https://doi.org/10.17221/318/2016-AGRICECON

Intensive agriculture, marketing and social structure: the case of south-eastern Spain

Gonzalo HERRANZ DE RAFAEL, Juan Sebastian FERNANDEZ-PRADOS*

University of Almería, CEMyRI, Almería, Spain

*Corresponding author: jsprados@ual.es

Herranz de Rafael G., Fernandez-Prados J.S. (2018): **Intensive agriculture, marketing and social structure: the case of south-eastern Spain**. Agric. Econ – Czech, 64: 367–377.

Abstract: The main purpose of this study was to analyse the opinions of farmers in the province of Almería concerning the state of the fruit and vegetable sector, to learn about the main considerations in their decision-making processes when marketing their products and their assessment of the image of companies and cooperatives and to analyse the social structure of this collective. To that end, the analysis was conducted on three levels: a descriptive analysis on two levels – a quantitative analysis of the socio-demographic, socio-economic and marketing characteristics of farmers in the province of Almería and a qualitative analysis based on the opinions of farmers and a group of experts in the sector; and an explanatory analysis, based on a binary logistic regression model, to show how decision-making occurs in the marketing dialectic, whether it either be at the source (auction) or the end-point (cooperative). The conclusion is that the marketing variables that are most tied to context – such as price, timeframe or certification – better explain the decision-making process of farmers in the province of Almería when marketing their products, both for cooperative members and for those who sell their products in *alhóndigas* (traditional auction houses).

Keywords: Almería, auction, cooperatives, farmers, retail distribution

Traditionally, studies in the field of agriculture have centred on results, soil, output (kg/ha), production, price, the value of different agricultural products (MAAMA 2014) and perhaps production structure and organisation, logistics and marketing. The opinions of farmers have rarely been consulted or analysed (Agrolanzarote 2011) although these are decisive for decision-making in a market that is increasingly more global and competitive in the European context. Consideration of all of these variables will undoubtedly enrich research, and this is the purpose of the current study.

The general objective of this study consists of analysing the opinions of self-employed farmers in the province of Almería concerning the state of the fruit and vegetable sector to learn the reasons behind their decisions when marketing their products, to ascertain the assessments of the image of the agricultural companies and cooperatives in Almería and to analyse the social structure of this collective.

There is a long history of intensive greenhouse-based agriculture in the area commonly known as El Campo de Dalías, which covers different municipalities including Roquetas de Mar and El Ejido as two of the main ones. It was in this region that the technique known as sanding (*enarenado*) was begun in 1955. The then-named National Institute of Colonisation (created in 1941) began to promote this technique. By 1959, 300 hectares of land had already been covered in sand. On the other hand, the parral-style greenhouse was introduced into this area in 1963 (Checa 2004; Checa et al. 2007). The incorporation of these innovations has had a massive impact on farms, substantially improving their output to the point that the average production per hectare has more than doubled, going from slightly more than 25 tons in 1975 to over 59 tons in 2010 (Sánchez-Picón et al. 2011). In addition to this increase in output, there has been an improvement in quality, an expansion of the production calendars, and the procurement of two, and even three, harvests per year; as a result, the term 'forced crops' began to be used. Throughout these years, research and development centres have emerged all around the province, focusing their activities on the resolution of the needs of the sector and favouring

https://doi.org/10.17221/318/2016-AGRICECON

the development of innovations (Galdeano-Gómez et al. 2011).

There is an enormous diversity of agents who operate in the marketing system and who constitute the source markets. Therefore, it is possible to find isolated farmers, farmers in groups, contracting centres (*alhóndigas*, contracting markets, networks), wholesalers, transportation agents, brokers, source warehouse owners, cooperatives, agricultural processing companies (SAT according to their initials in Spanish) and partnerships (CB according to their initials in Spanish), etc. There are also intermediaries between these different actors. The existence of all of these agents, together with the diversity of the products that are sold, generates the complex fabric of relations that compose the market for the origin of these products. During the 2013/2014 season, there were a total of 29 035 hectares of greenhouses, which, if we consider the effective surface of production (considering the diversity of cycles of production) implies a total of 51 349 hectares. On these, a total of 3 180 689 tons of fruit and vegetables were produced, of which 2.2 million were exported, that is, 69.9% of the total produced (Fundación Cajamar 2014).

Our target population comprises farmers in Almería who are self-employed and, as such, make decisions about how to organise themselves, where to send their production, etc. According to the Labour Force Survey (EPA – Encuesta de Población Activa), prepared by the National Statistics Institute of Spain (INE), the number of people who are engaged in agriculture in Almería amounted to 44 800 people in the third trimester of 2014. Of this total, by our count, by 1 November 2014, 17 487 workers were registered as self-employed in the social security registry. We discuss this population based on three subgroups (subsectors) or sub-samples (in the case of the descriptive analysis), depending on whether the farmers are clients of marketing companies, whether they are members of one of the 175 agricultural cooperatives in the province (Analistas Económicos de Andalucía 2013) or whether they sell their products through other companies. In the explanatory analysis, the population includes clients of *alhóndigas* (traditional auction houses) and cooperatives.

