Commercial performance of the integration of standards in olive oil and agri-food marketing

Rocio Carrillo Labella, Fatiha Fort, Manuel Parras Rosa

COMMERCIAL PERFORMANCE OF THE INTEGRATION OF STANDARDS IN OLIVE OIL AND AGRI-FOOD MARKETING

Rocio Carrillo Labella
Associate Professor of Marketing Management.
University of Jaen, Spain.
Paraje las Lagunillas S/N. 23071 Jaén, Spain
rlabella@ujaen.es

Fatiha Fort
Professor of Marketing Management.
Institut Agro, Montpellier SupAgro/IRC.
1101 Avenue Agropolis,
34 093 Montpellier Cedex 5 France.
Fatiha.for@supagro.fr

Manuel Parras Rosa
Professor of Marketing Management.
University of Jaen, Spain. Paraje las Lagunillas S/N
23071Jaen, Spain.
maparas@ujaen.es

Abstract

Globalisation has led to more and more companies in the agri-food sector turning to accreditations such as those guaranteeing quality (ISO 9001), environmental sustainability (ISO 14001) and food safety (ISO 2200, BRC and IFS) for commercial purposes. However, these changes may not lead to an improved economic and commercial performance for olive oil companies. This study, therefore, has two specific objectives: first, to find out if there are groups of accreditations that determine company profiles; and, secondly, to analyse whether these profiles have any kind of influence on the economic and commercial performance of the olive oil industry. A quantitative investigation was carried out using ANOVA and among the main results, a bipolarity was observed between those that have no certification and those that are highly accredited for quality, environment, and food safety. Regarding the second objective, the results uphold the commercial function of accreditation in terms of improving commercialisation. It was not possible however to confirm such positive results in operative earnings, but it was observed that the companies with the strongest results invest more in accreditations, especially in food safety.

Key Word: marketing, economic performance, quality, food safety, environment, agriculture.

1. Introduction

The globalisation of the world economy, as well as the growth and development of international trade, have led to the emergence of rapid quality standardisation processes - crucial for conveying a product's quality and for generating trust among consumers, the retail sector and society in general. In addition, the agri-food industry is also fiercely competitive, with continuous technological progress, new consumer demands and scarce natural resources that must be conserved (De Oliveira, 2013). It is increasingly common for consumers to make choices based not only on quality, but also on matters of environmental conservation and sustainability (Domingues et al., 2016). To this changing behaviour must be added the issue of food safety, which has become, in the last decade, one of the most important aspects to influence national and international economic and commercial patterns (Aggelogiannopoulos et al., 2007).

The globalisation of food production and procurement has made food chains longer and more complex, thereby increasing the risk of food safety incidents. These factors make the food industry one of the most regulated in the world, which has led companies to adopt multiple quality and safety standards in their production practices, unifying processes in order to guarantee quality via third-party certification procedures.

In recent years, some certification bodies have highlighted the increasingly common practice of companies requiring joint certification of different standards, such as quality (ISO 9001) with an organisational objective (ISO 9001: 2015), environmental sustainability (ISO 14001) whose objective is the protection of the environment and minimisation of waste (ISO 14001: 2015) and / or food safety (ISO 22000, British Retail Consortium (BRC) International Food Safety (IFS)), in order to guarantee safety and product safety. This behaviour is also occurring in the agri-food industry (Djekic, et al., 2014). It should be noted that these certifications are mostly implemented in order to improve their commercial performance and increase their profits (Movahedi et al., 2013; Escanciano and Santos Vijande, 2014; Nunhes et al., 2016; Boiral et al., 2018). Although, it should be noted that this integration involves complexity given the extensive human and financial resources spent on implementation (Nunhes et al., 2017).

In this context, the main objective of our study is to examine the behaviour of companies in the Andalusian olive oil industry with regard to the adoption of these standards in an integrated way. We first analyse whether these accreditations have a strong internal association, that is, whether groups of accreditations exist that determine company profiles; and, secondly, whether these profiles have some kind of influence and relationship on the economic and commercial performance of the olive oil industry. It is noteworthy to mention that Europe produces almost 67% of the oil produced in the world, and that Spain generates a third of all world olive oil production, Andalusia being the world's olive oil-producing region par excellence. The highest producing provinces, Jaén and Córdoba,64% of annual olive oil production for the whole of Spain.] It is clear that this region's asset - if well managed - has an extraordinary commercial value and has earned the region the status of being the world's leading producer of olive oil.

