

## Cooperatives' Export Performance: Is Size Relevant?

MERCÉ SALA-RÍOS<sup>1</sup>, TERESA TORRES-SOLÉ<sup>2</sup>, MARIONA FARRÉ-PERDIGUER<sup>3</sup>

Departamento de Economía Aplicada. UNIVERSIDAD DE LLEIDA, SPAIN.

<sup>1</sup>E-mail: merce.sala@udl.cat

<sup>2</sup>E-mail: teresa.torressole@udl.cat

<sup>3</sup>E-mail: mariona.farre@udl.cat

### ABSTRACT

This research deals with a particular business organisation model, such as manufacturing cooperatives. The general aim is to analyse the relationship between cooperatives' export behaviour and their size. The specific objectives are twofold: i) to determine whether size is positively related to the cooperatives' export status (exporters versus non-exporters) and ii) to analyse the relevance of size on cooperatives' export intensity. We use data at the Spanish firm-level that covers the period 1991 to 2016. The research confirms that cooperatives' behaviour with respect to exports is similar to that highlighted in the literature for capitalist companies. We have reached an empirical basis for affirming that cooperatives' size significantly influences the decision to export or not to export, but once that step has been taken, the intensity of the exports responds to a plurality of causes, among which the size of the cooperative is not the most important. The results reveal that higher levels of export intensity are positively linked to higher levels of productivity, wages and innovation.

**Keywords:** Cooperatives; Exports; Export status; Export intensity; Panel data; Manufacturing.

**JEL Classification:** D22; F14; J54; P13

---

Received: September 03, 2021

Accepted: April 27, 2022

---

## ¿Es Relevante el Tamaño de las Cooperativas para Explicar su Dinámica Exportadora?

MERCÉ SALA-RÍOS<sup>1</sup>, TERESA TORRES-SOLÉ<sup>2</sup>, MARIONA FARRÉ-PERDIGUER<sup>3</sup>

Departamento de Economía Aplicada. UNIVERSIDAD DE LLEIDA, ESPAÑA.

<sup>1</sup>E-mail: merce.sala@udl.cat

<sup>2</sup>E-mail: teresa.torressole@udl.cat

<sup>3</sup>E-mail: mariona.farre@udl.cat

### RESUMEN

El estudio se ocupa de un modelo de organización empresarial particular, como son las cooperativas del sector manufacturero. El objetivo general es analizar la relación entre la dinámica exportadora de las cooperativas y su tamaño. Los objetivos específicos son dos: i) determinar si el tamaño está relacionado positivamente con la situación exportadora de las cooperativas (exportadoras versus no exportadoras) y ii) analizar la relevancia del tamaño en la intensidad exportadora de las cooperativas. Utilizamos datos a nivel de empresa española que cubren el período 1991-2016. La investigación confirma que el comportamiento de las cooperativas con respecto a las exportaciones es similar al destacado en la literatura para las empresas capitalistas. Así, observamos que el tamaño de las cooperativas influye significativamente en la decisión de exportar o no exportar. Sin embargo, también se constata que la intensidad de las exportaciones responde a una pluralidad de causas, entre las cuales el tamaño de la cooperativa no es la más importante. Los resultados revelan que mayores niveles de intensidad exportadora están positivamente vinculados a mayores niveles de productividad, salarios e innovación.

**Palabras clave:** Cooperativas; Exportaciones; Estado de exportación; Intensidad exportadora; Panel de datos; Sector manufacturero.

**Clasificación JEL:** D22; F14; J54; P13

---

Recibido: 03 de Septiembre de 2021

Aceptado: 27 de Abril de 2022

---

## 1. Introduction

There is no doubt that exports are a key factor in promoting countries' economic growth. In the past, companies could successfully survive in the domestic market with strategies and management models based on continuity. At present, in a globalised environment, companies have to be able to adapt against a continuously changing environment and fierce competition. Internationalization strategies have become a way to guarantee firms' capacity to grow and succeed in a competitive and dynamic market (Aydiner, Tatoglu, Bayraktar, Zaim, & Delen, 2019). In this scenario, firm size is one of the most important variables highlighted by researchers as a determinant of exporting behaviour (Ali & Swiercz, 1991; Alshiqi, 2020; Archarungroj & Hoshino, 1998; Bandick, 2020; Calof, 1993, 1994; Celebic, Stitkovac, Halilbegovic, & Arapovic, 2020; Culpan, 1989; Ha, Holmes, & Le, 2020; Hernández, 2020; Majocchi, Bacchiocchi, & Mayrhofer, 2005; Moen, 2012; Wagner, 2001).

The literature often deems the positive relationship between firm size and exports to be a stylized fact (Wagner, 1995). This acceptance leads scholars on the subject to focus their attention on explaining how to improve the export activities among small firms (Calof, 1994). It is supposed that, although small firms can be successful exporters, size increases firms' possibility to become exporters and to reach higher values of the export/sales ratio (Wagner, 2001). There are several theoretical reasons to argue that large firms are more capable of success in foreign markets. Among them, we want to highlight the following. First, the benefits of the economies of scale are linked to large firms, and these benefits improve their competitiveness in international marketplaces (Alshiqi, 2020; Culpan, 1989; Ha et al., 2020; Majocchi et al., 2005; Moen, 2012; Rodil, Vence, & Sánchez, 2016; Wagner, 1995). Second, exporting requires resources and capabilities that are often associated with the size of the company; thus, small firms may face a resource disadvantage. For example, large firms have greater availability of financial and human resources, so they are less constrained in devoting them to exporting (Bonaccorsi, 1992; Calof, 1994; Ha et al., 2020; Majocchi et al., 2005; Moen, 2012; Moini, 1995; Sousa, 2004; Verwaal & Donkers, 2002; Wagner, 1995, 2001). Third, in order to address foreign markets, it is necessary to have organisational and management capabilities and to develop specialised functions. These processes are linked to sunk costs, which in many cases are fixed by their nature. Large firms support low unit costs by spreading them over a large number of units produced (Bernard & Jensen, 1999; Hernández, 2020; Majocchi et al., 2005; Verwaal & Donkers, 2002; Wagner, 1995, 2003). Finally, small firms may be more risk averse than large because they have less capacity for collecting information (Alshiqi, 2020; Calof, 1994; Verwaal & Donkers, 2002; Wagner, 1995, 2001).

The arguments put forward should lead us to affirm that there is a positive relationship between export behaviour and firm size. However, there are contradicting results from investigations regarding the relationship between firm size and export performance (Moen, 2012; Moini, 1995). As we will see in the next section, on the one hand, there are studies that advocate a positive correlation between the two variables. On the other hand, some studies conclude that size has no effect on exports or even support a negative link. Small firms have more flexible structures and a greater ability to spot opportunities, which would make it easier to adapt and take on change even in a competitive environment (Esteve-Pérez & Rodríguez, 2013; Lee, Shin, & Park, 2012). Hence, any conclusion in this field should be empirically contrasted and duly placed in context.

The general aim of this paper is to analyse the relationship between cooperatives' export behaviour and their size using the particular business organisation model of cooperatives. The study is focused on Spanish manufacturing cooperatives. The specific objectives are twofold: i) to determine whether size is positively related to the cooperatives' export status (exporters versus non-exporters) and ii) to analyse the relevance of size on cooperatives' export intensity.

Addressing the study of cooperatives is relevant because Spain has a long tradition with regard to cooperatives. Over time, the number of cooperatives and the activities in which they were active expanded. In the early 1980s, the growth of the European cooperative movement and measures of legislative and financial support granted cooperatives a significant role in the fight against unemployment (Author, 2020a). In the mid-1980s, the European Union supposed the expansion of

markets, reducing their relevance. The incorporation of Spain into the EEC had different sectorial impacts, but in general, agricultural cooperatives with greater exporting aptitude were those which adapted more quickly to European regulations (Román, 2014). In the early 1990s, the economic downturn, legislative adjustment at the regional level, and a high dependence on government aid brought about a new increase in the number of cooperatives. In contrast, the economic expansion between 2000 and 2007 relegated the cooperative movement to the background. The 2008 crisis, which created millions of unemployed and growing social needs, brought cooperatives into the spotlight once again as an alternative to capitalist companies (Divar Garteiz-Aurrecoa, 2013).

The cooperatives' democratic and participative principles are other reasons that give an added value to this study. Cooperatives have demonstrated their resilience and become an alternative business model that should be supported and promoted. Gallego-Bono & Chaves-Avila (2020) recognise their role as the drivers of the spreading and exaptation processes of social innovation. In addition, we can find a substantial amount of literature that stresses the greater resilience of cooperatives over capitalist companies, particularly in times of crisis. Various pieces of scholarship, such as the work of Basterretxea & Storey (2018), Fusco & Migliaccio (2018), and Musson & Rousselière (2018), review several studies that confirm that employee ownership yields positive effects in terms of satisfaction and motivation, which would improve productivity and commitment. The greater willingness of cooperatives to safeguard jobs – and together with elements such as gender equality, non-discrimination, and inclusion – increases the quality of employment (Calderón & Calderón, 2012; Roelants, Dovgan, Eum, & Terrasi, 2012).

However, to increase the chances of survival, cooperatives have to combine their participatory and democratic principles with strategies that are typical of capitalist firms. The challenge lies in balancing their values with strategies linked to profits (Jäger & Beyes, 2010). In this context, there is no doubt that international expansion of cooperatives is not a marginal phenomenon and is a response to the need to improve power positions and diversify risks (Bartual-Figueras & Turmo-Garuz, 2019; Bretos & Marcuello, 2017).