The major agricultural organisations that are concerned with the sale of fruit and vegetable products in south-eastern Spain are the cooperatives and the *alhóndigas*, i.e., traditional auction houses. Both of these are, in turn, grouped as part of the Organisation of Fruit and Vegetable Producers (Organizaciones de productores de frutas y hortalizas – OPFH), which are entities with their own legal standing, created and regulated by EU Regulation No. 1234/2007 from 22 October 2007. In 2014, there were 42 OPFHs in the province of Almería, bringing together 8363 producers.

The cooperatives, which may be first-degree, second-degree as well as subsequent degrees, can take the following legal forms: cooperative, agricultural processing company (sociedad agraria de transformación – SAT), trading company and informal partnership. However, the most relevant are the first two types.

According to the Spanish Socio-economic Observatory of Food Cooperatives (Observatorio Socioeconómico de Cooperativas agroalimentario Español – OSCAE) and the Agrarian Associations (Entidades Asociativas Agrarias – EAAs), there are four types of these cooperatives: first-degree cooperatives, which accounted for 85% of cooperatives in 2014; second-degree cooperatives, which accounted for 3%; Agricultural Processing Companies (SAT); and Cooperatives of Agricultural Equipment Use (Cooperativas de utilización de maquinaria agraria – CUMAS) and Community Land Use Cooperatives (Cooperativas de explotación comunitarias de la tierra – CEC), which comprise 12% (Arcas et al. 2016).

The cooperatives and the SAT, unlike other types of partnerships which purchase products in *alhóndigas* or directly from farmers, directly involve the producer in the marketing process, at both the national and the international levels.

The first-degree cooperatives fulfil three functions: firstly, they provide fertilisers, seeds and other inputs to their members, buying wholesale to find lower prices; secondly, they industrialise their members' harvest; and, finally, they market those harvests, both those that are in their natural state and those that have been subjected to simple or industrial processing.

In addition to these functions, cooperatives can obtain a larger margin in the marketing of their products because, when normalising and packaging at the source, a part of the incorporated value added remains in the hands of the producing sector. On the other hand, the progressive increase in the participation of these entities in the end-point marketing process, going so far as to include direct sale to consumers and the elimination of intermediaries, means that part of the wealth generated in the process is returned to the producers.

Second-degree cooperatives and beyond have as their main objective a concentration of the supply

https://doi.org/10.17221/318/2016-AGRICECON

with the aim of improving conditions. They are characterised by the hiring of management to perform all of the marketing operations for the cooperative's members.

The Agricultural Processing Companies (SAT) represent organisations that are halfway between cooperatives and trading companies. They operate similarly to cooperatives, though they distribute benefits according to each member's participation.

The *alhóndiga* is an intermediary that receives the farmer's harvest and is responsible for its sale and for paying the price that is paid at auction, minus the corresponding commission. It organises and controls the weighing and loading of the products. The farmer is paid practically at the moment when the goods are delivered. They set up real organised markets, with opening dates, auction times, starting times, etc. The price is set according to daily market conditions.

Meanwhile, the farmer is no longer responsible for the goods once the auction occurs, which is why the farmer is not aware of the value added throughout the marketing process.

The *alhóndiga* favours free exchange at the source of production. The other types of marketing agents that exist (both individual and associations) sometimes turn to the market in the *alhóndigas*, and frequently act as *alhóndigas* themselves, using their premises for auctions. Therefore, today, in addition to marketing the products of their members, cooperatives themselves relatively frequently act as public *alhóndigas*.

The two marketing models, with their similarities and differences, are clearly interchangeable, though it can be said that, at the macro/collective scale, they behave with a clear complementarity by introducing elements of competition into the local production system of Almería (Ortiz-Miranda et al. 2013).

This study is divided into three clearly differentiated parts. In the first part, the methodologies that were employed and the initial hypothesis are described. In the second part, a descriptive analysis is conducted on two levels: a quantitative analysis of farmers in Almería based on their socio-demographic, socio-economic and marketing characteristics; and another qualitative analysis based on the opinions of farmers and a group of experts in the sector. Finally, an explanatory analysis is undertaken based on a binary logistic regression model of how decision-making occurs in the marketing dialectic, whether it be either at the source (auction) or at the end-point (cooperative).

The general trends of the sector highlight a positive evolution in terms of quality, more sustainable production methods and higher concentration. However, in other areas it has retreated, such as in market power and increasing competition.

Among the main trends identified by experts in the fruit and vegetable sector in Almería, we can highlight the possible vertical integration of some chains that may result in guaranteeing supply through multiple-year supply contracts with farmers at the source. This would guarantee them concrete production and product quality conditions. Furthermore, it would be convenient to establish potential partnerships between first- and subsequent-degree cooperatives and food industry companies to develop new products or for more cooperatives to enter the IV and V spectrum markets. There is a more generalised use of biological controls for the vast majority of pests, re-establishing the population balance even using reservoir plants. There is also a greater tendency to form large companies (or business agreements) that may move a volume (size matters) greater than 500 000 tons a year with quality and continuity. The trend in marketing is towards an increase in the degree of concentration in the sector, given that merger/acquisition processes will continue to occur. There is a great potential for scalability. Nevertheless, there are areas in which Almerian marketing companies must make a greater effort, for example, with respect to innovation, planning and the hiring of more qualified staff. Improvements in these areas would allow them to make a qualitative leap that is indispensable for facing the increasing challenges in international markets with greater assurance.