To satisfy these objectives, this work is structured in four parts: in the first, we undertake a review of the literature on accreditations from a management perspective. In the second, we explain the methodology used. In the third, the main results are presented and finally, in the fourth, the main results and conclusions of the study are discussed.

2. Review of existing literature

Focusing on the commercial perspective, the reasons that lead companies to seek certification are: to improve their image (Casadesús and Karapetrovic 2005), positive influence on the market share (Singh, 2008), the increase in sales (Casadesús and Karapetrovic, 2005), improvement in export figures (Arauz and Suzuki, 2004), and obtaining higher profits (Dick et al., 2008). These results show that many companies today implement quality standards such as ISO 9001 for external reasons, thus making the standard a good marketing tool (Martínez-Costa et al., 2008).

In relation to the ISO 14001 standard, much of the literature supports the same motivational behaviour as for quality standards, i.e., that via certification companies seek to improve their image and reputation (Murmura et al., 2018; Salim et al., 2018), greater competitiveness (Carrillo-Labella et al., 2020), increased sales (Grolleau et al., 2007), access to new markets and exports (Grolleau et al., 2007; Murmura et al., 2018) and, finally, improved economic performance and benefits (Heras-Saizarbitoria et al., 2011; Boiral et al., 2018; Carrillo-Labella et al., 2020). Like quality standards, ISO 14001 is considered a good marketing instrument (Murmura et al., 2018; Boiral et al., 2018).

Finally, food safety standards behave in a similar way to those for quality and the environment. Although the main objective of food safety regulations is to seek greater internal efficiency and guarantee the quality and safety of products during the production process (coinciding in these elements with quality and environmental regulations), companies that adopt food safety standards seek to improve the image and reputation of the company (Chalak and Abiad, 2012), develop competitive advantage (Escanciano and Santos-Vijande et al., 2014) increase sales and market share (Tomasevic et al., 2016) and, especially, increase their presence and access to new foreign markets (Escanciano and Santos-Vijande, 2014; Tomasevic et al., 2016). All these factors can consequently bring improved results and benefits for the organisation (Kafetzopoulos and Gotzamani, 2014).

By way of conclusion, it can be said that the literature review highlights an increase in the joint adoption of quality, environment and food safety standards in the agri-food industries. The purpose of this practice is to guarantee the quality of the products, as well as to improve the image of the companies and increase their sales and their export figures, all with the ultimate objective of improving the economic and commercial performance of the organisation. It cannot be overlooked obtaining integrated certification implies higher costs and an increase in bureaucracy and audit time for companies, which makes us wonder if the simultaneous adoption of these standards really leads to better organisational results. In order to discover how these certifications - pertaining to quality, environment and food safety - effect economic and commercial performance, we propose the following hypotheses.

H1: Companies with a higher degree of accreditation (quality, environmental and food safety) have higher national sales.
H2: Companies with a higher degree of accreditation (quality, environmental and food safety) have a higher percentage of export figures.
H3: Companies with a higher degree of accreditation (quality, environmental and food safety) have higher foreign sales.
H4: Companies with a higher degree of accreditation (quality, environmental and food safety) have higher operative earnings.

3. Research methodology

To meet our objectives, we began with a comprehensive census of 848 companies in Andalusia. Accounting and financial statements were requested for all of them, via the corresponding official records (cooperatives registry and mercantile registries). Given that 95% of the companies turned out to be SMEs, we decided to focus exclusively on this type. Finally, a sample of 374 SMEs was obtained with data from three consecutive years (2013-2015), to form the sample that was used in the longitudinal study (Panel data). Subsequently, via telephone survey, information was obtained about export orientation (exported business volume and export percentage of total production) and certification level where, 122 companies were accredited with food safety -ISO 22000, BRC, IFS-, quality ISO 9001 and environment ISO 14001. The 24 companies had implemented only some food safety certification (ISO 22000, BRC, IFS), 36 accredited with quality and environment (ISO 9001, ISO 14001) and the majority of the sample, that is, 192, sustained that they did not have such certifications implemented (Table 1). This work/investigation/research was carried out during the months of September to December 2019.

