

Expanded abstract

Second degree cooperativism and ICT adoption

Scientific literature points to innovation and investment in R&D as the main engines of economic growth, as well as job creation in a given country or region (Feldman, 1993 and Mendez 1998). Schumpeter (1934) already predicted that technological change would be decisive, assuming that companies that were not capable of adapting to innovations would not survive in the market. In this sense, Porter (1985 and 1990) indicated what competitiveness was: “competitive advantage derives from the way in which companies organize and carry out discrete activities.... To gain competitive advantage over its rivals, a company must offer a service at a value comparable to that of the competitor, but carry out the activities more efficiently than its competitors (lower cost) or carry out the activities in a peculiar way that creates greater value for the buyer and allows for an overpricing (differentiation)”. Undoubtedly, the correct use and management of ICTs constitutes a differentiation (Fernández, Bernal, Mozas and Medina, 2019; Moreno and Sempere, 2019).

ICTs, therefore, have emerged as necessary elements for achieving economic development. This is such an accepted fact that the European Union indicates that the development of ICTs is vital for Europe’s competitiveness in today’s increasingly digitalized world economy. During the 2014-2020 funding period, the European Regional Development Fund (ERDF) set aside more than 20,000 million euros for investment in ICTs and the European Commission established the Digital Europe 2021-2027 program, which aims to support the digital transformation of the European economy and society and, in this way, transfer its benefits to European citizens and companies (Regulation of the European Parliament and Council establishing the Digital Europe program for the period 2021-2027). Within this digitalization process, made more urgent by Covid-19, cooperatives seem the best way to channel the collaborative economy, under the modality of working on a digital platform (Arrieta, 2019).

In this paper we focus our analysis on one family of the Social Economy: agricultural cooperatives. Specifically, we will go into the analysis of the Spanish olive cooperative movement for several reasons: a) Spain is the world’s leading producer of olive oil and more than 70% of it is produced by cooperatives (Cooperativas Agroalimentarias de España, 2017) and the Consejo Económico y Social de la Provincia de Jaén, 2019). According to the data provided by the International Olive Oil Council (2019 a and b) for the 2018-19 campaign, Spain has produced more than 51% of the world’s olive oils and the new plantations predict a constant increase; b) there are 11,316,000 hectares in the world that are exclusively dedicated to the cultivation of 1 500 million olive trees (72% are mountain and hill), located mainly in the Mediterranean basin (79%), which gives them an enormous environmental value (at the same time that they serve to reduce erosion and constitute a CO2 sink) which leads them to be considered by many

researchers as public goods (Mozas, 2019b); c) annually, an increase in the world's olive grove surface area is observed, which represents 1% per year (between 34 and 45 million seedlings, which means 154,000 new hectares). The importance of the olive grove is spreading worldwide, since there are already 56 countries in which the olive grove is cultivated and 169 in which its products are consumed (Vilar and Cárdenas, 2016) and these figures are increasing year after year (Mozas, 2019b); d) on the other hand, the production of olive oil with respect to the total of oils and fats produced in the world represents barely 2%. However, consumption has been growing at between 2 and 4% annually, which is why companies are interested in this product. In fact, the turnover of the sector has experienced a growing increase in recent years, ranging from 9,000 to 13,600 million euros per year and employing more than 30 million people (Vilar and Cárdenas, 2016). All these reasons make it a strategic sector worldwide and for Spain in particular.

The main objective we have set ourselves is to verify which are the structural, organizational and commercial factors that favor technological innovation in the second degree olive oil cooperatives in Spain.

From the theoretical framework that has been analyzed, the following work proposals have been derived:

Proposition 1. Training employees in ICTs favors innovation in the organization.

Proposition 2. The application of measures aimed at commitment to CSR favors innovation in the organization.

Proposition 3. The degree of internationalization, measured by the percentage of exports, favors innovation in the organization.

Proposition 4. The commitment to organic production favors innovation in the organization.

Proposition 5. The degree of business integration, measured through the number of member cooperatives, favors innovation in the organization.

Population and method

The organizations analyzed in this study have a total of 449 companies (444 cooperatives: 1 SAT; 3 SA; 1 cooperative group), most of them first degree cooperatives, integrating more than 165,000 individual members with a turnover of more than 2 billion euros and employing more than 2,500 people. These organizations are integrated around 35 second degree cooperative societies dedicated to the marketing of olive oil in Spain and constitute our population under study. In order to collect part of the data of this study a survey has been carried out on the population under study, but others were requested from Agro-Food Cooperatives in Spain within the framework of the work of the Socioeconomic Observatory of Spanish Agro-Food Cooperativism (OSCAE).

The methodological technique used in this study was Qualitative Comparative Analysis (QCA), using the fuzzy set approach (fsQCA) in order to establish technological and organizational variables that together are associated with a higher level of efficiency. The QCA technique, based on Boolean algebra, uses a verbal, conceptual and mathematical language that configures it as a qualitative and quantitative approach, combining the main advantages of

both (Ragin, 1987). Thus, applying QCA it is possible to systematically analyze a set of cases in order to determine causal patterns in the form of need and sufficiency relationships between a set of conditions and an outcome (Scheider & Wagemann, 2010). This method has the advantage over a regression technique of establishing relationships between subsets of variables to explain relationships. In addition, this technique allows working with medium-size samples not large enough to apply traditional quantitative methods (Ragin et al., 2003; Ragin and Rihoux, 2009).

Specifically, in this study the fuzzy set variant (fsQCA) has been used, since it resolves one of the main drawbacks and criticisms of the initial method, called csQCA, which is its strictly dichotomous approach (Sehring et al., 2013).

The dependent variable is the degree of technological innovation. This variable has been created by considering the different ICTs used by the company in its business performance. Thus, a count has been made of the number of technologies used by the company, considering the following: intranet, website, presence in social networks, e-shop, presence in electronic markets and apps. For their part, the causal variables used have been: training in ICT of human resources (staff and top management), the degree of commitment to Corporate Social Responsibility, the export nature, the sale of ecological supply, and business integration.

The results obtained in this study allow us to verify, by means of the fuzzy set Qualitative Comparative Analysis (fsQCA) technique, that the immersion of the companies in ICTs is favored by the following factors: the intensity of cooperative integration, measured by the number of first degree cooperatives or other entities that make up the second degree cooperative; the ICT training of the employees; the export character of the cooperative, the offer of ecological products and the degree of commitment of the cooperatives to Corporate Social Responsibility (CSR) actions.

The original value of this study is the direct link between economic development and innovation and investment in Information and Communication Technologies (ICT). Furthermore, the conclusion we draw is that far from considering Corporate Social Responsibility as a burden for companies and institutions, it should be analyzed and integrated into organizations as an opportunity. The relationship between these variables will improve not only the competitive position of the company, but also the situation of its environment.

Keywords: Second degree cooperativism, olive oil, innovation, training, Corporate Social Responsibility (CSR), integration, internationalization, organic production.