In terms of the accounts from farmers, they argue that there is no unity in the sector and that they are aware that demand is becoming concentrated whereas supply remains atomised.

In the areas of quality and price, farmers greatly value transparency. It is their great concern, but they understand that all of the companies offer the same terms in this area. Furthermore, they observe a great disconnect between the quality of the product that they offer and the prices that they perceive. They understand that the gap is widening and that quality is demanded but not compensated. There is a generalised perception that the evolution of the prices of agricultural products is greater than the prices that the farmers perceive.

The company/cooperative dialectic is always present in farmers' accounts. For farmers, the cooperative offers a minimum price, whereas the company offers the maximum price. Thus, they view auctions as being

https://doi.org/10.17221/318/2016-AGRICECON

tied to greater transparency in prices. Auction prices continue to be an indispensable reference for farmers, both for those who sell their goods in *alhóndigas* and for cooperative members. However, farmers tend to consider that the differences in price are connected with 'under the table' businesses.

Finally, they highlight a high degree of loyalty towards the marketing company and the form of sale (company/cooperative), and as has been previously specified, there is very little movement of farmers between the two sale models.

MATERIAL AND METHODS

The methodological strategy was performed using a survey method with the objective of collecting numerical information and describing – and as far as possible, explaining – the object of study.

The survey fact sheet is schematically organised in the following way: (a) Population: 17 487 self-employed farmers in the province of Almería (the information has been obtained from the Social Security Registry average for 2014). Area: describes the geographic space considered in the survey. (b) Sample size: 460 personal interviews. (c) Sampling error: ± 4.5 (in a probabilistic study case). (d) Confidence level or confidence interval (K): 95% (2) and variability (0.5). (e) Sample selection and type of sampling: In the first stage, by quota, according to the importance of marketing companies or enterprises, and cooperatives in the market; in the second state, systematic random sampling in lines while waiting to deliver products. Personal interviews (in our case, personal or face-to-face); if the previous elements of the survey referred to the size of the sample, then these elements are concerned with how the components of the sample were chosen, in short, whether it has been at random (as it was carried out by quota and incidentally, it will be non-random). (f) Fieldwork: Performed between 4 February and 11 March 2015 by interviewers from the Sociology Department at the University of Almería

According to the Ranking Index of Companies (Einforma 2015), in the province of Almería, there are nine cooperatives and 29 companies devoted to the wholesale of fruits and vegetables that have a sales volume greater than €10 million each. During 2014, they reached a total sales volume of €1802 million of which €629 million (35%) were from cooperatives and €1173 million (65%) from companies.

Fieldwork, as indicated in the survey fact sheet, was performed between 4 February and 11 March 2015. The 460 interviews were conducted during a period of little over a month at the product delivery points and meeting points for the farmers: 301 in companies and *alhóndigas* (65% of the sample) and 159 in cooperatives (35% of the sample).

The main objective of this study was to understand the motivations behind Almerian farmers' decision-making when marketing their products, in a continuous dialectic between marketing at the source (auction) and end-point marketing (cooperative), according to an interchangeable model at a micro/individual scale that is typical of a local production system. In this sense and as a working hypothesis, it is expected that the type of chosen marketing agent is mostly determined by the variables that are tied to the marketing context – such as price, time-frame and proximity – rather than socio-demographic or production variables.

RESULTS AND DISCUSSION

Quantitative analysis: description

The fruit and vegetable sector in Almería is based on intensive greenhouse farming and continues to be a sociologically traditional sector that is led and managed by men, with a marginal presence of women in the management of production. In fact, approximately 95% of farmers are men.

Farmers in Almería are primarily aged between 30 and 50 years old, although the interval of 40 to 50 years of age clearly composes the majority. As is traditional, the Almerian farmer continues to be middle-aged, although noticeable ageing is observed as a consequence of the difficulties in making agriculture attractive to new generations.

Although in other subsectors of the industry that are auxiliary to agriculture there has been a clear rejuvenation as a result of, on the one hand, the higher level of education of young people and, on the other hand, the higher rate of youth unemployment, in the case of agricultural production, the generational renewal has been much more incremental, with less intergenerational dialogue and with greater challenges in passing the baton.

For the subsector of people who use *alhóndigas*, the age range is between 41 and 50 years of age, whereas the age range of cooperative members is between

https://doi.org/10.17221/318/2016-AGRICECON

31 and 50 years of age. Those who choose private marketers are the oldest, whereas those who seek private companies are the youngest – under 30 years of age.

