AMOUNT TURNOVER	2001	2.50	2.60	3.20	3.40	3.20	4.00	3.40
	2002	3.50	2.00	1.40	2.60	3.40	3.20	4.20
	2003	4.25	3.20	3.20	2.20	2.80	3.40	3.20

APPENDIX 5

EFFICIENCY INDICATORS OF MEDIUM, SMALL AND MICROENTERPRISES OF THE CONSTRUCTION SECTOR MERGED IN 2001, 2002 AND 2003
(relative to respect to non-merged sample companies of the same sizes)

Indicators	*M&A*	*Medium-sized enterprises*							*Large-sized enterprises*													
	Year	*1999*	*2000*	*2001*	*2002*	*2003*	*2004*	*2005*	*1999*	*2000*	*2001*	*2002*	*2003*	*2004*	*2005*	*1999*	*2000*	*2001*	*2002*	*2003*	*2004*	*2005*
FINANCIAL COSTS / TURNOVER	2001	0.70	0.60	1.03	0.75	0.72	1.29	0.92	0.79	0.53	1.33	2.17	0.38	0.72	0.27	0.24	0.62	0.54	0.69	0.55	0.68	0.51
	2002	0.00	0.27	0.06	1.21	1.00	2.13	0.85	0.07	0.20	-0.36	0.89	0.24	0.83	1.39	0.58	1.13	1.11	1.06	0.22	0.18	0.07
	2003	0.02	0.03	0.04	0.37	1.26	0.39	1.26	0.51	0.59	1.64	1.06	0.64	0.62	0.68	0.15	0.01	0.01	0.06	0.42	0.08	0.90
ECONOMIC PROFITABILITY	2001	0.60	0.47	0.95	0.83	0.69	1.29	0.60	0.48	0.74	0.59	1.50	1.10	0.99	0.50	0.37	1.24	0.95	0.91	0.89	0.70	0.89
	2002	0.73	0.66	0.20	0.77	0.78	1.57	0.93	0.23	0.67	-0.85	0.64	0.69	0.84	1.05	0.71	0.73	0.68	1.06	0.34	0.15	0.78
	2003	0.08	0.17	0.50	0.46	0.83	0.89	1.22	0.59	0.92	1.91	1.01	1.25	0.94	0.55	0.41	1.31	0.36	0.11	0.71	0.33	1.99
PRODUCTIVITY	2001	0.87	1.00	1.45	1.36	1.17	1.14	1.10	0.82	0.85	1.08	1.22	1.22	1.18	1.20	0.76	1.34	1.53	1.15	1.43	1.24	1.45
	2002	1.08	1.35	1.15	1.44	1.35	1.36	1.36	1.50	1.40	0.66	1.49	1.47	1.39	1.35	1.10	0.97	1.09	1.34	1.41	1.15	1.05
	2003	1.15	1.10	1.41	1.78	1.48	1.48	1.29	0.00	0.00	0.00	0.00	1.37	1.17	1.22	1.30	0.91	1.09	1.08	1.44	1.44	1.99
EBITDA / TOTAL ASSETS	2001	0.75	0.41	0.95	0.58	0.87	0.92	0.60	0.12	0.10	0.10	0.27	0.15	0.14	0.09	0.20	0.51	0.82	1.21	0.78	0.49	0.46
	2002	1.06	0.56	0.38	0.73	0.72	1.04	0.69	0.26	0.23	0.01	0.14	0.10	0.12	0.08	0.62	0.31	0.49	0.65	0.17	0.17	0.14
	2003	0.05	0.25	0.50	0.42	0.72	0.89	0.99	0.10	0.16	0.06	0.19	0.16	0.13	0.12	0.24	0.52	0.21	0.22	0.55	0.41	1.59
EBITDA/NET AMOUNT TURNOVER	2001	1.00	1.14	1.38	1.00	1.33	1.00	0.67	1.60	2.67	1.33	1.40	2.25	1.80	1.33	2.83	2.00	3.40	6.00	2.40	2.60	1.60
	2002	3.83	1.59	0.75	2.86	3.33	3.29	3.17	1.60	2.50	0.33	1.60	2.75	2.80	2.83	1.50	1.83	1.00	1.00	0.60	1.20	0.60
	2003	1.00	1.14	1.75	2.71	1.33	0.57	1.00	2.40	1.60	2.60	2.20	2.00	1.40	1.40	1.67	3.33	3.00	4.40	4.80	4.60	10.6