

## **Mergers of agrifood cooperatives and their effects: from expectations to results. An empirical study in four Spanish Autonomous Regions**

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### **Abstract**

Mergers have become the most widely accepted formula for business growth among many different sectors. However, these processes do not always contribute to obtaining the expected results, particularly from an economic viewpoint. In light of these reflections, this study attempts to establish whether mergers carried out between Spanish agrifood cooperatives during the period 1995-2005 have contributed to reaching some of the objectives they were set out to achieve: improving the economic-financial situation of the companies involved, increasing income and reducing costs. To do so, mergers that took place during this period were analyzed in four autonomous communities (Andalusia, Navarra, La Rioja and the Basque Country). Despite the considerable variability observed following the time-based analysis of the economic-financial situation of cooperatives prior to and after merger, statistically significant differences were only found in four of the fifteen variables studied. These were operating profit (a 99% reduction), financial income (an increase of 240%), extraordinary income (400% increase) and cost of goods sold (16% reduction), of all of which are calculated with respect to production value. The results obtained generally indicate that the objectives that were originally the motivation for initiating the merger processes have not been reached, as the financial situation of the cooperatives has not, by and large, undergone any significant improvement, nor have average unit costs been reduced. Performance and profitability have not improved either and the firms involved have found themselves at lower levels than the average for the sector.

**Additional key words:** costs, integration, synergies.

### **Resumen**

**Los procesos de fusión de cooperativas agroalimentarias y sus efectos: de las expectativas a los resultados.  
Un estudio empírico en cuatro comunidades autónomas españolas**

La fusión se ha consolidado como la fórmula de crecimiento empresarial más extendida entre los diferentes sectores empresariales. Sin embargo, no siempre estos procesos contribuyen a los resultados esperados, especialmente en el plano económico. Ante estas cuestiones este trabajo pretende establecer si las fusiones llevadas a cabo entre cooperativas agroalimentarias españolas en el período 1995-2005 han contribuido a lograr algunos de los objetivos con los que se postularon: mejorar la situación económico-financiera de las sociedades implicadas, incrementar sus ingresos y reducir sus costes. Para ello, se han analizado las operaciones de fusión realizadas en el periodo indicado en cuatro comunidades autónomas (Andalucía, Navarra, La Rioja y El País Vasco). A pesar de la considerable variabilidad observada tras el análisis temporal de la situación económico-financiera pre/post fusión de las cooperativas, únicamente se han obtenido diferencias estadísticamente significativas en cuatro de las quince variables estudiadas, siendo éstas el resultado de explotación (disminución del 99%), resultado financiero (aumento del 240%), resultado extraordinario (incremento del 400%) y gastos de aprovisionamiento (reducción del 16%), todos ellos con respecto al valor de la producción. Los resultados obtenidos indican que en general no se han alcanzado los objetivos que motivaron la realización en su momento de estos procesos, ya que mayoritariamente no se ha logrado mejorar de forma significativa la situación financiera de las cooperativas, ni se han reducido sus costes unitarios medios y tampoco han mejorado sus resultados y rentabilidades, situándose en muchos casos, tras la integración, en una posición de inferioridad con respecto a la media sectorial.

**Palabras clave adicionales:** costes, integración, sinergias.

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## Introduction

Agri-food cooperative companies, which like other companies, are dependent on an increasingly competitive market, have not shied away from the external growth strategies prevailing in different fields of business. These strategies have turned achieving an appropriate business size into an objective of foremost necessity.

European Union countries such as Denmark, Holland and Ireland have used this formula to transform their agri-food cooperatives into leading companies in the worldwide food industry. Examples of such companies can be found in the various business subsectors. For example, in the dairy sector, the degree of consolidation reached is such that 80% of domestic dairy production in Denmark is processed by a single company (Danish Crown), two companies in Holland (Friesland Coberco Dairy Foods and Campina), and six companies in Ireland (Kerry Group, Glanbia, etc.), all of which are cooperatives (PROMAR Internacional, 2003).

Business consolidation strategies have given rise to a drastic fall in the number of agri-food cooperatives in these countries. For example, the number of agri-food cooperatives in Holland dropped from 115 in 1998 to 44 in 2002, with an average turnover of €1,026 million/cooperative, and in Denmark, the number of cooperatives had fallen to 14 in 2003, with an average turnover of €1,346 million (COGECA, 2005). Taking into account that the average turnover recorded by European agri-food cooperatives in the same year amounted to €9.5 million/cooperative, the differences are evident.

In Spain, agri-food cooperatives fall far short of these figures, with average turnover at just €4.07 million/cooperative in 2007 (OSCAE, 2009). This is clearly lower than the average of European cooperatives, and more so when compared to the leading countries in this field on which data has been provided above. Therefore, Spanish cooperatives are faced with worse conditions under which to consolidate production, undertake new investment projects, achieve economies of scale and, definitively, have sufficient negotiating capacity to face the increasingly prevalent concentration of distribution.

Numerous studies highlight the excessive atomization of Spanish agricultural cooperatives as one of their most notable weaknesses, and conclude that one of their main problems is their small size (Vargas, 1993, 2007; Caballer *et al.*, 1995; Arcas and Munuera, 1998; Caballer, 1998; Juliá and Server, 1999; Juliá and Meliá, 2003; Montero and Montero, 2005; Meliá and Juliá, 2008).

The Spanish Confederation of Agricultural Cooperatives (Confederación de Cooperativas Agrarias de España, CCAE) includes reaching a competitive size as the first of six basic strategic priorities listed in the Spanish Agricultural Cooperative Strategic Plan (OSCAE, 2007).

In view of this situation, many different forms of integration have been addressed in the environment of cooperatives, including merger processes, which have acquired increased importance in recent years.

As in the case of mergers between other legal forms of companies, mergers between cooperatives are largely driven by the desire to improve the cooperative's efficiency by improving business results through the rationalization of the consumption of material and human resources in the companies involved. However, it is also known that these operations involve certain risks and that, on occasions, the effects of the merger are not as expected.

Questions arise as to whether the increase in size resulting from the merger of cooperatives contributes to improving the economic and financial condition of the companies involved. Has it actually made these companies more stable in view of the increasingly frequent changes in the economic environment? Has it really contributed to improving their capacity to generate income? Has it lowered costs? Has it improved their profitability?

