
INTERNATIONALISATION OF SMES AND SIMULTANEOUS STRATEGIES OF COOPERATION AND COMPETITION: AN EXPLORATORY ANALYSIS

Emilio GALDEANO-GÓMEZ¹, Juan C. PÉREZ-MESA²,
José A. AZNAR-SÁNCHEZ³

^{1,3}*Departamento de Economía Aplicada, Universidad de Almería,
La Cañada de San Urbano, s/n, Almería 04700, Spain*

²*Departamento de Dirección y Gestión de Empresas, Universidad de Almería,
La Cañada de San Urbano, s/n, Almería 04700, Spain*

E-mails: ¹galdeano@ual.es (corresponding author); ²juancar1@ual.es; ³jaznar@ual.es

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Abstract. The present work examines the relationships between SMEs' marketing internationalisation and the combination of cooperation and competition strategies, i.e. co-opetition. Recent analyses have shown that the SMEs' exports capabilities are highly dependent on co-opetition, while others suggest that the challenges of international supply chain constitute a major driver to this combination. This analysis contributes to the literature by providing empirical evidence on both of these issues. A multivariate regression analysis is developed, measuring variables of SMEs' co-opetition and international activity, and taking as reference a set of 136 Andalusian food exporters. The results confirm the positive effect of strategies of cooperation with competitors (regarding logistics, promotion, quality and R&D) on international marketing activity. This positive effect is enhanced when large retailers are the main buyers, i.e. in hierarchical relationships. Furthermore, exporting activity is shown to promote co-opetition among suppliers. These findings highlight the importance of such strategies as regards both export capabilities of the food firms in this region and their expansion into new foreign markets. The empirical approach and certain implications drawn from the results can be extended to other analyses on SMEs in international contexts.

Keywords: cooperation, competition, SMEs, internationalisation, supply chain, food industry.

JEL Classification: F23, L14, L25, M21.

Introduction

The situation in which firms engage in simultaneous cooperation and competition with each other is a phenomenon known as co-opetition. This scenario has received increasing attention in business economics and management analyses (Stein 2010; Bouncken, Kraus 2013; Raza-Ullah *et al.* 2014; Park *et al.* 2014). In the domain of supply chain networks and for small and medium-sized enterprises, SMEs, these strategies are of

greater relevance given the complex environment of globalisation and competition in open markets (Bengtsson, Kock 2000; Song 2002; Luo 2007; Bigliardi *et al.* 2011). These firms face greater challenges regarding technology and access to specific resources due to their limited capabilities and limited market presence (Gnyawali, Park 2009). Consequently, alliances and collaborations with both buyers and suppliers prove to be key elements in overcoming these constraints. However, rivalry and competition are also regarded as major factors in successful internationalisation processes, as they are drivers for firms to attain a greater degree of specialisation and to improve efficiency, for example enabling them to allocate scarce resources optimally and providing incentives for innovation and entrepreneurship (Wagner 2007; van Beers, van der Panne 2011).

In certain industries, this combination of factors leads to a complex scenario of inter-organisational relationships of cooperation and competition. In supply chain management analyses (Gurnani *et al.* 2007; Wu *et al.* 2010), these relationships tend to be classified as either buyer-supplier (vertical level) or supplier-supplier relationships (horizontal level). In practice, the dyadic or triadic perspectives are over-simplified, as relationships between more than two or three actors should be considered (Wilhelm 2011). Several buyers and suppliers tend to participate in supply chain networks, particularly in industries with a high proportion of SMEs (Provan *et al.* 2007; Gnyawali, Park 2009), and in which the form of governance (hierarchical and non-hierarchical) influences cooperation and competition strategies. For instance, due to their market power and/or their closeness to the end consumer, some buyers (e.g. large retailers in food markets) can exert an influence on the selection and interaction of several of their intermediate suppliers, thus endowing certain networks in the supply chain with greater stability. This hierarchical influence may in turn allow these suppliers to develop their capabilities (e.g. specialisation) to a greater extent (Wilhelm 2011). On the other hand, for those suppliers that are outside these networks, this environment of hierarchy, characterised by a “hub firm” (Wassermann, Fauts 1994), may provide an incentive for developing their co-opetition relationships (Czaron 2009).

In particular, the internationalisation process requires the establishment of multilateral relationships with different partners in the trade channel (Wong 2011), implying an incentive for these simultaneous strategies (Provan *et al.* 2007). Concurrently, the competitive advantages derived from co-opetition usually constitute an essential generator of capabilities for exports in SMEs (Vanyushyn *et al.* 2009; Kock *et al.* 2010). Nevertheless, to date these dual implications have not been analysed empirically.

The present work aims to contribute to the literature on SMEs’ internationalisation strategies. To this end, a multivariate regression analysis is developed, measuring variables of co-opetition and international activity. The study takes the export supply chains related to the food industry in Andalusia (Spain), and tests two questions: i) What is the effect of simultaneous competition and cooperation on the SMEs’ international activity?; ii) Can the SMEs’ internationalisation enhance their co-opetitive strategies?

The sample of marketing firms from the Andalusian food sector is considered a suitable empirical setting for this analysis. In the last two decades this sector has experienced

considerable growth in sales to new foreign markets, mainly in Europe, dealing with large retail chains and wholesalers as main buyers (Rodríguez-Rodríguez *et al.* 2012). This supply industry is predominantly made up of numerous SMEs, which has implied a certain disadvantage when dealing with the buyers, as negotiations have traditionally been held on an individual basis and in the face of high competition among suppliers. Over recent years, however, cooperation among these marketing firms has become more common, for example regarding R&D, promotion, scheduling of production and sales (Galdeano-Gómez 2010).