When carrying out the study, we considered the following variables: National sales (Turnover-export sales) Export (Turnover*PCT Export), export percentage (Export Sales/Turnover), operative earnings (Operating income-operating cost).

4. Main results

Firstly, the profiles of the companies are identified and organised according to their degree of certification and, secondly, once the groupings have been identified, the influence of each on economic and commercial performance is analysed, using the variables mentioned above.

4.1. Analysis of the dimensions

A multiple correspondence analysis (MCA) was carried out in order to address the need for dimension reduction, since there are 5 dichotomous categorical variables. The homogeneity of the variables makes this the optimum analysis for explaining our area of interest, the predisposition to accreditations.

The results show that a clear dimension explains the highest percentage, 79.73% of variability. This dimension is weighted for all accreditation categories and similarly for positive association. Ultimately, it is a component of the “accreditation size”. Interpreted literally it indicates that, in general, companies are divided into those that are highly accredited and those that lack accreditation. In other words, there is a strong positive association between accreditations. Companies that opt for accreditation, do so in a global, holistic way.

The second dimension presents only 9.55% explained inertia. Although it presents little variability, it is worth noting that when observing the MCA coordinates, this dimension shows certain nuances in the manner of accrediting itself. There is a clear distinction between a group of companies that tends towards accreditation for quality and environment -ISO 9001 and ISO 14001- versus another group that tends towards accreditations related to food safety -ISO 22000, BRC and IFS. In this latter the ISO 22000 is less well represented. The third dimension is very uninformative and would indicate the tendency of a very small group of companies to be accredited only in ISO 22000.

Based on the previous study, we classified the companies into four types (a four-level factor that we will call "Label"): 1) Companies with at least one accreditation for quality and environment and at the same time some

accreditation in food safety - we call them hyper-accredited (H). 2) Companies with at least one accreditation for quality and environment and none in food safety - we call them quality (Q). 3) Companies with at least one accreditation for food safety and none in quality and environment - we call them food (F). 4) Companies with no accreditation (N). Table 1 shows the percentages of the different types of companies.

Table 1. Typology of companies based on accreditations

Label	H	F	Q	N	Total
Frequency	122	24	36	192	374
Percentage	32.62%	6.42%	9.63%	51.34%	100%
Confidence interval	[27.9; 37.4]	[3.9; 8.9]	[6.6; 12.6]	[46.3; 56.4]	

Source: Own production

4.2. Hypothesis contrast

To contrast the hypotheses raised, an ANOVA for repeated measures or mixed factor analysis was carried out, considering both intra-subject variables (year factor) and between-subject variables ("Label" variable). The ANOVA for repeated measures. The label factor has four levels and the year factor three. To harmonise the data, we performed a logarithmic transformation of the variable "national sales (variable "log (National)") considering the results negative

With respect to hypothesis H1, the results reveal that there are significant differences in national sales with respect to the level of certification (p-values <0.05). Regarding the certification factor, a non-parametric Kruskal Wallis test was carried out for independent samples, the objective of which was to contrast whether the samples compared come from the same population. Here we also concluded that significant differences are evident (p-value <0.05) with respect to the certification level of the companies. To determine between which levels significant differences were produced, we must resort to a multiple comparisons test (Bonferroni test). The p-values corresponding to the comparisons between the certification levels (H, F, Q) are greater than 0.05. Therefore, at a significance level of 5%, we cannot assume differences between the national sales averages of companies with these levels of certification. However, we can conclude that the national sales of the companies that are not accredited (level N) are lower than the corresponding national sales of the companies with at least some certification (p-values less than 0.05), and thus H1 is accepted.