This research analyzes the economic and financial effects of the cooperative merger processes carried out in Spain through the study of ex-ante and ex-post financial statements. For this purpose, the merged companies' performance in the year prior and subsequent to the merger was studied, paying specific attention to certain aspects which are decisive for their business stability, such as liquidity and solvency, indebtedness, cost of debt, return on assets and return on investment, income, the evolution of the cost structure, etc. in an attempt to determine to what extent merger operations have contributed to an improvement in the position of the cooperatives involved.

Based on the results obtained, the final section looks at causes and factors of the common differences between the expected and real effects of the merger.

## Background

The study of merger processes and their contribution to a company's generation of value is a topic which has been addressed by many researchers.

Numerous theoretical and empirical studies have been conducted in recent decades by authors including Meeks (1977), Cosh *et al.* (1980), Healy *et al.* (1992) and Ghosh (2001), for the purpose of analyzing these operations from different standpoints. The focus of these studies is diverse and considers both the causes leading to merger processes and their effects. A great deal of research has been conducted on the effect of merger processes on the profitability or efficiency of the entities involved through the use of different methodologies. However, it appears that there is still no consensus on whether mergers contribute to an improvement in a company's performance given the varying results of these studies.

Spanish literature in the field of cooperative mergers includes references to studies analyzing these processes from different perspectives (Bel, 1999; Embid, 1999; Server and Meliá, 2002, 2004, 2006; Juliá *et al.*, 2004; Meliá, 2004, 2008; Meliá *et al.*, 2008). However, the lack of studies and research analyzing the effects of mergers on cooperatives from an analytical or experimental perspective is notable, with just a few international references on this topic, such as the studies conducted by Kenkel *et al.* (2003), Richards and Manfredo (2003) or Zopounidis *et al.* (2006).

Generally, empirical research on this subject can be grouped into two areas:

- Studies based on information supplied by the capital market, exploring the effect of a merger on the value of the resulting company and shareholder profitability in view of the changes in the company's stock market variables (Langetieg, 1978; Asquith, 1983; Dennos and McConell, 1986; Frank and Harris, 1989; Limmack, 1991; García de Valencia, 1994).

- Studies assessing the results of mergers by means of an analysis of economic and financial information through the application of ratios of differing significance (Healy *et al.*, 1992; Apellaniz *et al.*, 1996; Serra *et al.*, 2001; Kenkel *et al.*, 2003; Richards and Manfredo, 2003; Colarte and Rodríguez, 2006; Kumar, 2009).

Bearing in mind that our study is included within the second group in view of the corporate nature of cooperatives and the fact that they cannot be listed on the capital market, this section goes on to provide a brief summary of the different procedures and approaches adopted, based on some of the main contributions, which have been referenced herein. The studies aimed at determining whether mergers have contributed to improving or worsening the financial position

and performance of the companies, taking different aspects into consideration, can be classified as follows:

- Studies using different ratios and indicators to compare a sample of merged entities to a group that has not been merged or studies that use similar samples for a particular time period encompassing the previous year and several years subsequent to the merger.

- Studies comparing the performance of indicators obtained for the sample of merged companies against the mean ratios for the sector.

- Studies on the changes in indicators defined in companies prior and subsequent to a merger.

The three approaches have their pros and cons, and several of the contributions made combine different alternatives in order to overcome certain risks that are intrinsic to these studies. These risks mainly derive from the difficulty in distinguishing to what extent such changes are a consequence of the merger and the degree to which they are a result of external factors (economic cycle, situation of the sector, etc.) when analyzing the post-merger data. In fact, the first approach solves this problem by ignoring the comparison of the group of merged entities prior and subsequent to the merger, and instead, contrasts the sample of entities which have and have not taken part in a merger, in order to determine if there are significant differences between both groups in the years prior to and subsequent to the merger (Apellaniz *et al.*, 1996; Serra *et al.*, 2001; Colarte and Rodríguez, 2006).

The second approach, whose purpose is the same, compares the indicators relating to a sample of merged companies before and after the merger, but adjusted to the mean for the sector, meaning that the variables compared before and after the merger are not the indicators themselves but rather their values as compared to the sector average, *i.e.* their relative position with respect to the mean, so as to prevent distortions in the analysis of the results stemming from the economic backdrop of the sector in which the entities operate (Healy *et al.*, 1992; Apellaniz *et al.*, 1996; Kumar, 2009).

The third option is based on the study of time periods and a comparison of the pre-merger and post-merger entities (Kumar, 2009). This approach has certain disadvantages, including the fact that it is impossible to distinguish between the effects stemming from factors relating to the economic environment of the resulting entities' sector and those stemming from the merger process itself.

Additionally, the use of this method requires the calculation for the years prior to and after the merger

of indicators that would have been present if a fictitious entity resulting from the aggregate of the entities involved in the merger were to have existed. The calculation of these pre-merger indicators gives rise to another hurdle when there are large differences in the size of the acquiring and acquired companies, which could cause the values of the acquired company not to be visible in this aggregate in view of the differences in size. To resolve this problem, there are several authors who have included only large-sized companies in their samples (Healy *et al.*, 1992). An alternative method used by Healy *et al.* (1992) and Clark and Ofek (1994), is to calculate the pre-merger indicators relating to the sum of the merged entities, weighted by the size of each of the entities in the resulting entity (normally based on the value of its assets).

## Methodology

As discussed in relation to the aims of this research, the main purpose of this study is to analyze the extent to which the companies taking part in the merger processes have achieved an improvement in economic and financial aspects that are decisive for their corporate stability. For this purpose, the changes in aspects relating to the firms involved in the years prior to and after the merger such as liquidity and solvency, debt-equity ratio, cost of debt, return on assets and return on investment, turnover, changes in the cost structure, etc., are first analyzed to determine whether the merger of the cooperatives has led to an improvement in their position.

Of the three approaches discussed in the background section, the third, based on the comparison of indicators relating to the performance of the cooperatives prior to and subsequent to the merger, was chosen for the purposes of this study. The first approach was ruled out due to the obstacles involved, since a sample of non-merged companies with features similar to those of the companies taking part in the mergers (volume of assets, turnover, etc.) would be required, and although there are 4,000 registered agrifood cooperatives in Spain (Socio-Economic Observatory of Agrifood Cooperatives, *Observatorio Socioeconómico del Cooperativismo Agrario Español*, OSCAE, 2009), there is no active database from which to select these cooperatives.