At this point, we want to point out how this paper contributes to the literature. First, in export performance theoretical framework, firms analysed are mainly capitalist firms. This is the first study, to our knowledge, to focus on Spanish cooperatives' export performance. Second, over the last few decades, there has been a significant increase in cooperatives' exports. In the early 1990s, around 36% of cooperatives were exporting, and by the mid-2000s, the percentage had increased to almost 70%.<sup>1</sup> The figures are still lower than those shown by capitalist firms; however, the gap has been decreasing (Author, 2020b). It seems necessary to take account of how cooperatives behave regarding exports. Third, our findings will help policy-makers to design policy measures with a focus on supporting cooperatives' exporting activities.

The rest of this paper is organised as follows. Section 2 presents a conceptual framework of the relationship between export behaviour and size. Section 3 explains the data source used and the methodological aspects. Section 4 presents the main results, while a robustness analysis is carried out in Section 5. Finally, Section 6 contains the discussion and conclusion of the study.

## **2. Conceptual framework**

There are two main propositions that may be taken as the state-of-the-art in the study of the relationship between export behaviour and size of firms: i) the larger the firm size the greater the probability to become an exporter and ii) export intensity is linked with firm size.

Behind the first proposition lies the idea that while smalls firms cannot afford the risk involved in export activities, large firms need to engage export activities to increase their returns (Leonidou, 1998; Wagner, 1995). This general hypothesis is linked with the self-selection mechanism proposed by Melitz (2003). Self-selection holds that foreign markets self-select the most productive firms because they

---

<sup>1</sup> Sample data. See data section.

are better able to recoup the sunk costs associated with export activities (Bernard & Jensen, 1999). As some of these costs are fixed, large firms have an advantage with respect to small firms. Hence, we can expect a higher level of exporters among large firms. There is widespread agreement in the empirical studies at the country level that a good explanation for the relationship between size and export status (exporter / non-exporter) is that the larger the firm size, the greater the probability of becoming a firm exporter (Bonaccorsi, 1992; Esteve-Pérez & Rodríguez, 2013; Máñez-Castillejo, Rochina-Barrachina, & Sanchis-Llopis, 2010; Revindo, Gan, & Massie, 2019; Serrano & Myro, 2019; Trang & Nam, 2020; Wagner, 1995, 2007).

The second proposition is widely analysed in the literature. There is less agreement on the results. Moreover, there are contradicting results. On the one hand, some scholars advocate a positive correlation between the two variables. On the other hand, some conclude that size has no effect on exports or even support a negative link. We highlight some of the papers that deal with the subject.<sup>2</sup> We start with papers that found a positive correlation. Calof (1993), analysing Canadian manufacturing firms, attests a positive association between firm size and internationalisation, although there is no evidence that size was a barrier for firms' internationalisation. A later study (Calof, 1994) deals with the direct and indirect effects of firm size on three dimensions of export behaviour: the propensity to export, destination countries for exports, and export attitudes. The results indicate that firm size presents a positive but moderate relationship with the three dimensions.

The research reported by Moini (1995), in the case of manufacturing firms in Wisconsin, and Dhanaraj & Beamish (2003), in the case of Canadian nationwide and U.S. firms located in an industrial Midwestern state, conclude that firm size has positive and significant influence on export success. More recently, studies by Majocchi et al. (2005), for Italian manufacturing firms; Reis & Forte (2016), for Portuguese manufacturing firms; Alshiqi (2020), for Republic of Kosovo exporting firms; Bandick (2020), for Danish manufacturing firms; and Celebic et al. (2020), for Bosnia and Herzegovina manufacturing firms, find a strong support for the positive effect of firm size on export performance. Ogawa & Tokutsu (2015) compare the relative importance of three factors: firm size, productivity, and financial factors in Japanese firm exporting activities. They focus on the four leading exporting industries: general machinery, electrical machinery, transport equipment, and precision instruments. They detect that firm size is an important determinant of both export market participation decision and export volume decision.

Other studies do not obtain a clear and invariant positive relationship. Bonaccorsi (1992), using an Italian firms database, indicates on the one hand, that firm size increases the probability of becoming an exporter; on the other hand, he highlights many reasons to reject the idea that firm size is positively linked to export intensity. Wagner (1995, 2003), focusing on German manufacturing firms, demonstrates, first, the positive, but decreasing with size, impact of firm size on the export intensity. Second, the larger the company, the stronger the relationship between sales growth and export intensity. Finally, the fact that export intensity increases with firm size disappears when unobserved firm heterogeneity is controlled for. In another study, Wagner (2001) finds an inverse U-shaped connection between size and exports in some manufacturing activities. Firm characteristics are used by Wagner (2006) to indicate that the impact of these characteristics, including firm size, varies along with the size distribution of the export/sales ratio. Hernández (2020), dealing with Spanish manufacturing companies, finds that firm size has a positive effect on the propensity to export, although the smaller the propensity, the greater the effect. Ha et al. (2020), in their analysis of the Vietnamese manufacturing sector, present similar conclusions.

Equally extensive is the literature that does not find significant the relationship between exports and firm size. Again, without being an exhaustive review, we point out some of the papers. Culpán (1989) conducts a survey with manufacturers in Pennsylvania and affirms that size is not revealed to be fundamental when it comes to distinguishing between the products that are exported and the

---

<sup>2</sup> A literature review can be found for instance, in Alshiqi (2020), Bonaccorsi (1992), Calof (1994), Dhanaraj & Beamish (2003), Ha et al. (2020), Hernández (2020) or Pla-Barber & Alegre (2007).

international markets to which they are directed. However, larger companies achieve higher levels of export intensity. This greater involvement in export activities also requires a greater volume of information and training, especially in relation to export mechanics and documentation. Ali & Swiercz (1991) examine the relationship between firm size, export experience, and export attitudes. The questionnaire used allows them to conclude that size does not exert an influence on managerial attitudes towards exporting. Archarungroj & Hoshino (1998), for Thailand exporting firms, attest that smaller exporting firms are more deeply involved in foreign trade and have more positive attitudes towards it than do larger exporting firms.

Wolff & Pett (2000) analyse data from U.S. firms and indicate that there is no statistically significant difference in the export intensity for any of the size categories. Pla-Barber & Alegre (2007), evaluating a survey to French biotechnological industry, affirm that firm size and export intensity present a small and not significant relationship. The authors state that this does not imply that size is not important for the internationalisation process, but it reveals that it is not the main factor. Pekovic & Rolland (2016), using data from French firms to analyse the relationship between quality standards and export activities, do not find evidence showing that, for the European Union, that relationship depends on the firm size. Moen (2012) deals with Norwegian firms and concludes that small firms can achieve the same level of success as larger ones in international markets.

Finally, fewer studies affirm that firm size and export behaviour are negatively correlated. Patibandla (1995), for the Indian engineering industry, stresses a negative relationship under certain circumstances of the market. The results bring out, on the one hand, that export intensity and firm size show a negative correlation up to a size threshold, defined by the author as critically large, at which the association becomes positive. On the other hand, the results show that, when large and small firms are equally efficient in production but the costs of selling for small firms are similarly higher in the domestic market as they are in the foreign market, the export intensity of small firms is higher. Iyer (2010), investigating the export intensity in New Zealand's agriculture and forestry, points out that firm size has a negative effect on export intensity. Similarly, Ahmed & Rock (2012), through a survey of Chilean manufacturers that export, conclude that export intensity is positively associated with small firms. In the case of firms in Netherlands, Verwaal & Donkers (2002) conclude that firms with large export relationships have higher export intensity. This first result leads to the second one: in those industries in which the export relationships are larger, an insignificant or even a negative relationship between firm size and export intensity can be expected.

It has been confirmed that there are contradicting results from investigations into the relationship between firm size and export intensity. Calof (1994) wonders why there is so much inconsistency in the literature. Some reasons have been proposed. Among them stand out differences in the measurement of size and the presence of different sample frame characteristic or sectorial and geographical factors (Archarungroj & Hoshino, 1998; Calof, 1994). In any case, we cannot state unequivocally the direction of the relationship. Therefore, empirical investigation is needed. We will carry out our empirical analysis supported by the two main propositions that opened this section. Therefore, the following hypotheses will be developed.

Hypothesis 1 (H1): Cooperative size is positively related to exports status

Hypothesis 2 (H2): Cooperative size is positively related to export intensity

### **3. Data and methodology**

#### **3.1. Data**

The analysis is carried out using data at the Spanish firm level from Encuesta sobre Estrategias Empresariales (ESEE), an annual survey carried out by the Fundación SEPI under an agreement with the current Spanish Ministry of Finance. The database is focused on the manufacturing sector and contains information on firms with ten or more employees, broken down into the three-digit



aggregation CNAE-09.<sup>3</sup> It has an unbalanced nature due to in and out movements and missing observations. The survey allows differentiation according to the firms' legal form. Work cooperatives, the firms on which this study focuses, are one of the legal forms included. The initial sample gathered 101 work cooperatives; after cleaning, the final sample contains panel data on 70 cooperatives. The main criteria applied to clean the data are the following: i) although the ESEE spans 1990 to 2016, our study covers the period 1991 to 2016 because some essential variables, such as the number of employees, begin in 1991; ii) cooperatives must provide information for at least three consecutive years; and iii) the sample does not incorporate those cooperatives with missing information on key variables for our analysis.