In general, from the economic perspective, the fruit and vegetable farmers in Almería – both those who sell their products in *alhóndigas* and members of cooperatives – are mostly conservative. In their economic reasoning, *hyperbolic discounting* predominates over *exponential discounting*. That is, they overestimate the present over the future, even if doing so means losing significant and reasonable options. The exceptions are those who take their products to private companies, and in so doing demonstrate greater speculative behaviour.

As is the case with the rest of society, fruit and vegetable farmers in Almería have nuclear families with an average of four family members.

The eminently agricultural character of the family has diminished in contrast to traditional models of agriculture, although the family farming component of the fruit and vegetable production model in the province of Almería persists in many respects. It can be said that there has been a process of rationalisation and modernisation of the family resources, partially removing the productive aspects and externalising part of the work that was traditionally performed within the family unit.

Fruit and vegetable farmers in Almería have extensive experience in the productive sector. They very well understand their business at the front-end of the value chain and the production conditions that they must face. Similarly, they have addressed different periods of crisis that have revealed the counter-cyclical nature of the fruit and vegetable sector in this province. In particular, approximately three out of four farmers have worked in the fruit and vegetable greenhouse production sector in Almería for more than 10 years.

For social-historical reasons, the average education level of fruit and vegetable farmers in the province of Almería is low. The majority of farmers have a basic education level – the exception being those farmers who are college-educated, who account for 5.6%. Analysing the data, it can be said that farmers who are tied to fruit and vegetable cooperatives have a higher educational level than those tied to the other types of fruit and vegetable companies.

One of the salient features of the Almerian development model based on intensive greenhouse agriculture has been the permanent integration of technology into productive processes. This integration of technology has made it possible to compensate for the higher production costs with increases in the volume of production and the relative decline in the prices perceived by farmers in comparison to the costs for agricultural inputs that they must take on.

However, despite the distinct innovative character of farmers in Almería, their use of information and communication technologies is noticeably lower than that of other productive sectors. Undoubtedly, their low level of education and middle age contribute to this level of usage.

In particular, although three out of four farmers have a smartphone, over half of them have never used, or hardly use, email. Similarly, approximately half of the farmers have never used, or rarely use, social media.

However, the use of free instant messengers (WhatsApp) is frequent, especially among farmers who are cooperative members.

Although in recent years larger and technologically more advanced greenhouses have been built, smallholder family farming still clearly predominates in the fruit and vegetable production model in Almería, with the size of farms ranging from one to two hectares. This size of production is adequate in scale for family farming, bringing in sufficient income to meet the needs of an average family whose main source of income is intensive agriculture. The net income that the majority of farmers declare is in the range of €30 000 or less (65%).

The majority of farmers reported a production of less than 200 000 kg; however, reported production among cooperative members is significantly larger – more than one-third (37.2%) reported producing more than 300 000 kg a year.

Over 70% of farmers have one or two farms, but among cooperatives, there is a greater dispersion of farms, which can be explained by several variables. One of these is the longer career of farmers in cooperatives, who, having spent more years in fruit and vegetable production, are more likely to have participated in the original distribution of lands.

Therefore, it can be said that there continues to be a high level of atomisation in intensive fruit and vegetable greenhouse production – between one and two hectares. This characteristic represents an essential element in the configuration and survival of the model. Within this essentially family-based sociological model, opportunities for the scalability of the production model are relatively exhausted in larger operations.

This extreme situation has implications for the professionalisation of production, the integration

https://doi.org/10.17221/318/2016-AGRICECON

of technology, its profitability and its efficiency, and it leads to lower sales margins and the possibility of supplementary family income.

This smallholding or atomisation of property is a cause – and, simultaneously, a consequence of – the legal relationship of farmers to their production. An overwhelming majority of farmers in Almería who are tied to intensive greenhouse farming own their land, making other forms of landholding marginal. Specifically, between 80% and 85% of farmers own their farms. The second type of landholding after 'property' is 'leasing'. This type of landholding is mainly associated with more recent landholdings and/or subsequent generations of farmers.

However, it can be said that, from a technological perspective, the greenhouse method is similar. Although the distribution is similar for the four groups that we analyse in this study, with the *raspa y amagado* backbone greenhouse being the most commonly used compared to the flat parral-style greenhouse, which is more basic, the cooperative subsector has implemented more complete models in larger numbers, though still rarely.

Meanwhile, we must note that approximately three out of four farmers who are associated with marketing companies that sell their goods through auction use some type of biological control technique (approximately 74%). However, in the case of cooperatives, this percentage is significantly higher (approximately 87%).

In terms of the concern for the quality of fruit and vegetable products, it can be said that, for many years now, quality systems have been very well implemented in the Almerian sector. Scandals in the food industry and the ever-increasing demands of consumers and buyers have accelerated the certification process in recent decades, to an extent that it can be said that quality certifications have been *commoditised*. In other words, they do not bring differentiated elements to fruit and vegetable products in Almería. They are a necessary condition for marketing but not sufficient to generate differentiation.