The second approach adjusting the value of the indicators for each year to the mean ratios for the sector was also impossibility, since there are no published mean ratios relating to the Spanish agrifood cooperative sector for most of the years comprising the study period. In fact, the study on agrifood cooperatives in Spain for the period closest to the one chosen for analysis for this research (OSCAE, 2007) provides sector ratios for the year 2005<sup>1</sup>. Additionally, the mean ratios for agrifood business enterprises cannot be relied on, since they differ greatly from cooperatives in terms of many management aspects.

Therefore, it was decided that the third approach, based on the comparison of indicators on the performance of the cooperatives prior and subsequent to the merger, was to be used. However, the indicators obtained for the sample of merged cooperatives were also compared to the mean ratios for the Spanish agricultural sector in 2005 since, although they do not relate to the time period analyzed, in view of the inexistence of information on the sector, this is the only reference available and therefore it seems illogical to rule it out, although it is used with the utmost caution.

The use of this approach requires fictitious aggregate accounts for the year prior to the merger, similar to the accounts the cooperatives involved in the merger would have had if they had already been merged in the year N-1, and the pre-merger ratios are based on these accounts. In these cases, when there are considerable differences in the size of the cooperatives taking part in the mergers, procedures such as those laid down by Healy (1992), or Clark and Ofek (1994) tend to be adopted. These procedures are based on the calculation of the ratios for the year prior to the merger, weighting the ratio obtained by each entity in view of the weighting of its assets. This causes the value reached by the ratio of the acquired entities to have a certain repercussion on the ratio estimated for the aggregate prior to the merger, since if it is calculated using the consolidated balance sheet, the reduced value of the accounts of the acquired company cause the ratio to be extremely diluted. In the case of this study, given the similar size of most of the cooperatives included in the sample, this adjustment is not required and consequently the pre-merger ratios are based on the consolidated balance sheet of the merged entities prior to the merger.

<sup>1</sup> There are mean ratios published by this observatory for more recent years (2007 OSCAE survey), but the information for 2005 was used since this is the closing year of the period of study (1995-2005).

Firstly, and once the sample of merged entities is established, normality tests were applied in order to determine whether the sample in N-1 and N+4 display normal distribution.

Secondly, to verify whether the differences in the ratios analyzed prior and subsequent to the merger can be considered to be significant, a statistical hypothesis test was performed, using two statistical methods:

a) Parametric statistical method for the comparison of averages (t-Student), when the sample fits a normal distribution, which is chosen for the following reasons:

— Its use is advisable in view of the features and size of the data (random values with normal distribution when the population variance is unknown).

— Its use has proven to be successful in other empirical studies of this nature (Apellániz *et al.*, 1996; Serra *et al.*, 2001; Kumar, 2009).

b) Non-parametric statistical hypothesis test for related samples (Wilcoxon) when the sample cannot be assumed to be normally distributed.

This analysis is complemented by determining the proportion of cooperatives whose economic and financial position improved following the merger and the proportion of cooperatives whose position was worsened, which prevents the possible result masking the effects caused by working with mean data.

### **Identification of the merger processes carried out by agrifood cooperatives in Spain and establishment of the period for analysis**

The mergers carried out in Spain were identified via consultation of all the Cooperative Registries in the different Autonomous Regions and their corresponding provincial offices, and in certain cases, to the Mercantile Registries. The results obtained from this query are stated in Table 1.

It was determined that an eleven-year period from 1995 to 2005 would be analyzed, and for each merger process a six-year period was fixed: the year prior to each merger (N-1), the year of the merger (N), and the four years following the merger (N+1 to N+4).

The input information for the analysis is the financial statements of the cooperatives involved, which were requested once the processes had been identified as a result of a consultation made to the registries.

It should be taken into account that for the purposes of the analysis, the information on different companies

is considered to be comparable if it meets a number of conditions, which are summarised by Rivero Torre (1993) as follows: i) standard accounting systems and similar valuation standards are used; ii) equal periods of time are compared for each company; iii) the business activities engaged in are within the same economic sector; iv) the financial statements present real and reliable data; v) comparisons are made between figures relating to the main line of business rather than business activities of an exceptional nature.

### **Selection of the merger processes composing the sample to be studied**

All the merger processes carried out during the indicated period (1995-2005) for which annual financial statements were available at least one year prior and subsequent to the merger were selected, meaning that for the purposes of analysis, the mergers that took place in 2005 were excluded.

With regard to the location of the processes, this study was performed taking the merger processes carried out in four autonomous regions as a reference: the Community of Andalusia, La Rioja, the Foral Community of Navarra and the Basque Country. The mergers carried out in other Communities were excluded for the following reasons:

— Because the cooperatives' financial statements were not provided by the corresponding registries. This was the case of the Communities of Aragón, Canarias, Castilla La-Mancha y Castilla-León, Cataluña, and Galicia.

— Because there were no merger processes registered within the period indicated in these Autonomous Communities, or because the merger was carried out in 2005, the year was excluded from the analysis. This was the case of the Communities of Murcia, Madrid and the Balearic Islands.

In these four autonomous regions 40 mergers were carried out in this period: 22 cooperatives in Andalusia (12 takeovers and ten newly-created mergers); 4 in the Basque country; 11 in Navarra and 3 in La Rioja, all of which were takeovers in the latter three regions.