In addition, the non-parametric test of multiple comparisons also detected significant differences between the levels of certification H and Q. That is, national sales in companies with quality and environmental certification (Q) are significantly higher than national sales in hyper-accredited companies (H).

Regarding hypothesis H2, from the non-parametric Kruskal-Wallis test p-value <0.05 is obtained It is thus inferred that there are significant differences in export percentages according to the level of certification they have. In other words, it can be concluded that there are significant differences in export percentages or, to put it differently, those companies with a higher degree of certification have a higher export percentage, confirming hypothesis H2.

Regarding the third hypothesis H3, or the analysis of the influence of the degree of certification on the volume of exports, the results show that there are significant differences in exports with respect to the year and with respect to the level of certification, in addition, the interaction between the factors is not significant (p-value 0.0921). Regarding the certification factor, a non-parametric Kruskal Wallis test was performed for independent samples, the objective of which was to contrast whether the compared samples come from the same population, also concluding that significant differences are evidenced (p-value less than 0.05).

To determine between which levels significant differences were produced, we must resort to a multiple comparisons test (Bonferroni test). The p-values corresponding to the comparisons between the certification levels (H, F, Q) are greater than 0.05. Therefore, at a significance level of 5%, we cannot assume differences between export averages of companies with these levels of certification. However, we can conclude that the exports of companies that are not accredited (level N) are lower than the corresponding sales of companies with at least some certification (p-values

less than 0.05), that is, the fact of having some certification improves the export volume, thus confirming hypothesis H3. It should be noted that the p-value corresponding to the FQ pair is close to the significance level and the average values of exports at the H and F levels are similar. The differences were thus checked with a less conservative multiple comparison test than the Bonferroni test (Holm's test). With this test, significant differences are also detected between companies accredited in food safety (F) and those accredited in quality and the environment (Q).

In relation to the last hypothesis regarding operative earnings and profits H4 no p-value was less than 0.05. This means that neither of the two factors has a statistically significant effect on the study variable with a 95% confidence level. That is, there are no significant differences in operative earnings at the certification level. The interaction between the factors is not significant either (p-value 0.697). In general, it is inferred that there are no significant differences in the average values of the operative earnings with respect to any of the factors considered (level of certification and time). However, the non-parametric Kruskal-Wallis test and the subsequent Bonferroni multiple comparison test detect significant differences between the median of the companies with food certification (F), with respect to the median in the rest of the companies.

Table 2 contains a synthesis of the results previously presented on the analysis of variance with regard to two factors - years and profile of companies according to accreditations - and their relationship with the hypotheses formulated.

Table 2. Analysis of variance with regard to two factors (Company Profile-Year) and hypotheses

ACCREDITATIONS		N	Average	Median	Dev. Est.	p-value	Hypothesis
NATIONAL (Million euros)		1122	4.185	247,746	4.992		
	H	366	4.37	2,961,158	4.5		
	F	72	6.466	4,338,020	6.666	0.000**	YES
	Q	108	5.764	3,823,856	5.625		
	N	576	3.491	1,909,273	4.768		
%EXPORTATION		251	30.21	25	18.32		
	H	120	42.22	50	12.37		
	F	21	31.24	23	21.47	0,000**	YES
	Q	27	22.7	25	12.7		
	N	83	15.03	10	13.2		
EXPORTATION (Million euros)		753	2.278	107,068	3.137		
	H	360	3.266	20,531,459	3.597		
	F	63	3.269	11,083,232	4	0,000**	YES
	Q	81	1.496	10,787,075	1.4		
	N	249	0.851	0.4000899	1.601		
OPERATIVE EARNINGS		1122	0.053	0.018	0.199		
	H	366	0.055	0.021	0.212		
	F	72	0.097	0.064	0.222	0.217	NO
	Q	108	0.089	0.015	0.27		
	N	576	0.039	0.016	0.168		

***p < 0.01; **p < 0.05; *p < 0.1

Source: prepared by the authors.

5. Discussion and Conclusions

The results obtained from our study highlight the existence of two large blocks of companies: on the one hand, the so-called hyper-accredited companies (H) that have a quality standard, environment and some type of food safety certification and, on the other hand, companies that do not have any certification (N). It should also be noted that some companies are focused only on quality and the environment (Q) and others that have opted only for food safety (F), with the ISO 22000 standard being the least well-represented.