Export status is measured with a dummy variable, taking the value 1 when the cooperative exports and 0 otherwise (Caldera, 2010; Máñez-Castillejo, Rochina-Barrachina, & Sanchis-Llopis, 2009; Monreal-Pérez, Aragón-Sánchez, & Sánchez-Marín, 2012). Export intensity is measured through the export-to-total sales ratio. This ratio is one of the most broadly used in the literature as an indicator of export intensity (Alshiqi, 2020; Calof, 1993; Majocchi et al., 2005; Manjón, Máñez, Rochina, & Sanchis, 2013; Moini, 1995; Pla-Barber & Alegre, 2007; Reis & Forte, 2016; Wagner, 1995, 2003, 2006; Wolff & Pett, 2000).

The indicator of size used is the cooperatives' employment. This is a firm size indicator widely used in analyses focusing on the relationship between exporting and firms' performance (Alshiqi, 2020; Bandick, 2020; Culpan, 1989; Ha et al., 2020; Hernández, 2020; Majocchi et al., 2005; Máñez, Rochina-Barrachina, & Sanchis-Llopis, 2015; Reis & Forte, 2016; Wagner, 2003, 2006, 1995, 2001; Wolff & Pett, 2000). Cooperatives are classified as small, medium, or large. According to the Commission Regulation (EU) N° 651/2014, a small-size cooperative is defined as a firm which employs 50 or fewer persons. The category of medium-size is made up of cooperatives which employ 250 or fewer persons. The large-size cooperatives are those which employ more than 250 persons.

### 3.2. Methodology

We assume firm heterogeneity to carry out a firm-level panel data analysis to deal with the relationship between size and export behaviour. As indicated in Majocchi et al. (2005), most empirical studies work with a cross-sectional methodology. However, it would be useful to use panel data to account for the dynamic aspect of the internationalisation process. Panel data are applied to the methodology explained below in order to test the two working hypotheses set out.

**H1:** Cooperative size is positively related to exports status

We analyse whether cooperatives operating in foreign markets are larger than those operating in domestic markets. The dependent variable is the export status (Export). It is a binary variable (exports = 1, does not export = 0) included in the panel data model. Specifically, given the binary nature of Export, we propose a probit model:

$$Export_{it} = 1 \text{ if } Export_{it}^* \geq 0$$

$$Export_{it}^* = \beta_0 + \beta_1 \ln Employment_{it} + \beta_2 \ln employment_{it}^2 + \beta_3 \theta_{it} + \beta_4 Control_{it-1} + \gamma_j + \delta_t + u_{it}$$

$$Export_{it} = 0 \quad otherwise \tag{1}$$

i = cooperative, j = industry, and t = time.

As explanatory variables the model includes the cooperatives' employment expressed in logarithms as proxy for the cooperatives' size (ln Employment). Following Bandick (2020) and Majocchi et al.

<sup>3</sup> See more detailed information about data set in Fariñas & Jaumandreu (1999), Fariñas & Martín-Marcos, (2007) and Máñez-Castillejo et al. (2010).

(2005), the model also includes the squared value of cooperatives size ( $\ln \text{Employment}^2$ ) to measure the possible U-shaped (i.e., non-linear) form in the relationship, and a dummy variable ( $\theta_{it}$ ) to test whether a threshold exists that sets the level below which the cooperatives' export status becomes irrelevant (1 for cooperative with less than 20 employees, 0 otherwise). Control is a vector of control variables in logarithm: cooperative age to control experience, R&D effort to proxy the firm innovation, wages to control labour quality, and total factor productivity (TFP) to control efficiency. We include these variables because they may have an influence over exports (Ayllón & Radicic, 2019; Caldera, 2010; Minondo, 2011; Monreal-Pérez et al., 2012; Reis & Forte, 2016). We assume a sector-specific component ( $\gamma_j$ )<sup>4</sup> that accounts for differences in terms of technology, opportunities to enter the export markets, and other common effects. The variable ( $\delta_t$ ) is a time-specific component that measures macroeconomic effects (Caldera, 2010). All control variables are lagged to avoid simultaneity problems. Table 1 displays a description of the variables.

**Table 1** Description of the variables

Variable	Description
Age	Number of years since the cooperative started to operate
Employment	Number of employees during the year (average)
R&D effort	Expenditures on R&D + imports of technology over total sales (%)
Sales	Sale of goods + sale of transformed products + provision of services + other sales
Total factor productivity (TFP)	Calculated according to Caves, Christesen, & Diewert (1982) and Good, Nadiri, & Sickles (1997) Inputs used: real capital, labour and real intermediate inputs
Wages	Gross salaries and wages + compensation + social security contributions paid by the company + contributions made to supplementary pension systems + other social expenses

Source: Own elaboration

## H2: Cooperative size is positively related to export intensity

The effect of cooperative size on export intensity is analysed by estimating the following model:

$$\text{Export intensity}_{it} = \beta_0 + \beta_1 \ln \text{Employment}_{it} + \beta_2 \ln \text{Employment}_{it}^2 + \beta_3 \theta_{it} + \beta_4 \text{Control}_{it-1} + \gamma_j + \delta_t + u_{it} \quad (2)$$

$$(u_{it} = \mu_i + \epsilon_{it})$$

Where export intensity is defined as the proportion of sales intended for exporting (export/sales),  $i$  is the index of cooperative,  $j$  is the index of industry, and  $t$  is the index of year. The variables are defined the same way as before.

## 4. Results

### H1: Cooperative size is positively related to exports status

We initiate our analysis carrying out a descriptive analysis of the export status (Table 2). We can see in the first eight rows of Table 2 the main descriptive statistics relating to the cooperatives' export status and size. In the bottom of Table 2, we present the differences between predicted and actual export status by cooperative size. We follow Mittelstaedt, Harben, & Ward (2003) to determine if the actual number of small-, medium-, and large-sized cooperatives is over- or underrepresented with respect to that expected. The conditional probability of the number of exporting cooperatives by size is:

<sup>4</sup> Three-digit aggregation CNAE-09 of manufacturing industries.



$$\begin{aligned}
 E_{size} &= (Total\ cooperatives) * P(Exporting|Size) = \\
 &= (Total\ cooperatives) * \left( \frac{Exporting\ cooperatives}{Total\ cooperatives} \right) \\
 &* \left( \frac{Exporting\ cooperatives\ according\ to\ size}{Total\ cooperatives} \right) \tag{3}
 \end{aligned}$$

By subtracting the estimated number of a given size ( $E_{size}$ ) from the actual number of exporting cooperatives of that size ( $A_{size}$ ), we find out if such size is over- or underrepresented ( $R_{size}$ ).

$$R_{size} = A_{size} - E_{size} \quad \text{If } R_{size} > 0 \text{ overrepresented} \quad \text{If } R_{size} < 0 \text{ underrepresented}$$

**Table 2** Descriptive statistics by export status and size

Variable: Employment	Mean	Std. Dev.	Min	Max
<b>Exporters:</b>	467.25	784.00	6.00	4,178.00
Small	24.59	11.65	6.00	50.00
Medium	131.81	58.84	51.00	248.00
Large	1,022.36	963.24	252.00	4,178.00
<b>Non-exporters</b>	41.80	80.89	2.00	788.00
Small	19.12	12.43	2.00	50.00
Medium	109.23	48.46	51.00	220.00
Large	463.29	223.13	300.00	788.00
<b>Differences between predicted and actual export status by cooperative size</b>				
<b>Size</b>				$R_{size}$
Small				-86.25
Medium				14.39
Large				71.86

Source: STATA and Own elaboration

Table 2 shows that, on average, exporting cooperatives are larger than non-exporters, with an important gap in the maximum values. The over/under weight of the exporting ( $R_{size}$ ) indicates that there are significant differences between the expected and the actual export status. Small cooperatives are underrepresented compared to medium-sized, and especially, to large cooperatives. It would be expected that there were 86 small cooperatives more that engage in export markets, while medium (large) cooperatives show an overrepresented estimate of 14 (72).

The sample shows that exporting cooperatives' size is greater than that of non-exporting ones. Despite this being a stylised fact that is reported in the literature, we want to take a step further and assess the robustness of these findings.

To test whether the differences showed by the descriptive statistics presented in Table 2 are significant, we estimate the probit model specified in (1). We check whether a random effects probit model is adequate. The proportion of the total variance contributed by the panel-level variance component ( $\rho = \frac{\sigma_v^2}{\sigma_v^2 + 1}$ ) is significant, which leads to reject the null hypothesis that it is equal to zero. The proper estimation method is the random-effects probit model. The estimators are consistent and more efficient than those obtained with the standard probit model.

The estimate of (1) includes a dummy variable ( $\theta_{it}$ ) to test for the presence of a threshold effect. The threshold was fixed at fewer than 20 employees. The dummy variable was found to be insignificant. Before omitting the variable, we wanted to rule out that the threshold level set could influence the results. We modified the threshold by testing it at fewer than 30, fewer than 15, and fewer than 10 employees, respectively. In all cases our results showed that the dummy was insignificant. Also, in all these estimates,  $(\ln Employment^2)$  was not significant. Cooperative size seems to not have a U-shaped form. In contrast with Bandick (2020), the linear relationship is the most likely for our data and period.