However, not all the merger processes could be included in the study since no annual financial statements had been filed in the Registers for certain of the cooperatives involved or the financial statements filed were incomplete. Therefore, as shown in Table 1, 11 merger processes involving cooperatives in Andalusia,



**Table 1.** Mergers of Spanish Agrifood Cooperatives between 1995-2005

Autonomous region	Province	No. mergers (1995/2005)	Acquisition	Formation	Financial statements furnished	Included in study <sup>a</sup>
Andalucía	Almería	1	1	0	1	1
	Cádiz	0	0	0	0	0
	Córdoba	3	3	0	3	3
	Granada	1	1	0	1	0
	Huelva	1	0	1	1	1
	Jaén	8	5	3	1	1
	Málaga	4	1	3	2	1
	Sevilla	3	1	2	3	3
	Córdoba+Málaga <sup>b</sup>	1	1	0	1	1
Aragón	Huesca			Have not furnished data		
	Teruel			Have not furnished data		
	Zaragoza			Have not furnished data		
Asturias	Asturias	1	1	0	1	0
Baleares	Baleares	0	0	0	0	0
Canarias	Las Palmas	0	0	0	0	0
	Sta. Cruz de Tenerife					
Cantabria	Cantabria	0	0	0	0	0
Castilla y León	Ávila	1		Have not furnished data		
	Burgos	1		Have not furnished data		
	León	0	0	0	0	0
	Palencia	0	0	0	0	0
	Salamanca	2		Have not furnished data		
	Segovia	0	0	0	0	0
	Soria	0	0	0	0	0
	Valladolid	0	0	0	0	0
	Zamora	0	0	0	0	0
Castilla-La Mancha	Albacete	5	5	0	5	0
	Cuenca					
	Ciudad Real		0	2	2	0
	Guadalajara					
	Toledo					
Cataluña	Barcelona		1	0	0	0
	Gerona		4	0	0	0
	Lérida			Have not furnished data		
	Tarragona			Have not furnished data		
C. Valenciana	Alicante			Have not furnished data		
	Castellón			Have not furnished data		
	Valencia			Have not furnished data		
Extremadura	Cáceres	1	1	0	0	0
	Badajoz	2	2	2		1
Galicia	La Coruña	3	1	2	Have not furnished data	
	Lugo	5	2	3	Have not furnished data	
	Orense	0	0	0	Have not furnished data	
	Pontevedra	1	0	1	Have not furnished data	
C. Madrid	Madrid	0	0	0	0	0
R. Murcia	Murcia	0	2	0	0	0
Navarra	Navarra	11	11	0	11	7

**Table 1 (cont.).** Mergers of Spanish Agrifood Cooperatives between 1995-2005

Autonomous region	Province	No. mergers (1995/2005)	Acquisition	Formation	Financial statements furnished	Included in study <sup>a</sup>
Pais Vasco	Álava	2	2	0	2	2
	Guipúzcoa	1	1	0	1	1
	Vizcaya	1	1	0	1	0
La Rioja	La Rioja	3	3	0	3	3
Ceuta	Ceuta			Have not furnished data		
Melilla	Melilla			Have not furnished data		
	Total	59	38	16	39	24

<sup>a</sup> The mergers which included cooperatives that had incomplete financial statements or which merged prior to 2005 were excluded from the study. *Source:* Compiled from replies to the questionnaire sent by the authors to all Cooperative Registries in the different Autonomous regions and their corresponding provincial offices, and in certain cases, to the Mercantile Registries.

<sup>b</sup> Merger entered in the register of cooperatives in Andalusia.

3 mergers in the Basque Country, 7 in Navarra, and 3 in La Rioja were finally included in this study.

## Data analysis and results

The variables and ratios used in the analysis were as follows:

— Financial, calculated on the basis of the balance sheet amounts (liquidity, solvency, indebtedness, etc.).

— Economic and mixed, based on information contained in the balance sheets and profit and loss accounts (turnover, financial expenses over sales, sales margin, asset turnover, return on assets, depreciation costs, production value, etc.). While these indicators are not specific to cooperatives, they are commonly used in an economic financial analysis of such companies (Segura and Oltra, 1995; Domingo, 2001; Montagut *et al.*, 2002).

When examining the results, certain limitations that condition the analysis had to be taken into account. Firstly, the fact that the timeframe of the different merger processes are different made it impossible to relate trends seen in various ratios to economic events taking place in specific years, since each financial year (N+1, N+2, etc.), corresponded to a different natural year depending on the merger in hand.

The use of the aforementioned methodology required a number of adjustments for the correct handling of the information to be analyzed.

Firstly, a study of the values of all ratios was performed on each of the years included in the research, and in the sample studies, cooperatives with incongruencies in their financial statements such as negative items

in current receivables or cash balances were detected and consequently eliminated from the study. Hence, a total of four mergers involving eight companies were rejected.

Subsequently, the ratio variability was calculated in the two periods studied, and for this purpose, since there were a total of 50 entities in the year N-1 and only 22 following the merger processes, an aggregated balance sheet was prepared for the year prior to the merger, as described in the methodology section.

In this manner, the sample was made more homogeneous and the effect of certain entities with extreme values on the distribution was tempered, particularly in the year N-1. It should also be pointed out that no profit and loss account was available in the year N-1 for 6 of the merger processes, meaning that for the analysis of the variables and ratios containing information included in these profit and loss accounts, the sample was decreased to 16 mergers.

The next step was to perform a statistical analysis on each of the ratios and variables to be studied in order to determine whether the distribution was normal. For this purpose, descriptive statistics such as the mean, median, standard deviation, asymmetry, kurtosis, maximum and minimum values, etc. were analyzed.

In order to confirm the degree of fit of the data to a normal distribution, a contrast was applied to the hypotheses for a confidence level of 5%. This contrast was designed to confirm the null hypothesis that the data came from a population with normal distribution. Normality contrasts were carried out using the Kolmogorov-Smirnov test and were corrected by the use of Lilliefors and Shapiro Wilk tests. The Kolmogorov-Smirnov test was not employed without the correction

**Table 2.** Normality tests prior to and following the merger process

Variable	N-1			N+4		
	Kolmogorov-Smirnov	Shapiro Wilk	Results	Kolmogorov-Smirnov	Shapiro Wolk	Normal
Liquidity	0.000	0.000	—	0.000	0.002	—
Solvency	0.000	0.000	—	0.000	0.001	—
Indebtedness (debt-equity ratio)	0.200	0.781	Normal	0.200	0.223	Normal
Fixed assets/Production value <sup>a</sup>	0.007	0.003	—	0.002	0.000	—
Financial expenses/Production value	0.002	0.001	—	0.138	0.025	K-S (Normal)
Financial expenses/Debt (debt-cost ratio)	0.089	0.058	Normal	0.000	0.000	—
Return on sales or Net profit margin	0.200	0.718	Normal	2.000	0.245	Normal
Asset turnover	0.001	0.001	—	0.189	0.075	Normal
Staff expenses/Production value	0.004	0.001	—	0.005	0.005	—
Depreciation expenses/Production value	0.100	0.160	Normal	0.200	0.600	Normal
Costs of goods sold/Production value	0.019	0.039	—	0.011	0.003	—
Operating profit/Production value	0.200	0.714	Normal	0.006	0.010	—
Financial net income/Production value	0.011	0.023	—	0.145	0.016	K-S (Normal)
Extraordinary income/Production value	0.200	0.084	Normal	0.000	0.000	—
Grants related to assets/Production value	0.000	0.000	—	0.010	0.002	—

Significance level: 0.05. *Source:* Based on the analysis of financial statements of the cooperatives analyzed. <sup>a</sup> Production value: Net sales + Finished product inventory change + Other operating income.

of the Lilliefors test as the results of the former on their own tend to be too conservative.