On the other hand, it was confirmed that companies with some certification (H, F, Q) sell more in national markets compared to those with none (N). In addition, median national sales are significantly higher in companies with quality and environmental accreditation (Q) than in hyper-accredited companies. Despite the literature indicating that food safety has become one of the most important aspects to influence national and international economic and commercial patterns (Aggelogiannopoulos et al., 2007), in the case of the olive sector this seems to be less of a consideration in the national market. In addition, these results confirm that companies in the olive oil industry obtain higher sales and a improved commercial performance, in keeping with other studies (Tomasevic et al., 2016).

Regarding exports, the results show that companies with some accreditation (H, F, Q) have higher sales in foreign markets than those with none (N). It should be noted that the average values of hyper-accredited companies and those accredited only with food safety (F) are quite similar. In addition, the average export volume of hyper-accredited companies is higher than companies that have quality and environmental accreditation (Q). This leads us to think, as mentioned above, that in foreign markets more importance is given by the retail sector and consumers in general to food safety, than to ISO 9001 quality standards and ISO 14001 environmental standards, without forgetting that they are also valued. Likewise, these results confirm that companies in the olive oil industry obtain increased exports and improved commercial performance, with food safety in particular coinciding with other authors (Escanciano and Santos-Vijande, 2014; Tomasevic et al., 2016).

Regarding company results, the fact of being accredited - regardless of the degree - does not imply larger profits. Although part of the literature concludes that accreditations can lead companies to greater profits (Heras-Saizarbitoria et al., 2011; Kafetzopolous and Gotzamani, 2014; Boiral et al., 2018), no relationship has been found in the olive oil industry; yet it can be considered that companies who invest more in accreditation, especially for food safety, are those which obtain better results.

By way of conclusion, this study has implications, both from an academic and business perspective. We recommend that olive-growing agri-food companies adopt standards, especially environment and food safety ones, to improve the commercialisation of their olive oils, especially if they want to start or consolidate a process of internationalisation.

Acknowledgment: This work and the research it contains was carried out in the context of the Research Project, "Eco-innovation in the Andalusian olive oil sector: situation, driving factors and strategies" with reference: 1264899-FEDER-UJA (Resolution of January 17th , 2020, of the Rector of the University of Jaén, which constitutes the Definitive Resolution of the allocation of financial support for R & D & I projects in *Andalusia. Operational program*: *Andalusia ERDF 2014-2020* is public and operates an open and competitive selection process. Call 2018)

References

Aggelogiannopoulos, D., Drossinos, H. & Athanasopoulos, P. (2007). Implementation of a quality management system according to the ISO 9000 family in a Greek small-sized winery: a case study. *Food Control,* 18 (9), 1077-1085. https://doi.org/10.1016/j.foodcont.2006.07.010.

Boiral, O., Guillaumie, L., Heras-Saizarbitoria, I. & Tayo-Tene, CV (2018). Adoption and outcomes of ISO 14001: a systematic review. *International Journal of Management Review,* 20, 411-432. DOI: 10.1111 / ijmr.12139.

Casadesús, M. & Karapetrovic, S. (2005). Has ISO 9000 lost some of its luster? A longitudinal impact study. *International Journal of Operation and Production Management,* 25 (6), 580-596. DOI: 10.1108 / 01443570510599737.

Carrillo-Labella, R., Fort, F. & Parras-Rosa, M. (2020). Motives, Barriers, and Expected Benefits of ISO 14001 in the Agri-Food Sector. *Sustainability,* 12 (5), 1724, https://doi.org/10.3390/su12051724.

De Oliveira, O. (2013). Guidelines for the integration of certifiable management systems in industrial companies. *Journal of Cleaner Production,* 57, 124-133. http://dx.doi.org/10.1016/j.jclepro.2013.06.037.

Dick, G.P.M., Heras, I. & Casadesús, M. (2008). Shedding light on causation between ISO 9001 and improved business performance. *International Journal of Operations and Production Management,* 28(7), 687-708. http://dx.doi.org/10.1108/01443570810881811.