The Global GAP certification is the most commonly used certification by farmers who market their products through companies and *alhóndigas*. However, cooperatives overwhelmingly use the UNE 155 000 certification, though they also use the Naturane ANECOOP certification. All other certifications are marginally used by both groups.

In terms of the type of marketing scheme that they use, as a general rule, Almerian fruit and vegetable farmers do not distribute their products among different types of marketing models. In general, they are loyal to the type of marketing scheme that they use, though the level of loyalty is greater in the case of cooperatives. In other words, fruit and vegetable cooperatives in Almería connect/generate loyalty in the marketing scheme and in the cooperative to which the member belongs. On this point, we want to say that the cooperative farmer is generally associated with the same cooperative throughout his life. That is, we mean that the cooperative connects and generates loyalty more than any other marketing scheme in this productive context.

The part of the sector that sells through auction and the part that sells through average prices (cooperatives) behave as isolated compartments. In general, there is very little movement of farmers from one scheme to the other.

Nevertheless, more than one in five farmers who market their goods through auctions have the intention of becoming members of a cooperative in the coming years. On the other hand, the likelihood that companies that sell through auction will recruit farmers from cooperatives is very low. As stated above, cooperatives have a great potential for connecting/generating loyalty. Therefore, over 90% of the farmers who are currently members of cooperatives want to continue being members in the coming years.

In terms of the motivation for choosing a marketer, in this study there are different motivations that the farmer can potentially experience when selecting the current marketing company. The following potential motivations were included in the survey: (1) price; (2) timeframe and/or payment guarantees; (3) no initial contribution; (4) proximity or closeness; (5) confidence and transparency; (6) services; (7) subsidies; (8) sense of belonging; (9) habit; (10) works here; (11) is a member/owner; (12) convenience; and (13) price stability. Of all those potential motivations, price is the most critical element when justifying the selection of the current marketing company. Price is followed in importance by the concern over the timeframe and/or payment guarantee, in addition to concerns over confidence and transparency. A sense of belonging is only relevant in the case of cooperative farmers.

Nevertheless, taking into consideration the second and third answers of the farmers, the map of motivations becomes richer, especially for those farmers who are members of a cooperative. Considering the nuances that are included in the second and third answers, in the world of *alhóndigas* and companies,

https://doi.org/10.17221/318/2016-AGRICECON

price continues to be a fundamental variable when choosing the current marketer. However, in the case of farmers in the subsector of cooperatives, there is a greater diversity of motivations.

Approximately 70% of farmers associated with *alhóndigas* and companies (first answer) would change to other marketing companies, particularly auction and marketing at the source, because of price. This percentage decreases, as is clear by what has been expressed in this study, in the case of the cooperative subsector (50%). If we add up the percentages concerning price in its broadest sense – including timeframe and guarantee of sale – then the percentages become much higher.

The rate of loyalty generation is very high for cooperative farmers. They are less sensitive to price and other variables compared to farmers in the company and *alhóndiga* subsector. Specifically, 33% of cooperative farmers would not change marketing schemes in response to a non-substantial variation in other variables. This figure is 10.1% for the company and *alhóndiga* subsector.

Subsidies and services have a very small impact on the decision to change to another marketing company as judged by the answers of farmers concerning their motivations. Other variables – such as price stability, convenience or the onerousness of the initial contribution – are marginal. The convenience factors predominate among the current farmers in the company and *alhóndiga* subsector, whereas in the cooperative sector, the loyalty factors are more predominant.

An interesting aspect for analysis concerns the evolution of farmers' sensitivity to price during their affiliation with the current marketing company. Here, we are referring to barriers to entry and exit in terms of price. In other words, farmers perceive that, subjectively, they can change to another company practically with the same ease with which they began cooperating with their current marketer. Barriers to exit, relative to the price variable, decrease in relative terms in the case of the company and *alhóndiga* and cooperative sectors. Barriers to exit, relative to price, decrease most in the company and *alhóndiga* subsector, where it decreases by more than 40%.

Finally, a positioning map that plots the brand image of different marketers of fruit and vegetable products was analysed. Two position variables that give rise to such an image were assessed: confidence and the marketing potential of the marketing companies. To plot the points, the answers of farmers who are among the first three positions, that is, in the first three ordinal positions of the answers, were considered. The first two cooperatives and the first two companies most highly valued in both aspects accounted for 80% of the responses. In other words, farmers' opinions were very concentrated both in terms of confidence and marketing potential in both marketing schemes (Figure 1).