Table 2 shows the normality test results obtained. We can accept that data fit a normal distribution when a *p*-value larger than 0.05 is obtained.

The application of parametric statistical methods for hypothesis testing of related samples requires that both samples fit a normal distribution (in our case N-1 and N+4 values). Variables that fit that premise are: indebtedness, asset turnover and depreciation with respect to production value.

Table 3 shows the results obtained for each variable and the period studied. This table shows the mean and median corresponding to the group of merged agrifood cooperatives before and after the merger, the sector mean and the significance level of the t-statistics which will confirm or reject the null hypothesis that there are no significant differences between the variables and ratios analyzed prior and subsequent to the merger:

— H0:  $u_1 - u_4 = 0$  there are no significant differences in the variables<sup>2</sup> analyzed

— H1:  $u_1 - u_4 \neq 0$  there are significant differences in the variables analyzed

where  $u_1$  is the mean of the cooperatives prior to the merger (year N-1) and  $u_4$  is the mean of the companies following the integration (N+4).

Following an analysis of the results it was observed that, for most of the variables and ratios studied, there is a considerable variability in the pre-merger and post-merger performance of the cooperatives. Nevertheless, according to Wilcoxon, these differences are only statistically significant for a t-Student test with a significance level of 0.05 for the ratio of liquidity and the ratio of financial net income with regard to production value. The difference in the rest of the variables analyzed from N-1 to N+4 are not statistically significant. Therefore the null hypothesis that there are no differences between the variability of the indicators for the cooperatives analyzed should be accepted.

## Analysis of the results

### Analysis based on the balance sheet

Based on the changes in the financial indicators for the year N-1 to N+4, i.e. using information from

<sup>2</sup> Parametric statistical methods (t-student) are applied to determine whether there are significant differences between the means of two samples; this is the case of indebtedness, asset turnover and amortization/production value. Otherwise, non-parametric methods (Wilcoxon) are used to establish if there are significant differences between the medians of both samples; as in the case of the rest of the indicators analyzed.



**Table 3.** Economic and financial mean and median ratios prior to and following the merger process and statistical test results

Variable	Standard deviation (N-1)	Pre-merger mean (N-1)	Post-merger mean (N+4)	Variation N-1/N+4 (%)	Pre-merger median (N-1)	Post-merger median (N+4)	Variation N-1/N+4 (%)	Wilcoxon (non parametric) (p-value)	t-test (parametric) t-Ratio	Average Spanish Agricultural Cooperatives 2005
Liquidity	1.73	2.35	1.64	-30.21	1.45	1.25	-13.92	0.011	0.022	3
Solvency	1.48	2.38	2.43	2.10	1.85	1.77	-3.98	0.615	0.85	1.83
Indebtedness (debt-equity ratio)	0.23	0.53	0.54	2.07	0.54	0.56	4.46	0.615	0.777	0.544
Financial expenses/Sales	0.45	0.007	0.01	47.06	0.003	0.004	23.33	0.523	0.276	0.01
Financial expenses/Debt (debt cost ratio)	0.0074	0.02	0.01	-22.64	0.0069	0.0128	85.51	0.586	0.441	0.0244
Return on sales or Net profit margin	0.017	0.01	0.02	42.86	0.01	0.01	-3.70	0.163	0.519	0.0249
Asset turnover	0.013	1.4	1.33	-5.00	1.29	1.04	-19.33	0.679	0.599	0.133
Fixed assets/Production value	0.77	0.45	0.42	-6.67	0.33	0.34	1.45	0.877	0.762	—
Staff expenses/Production value	0.049	0.05	0.07	26.92	0.04	0.04	13.17	0.256	0.692	0.074
Depreciation expenses/Production value	0.015	0.026	0.031	19.23	0.023	0.033	40.69	0.196	0.256	0.0267
Cost of goods sold/Production value	0.22	0.78	0.66	-15.38	0.9	0.82	-7.97	0.501	0.193	—
Operating income/Production value	0.014	0.068	0.0006	-99.12	0.005	0.0024	-48.94	0.255	0.38	—
Financial net income/Production value	0.0069	-0.003	-0.009	240.00	-0.001	-0.005	316.67	0.023	0.042	—
Extraordinary income/Production value	0.0036	0.003	0.015	400.00	0.002	0.002	-11.11	0.345	0.11	—
Grants related to assets/Production value	0.004	0.003	0.005	88.00	—	0.0014	—	0.128	0.264	—

Significance level: 0.05. *Source:* Based on the analysis of financial statements of the cooperatives analyzed and average OSCAE 2007 ratios. Production value: Net sales + Finished product inventory change + Other operating income.

the balance sheet, the following conclusions can be drawn.

Firstly, a comparison of the position of the merging cooperatives and the resulting one reveals a drop of over 14% in the general liquidity median following the merger. It should be pointed out that after the merger, general liquidity is below the interval considered to be appropriate for this ratio (1.5-2), increasing the distance to the mean of the Spanish agricultural cooperatives in 2005 (3) (Table 3)