Given these outcomes, the results that we present below include neither the threshold dummy nor the size squared. Without these variables, the fit of the model improves. Table 3 and Table 4 show,

respectively, the coefficients and the marginal effects of the random-effects probit model (Model 1). For comparison purposes, the results of the standard probit models are also presented in Table 3 (Model 2).

In Model 1, three of the control variables are not significant. We have omitted them and have carried out again the estimation process (Model 3). As we can see in Table 3 Model 3,  $\rho$  is significant and the goodness-of-fit of the regression improves. Then we analyse the results of Model 3.

**Table 3** Estimated coefficients. Random/Standard probit models

Dependent variable: Export	Model 1		Model 2		Model 3	
	Coefficient1	P> z	Coefficient1	P> z	Coefficient1	P> z
Constant	-18.415 (10.884)	0.091	-9.580*** (2.174)	0.000	-17.233*** (4.099)	0.000
In Employment	3.823** (1.435)	0.008	0.111 (0.274)	0.687	5.548*** (0.753)	0.000
Control variables						
In Age	-2.215* (0.927)	0.017	-0.610*** (0.165)	0.000	-2.261 (1.242)	0.069
R&D effort	0.042 (0.170)	0.804	0.118 (0.075)	0.116		
In TFP	0.692 (0.824)	0.401	0.476* (0.191)	0.013		
In Wages	0.397 (1.207)	0.742	0.684** (0.249)	0.006		
In $\sigma^2$	3.796*** (0.375)				4.407*** (0.352)	
$\sigma v$	6.673 (1.252)				9.057 (1.595)	
$\rho$	0.978*** (0.008)				0.988*** (0.004)	
Log likelihood	-59.350		-175.630		-58.238	
Wald chi2	140.18		561.49		173.78	
Prob > chi2	0.000		0.000		0.000	
PseudoR2			0.615			
LR test $\rho=0$ chibar2	232.56				260.71	
Prob $\geq$ chibar2	0.000				0.000	
AIC	202.701		433.260		194.477	
BIC	392.381		618.424		370.608	
Time effects	Yes		Yes		Yes	
Industry specific effects	Yes		Yes		Yes	
% positive outcome (P>0,5)2	57.69%				58.28%	

1. Std. Err. in parenthesis

2. It is calculated with the probability of a positive outcome, assuming that the random effect for that observation's panel is zero.

\* p< 0.05 \*\* p< 0.01 \*\*\*p< 0.001

Source: STATA

**Table 4** Marginal effects. Random-effects probit model

Dependent variable: Export	Model 1		Model 3	
	dy/dx1	P> z	dy/dx1	P> z
In Employment	0.124** (0.049)	0.011	0.119*** (0.031)	0.000
Control variables				
In Age	-0.072* (0.029)	0.015	-0.048 (0.031)	0.115
R&D effort	0.001 (0.005)	0.806		
In TFP	0.022 (0.027)	0.405		
In Wages	0.013 (0.039)	0.741		

1. Std. Err. in parenthesis

\* p< 0.05 \*\* p< 0.01 \*\*\*p< 0.001

Source: STATA

The obtained coefficients in the best fitting regression model (Model 3) show that size is significant in determining the export status. The positive relationship between size and export status is verified as being robust. The results support the fact that cooperatives' size matters. A 1% increase in firm size leads to a 12% increase in the probability of exporting (Table 4).

Our results agree with previous studies (e.g., Bonaccorsi, 1992; Calof, 1993; Revindo et al., 2019; Trang & Nam, 2020), including those concerning Spanish capitalist firms (e.g. Caldera, 2010; Donoso & Martín, 2008; Fariñas & Martín-Marcos, 2007; Juan A. Máñez et al., 2015; Juan A. Máñez, Rochina-Barrachina, & Sanchis, 2008; Monreal-Pérez et al., 2012; Rodil et al., 2016; Serrano & Myro, 2019). Among studies of Spanish cooperatives, size is deemed important for exporting strategies in papers such as Medina, Mozas, Bernal, & Moral (2014) for olive-growing cooperatives of Andalucía, Fernández, Peña, & Hernández (2008) for winemaking cooperatives of Castilla la Mancha, or Fuentes, Sánchez, & Santos (2011) for agri-food cooperatives of Andalucía. Finally, Bretos, Díaz-Foncea, & Marcuello (2018), based on a literature review, identify cooperatives' small size as a key factor that limits the internationalisation of cooperatives.

Conversely, cooperatives' longevity shows a negative relationship with export status. Although not significant, the marginal effect indicates that the probability of export decreases with cooperatives' age. The study of Medina et al. (2014) is in line with this finding. However, they do not point out a negative link but the absence of a relationship between age and the presence of the cooperatives in the foreign markets. By contrast, Caldera (2010) affirms that the link is positive and significant, and Esteve-Pérez & Rodríguez (2013) and Máñez et al. (2015, 2008) find a positive but not significant relationship.

So far, we confirm our first hypothesis: cooperative size is positively related to exports status. The results may indicate the impact of economies of scale on the capacity of firms to get into foreign markets (Caldera, 2010; Rodil et al., 2016).

## **H2: Cooperative size is positively related to export intensity**

Before estimating the model specified in (2), a descriptive analysis is carried out. Table 5 presents the summary statistics; determines if small-, medium-, and large-sized cooperatives with export intensity larger than the mean are over- or underrepresented; and shows the Pearson correlation coefficients between cooperatives' size and export intensity. Regarding the descriptive statistics, the maximum value of the export intensity and the minimum standard deviation correspond to the small size. The ( $R_{size}$ ) of small cooperatives is negative, however, its level is lower than that obtained in the previous analysis of cooperatives' export status. Finally, we should expect a negative Pearson coefficient in the small size and a positive one in the large size. The figures in Table 5 do not corroborate this. The small and medium cooperatives show a positive, although not significant, coefficient. Conversely, the large ones present a significant negative coefficient. The results do not provide clear evidence that there is a positive relationship between the size of the cooperative and the intensity of exports.

In order to obtain more robust conclusions, we estimate the expression (2). The Chow test/likelihood ratio for poolability indicates that a pooled model is not adequate ( $F=0.000$ ). A random-effect model is estimated since the results of the Hausmann test do not support the use of the fixed-effect model.

As in the previous analysis, the threshold was found to be insignificant. Again, before omitting the variable, we estimate the model giving different values to the threshold (fewer than 30, fewer than 15, and fewer than 10 employees). In all cases, the results showed that the dummy was insignificant. This outcome is in contrast with Mittelstaedt et al. (2003), who find that a minimum size of firm has to be achieved to export successfully. However, it is in accordance with Majocchi et al. (2005). Also, in all those estimates relating to threshold, ( $\ln \text{Employment}^2$ ) was not significant. Cooperative size seems to not have a U-shaped form. The linear relationship is the most likely for our data and period. This trend was already found by Majocchi et al. (2005) and Wagner (2006).

**Table 5** Descriptive statistics by intensity and size

Dependent variable: Export intensity	Mean	Std. Dev.	Min	Max
Total	22.28	29.37	0.00	99.86
Small	11.22	22.57	0.00	99.86
Medium	21.08	25.70	0.00	99.72
Large	47.23	29.94	0.00	94.66
Differences between predicted and actual export status by cooperative size				
Size				R <sub>size</sub>
Small				-76.24
Medium				7.13
Large				69.10
Correlations between cooperative size and export intensity by size				
	R	p-value	N	
Small	0.076	0.1189	416	
Medium	0.123	0.149	139	
Large	-0.178*	0.014	191	

\* p< 0.05 \*\* p< 0.01 \*\*\*p< 0.001  
Source: STATA and Own elaboration

The expression (2) was estimated without threshold and squared value of employment (Model 4). Table 6 presents the outcomes.

**Table 6** Estimated coefficients. Random-effects model

Dependent variable: Export intensity	Model 4	
	Coefficient1	P> z
In Employment	0.990 (1.863)	0.595
Control variables		
In Age	-4.998* (2.438)	0.040
R&D effort	0.505* (0.254)	0.047
In TFP	2.736** (0.985)	0.005
In Wages	4.642** (1.661)	0.005
Sigma_u	24.642	
Sigma_e	9.343	
Rho	0.874	
Wald chi2	122.74	
Prob>chi2	0.000	
R-sq	0.483	
Time effects	Yes	
Industry specific effects	Yes	

1. Std. Err. in parenthesis  
\* p< 0.05 \*\* p< 0.01 \*\*\*p< 0.001  
Source: STATA

The model shows that the effect of size is positive as expected, although the coefficient is not significant. Our analysis confirms that size is not a crucial variable influencing the export intensity of cooperatives. In other words, the level of export intensity achieved by cooperatives does not have a significant relationship with their size. Therefore, any change in the size of cooperatives tends to not impact significantly on the ratio of export/sales. In short, we can affirm that once small cooperatives overcome the barriers imposed by foreign markets associated with the self-selection process (Melitz, 2003), they demonstrate their ability to increase the share of exports over sales.

This result agrees the study of authors such Pla-Barber & Alegre (2007) and Wagner (2003, 2006). In studies on Spanish capitalist firms, findings vary. In Madrid & García (2004), the impact of size on export intensity is only observed positive and significant in some economic sectors. Donoso & Martín (2008) affirm that there is no growing and monotonous relationship between export intensity and size. The export intensity seems to have an inverted U shape, where from a certain limit, the export intensity

declines. For Alonso & Donoso (2000), size is not among the most relevant variables explaining greater export propensity.