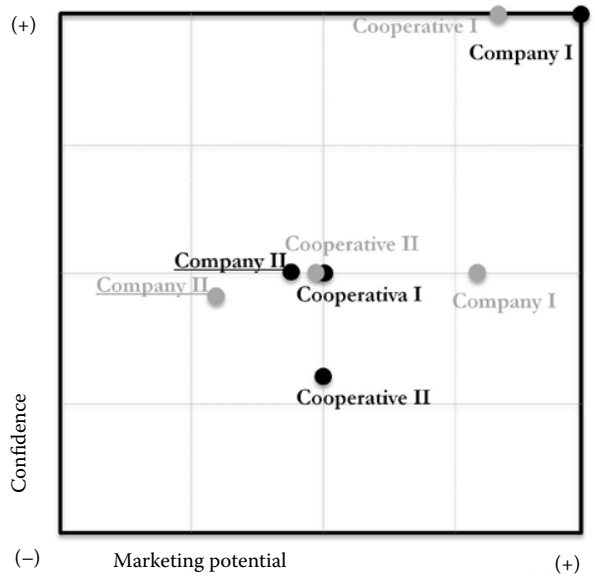

Figure 1. Positioning map (relative points)

Bold type represents the perspective of farmers affiliated with companies and *Alhóndigas*; and grey describes the perspective of cooperative farmers.

Source: Prepared by the authors

Quantitative analysis: explanation

Progressing further along in the study, a binary logistic regression analysis was conducted to observe the different variables that seem to better explain the dialectic between marketing at the source (company/*alhóndiga*) and end-point marketing (cooperative), given that they are two interchangeable marketing models at the specific micro/individual scale of the local productive system in Almería. Thus, the question that defines the dependent variable in the questionnaire appears as follows 'Where do you mainly bring the harvest? (a) Cooperative; (b) Company/alhóndiga'.

In this study, the type of marketer (company or cooperative) is the dependent variable. The independent variables are represented by three groups

https://doi.org/10.17221/318/2016-AGRICECON

of items; some are of a **socio-demographic** nature (age, education level, the use of email and the length of experience in the field), whereas others concern **production** itself (size of the plot, production, income, number of certifications) and, finally, aspects of the **marketing** process (price, timeframe, confidence and proximity). In two prior meetings where we agreed upon the final version of the questionnaire, all the variables were discussed and decided upon with a group of experts who work in the retail and marketing of fruit and vegetable products. During this meeting, we also presented a concise overview of the literature that has considered other social variables beyond strictly economic ones (Eid and Martínez-Carrasco 2014; Gómez-Limón et al. (2013); Garrido-Fernández 2014; Galdeano-Gómez et al. 2016).

Table 1. Description of the main variables in the study

		Number of observations	Average	Standard deviation	Standard error
AGE(years)	company	301	43.59	11.214	0.647
	cooperative	159	42.52	10.693	0.847
	total	460	43.22	11.037	0.515
EDUCATION (1 = no schooling; 4 = university studies)	company	301	2.28	0.605	0.035
	cooperative	159	2.34	0.583	0.0046
	total	460	2.30	0.598	0.028
TECHNOLOGICAL (1 = never; 4 = regularly)	company	301	2.33	1.232	0.071
	cooperative	159	2.59	1.234	0.098
	total	460	2.42	1.238	0.058
EXPERIENCE (years)	company	301	20.50	12.166	0.702
	cooperative	159	21.19	12.433	0.985
	total	460	20.74	12.250	0.571
SURFACE AREA (ha)	company	301	2.311	2.1570	0.1244
	cooperative	159	3.103	2.0579	0.1630
	total	460	2.586	2.1542	0.1004
PRODUCTION (kg)	company	285	242 576.19	281 875.787	16 704.795
	cooperative	155	326 007.60	254 959.938	20 457.110
	total	440	272 025.36	275 295.068	13 123.283
INCOME per year (1 = < €20 000; 5 = > €50 000)	company	294	2.26	1.136	0.066
	cooperative	156	2.49	1.205	0.096
	total	450	2.34	1.164	0.055
CERTIFICATIONS (number)	company	300	1.7391	1.03897	0.06002
	cooperative	159	2.4665	1.02287	0.08103
	total	459	1.9916	1.08894	0.05083
PRICE (1 = very important; 4 = of little importance)	company	301	2.1179	1.29112	0.07446
	cooperative	159	3.1778	1.23450	0.09780
	total	460	2.4850	1.36709	0.06374
TIMEFRAME (1 = very important; 4 = of little importance)	company	301	2.8463	1.15188	0.06643
	cooperative	159	3.2217	1.19340	0.09455
	total	460	2.9763	1.17877	0.05496
CONFIDENCE (1 = very important; 4 = of little importance)	company	301	2.9350	1.04987	0.06055
	cooperative	159	2.7155	1.13073	0.08958
	total	460	2.8590	1.08240	0.05047
PROXIMITY (1 = very important; 4 = of little importance)	company	301	3.1951	1.05315	0.06074
	cooperative	159	3.2573	1.07347	0.08504
	total	460	3.2166	1.05948	0.04940

Source: Prepared by the authors

https://doi.org/10.17221/318/2016-AGRICECON

Before discussing the logistic regression model, we were first interested in learning the degree of importance that the socio-demographic, production and marketing variables hold for the type of marketer (company or cooperative) through an analysis of variance with a first descriptive table. This first descriptive approach tells us that cooperative members are somewhat younger, have a higher level of education and heavier use of new technologies and even have more experience in agriculture than the farmers who use companies and *alhóndigas.* In terms of production, cooperative members also own larger farms with higher production and income levels, and they use more certifications. Finally, when marketing their products, cooperative members give more weight to confidence than those who choose companies, and they give less weight to money and timeframe issues compared to farmers who market their products through companies or *alhóndigas* (Table 1).