Djekic, I., Rajkovic, A., Tomic, N., Smigic, N. & Radovanovic, R. (2014). Environmental management effects in certified Serbian food companies. *Journal of Cleaner Production,* 76, 196-199. http://dx.doi.org/10.1016/j.jclepro.2015.10.126.

Domingues, P., Sampaio, P. & Arezes, P.M. (2016). Integrated management systems assessment: a maturity model proposal. *Journal of Cleaner Production,* 124, 164-174. https://doi.org/10.1016/j.jclepro.2016.02.103.

Escanciano, C. & Santos-Vijande, M.L. (2014b) Implementation of ISO-22000 in Spain: obstacles and key benefits. *British Food Journal,* 116(10), 1581-1599. DOI: 10.1108/BFJ-02-2013-0034.

Grolleau, G., Mzoughi, N. & Thomas, A. (2007). What drives Agri-food firms to register for an environmental management system? *European Review of Agricultural Economics*, 34 (2), 233-255. DOI: 10.1093/erae/jbm012.

Heras-Saizarbitoria, I., Molina-Azorín, J.F. & Gavin, P.M. (2011). ISO 14001 certification and financial performance: Selection-effect versus treatment-effect. *Journal of Cleaner Production,* 19, 1-12. DOI: 10.1016 /j.jclepro.2010.09.002.
Kafetzopoulos, D.P. & Gotzamani, K.D. (2014). Critical factors, food quality management and organizational performance. *Food Control,* 40, 1-11. http://dx.doi.org/10.1016/j.foodcont.2013.11.029
Martínez-Costa, M., Martínez-Lorente, A.R. & Choi, T.Y. (2008). Simultaneous consideration of TQM and ISO 9000 on performance and motivation: an empirical study of Spanish companies. *International Journal of Production Economics,* 113, 23-39. http://dx.doi.org/10.1016/j.ijpe.2007.02.046.
Movahedi, M.M., Teimourpour, M. & Teimourpour, N. (2013). A study on effect of performing quality management system on organizational productivity. *Management Science Letters,* 3, 1063-1072. https://doi.org/10.5267/j. msl.2013.03.022.
Murmura, F., Liberatore, L., Bravi, L. & Casolani, N. (2018). Evaluation of Italian Companies' Perception about ISO 14001 and Eco Management and Audit Scheme III: Motivations, Benefits and Barriers. *Journal of Cleaner Production,* 174, 691-700. https://doi.org/10.1016/j.jclepro.2017.10.337.
Nunhes, T.V., Cesar, L., Motta, F. & De Oliveira, O.J. (2016). Evolution of integrated management systems research on the journal of cleaner production: identification of contributions and gaps in the literature. *Journal of Cleaner Production,* 139, 1234-1244. https://doi.org/10.1016/j.jclepro.2016.08.159.
Nunhes, T.V., Cesar, L., Motta, F. & De Oliveira, O.J. (2017). Identification and analysis of the elements and functions integrable in integrated management systems. *Journal of Cleaner Production*, 142, 3225-3235. http://dx.doi.org/10.1016/j.jclepro.2016.10.147
Salim, H.K., Padfield, R., Lee, C.T., Syayuti, K., Papargyropoulou, E. & Tham, M.H. (2018). An investigation of the drivers, barriers, and incentives for environmental management systems in the Malaysian food and beverage industry. *Clean Technologies and Environmental Policy,* 20, 529-538. DOI: 10.1007 / s10098-017-1436-8..
Singh, P.J. (2008). Empirical assessment of ISO 9000 related management practices and performance relationships. *International Journal of Production Economics,* 113, 40-59. https://doi.org/10.1016/j.ijpe.2007.02.047.
Tomasevic, I., Smigic, N., Dekic, I., Zaric, V., Tomic, N., Miocinovic, J. & Rajkovic, A. (2016). Evaluation on food safety management systems in Serbian dairy industry. *Mljekarstvo,* 66(1), 48-58. Doi: 10.15567/mljekarstvo.2016.0105.