A clear impact comes from the control variables. Again, the age coefficient is negative, but in this case, significant. There are some studies that agree with us. For example, Zou & Stan (1998), through a literature review, affirm that firm's age seems to have an insignificant or even a negative effect on export intensity. However, Donoso & Martín (2008), López & Serrano (2020) and Majocchi et al. (2005) find a positive and significant relationship. Meanwhile, Pla-Barber & Alegre (2007) do not find age significant, although the relationship is positive.

In contrast to our previous analysis of export status, cooperatives' innovation, labour productivity, and wages show positive and significant coefficients. This confirms, first, that the more productive the cooperative, the more likely that the share of exports in sales increases (Ha et al., 2020). Second, cooperatives that innovate and pay higher wages present higher export intensity. We want to address these facts in a bit more depth.

We can find a large number of studies affirming that exports, productivity and innovation are correlated. However, there is no agreement regarding the direction of this relationship. From the one side, several studies (e.g., Ayllón & Radicic, 2019; Falk & de Lemos, 2019; Máñez-Castillejo et al., 2009) point out that productivity operates as an intermediate variable between innovation and exporting status; that is, productivity increases with innovations and the probability of improving exports increases with productivity. Caldera (2010) and Monreal-Pérez et al. (2012) indicate that innovation is a source of international competitive advantage because firms can benefit from better products or more efficient processes. In addition, the more productive exporting firms tend to export larger quantities of their production because they are better able to withstand the costs associated with foreign markets (Donoso & Martín, 2008; Iyer, 2010; Reis & Forte, 2016).

On the other side, there is an effect of exports on innovation. The stronger competition in foreign markets increases innovations as a way of improving efficiency and remaining competitive (Ayllón & Radicic, 2019; Damijan, Kostevc, & Polanec, 2010; Monreal-Pérez et al., 2012). Furthermore, it is easier for those firms that are present in foreign markets to access a new and often cheaper supply of technologies (Freixanet & Churakova, 2018).

We have found that cooperatives' innovation is not significant in explaining export status but has a positive and significant correlation with export intensity. This suggests that cooperatives could become exporters without having made an important innovation effort. However, innovation becomes a factor that can improve the volume of exports. Improving innovation would allow cooperatives to benefit from the positive effects mentioned in the previous paragraphs. The problem lies in the low level of innovation shown throughout the cooperative data. In this sense, more than 90% of the sample of cooperatives accounts for less than 6% of the R&D effort. This result does not differ between large and small or between export and non-export cooperatives. The lack of innovation becomes a weakness that does not allow cooperatives to take advantage of the positive relationship between exports and innovation (Author, 2020b). This lack could become a drag for exporting: if cooperatives do not innovate in order to improve in foreign markets, the positive effect of size on export status will be fruitless.

When analysing wages, two main ideas arise. On the one hand, Author (2020b), examining whether Spanish exporting cooperatives perform better than non-exporters, point out that a low and non-significant level of export premium between exporters and non-exporters is detected in wages. This export premium is practically non-existent by the fact that wages are more flexible in cooperatives than in capitalist firms. The role of employment in cooperatives is different from that in capitalist firms. Cooperatives are more targeted and more concerned about safeguarding employment than about maximising incomes (Díaz-Foncea & Marcuello, 2014). This argument can help to understand why wages are not significant to explain export status. On the other hand, improvement and survival in the export markets may be associated with more share of human capital among export firms' employees, which, at the same time, is associated with higher wages (Bezuidenhout, 2017; Fariñas & Martín-

Marcos, 2007; Hernández, 2020; Kölling & Antje, 2020). This argument allows us to understand the positive relationship between wages and export intensity.

Summarising, our results do not differ from those obtained by some studies focusing on capitalist firms. The estimates confirm our first hypothesis, which stated that cooperatives' size is a key factor in distinguishing between exporters and non-exporters. As regards the second hypothesis, we have concluded that size does not have significant impact on export intensity, while higher levels of export intensity are positively linked to higher levels of productivity, wages, and innovation.

## 5. Robustness check

For a robustness check, we changed from employment to sales as the proxy for size. As we have already indicated, inconsistencies in export study results may be due to the fact that different measurements of size are used. The two main indicators applied by researchers are number of employees and sales level. To avoid the bias that size measurement might imply, some studies use both variables (Archarungroj & Hoshino, 1998; Calof, 1994; Celebic et al., 2020; Moen, 2012; Moini, 1995; Pla-Barber & Alegre, 2007). In our case, we repeated the whole methodology applied to both the first and second working hypotheses.

We begin the analysis by estimating Model 1, replacing (ln Employment) with (ln Sales) (Model 5). Again, only age is significant. In Model 6, we omit all the control variables except age. The results of Model 5 and Model 6 are shown in Tables 7 and 8. They lie along the same line as the patterns of our baseline estimates (Tables 3 and 4). Therefore, the original estimates of the importance of size in the state of exports are robust to changes in the size indicator.

**Table 7** Estimated coefficients: Random-effect probit model

EXPORTS	Model 5		Model 6	
	Coefficient1	P> z	Coefficient1	P> z
Constant	-57.463*** (8.052)	0.000	-55.976*** (7.078)	0.000
ln sales	3.885** (1.313)	0.003	4.348*** (0.523)	0.000
Control variables				
ln age	-4.246** (1.400)	0.002	-4.261*** (1.246)	0.001
R&D effort	0.084 (0.254)	0.742		
ln TFP	0.438 (0.820)	0.593		
ln wages	0.565 (1.143)	0.622		
ln $\sigma v^2$	4.096*** (0.328)		4.116*** (0.311)	
$\sigma v$	7.752 (1.272)		7.830 (1.219)	
$\rho$	0.984*** (0.005)		0.984*** (0.005)	
Log likelihood	-58.083		-58.524	
Wald chi2	110.41		117.26	
Prob. > chi2	0.000		0.000	
LR test $\rho=0$ chibar2	233.52		251.09	
Prob. $\geq$ chibar2	0.000		0.000	
AIC	200.167		195.049	
BIC	389.847		371.180	
Time effects	Yes		Yes	
Industry-specific effects	Yes		Yes	
% positive outcome (P > 0.5)2	58.28%		58.58%	

1. Std err. in parentheses.

2. This is calculated with the probability of a positive outcome, assuming that the random effect for that observation's panel is zero.

\* p < 0.05; \*\* p < 0.01; \*\*\* p < 0.001.

Source: STATA.



**Table 8** Marginal effects: Random-effect probit model

EXPORTS	Model 5		Model 6	
	dy/dx1	P> z	dy/dx1	P> z
In sales	0.093** (0.033)	0.005	0.107*** (0.018)	0.000
Control variables				
In age	-0.101** (0.029)	0.001	-0.104*** (0.030)	0.000
R&D effort	0.002 (0.006)	0.741		
In TFP	0.010 (0.020)	0.602		
In wages	0.013 (0.027)	0.621		

1. Std err. in parentheses.  
\* p < 0.05; \*\* p < 0.01; \*\*\* p < 0.001.  
Source: STATA.

The random-effect model is the right model for analysing the second hypothesis, using sales as a proxy for cooperatives' size. The results in Table 9 reveal some differences. The relationship between sales and size is negative although not significant. Then, with respect to our second hypothesis, it is confirmed that cooperatives' size does not have a significant influence on the export intensity, regardless of the size measure used.

**Table 9** Random-effect model

EXPORT INTENSITY	Model 7	
	Coefficient <sup>1</sup>	P> z
In sales	-8.110 (6.417)	0.206
In sales <sup>2</sup>	0.549 (0.209)	0.109
Control variables		
In age	-5.652* (2.373)	0.017
R&D effort	0.479 (0.247)	0.052
In TFP	2.327* (0.949)	0.014
In wages	-1.367 (1.397)	0.328
Sigma_u	21.533	
Sigma_e	9.011	
Rho	0.851	
Wald chi <sup>2</sup>	200.71	
Prob>chi <sup>2</sup>	0.000	
R-sq.	0.526	
Time effects	Yes	
Industry-specific effects	Yes	

1. Std err. in parentheses.  
\* p < 0.05; \*\* p < 0.01; \*\*\* p < 0.001.  
Source: STATA.

Taking into account the fact that the export intensity values lie between zero and one (zero and one hundred per cent), Wagner (2003) indicates that the fractional logit regression model developed by Papke (1996) should be used. To test the second hypothesis, we carry out this regression. The marginal effects do not differ significantly from those obtained in the results subsection.5 As noted by Papke and Wooldridge, (2008, p. 130), "It seems evident that, for estimating the marginal effect of a given percentage change in spending, the difference between linear and nonlinear models is not important".

<sup>5</sup> Results are available upon request.

## 6. Discussion and conclusion

A great deal of literature, focusing mainly on capitalist manufacturing firms, deals with the relationship between exports and firms' size. There are two main questions that arise in this field: are large firms more likely to become exporters and is export intensity linked with firm size? The positive answer to the first question gathers more empirical consensus than the second.