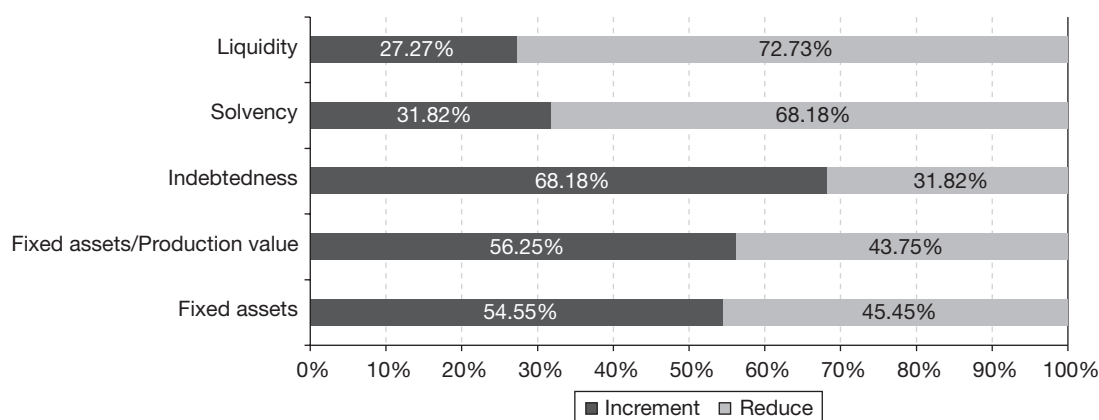
Figure 1 confirms the results obtained with the analysis of the median and shows that, when analyzed process by process, general liquidity is reduced in more than 70% of the firms included in the study, losing ground in comparison with the sector average. Despite these results appearing to be somewhat excessive, it is an indicator that cooperatives in this sector do not suffer problems of liquidity.

The median of the solvency ratios for the cooperatives remains practically unchanged following the merger, and consequently the same is true of the debt-

equity ratio. In this case, and contrary to the analysis of the liquidity ratios, the solvency ratios in the period studied are higher than the mean for the sector and the debt-equity ratio is within a range similar to this mean.

Additionally, the process by process study of these ratios shows results differing from those of the statistical analysis, and as observed in the previous figure, there was an increase in the debt-equity ratio in 70% of the cases. Consequently and inversely, solvency was reduced by the same amount. These differences in criteria stem from the fact that the increases (in the debt-equity ratio) and the reductions (in solvency) in 70% of the ratios were relatively small, and are not reflected in the mean or the median. Therefore, it can be concluded that despite the fact that they remained practically unchanged in both cases (debt-equity and solvency), the reality is that there was an increase in debt and a reduction in solvency in almost 70% of the mergers.

The aim of the study of the changes in assets is to determine whether investments were made in fixed



**Figure 1.** Variation in financial ratios (% of mergers). *Source:* Based on the analysis of financial statements of the cooperatives analyzed.

assets following the merger of the entities analyzed or if, on the contrary, the resulting cooperative was restructured and certain fixed assets were disposed of. For this purpose, an analysis of the investment in assets is performed, both in terms of absolute value and their weighting with respect to production value.

A first approximation shows a 1.45% drop in the median for this asset (Table 3) as compared to production value following the merger. However, as observed in Table 4, the absolute value of the volume of the fixed asset increased by 46.3% in the year N–1 to N+4. This fact was confirmed with the results obtained in Figure 1, where both in absolute terms and with respect to the production level, there were increases in this variable in almost 55% of the mergers. Therefore, it can be concluded that following the merger, there was an increase in the investment in fixed assets.

### Analysis of the profit and loss account

One of the first aspects analyzed was whether the merger has contributed to achieving one of the main

objectives pursued in the whole of the merger process, which is included in the annual reports of the Commission of the European Communities' on competition policy: the expansion and strengthening of an improved position in the market by the cooperatives involved. For this purpose, the evolution of the turnover of the cooperatives was analyzed in order to determine whether the merger contributed to an increase in this variable. This change is shown in Table 4, where increases of around 16% have been recorded in the period analyzed.

In reality in over 80% of the merger processes there was an increase in turnover (Fig. 2), but not of the magnitude expected, since the mean only increased by 16% following the merger. However, it can be concluded that the merger contributed to an improvement in this variable.

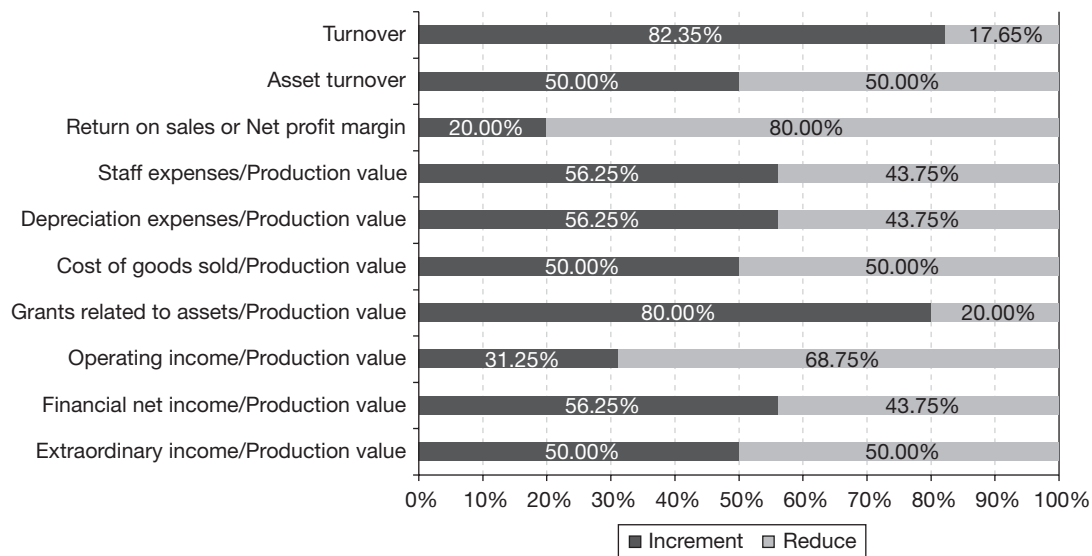
To complement the analysis of the changes in turnover, different economic ratios referencing the profit and loss account were calculated, the main exponents being profitability ratios and their components.

However, one aspect needs to be borne in mind with regard to the profitability of cooperatives. The dual role played by partner-suppliers in agrifood coopera-

**Table 4.** Turnover and fixed assets of co-operatives ratios prior to and following the merger process (euros)

Variable	Pre-merger N–1	Post-merger N+4	Variation N–1/N+4
Fixed asset aggregate	124,422,139.67	182,056,140.05	46.32%
Fixed asset average	5,655,551.80	8,275,279.09	
Turnover aggregate	415,840,240.81	484,719,739.58	16.56%
Turnover average	24,461,190.64	28,512,925.86	

*Source:* Based on the analysis of financial statements of the cooperatives analyzed.