The analysis of variance gives us the results of the significant differences of means, taking into account all of the continuous variables, though some are ordinal whereas others are interval, and considering that they fulfil the principles of normality, independence and homoscedasticity, given that all of the variables demonstrate a sufficiently low Levene's test value. Only the difference in the variance in the use of technology (email) between cooperative farmers and those who are not members of a cooperative is significant. However, in the group of items concerning production, all of the variance differences are significant, as is the case with the grouping of items concerning marketing, with the exception of proximity. Based on Snedecor's *F* distribution, the variables with greater variability concern the degree of importance of price (72.327) and the number of certifications (F = 51.533), in addition to, with somewhat less but nonetheless significant variability, the surface area variable (F = 14.498) and the degree of importance of the timeframe (F = 10.789) (Table 2).

The multivariable binary logistic regression allows us to evaluate how the dependable variable of 'marketing agricultural products through cooperatives or companies/*alhóndigas*' is presumably connected and also to construct a predictive model or equation. The Table 3 highlights the role of the variables concerning marketing (three of them are significant: price, timeframe and proximity) compared to socio-demographic and production variables, which have only one significant variable (use of technology and the number of certifications). These five variables, which are significant within the regression model, are rated in order of importance using the Wald test: the first is 'price', followed by 'timeframe', the number of 'certifications', 'proximity' and, finally, 'education'. Similarly, the *Beta* symbol shows us the meaning of the significance and an explanation. Thus, on the one hand, the lesser importance awarded to price,

Table 2. Analysis of variance of the variables under study concerning the type of marketing scheme (cooperative or company/*alhóndiga*)

	Sum of Squares	Df	F	Sig.
AGE. How old are you?	119.623	1	0.982	0.322
EDUCATION. Level of education	0.389	1	1.090	0.297
TECHNOLOGICAL. How frequently do you use email?	7.469	1	4.918	0.027
EXPERIENCE. How long have you been working in agriculture?	49.330	1	0.328	0.567
SURFACE AREA. What is the total surface area of the land in your farm or farms?	65.361	1	14.498	0.000
PRODUCTION. Total from last year in kilos	699 577 376 494.909	1	9.406	0.002
INCOME. In what range would your household's net annual income fall?	5.332	1	3.960	0.047
CERTIFICATIONS. Number of certifications	55.035	1	51.533	0.000
PRICE (importance)	116.994	1	72.327	0.000
TIMEFRAME (importance)	14.679	1	10.789	0.001
CONFIDENCE (importance)	5.020	1	4.316	0.038
PROXIMITY (importance)	0.404	1	0.359	0.549

Df – degrees of freedom; F – Snedecor *F*-test; Sig. – significance probability

Source: Prepared by the authors

https://doi.org/10.17221/318/2016-AGRICECON

Table 3. Logistic regression analysis

	B	S.E.	Wald	Df	Sig.	Exp (B)
AGE	–0.028	0.021	1.832	1	0.176	0.972
EDUCATION	–0.096	0.222	0.186	1	0.666	0.909
TECHNOLOGICAL	0.232	0.114	4.151	1	0.042	1.261
EXPERIENCE	0.011	0.019	0.343	1	0.558	1.011
SURFACE AREA	0.192	0.126	2.321	1	0.128	1.212
PRODUCTION	0.000	0.000	0.309	1	0.578	1.000
INCOME	–0.020	0.111	0.031	1	0.860	0.981
CERTIFICATIONS	0.517	0.122	17.996	1	0.000	1.677
PRICE	0.798	0.106	56.764	1	0.000	2.220
TIMEFRAME	0.459	0.108	18.143	1	0.000	1.583
CONFIDENCE	0.169	0.117	2.090	1	0.148	1.185
PROXIMITY	0.412	0.122	11.398	1	0.001	1.509
Constant	–6.653	1.299	26.234	1	0.000	0.001

B – coefficient for the constant; Df – degrees of freedom; Exp (B) – exponentiation of B coefficient; S.E. – standard error; Sig. – significance probability; Wald – Wald chi-square test

Source: Prepared by the authors

timeframe and proximity and, on the other hand, the greater number of certifications and more frequent use of new technologies predict the selection of a cooperative. Regardless, the proportion of variability in the selection of marketing through a cooperative or a company is not excessively high (between 26.9%, according to the Cox and Snell *R* squared and 36.9%, according to Nagelkerke's *R* squared).