The analysis of those two questions applied to cooperatives remains an issue pending resolution. Cooperatives are a suitable association formula to generate social and economic value; therefore, it seems appropriate to fill this gap and to take their role in foreign markets into account. This is precisely the main contribution of this paper. We investigate how exporting cooperatives evolve and differ from those that are geared towards the domestic market. There are two working hypotheses: (i) cooperatives' size is positively related to their export status; and ii) cooperatives' size is positively related to their export intensity.

With regard to the first hypothesis, the model specified strongly confirms that the relationship between firm size and export status remains positive and significant. The results support the assertion that cooperatives' size matters. Engaging in export activities is more difficult for small cooperatives; therefore, a self-selection mechanism exists. The second hypothesis is line with those works that do not find a significant impact of firm size on export intensity. We can lend weak support to the idea that size has an important effect on the possibility of increasing the export intensity. Thus, cooperatives' behaviour with respect to exports is similar to that highlighted in the literature for capitalist companies.

We have reached an empirical basis for affirming that cooperatives' size significantly influences the decision to export or not to export, but once that step has been taken, the intensity of the exports responds to a plurality of causes, among which the size of the cooperative is not the most important. If higher export intensity indicates a greater effectiveness in firms' internationalisation activities (Wolff & Pett, 2000), the small cooperatives that overcome the difficulties to become exporters could show at least the same effectiveness as the large.

The paper also provides evidence that innovation is not significant in defining cooperatives' export status, but it becomes essential to boosting their export intensity. The sample data show a low level of innovation among cooperatives. There is no doubt that cooperatives have to overcome this lack if they want to have a chance to strengthen their position in foreign markets. There are two key ideas that need to be kept in mind. First, Fayos, Calderón, & Mir (2011) indicate that the literature agrees that product differentiation and brand development should be the main innovation pathways for cooperatives. They should orient innovation towards customers, and product differentiation should be their identifying factor. This may lead to improved sales and margins. Second, coopetition, defined as a simultaneous process of cooperation and competition (Basterretxea, Charterina, & Landeta, 2019), has to be taken into account by cooperatives with limitations in terms of size and/or resources in order to enhance their possibilities for undertaking R&D projects. A collaborative relationship in R&D is difficult because, among other reasons, firms can see it as a transmission of knowledge to their competitors. However, there are important benefits such as reducing costs and risks, obtaining public funding, obtaining financial resources, or sharing knowledge (Basterretxea et al., 2019). The challenge is important but should be possible.

We have found a negative relationship between age and export performance. The fact pointed out by Bernard & Jensen (1999) that if annual export profits were the same for young and old firms, young firms would receive smaller returns upon entering the export market because they face higher risk of failure, does not seem to hold. Why does it not work? In our opinion, because of risk aversion and the difficulty in accessing external funding (Bretos & Marcuello, 2017), have historically been more valued by members of older cooperatives than returns from entering the export market. However, Guzman, Santos, & Barroso (2020) highlight that nowadays, cooperative philosophy and entrepreneurial quality are positively correlated. This means that, regardless the age, if resources and financing lines were

more available to cooperatives and, in addition, the dissemination of their principles and values among society increased, the cooperatives' results in domestic and foreign markets would improve.

Our empirical findings yield important policy implications. If size is important to achieve exporter status, measures can be taken to encourage the size of cooperatives, although, in our opinion, they should not be the only ones. In order to guarantee the success of cooperatives in foreign markets, policy-makers should play a more vital role in facilitating access to financing lines and in providing information that reduces uncertainty. However, to support cooperatives to engage in foreign markets is not without some collateral dangers. Given the form of how internationalisation unfolds, it may come into conflict with the nature of cooperatives (Bretos & Marcuello, 2017; Flecha & Ngai, 2014). Exporting as the first step towards internationalisation can drive cooperatives to become a “coopitalist” dual model that makes it difficult to comply with cooperative principles (Bretos, Errasti, & Marcuello, 2020, 2018; Bretos & Marcuello, 2017; Errasti, 2015; Flecha & Ngai, 2014). Global markets may suppose degenerative tensions that lead cooperatives closer to capitalist values and farther from their original democratic and social dynamic (Bretos & Errasti, 2017; Bretos, Errasti, et al., 2018; Leite & Duaibs, 2017). However, this is not true by nature. Ignacio Bretos et al. (2020) affirm that a balanced path is possible by activating processes and mobilising resources to revitalise the cooperative practices and values. The tendency for regeneration can occur, even simultaneously with degenerative processes.

Therefore, transversal policies must be established. Their aims should be not only to help the creation or boost the size of cooperatives, to facilitate access to financing and boost exports or innovation, but also to promote subjects in the educational system focusing on training, teaching, and consolidating the principles and values of cooperatives. This way of proceeding would lead new entrepreneurs to know that cooperatives could be a successful alternative organisational model and decide to bet on them. The design and application of policies based on the principles of democracy and cooperation in companies is, even today, far from being achieved. That is precisely why it is necessary to continue persevering at it.

Despite the value of findings, our study has several limitations. First, the study is focused on the manufacturing sector, and the number of cooperatives is lower than that of other analyses in this field. Second, as we have already indicated, the ESEE provides information on firms with ten or more employees, and this could imply overrepresentation of export cooperatives (Delgado, Fariñas, & Ruano, 2002). Furthermore, export activity is affected by many factors that are not easily controlled. Nevertheless, referring to the sample, many papers focusing on Spanish manufacturing firms work with this survey, which grants validity; and referring to the variables modeled, they are those used in similar investigations.

As a final reflexion, our results can guide cooperatives and institutions to design strategies and policies that will improve exporting results. We want to emphasise again the need that these processes must be done preserving the cooperatives' principles and values. Increasing the size of cooperatives to improve their achievements in the international market will be useless if it is followed by a loss of cooperative identity.

## References

---

1. Ahmed, S. A., & Rock, J. (2012). Exploring the Relationship Between Export Intensity and Exporter Characteristics, Resources, and Capabilities: Evidence From Chile. *Latin American Business Review*, 13(1), 29–57. <https://doi.org/10.1080/10978526.2012.673423>
2. Ali, A., & Swiercz, P. (1991). Firm Size and Export Behavior: Lessons from the Midwest. *Journal of Small Business Management*, 29(2), 71–78.
3. Alonso, J. A., & Donoso, V. (2000). Modelización del comportamiento de la empresa exportadora española. *ICE Sector Exterior Español*, (788), 35–58.
4. Alshiqi, S. (2020). Firm Size Related To Export Performance. *International Journal of Economics and Business Administration*, 8(1), 51–61. <https://doi.org/10.35808/ijeba/408>

5. Archarungrroj, P., & Hoshino, Y. (1998). The Impact of Firm Size on Export Performance and Attitudes : An Empirical Study on Thailand Exporters. *Japanese Journal of Administrative Science*, 12(2), 79–88.
6. Author (2020a). Cooperative employment cycles in Spain. Does regional localization matter? *REVESCO. Revista de Estudios Cooperativos*, 136(e71857). <https://doi.org/https://dx.doi.org/10.5209/reve.71857>. 1.
7. Author (2020b). Exporting and Firms ' Performance — What about Cooperatives ? Evidence from Spain. *Sustainability*, 12(8385), 1–22.
8. Aydiner, A. S., Tatoglu, E., Bayraktar, E., Zaim, S., & Delen, D. (2019). Business analytics and firm performance: The mediating role of business process performance. *Journal of Business Research*, 228–237. <https://doi.org/10.1016/j.jbusres.2018.11.028>
9. Ayllón, S., & Radicic, D. (2019). product innovation, process innovation and export propensity: persistence, complementaries and feedback effects in Spain firms. *Applied Economics*, 51(33), 3650–3664. <https://doi.org/https://doi.org/10.1080/00036846.2019.1584376>
10. Bandick, R. (2020). Global sourcing, firm size and export survival. *Economics: The Open-Access, Open-Assessment E-Journal*, 14(2020–18), 1–29. Retrieved from <http://dx.doi.org/10.5018/economics-ejournal.ja.2020-18>
11. Bartual-Figueras, M. T., & Turmo-Garuz, J. (2019). Competitive Strategies in Agricultural Cooperatives: The Case of a Rice Cooperative, Catalonia, Spain. *The International Journal of Business & Management*, 7(6), 166–176. <https://doi.org/10.24940/theijbm/2019/v7/i6/bm1905-054>
12. Basterretxea, I., Charterina, J., & Landeta, J. (2019). Coopetition and innovation. Lessons from worker cooperatives in the Spanish machine tool industry. *Journal of Business and Industrial Marketing*, 34(6), 1223–1235. <https://doi.org/10.1108/JBIM-01-2018-0015>
13. Basterretxea, I., & Storey, J. (2018). Do Employee-Owned Firms Produce More Positive Employee Behavioural Outcomes? If Not Why Not? A British-Spanish Comparative Analysis. *British Journal of Industrial Relations*, 56(2), 292–319. <https://doi.org/10.1111/bjir.12247>
14. Bernard, A. B., & Jensen, J. B. (1999). Exceptional exporter performance: Cause, effect, or both? *Journal of International Economics*, 47(1), 1–25. [https://doi.org/10.1016/S0022-1996\(98\)00027-0](https://doi.org/10.1016/S0022-1996(98)00027-0)
15. Bezuidenhout, C. (2017). *Essays in export behaviour at the firm-level*. North-West University.
16. Bonaccorsi, A. (1992). On the Relationship Between Firm Size and Export Intensity. *Journal of International Business Studies*, 23(4), 605–635. <https://doi.org/10.1057/palgrave.jibs.8490280>
17. Bretos, I., Díaz-Foncea, M., & Marcuello, C. (2018). Cooperativas e internacionalización: Un análisis de las 300 mayores cooperativas del mundo. *CIRIEC-España Revista de Economía Pública, Social y Cooperativa*, 92(92), 5–37. <https://doi.org/10.7203/CIRIEC-E.92.11480>
18. Bretos, I., & Errasti, A. (2017). Challenges and opportunities for the regeneration of multinational worker cooperatives: Lessons from the Mondragon Corporation—a case study of the Fagor Ederlan Group. *Organization*, 24(2), 154–173. <https://doi.org/10.1177/1350508416656788>
19. Bretos, I., Errasti, A., & Marcuello, C. (2018). Ownership, governance, and the diffusion of HRM practices in multinational worker cooperatives: Case-study evidence from the Mondragon group. *Human Resource Management Journal*, 28(1), 76–91. <https://doi.org/10.1111/1748-8583.12165>
20. Bretos, I., Errasti, A., & Marcuello, C. (2020). Is there life after degeneration ? The organizational life cycle of cooperatives under a ' grow-or-die ' dichotomy. *Annals of Public and Cooperative Economics*, (91), 435–457. <https://doi.org/10.1111/apce.12258>
21. Bretos, I., & Marcuello, C. (2017). Revisiting Globalization Challenges and Opportunities in the Development of Cooperatives. *Annals of Public and Cooperative Economics*, 88(1), 47–73. <https://doi.org/10.1111/apce.12145>
22. Caldera, A. (2010). Innovation and exporting: Evidence from Spanish manufacturing firms. *Review of World Economics*, 146(4), 657–689. <https://doi.org/10.1007/s10290-010-0065-7>
23. Calderón, B., & Calderón, M. J. (2012). La calidad del empleo de las entidades de la economía social en el período de crisis. *Ekonomiaz*, 79, 30–57.
24. Calof, J. L. (1993). The Impact of Size on Internationalization. *Journal of Small Business*