**Figure 2.** Variation in economic ratios (% of mergers). *Source:* Based on the analysis of financial statements of the cooperatives analyzed.

tives results in a proportion of the business profits going to partners in the form of higher prices received in their role as supplier for the cooperative, a procedure that, on the one hand, reduces the tax burden for the cooperative (as surpluses are reduced), while minimizing the allocation of resources to social funds, which can be beneficial bearing in mind the obligatory nature of this aspect according to Spanish law on cooperatives.

In so far as the calculation of profitability requires the comparison of the profit earned by the cooperative with another factor (assets, equity capital, etc.), it becomes less representative and meaningful for analysis purposes since as previously mentioned, the profit earned depends on the amount paid by the cooperative to the members for product deliveries. If the common calculation of profitability were applied to these cooperatives, results would be poor, not due to management problems, but as a result of payments made to partners at higher than market prices.

Therefore, when calculating profitability ratios in cooperatives, the market price of the products delivered by the members should be known, and if applicable, the cooperative's profit should be recalculated in cases where a proportion of the earnings was divided among members by increasing the payments made (Domingo, 2001).

The application of this method has received a good deal of criticism. Segura and Oltra (2005), point out some of the drawbacks of this method include the fact that many cooperatives are the sole market operators,

which can lead to a distortion in market prices and also cause difficulties in finding benchmark prices within their range.

However, and regardless of the reasons given above, in the analysis performed during this research, this fit is impracticable for several reasons. Firstly, the sample comprises cooperatives operating in different fields (citric and other fresh fruits, vegetables, nuts, wine, etc.) and there are numerous varieties within them, making the setting of an average market price for the purpose of correcting the cooperatives' results unfeasible. Secondly, although all the cooperatives belong to the same sector and operate with the same product, the years analyzed do not relate to any specific financial years, and as they depend on the year in which the merger was carried out (N), a market price cannot be established for each financial year.

Consequently, and due to the restrictions discussed, the profitability analysis was reduced to the calculation of two ratios: asset turnover and return on sales or net profit margin, the product of which gives rise to return on asset ratio (ROA), taking into account that the focus of the analysis of the latter ratio, and therefore, of profitability, was not the indicator itself or its components, but rather determining the effect the merger has had on them.

Commencing with the analysis of asset turnover, it should be pointed out that the mean decreased slightly following the merger ( $-5\%$ ), indicating that there was a decrease in the efficiency of the assets after the merger

to the extent that the income the cooperatives are capable of generating per unit invested in the assets was reduced. The process by process analysis indicates that this ratio increased in half of these mergers and decreased in the other 50%, leading to the conclusion that there was practically no change in this variable. It is also important to add that, following the merger, the assets turnover of the resulting cooperatives is at the same level as the mean for the sector (1.33).

A slight decrease (−3.7%) in the return on sales median was observed following the merger with respect to return on sales recorded by the merging entities in N−1. Furthermore, the mean ratio values for this sector were not reached.

The process by process study confirms these results, since in 80% of the mergers, the net profit margin decreased following the merger.

The ratio of financial expenses over sales with respect to production value analyzes the financial burden borne by a company in comparison to the income available to cover these costs. Focusing on the study of the ratio, an increase of almost 25% in the median was observed, reaching a value similar to the mean for the sector (0.01), but without reaching 0.015, which is the reference value that tends to be used in the economic and financial analysis of companies. Any values below this threshold call for precaution (Amat, 2008).

The debt-cost ratio relates the financial expenses to the debt implied in a given cost for the company. The debt-cost ratio tends to exclude items such as suppliers, compensation pending payment or debts to partners, in so far as these items do not bear a related financial cost. However, this distinction was not possible since there was no breakdown of the debt, and therefore this calculation was made on the total debt.

In the year N−1, the median debt cost was lower than 1% and following this year, this median increased up to 1.28%. The mean value of the agricultural cooperatives for this ratio was 2.44%, meaning that, according to the results obtained, the debt cost ratio for the cooperatives analyzed was lower than the mean for the sector.

With regard to the analysis of the evolution in the performance of cooperatives, such as staff costs, depreciation and cost of goods sold, the following conclusions can be made:

It should first be noted that this group includes one of the variables with statistically significant variations in the pre/post-merger comparison: financial net income with respect to production value.

The evolution in operating income is highly conditional upon depreciation costs, staff costs and cost of goods sold.

The cost of goods sold median decreased from 89.5% to 82.4% compared to production value following the merger.

It should be noted that evolution in these costs has a negative repercussion on the cooperative and for the partners. In the case of cooperatives, this is due to the fact that this item is the most relevant in terms of cost in the profit and loss account, and accordingly is key to obtaining positive results. For the partners, this is true to the extent that it is the cooperative's main supplier, meaning that an increase in this cost and the related decrease in profitability for the cooperative also leads to an increase in the profitability of the partner's business activity with the cooperative.

Staff and depreciation expenses with respect to production value increased by 13.17% and 19.23%, respectively. Also noteworthy is that the labor and personnel costs were below the average in 72% of the resulting cooperatives, but this was not the case of depreciation costs.

The process by process study showed that the changes in staff expenses with regard to production value were the same as the changes in the median, as there was an increase in this variable in 56% of the mergers. On the contrary, and despite the decrease in cost of goods sold with respect to production value, process by process it was observed that this item decreased in 50% of the cases. Also, it was observed that in close to 70% of the processes, the operating income decreased.

In the case of financial net income with respect to production value, the median loss increased following the merger as a result of the increase in the financial burden with respect to production value (the median increased by 316% following the merger), a variation which is statistically significant.

It is evident that, in most cases, the mergers did not lead to an increase in business profit to the extent that, although there was an increase in activity, the adjustments required to achieve an appropriate reduction in costs following the mergers were not made. On the contrary, these costs increased on several occasions, and in particular depreciation costs with respect to production value, as a consequence of the investment in assets, which increased in absolute value by 46%, while turnover increased by 16%, and staff costs.

A clear example is the financial burden intrinsic to the investments made by the cooperatives in fixed

structures, which, as observed, was not reduced. It is only logical that taking into consideration the fragmentation of Spanish agricultural cooperatives, certain real estate would be sold following a merger in accordance with the restructuring plan of the activity of each entity in order to concentrate production and minimize the intrinsic costs incurred. However, the analysis of the financial statements for the years subsequent to the merger of the different cooperatives shows that there were practically no such cases and the average volume of fixed assets actually increased.