CONCLUSIONS

– In terms of the direct marketing tools that farmers have, the two traditional models of the local intensive fruit and vegetable production system in Almería remain in force. In this sense, we can say that the dialectic between marketing at source (company/*alhóndiga*/auction) and end-point marketing (cooperatives) continues to exist in the minds of farmers and in the sector's dynamics, with these two tools being interchangeable marketing models. However, although they are clearly interchangeable models at the micro/individual level, we can say that, at the macro/collective scale, they behave with a clear complementarity, introducing elements of both competition and cooperation that are characteristic of a local productive system.
– A crucial aspect for the farmer, as well as for the marketing companies, is the price that they perceive for their product. This issue is far from clear, and, in attempting to understand the complexity of the fruit and vegetable sector in Almería, this variable acquires special importance, as it conditions other differentiating variables. Undoubtedly, price, in sharp contrast to other variables, continues to be the most important and recurrent motivation for farmers when selecting the marketing company with which they affiliate themselves to bring their products to the market. In times of crisis, such as in the current context, price – together with other variables that we could call, in market terms, *convenience* variables – acquires an even greater relevance. Nevertheless, its importance is placed in relative terms and is nuanced in the case of the *cooperative* subsector. Regarding a separate issue, it can be said that, for farmers in Almería, quality is necessary but not sufficient to generate differentiation. We can say that it has become *commoditised* and that the price does not compensate for the high quality of fruit and vegetable products from Almería.
– However, other aspects that could be more differentiating *a priori*, such as in the case of services or, if applicable, the existence of subsidies, bear relative importance when selecting the next link in the distribution chain.
– Nevertheless, these premises could lead us to believe that there are not any real elements that serve to generate loyalty between farmers and the marketing companies, but this is not the case. In fact, in general, we can observe a high degree of loyalty on the part

https://doi.org/10.17221/318/2016-AGRICECON

of the farmers towards the marketing companies. Similarly, we can observe a high degree of loyalty towards the type of selected marketing scheme (auction/cooperative), with very little movement of farmers between the two sales models.

– Based on the quantitative analysis of the survey that was conducted using a logistic regression model, we conclude that the significant variables that best explain the selection between cooperatives and corporations are mainly those that are linked to the marketing context, such as 'price', followed by 'timeframe', number of 'certifications', 'proximity' and, finally, 'education'. In this manner, on the one hand, less importance is given to price, timeframe and proximity and, on the other hand, a greater number of certifications and the more frequent use of new technologies predict a tendency to select a cooperative.

REFERENCES

Agrolanzarote (2011): Resultados generales de la encuesta a productores agrícolas y ganaderos de Lanzarote. Proyecto Mercalanzarote. Agrolanzarote, Lanzarote.

Analistas Económicos de Andalucía (2013): Informe anual del Sector Agrario en Andalucía 2012. Unicaja Fundación, Málaga.

Arcas Lario N. et al. (2016): Diagnóstico económico y financiero de las cooperativas agroalimentarias en España (2011–2013). Fundación Cajamar, Almería.

Checa Olmos J.C. (2004): La diferenciación residencial de los inmigrantes en Almería. El caso de Roquetas de Mar. Universidad de Almería, Almería.

Checa Olmos J.C., Arjona Garrido A., Checa Olmos F. (2007): Ecosistema de Campo de Dalías: (1950–2004). Universidad de Almería, Almería.

Eid M., Martínez-Carrasco F. (2014): Situación y marco general de las cooperativas en el ámbito internacional. Aproximación mediante una encuesta a expertos. CIRIEC-España, 81: 5–32.

Fundación Cajamar (2014): Análisis de la campaña hortofrutícola de Almería Campaña (2013/2014): Informes y Monografías, 47. Fundación Cajamar, Almería.

Galdeano-Gómez E., Aznar-Sánchez J.A, Pérez-Mesa J.C. (2011): The complexity of theories on rural development in Europe: an analysis of the paradigmatic case of Almería (south-east Spain). Sociologia Ruralis, 51: 54–78.

Galdeano-Gómez E., Pérez-Mesa J.C., Godoy-Durán Á. (2016): The social dimension as a driver of sustainable development: the case of family farms in southeast Spain. Sustainability Science, 11: 349–362.

Gómez-Limón J.A., Vera-Toscano E., Garrido-Fernández F.E. (2013): Farmers' contribution to agricultural social capital: evidence from southern Spain. Rural Sociology, 79: 380–410.

MAAMA (2014): Anuario de estadística Ministerio de Agricultura, Alimentación y Medio Ambiente. Secretaria General Técnica, Madrid.

Observatorio socioeconómico del cooperativismo agroalimentario de España (OSCAE) (2014): Macromagnitudes del cooperatvismo agroalimentario español. Ministerio de Agricultura, Alimentación y Medio Ambiente, Madrid.

Ortiz-Miranda D., Moragues-Faus A., Arnalte-Alegre E. (2013): Agriculture in Mediterranean Europe: Challenging theory and policy. In: Ortiz-Miranda D., Moragues-Faus A., Arnalte-Alegre E. (eds): Agriculture in Mediterranean Europe: Between Old and New Paradigms. Research in Rural Sociology and Development, 19: 295–310.

Sánchez-Picón A., Aznar-Sánchez J.A., García-Latorre J. (2011): Economic cycles and environmental crisis in arid southeastern Spain. A historical perspective. Journal of Arid Environments, 75: 1360–1367.

Received September 29, 2016
Accepted December 8, 2016
Published online May 2, 2018