- Management*, 31(4), 60.
25. Calof, J. L. (1994). The Relationship Between Firm Size and Export Behavior Revisited. *Journal of International Business Studies*, 25(2), 367–387. <https://doi.org/10.1057/palgrave.jibs.8490205>
  26. Caves, D., Christesen, L. R., & Diewert, W. E. (1982). Multilateral Comparisons of Output, Input, and Productivity Using Superlative Index Numbers. *The Economic Journal*, 92(365), 73–86.
  27. Celebic, N., Stitkovac, S., Halilbegovic, S., & Arapovic, A. O. (2020). Impact of firm size on the export performance in manufacturing companies in Bosnia and Herzegovina. *Ecoforum*, 9(22), 1–7.
  28. Culpan, R. (1989). Export behavior of firms: Relevance of firm size. *Journal of Business Research*, 18(3), 207–218. [https://doi.org/10.1016/0148-2963\(89\)90045-3](https://doi.org/10.1016/0148-2963(89)90045-3)
  29. Damijan, J. P., Kostevc, Č., & Polanec, S. (2010). From Innovation to Exporting or Vice Versa? *World Economy*, 33(3), 374–398. <https://doi.org/10.1111/j.1467-9701.2010.01260.x>
  30. Delgado, M. A., Fariñas, J. C., & Ruano, S. (2002). Firm productivity and export markets: A non-parametric approach. *Journal of International Economics*, 57(2), 397–422. [https://doi.org/10.1016/S0022-1996\(01\)00154-4](https://doi.org/10.1016/S0022-1996(01)00154-4)
  31. Dhanaraj, C., & Beamish, P. W. (2003). A resource-based approach to the study of export performance. *Journal of Small Business Management*, 41(3), 242–261. <https://doi.org/10.1111/1540-627x.00080>
  32. Díaz-Foncella, M., & Marcuello, C. (2014). The Relation between Total Employment and Cooperative Employment: A Convergence and Causality Analysis. *Spatial Economic Analysis*, 9(1), 71–92. <https://doi.org/10.1080/17421772.2013.864048>
  33. Divar Garteiz-Aurrecoa, J. (2013). Las cooperativas: Una alternativa económica y social frente a la crisis. *Boletín de La Asociación Internacional de Derecho Cooperativo*, (47), 257–264. <https://doi.org/10.18543/baidc-47-2013pp257-264>
  34. Donoso, V., & Martín, V. (2008). Características y comportamiento de la empresa exportadora. *Papeles de Economía Española*, (116), 168–182.
  35. Errasti, A. (2015). Mondragon's Chinese subsidiaries: Coopitalist multinationals in practice. *Economic and Industrial Democracy*, 36(3), 479–499. <https://doi.org/10.1177/0143831X13511503>
  36. Esteve-Pérez, S., & Rodríguez, D. (2013). The dynamics of exports and R&D in SMEs. *Small Business Economics*, 41(1), 219–240. <https://doi.org/10.1007/s11187-012-9421-4>
  37. Falk, M., & de Lemos, F. F. (2019). Complementarity of R&D and productivity in SME export behavior. *Journal of Business Research*, (96), 157–168. <https://doi.org/10.1016/j.jbusres.2018.11.018>
  38. Fariñas, J. C., & Jaumandreu, J. (1999). Diez años de Encuesta Sobre Estrategias Empresariales (ESEE). *Economía Industrial*, (329), 29–42.
  39. Fariñas, J. C., & Martín-Marcos, A. (2007). Exporting and economic performance: Firm-level evidence of Spanish manufacturing. *World Economy*, 30(4), 618–646. <https://doi.org/10.1111/j.1467-9701.2007.01007.x>
  40. Fayos, T., Calderón, H., & Mir, J. (2011). El éxito en la internacionalización de las cooperativas agroalimentarias españolas. Propuesta de un modelo de estudio desde la perspectiva del marketing internacional. *CIRIEC-España, Revista de Economía Pública, Social y Cooperativa*, (72), 42–72.
  41. Fernández, M. del V., Peña, I., & Hernández, F. (2008). Factores determinantes del éxito exportador. El papel de la estrategia exportadora en las cooperativas agrarias. *CIRIEC-España, Revista de Economía Pública, Social y Cooperativa*, (63), 39–64.
  42. Flecha, R., & Ngai, P. (2014). The challenge for Mondragon: Searching for the cooperative values in times of internationalization. *Organization*, 21(5), 666–682. <https://doi.org/10.1177/1350508414537625>
  43. Freixanet, J., & Churakova, I. (2018). Exploring the relationship between internationalization stage, innovation, and performance: The case of Spanish companies. *International Journal of Business*, 23(2), 131–150.
  44. Fuentes, F. J., Sánchez, S. M., & Santos, L. M. (2011). Cooperativas agroalimentarias y exportación. El proceso de internacionalización de la cooperativa del valle de los Pedroches (COVAP). *REVESCO Revista de Estudios Cooperativos*, (104), 38–62. <https://doi.org/10.5209/rev>



45. Fusco, F., & Migliaccio, G. (2018). Crisis, sectoral and geographical factors: financial dynamics of Italian cooperatives. *EuroMed Journal of Business*, 13(2), 130–148. <https://doi.org/10.1108/EMJB-02-2016-0002>
46. Gallego-Bono, J. R., & Chaves-Avila, R. (2020). How to boost clusters and regional change through cooperative social innovation. *Economic Research-Ekonomiska Istrazivanja*, 33(1), 3108–3124. <https://doi.org/10.1080/1331677X.2019.1696694>
47. Good, D. H., Nadiri, M. I., & Sickles, R. (1997). *Handbook of Applied Econometrics: Micro-Econometrics*. Oxford: Blackwell.
48. Guzmán, C., Santos, F. J., & Barroso, M. de la O. (2020). Cooperative Essence and Entrepreneurial Quality: a Comparative Contextual Analysis. *Annals of Public and Cooperative Economics*, 91(1), 95–118. <https://doi.org/10.1111/apce.12257>
49. Ha, V. T. C., Holmes, M. J., & Le, T. M. (2020). Firms and export performance: does size matter? *Journal of Economic Studies*, 47(5), 985–999. <https://doi.org/10.1108/JES-12-2018-0451>
50. Hernández, P. J. (2020). Reassessing the link between firm size and exports. *Eurasian Business Review*, 10(2), 207–223. <https://doi.org/10.1007/s40821-019-00126-9>
51. Iyer, K. (2010). The Determinants of Firm-Level Export Intensity in New Zealand Agriculture and Forestry. *Economic Analysis and Policy*, 40(1), 75–86. [https://doi.org/10.1016/S0313-5926\(10\)50005-5](https://doi.org/10.1016/S0313-5926(10)50005-5)
52. Jäger, U., & Beyes, T. (2010). Strategizing in NPOs: A case study on the practice of organizational change between social mission and economic rationale. *Voluntas*, 21(1), 82–100. <https://doi.org/10.1007/s11266-009-9108-x>
53. Kölling, A., & Antje, M. (2020). Exporting behavior and the demand for skills in German establishments. In *IMB Institute of Management Berlin Working Paper* (No. 97). Berlin.
54. Lee, Y., Shin, J., & Park, Y. (2012). The changing pattern of SME's innovativeness through business model globalization. *Technological Forecasting and Social Change*, 79(5), 832–842. <https://doi.org/10.1016/j.techfore.2011.10.008>
55. Leite, M. de P., & Duaibs, R. (2017). Cooperatives and productive internationalization: A new challenge. *Sociología & Antropología*, 7(2), 521–543.
56. Leonidou, L. C. (1998). Factors Stimulating Export Business: An Empirical Investigation. *Journal of Applied Business Research (JABR)*, 14(2), 43–68. <https://doi.org/10.19030/jabr.v14i2.5714>
57. López, J., & Serrano, B. (2020). Human capital and export performance in the Spanish manufacturing firms. *Baltic Journal of Management*, 15(1), 99–119. <https://doi.org/10.1108/BJM-04-2019-0143>
58. Madrid, A., & García, D. (2004). Influencia del tamaño, la antigüedad y el rendimiento sobre la intensidad exportadora de la PYME industrial española. *Información Comercial Española, ICE: Revista de Economía*, (817), 35–49.
59. Majocchi, A., Bacchiocchi, E., & Mayrhofer, U. (2005). Firm size, business experience and export intensity in SMEs: A longitudinal approach to complex relationships. *International Business Review*, 14(6), 719–738. <https://doi.org/10.1016/j.ibusrev.2005.07.004>
60. Máñez-Castillejo, J. A., Rochina-Barrachina, M. E., & Sanchis-Llopis, J. A. (2009). Self-Selection into exports : Productivity and/or innovation? *Applied Economics Quarterly*, 55(3), 219–241.
61. Máñez-Castillejo, J. A., Rochina-Barrachina, M. E., & Sanchis-Llopis, J. A. (2010). Does firm size affect self-selection and learning-by-exporting? *World Economy*, 33(3), 315–346. <https://doi.org/10.1111/j.1467-9701.2010.01258.x>
62. Máñez, J. A., Rochina-Barrachina, M. E., & Sanchis-Llopis, J. A. (2015). The dynamic linkages among exports, R&D and productivity. *World Economy*, 38(4), 583–612. <https://doi.org/10.1111/twec.12160>
63. Máñez, J. A., Rochina-Barrachina, M. E., & Sanchis, J. A. (2008). Sunk costs hysteresis in Spanish manufacturing exports. *Review of World Economics*, 144(2), 272–294. <https://doi.org/10.1007/s10290-008-0147-y>
64. Manjón, M., Máñez, J. A., Rochina, M. E., & Sanchis, J. A. (2013). Export intensity and the productivity gains of exporting. *Applied Economics Letters*, 20(8), 804–808.