Equally, following the mergers, the median of grants related to assets (gradually reversed during the useful lives of the respective assets and recognized in income) with regard to production value increased, meaning that new aid was received for the purpose of making new investments in fixed assets, which also explains why depreciation costs did not decrease.

## Discussion

This study constitutes pioneering research which quantifies the effects that merger processes have on the financial-economic situation of agrifood cooperatives.

Empirical studies have been carried out on the outcomes of mergers using financial information on sectors other than agrifood, such as banking (in particular on savings banks) (Apéllaniz *et al.*, 1996) and insurance companies (Serra *et al.*, 2001). In general terms, the conclusions drawn in the majority of these studies indicate that mergers have not implied an injection of advantages to the merged organizations. Although improvement is present in some of the indicators analyzed, the truth is that the firms involved lose out in comparison with the rest of their sector.

On an international level, the question of whether M&As improve corporate performance is one that has been addressed by many researchers over the last three decades (for example – Meeks, 1977; Cosh *et al.*, 1980; Cornett and Tehranian, 1992; Healy *et al.*, 1992; Switzer, 1996; Manson *et al.*, 2000; Ghosh, 2001; Lin and Switzer, 2001). Unfortunately, there still appears to be no consensus on whether M&A bring about improvements in operating performance (Kumar, 2009).

A great number of studies have been carried out in Europe, the US and other countries on the effect of these processes on the firms involved. Despite the fact that mergers galvanize growth in activity for these firms, existing studies suggest that, in general, there

does not seem to be any clear improvement in the post merger situation of the acquiring or resulting organization, as most economic indicators suggest a very small or inexistent improvement.

Few references exist within the field of agrifood. Manfredo (2003) analyzes the post-merger effects on US agrifood cooperatives. One of the most notable conclusions is the negative effect observed on sales growth following integration.

Subsequent to the empirical research carried out for this study, and coinciding with the ideas generally put forward in most of the studies carried out in this field, it is established that the mergers of agrifood cooperatives carried out in the autonomous regions analyzed in the period from 1995-2005 have not led to the expected results, or at least have not achieved the desired level in terms of financial results or cost control, and consequently, in terms of obtaining higher results and profitability.

Significant changes only showed up in two variables: liquidity and financial net income with regard to production value. In both cases, the comparison of the position of the merging cooperatives and the resulting one reveals a negative evolution [general liquidity decreased, where the N+4 value was below the interval considered to be appropriate for this ratio (1.5-2), and financial net income with respect to production value decreased by 316%].

As for the rest of the ratios (financial and economic), it can be concluded that the change in the post-merger operating performance is not statistically significant. This result means that merger events did not lead to changes in the performance of the cooperatives involved. In this sense, the results showed no significant improvement either in the cooperatives' financial situation (solvency, indebtedness, etc.), or in the economic indicators (evolution in costs, income, profitability, etc.). On the other hand, despite the fact that differences between the ratios in the year prior and subsequent to the merger were not significant, the results show that in most cases they have experienced a negative evolution.

In terms of the financial ratios, mergers did not lead to an improvement in the liquidity or solvency of the entities (decreased in 72% and 68% of the cases, respectively), which is of even more significance if we bear in mind that, in the case of the resulting cooperatives, both indicators were under the mean for the Spanish agrifood sector.

There was an increase in the debt equity ratio in 68% of the cases, and despite the fact that the related financial burden was not very high in comparison to the



mean for the sector, its weighting did increase with respect to the volume of sales following the merger, which undoubtedly contributed to worsening the business results.

A considerable investment in fixed assets was made (its aggregate value increased by 46%) and while this might have been a positive factor, this increase was not accompanied by an increase in turnover (its aggregate value increased by 16%) sufficiently covering the increase in depreciation costs.

Moreover, the economic indicators did not improve following most of the mergers. Although in the majority of cases, there was an increase in business activity, which is one of the objectives of these operations, they did not lead to a reduction in the main costs in terms of production value, and consequently did not lead to an improvement in business performance.

The evolution in the sales margin, or the income generated per unit earned for sales have not led most cooperatives to be above the sector average.

As for the profit and loss account items, operating income, financial income, and extraordinary results decreased with respect to production value.

Grants related to assets increased in 80% of the cases with respect to production value in the period analyzed, and led to many of the investments in fixed assets following the merger in most cases, and such investments increased in the majority of the resulting cooperatives. Undoubtedly, taking the changes in these results into account, obtaining grants related to assets was not conditional upon the submission of activity restructuring plans, a requirement that should be made without exception in these processes.

In fact, it is evident that the resources (human, material, etc.) of the cooperatives involved in the mergers were not restructured in most cases. The post-merger concentration of the production centres would have been appropriate for the purpose of reducing not only depreciation costs, but also the costs inherent to the production process, including a proportion of staff costs. However, the increase in depreciation and staff costs and the fact that there was a decrease in the average income generated per unit invested in assets (asset turnover) shows that this is not the general tendency in these processes.

Clearly, post-merger fits are even more complicated in the case of cooperatives. With respect to staff, this is due to the network of family and friendships generally tying the staff to the company base. Additionally, the concentration of production and handling centres is

generally not well accepted among the partners of merging cooperatives whose installations are to be sold or leased. However, without this type of fit, the courage often required by the shareholders to approve a merger is fruitless, because if synergies are not achieved, the mergers become pointless.

Finally, and in light of the results obtained, we would like to highlight the need for merger processes in agrifood cooperatives to be accompanied by a viability study of the resulting organization. This would go hand in hand with a financial examination of the firms involved, as normally occurs, given that this is a legal requirement, as is establishing the capital corresponding to each of the partners in the resulting cooperative, all of which are elements that should be included in the merger scheme.

Such a study should take into account fundamental aspects such as total production and human assets in the resulting organization and their inherent costs, and should establish the fits and pertinent restructuring, along with the timescale for their implementation. This would undoubtedly result in achieving more of the targets laid down for the merger.

In this context, it would be interesting to broaden the study further to include other autonomous communities, as well as taking a deeper look at the factors that lead to their success or failure in an effort to improve their results in real terms.

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