- <https://doi.org/10.1080/13504851.2012.748173>
65. Medina, M. J., Mozas, A., Bernal, E., & Moral, E. (2014). Factores determinantes para la exportación en las empresas cooperativas oleícolas andaluzas. *CIRIEC-España, Revista de Economía Pública, Social y Cooperativa*, (81), 241–262.
66. Melitz, M. J. (2003). The impact of trade on intra-industry reallocations and aggregate industry productivity. *Econometrica*, 71(6), 1695–1725. <https://doi.org/10.1111/1468-0262.00467>
67. Minondo, A. (2011). Learning to export with new managers. *Empirical Economic Letters*, 10(1), 7–11.
68. Mittelstaedt, J. D., Harben, G. N., & Ward, W. A. (2003). How Small is too Small? Firm Size as a Barrier to Exporting from the United States. *Journal of Small Business Management*, 41(1), 68–84. <https://doi.org/10.1111/1540-627x.00067>
69. Moen, O. (2012). The relationship between firm size, competitive advantages and export performance revisited. *International Small Business Journal*, 18(1), 53–72. Retrieved from <http://hjb.sagepub.com.proxy.lib.umich.edu/content/9/2/183.full.pdf+html>
70. Moini, A. H. (1995). An Inquiry into successful exporting: an empirical investigation using a three-stage model. *Small Business Management*, 33(3), 9–25.
71. Monreal-Pérez, J., Aragón-Sánchez, A., & Sánchez-Marín, G. (2012). A longitudinal study of the relationship between export activity and innovation in the Spanish firm: The moderating role of productivity. *International Business Review*, 21(5), 862–877. <https://doi.org/10.1016/j.ibusrev.2011.09.010>
72. Musson, A., & Rousselière, D. (2018). Exploring the effect of crisis on cooperatives : A Bayesian performance analysis of French craftsmen cooperatives. *Working Paper SMART – LERECO*, (18–07).
73. Ogawa, K., & Tokutsu, I. (2015). Productivity , Firm Size , Financial Factors , and Exporting Decisions : The case of Japanese SMEs. *RIETI Discussion Paper Series 15-E-031*.
74. Papke, L. E. (1996). Econometric methods for fractional response variables with an application to 401 (k) plan participation rates. *Journal of Applied Econometrics*, 11(6), 619–632. [https://doi.org/10.1002/\(SICI\)1099-1255\(199611\)11:6<619::AID-JAE418>3.0.CO;2-1](https://doi.org/10.1002/(SICI)1099-1255(199611)11:6<619::AID-JAE418>3.0.CO;2-1)
75. Papke, L. E., & Wooldridge, J. M. (2008). Panel data methods for fractional response variables with an application to test pass rates. *Journal of Econometrics*, 145(1–2), 121–133. <https://doi.org/10.1016/j.jeconom.2008.05.009>
76. Patibandla, M. (1995). Firm Size and Export Behaviour: An Indian Case Study. *The Journal of Development Studies*, 31(6), 868–882. <https://doi.org/10.1080/00220389508422394>
77. Pekovic, S., & Rolland, S. (2016). Quality standards and export activities: Do firm size and market destination matter? *The Journal of High Technology Management Research*, 27(2), 110–118. <https://doi.org/10.1016/j.hitech.2016.10.002>
78. Pla-Barber, J., & Alegre, J. (2007). Analysing the link between export intensity, innovation and firm size in a science-based industry. *International Business Review*, 16(3), 275–293. <https://doi.org/10.1016/j.ibusrev.2007.02.005>
79. Reis, J., & Forte, R. (2016). The impact of industry characteristics on firms' export intensity. *International Area Studies Review*, 19(3), 266–281. <https://doi.org/10.1177/2233865916646560>
80. Revindo, M. D., Gan, C., & Massie, N. W. G. (2019). Factors affecting propensity to export: The case of Indonesian smes. *Gadjah Mada International Journal of Business*, 21(3), 263–288. <https://doi.org/10.22146/gamaijb.41022>
81. Rodil, Ó., Vence, X., & Sánchez, M. del C. (2016). The relationship between innovation and export behaviour: The case of Galician firms. *Technological Forecasting and Social Change*, (113), 248–265. <https://doi.org/10.1016/j.techfore.2015.09.002>
82. Roelants, B., Dovgan, D., Eum, H., & Terrasi, E. (2012). The Resilience of the Cooperative Model. In *CECOP-CICOPA Europe*. <https://doi.org/10.1128/CEV.00435-06>
83. Román, C. A. (2014). Las cooperativas españolas y los ciclos económicos. Un análisis comparado. *CIRIEC - España. Revista de Economía Pública, Social y Cooperativa*, (80), 77–110.
84. Serrano, J., & Myro, R. (2019). From domestic to exporter, what happens? Evidence for Spanish manufacturing firms. *Structural Change and Economic Dynamics*, (51), 380–392.

- <https://doi.org/10.1016/j.strueco.2019.01.005>
85. Sousa, C. (2004). Export performance measurement: an evaluation of the empirical research in the literature. *Academy of Marketing Science Review*, 2004(09), 1.
86. Trang, P. T. H., & Nam, V. H. (2020). A longitudinal study of self-selection, learning-by-exporting and core-competence: The case of small-and medium-sized enterprises in Vietnam. *Accounting*, 6(4), 481–492. <https://doi.org/10.5267/j.ac.2020.4.010>
87. Verwaal, E., & Donkers, B. (2002). Firm size and export intensity: Solving an empirical puzzle. *Journal of International Business Studies*, 33(3), 603–613. <https://doi.org/10.1057/palgrave.jibs.8491035>
88. Wagner, J. (1995). Exports, firm size, and firm dynamics. *Small Business Economics*, 7(1), 29–39. <https://doi.org/10.1007/BF01074314>
89. Wagner, J. (2001). A Note on the Firm Size - Export Relationship. *Small Business Economics*, 17(4), 229–237. <https://doi.org/10.1023/A:1012202405889>
90. Wagner, J. (2003). Unobserved Firm Heterogeneity and the Size-Exports Nexus: Evidence from German Panel Data. *Review of World Economics*, 139(1), 161–172. <https://doi.org/10.1007/BF02659612>
91. Wagner, J. (2006). Export intensity and plant characteristics: What can we learn from quantile regression? *Review of World Economics*, 142(1), 195–203. <https://doi.org/10.1007/s10290-006-0063-y>
92. Wagner, J. (2007). Exports and productivity: A survey of the evidence from firm-level data. *World Economy*, 30(1), 60–82. <https://doi.org/10.1111/j.1467-9701.2007.00872.x>
93. Wolff, J. A., & Pett, T. L. (2000). Internationalization of small firms: An examination of export competitive patterns, firm size, and export performance. *Journal of Small Business Management*, 38(2), 34–47.
94. Zou, S., & Stan, S. (1998). The determinants of export performance: A review of the empirical literature between 1987 and 1997. *International Marketing Review*, 15(5), 333–356. <https://doi.org/10.1108/02651339810236290>