The results obtained show that both supplier-supplier and buyer-supplier cooperation actions, such as logistics, management quality and R&D, have a positive bearing on the propensity of SMEs to sell in foreign markets; even so the sector under analysis features a competitive structure. They also show that these effects may vary according to the type of governance that is prevalent in the international channel. On the other hand, they provide evidence to the effect that simultaneous strategies of cooperation and competition are encouraged by the SMEs' international activity. Although the analysis is limited to one specific industry, the empirical approach and certain implications drawn from the results can be extended to other analyses on SMEs in international contexts.

The remainder of the paper is organised as follows. Section 1 outlines the main theories and hypotheses. Section 2 expounds the empirical setting and the methodology. Section 3 goes on to explain the results of the applied study, while the final section outlines the conclusions.

1. Theory and hypotheses

1.1. Literature review

Over recent decades supply chains related to international markets have absorbed the production and distribution of an increasing number of firms (Wong 2011). Alliances are becoming more and more important in an environment characterised by globalisation and a high level of competition (Bigliardi *et al.* 2011). This is particularly true in the case of SMEs, since they face a greater degree of uncertainty and find it more difficult to access technologies and resources. As a result, cooperation proves essential for them to overcome these challenges. In addition, the differences in bargaining power among the actors in the supply chain provide a further incentive to cooperate with competitors (Czakoń 2009). For instance, a buyer with high bargaining power acts as a driver to cooperation among several small suppliers.

Nevertheless, these cooperation strategies are limited or hampered by the firms' tendency to go it alone and by the variability in trade power within the supply chain. On the one hand, cooperative actions require a certain degree of stability and balance in profit sharing, and for this reason they prove difficult to maintain in the long term for companies that are also interested in maximising their own profit (Bigliardi *et al.* 2011). On the other hand, capabilities may be created associated with rivalry among firms, e.g. correct allocation of resources and promotion of innovation (Kock *et al.* 2010), which

prove essential if the firm is to access international markets in better competitive conditions of efficiency and productivity (Jankowska 2011).

The co-opetitive perspective emerges in this context of business relationships, highlighting the ambivalence of competition and cooperation (Padula, Dagnino 2007; Stein 2010). Rather than a simple combination of these two basic strategies, this is regarded as a new strategic relationship between firms, more in terms of value creation or performance than merely in terms of profit (Brandeburger, Nalebuff 1996; Padula, Dagnino 2002). The motivation for cooperating with competitors can therefore vary, e.g. from sharing market risks and/or improving access to external knowledge and resources (Morris *et al.* 2007; Tidström 2009), to internal organisational learning and/or enhancing the business's overall performance (Luo *et al.* 2006; Park *et al.* 2014).

All of the above factors contribute to making these relationships complex, but at the same time dynamic, and more than a simple dyadic or triadic relationship among suppliers and buyers within the supply chain. For instance, a buyer and supplier might compete over the allocation of profits in a product while simultaneously collaborating in the product's marketing campaigns in new markets. Likewise, in order to acquire the product, a buyer with strong bargaining power may generate cooperation between two suppliers who compete with one another for market share (Czakov 2009; Wilhelm 2011).

Consequently, although for simplicity's sake supply chain analyses (e.g. Wu *et al.* 2010) tend to distinguish between horizontal (supplier-supplier) and vertical relationships (supplier-buyer), it seems logical to consider the idea of co-opetition also in terms of intensity (e.g. the number of cooperation activities with competitors) and diversity (Gnyawali *et al.* 2006), as well as from a dynamic perspective (Wilhelm 2011).

The variability in cooperation and competition strategies also depends on the type of governance prevalent in the supply chain network. For instance, Wilhelm (2011) considers that in the case of hierarchical governance the relationships between buyers and suppliers may be more stable. In international business activity, certain authors differentiate between hierarchical and hybrid export channels (He *et al.* 2012). While the former are more likely among firms that have developed strong capabilities in market orientation, the latter are more frequently found in companies with weak capabilities in this area. By way of example, the retail chains in the current European food market can be regarded as a direct, hierarchical channel. However, in cases where the role of wholesalers is more prevalent, the chain is a non-hierarchical one. The implications of these two types of channel are clearly differentiated: the retail chains exert more market power than the more numerous wholesalers, and they are therefore in a position to enhance vertical collaboration and ensure stable purchases (Pérez-Mesa, Galdeano-Gómez 2010).

The SMEs' internationalisation capabilities are therefore dependent on the multilateral horizontal and vertical relationships that they establish in supply chains. Along these lines Vanyushyn *et al.* (2009) analyse the degree of simultaneous cooperation and competition strategies of small Finnish export-oriented firms. Similarly, Jankowska (2011) outlines the relevance of co-opetition among small firms in Poland, also related to

their capabilities for international competition. Granata (2012) asserts that the smaller firms in the French wine industry find it easier to cooperate with competitors as their structures and procedures prove more flexible and therefore adaptable to testing new relationships. Zhang and Dai (2013) find that for Chinese exporters these relationships are the result of, among other factors, the development of simultaneous strategies of competition and cooperation with their business stakeholders in different kinds of international chains.

Nevertheless, there is a lack of empirical studies that quantify the effects of such strategies on the firms' export capabilities, while at the same time evaluating the implications of internationalisation challenges on the cooperation and competition between firms. The present work therefore intends to provide empirical evidence along these lines on international supply chains, employing an analytical approach to measure the SMEs' co-opetition in export activity efforts.

1.2. Hypotheses

The collective strategies of cooperation between competing firms provide a firm with access to resources, information and technologies for exporting activities (Kock *et al.* 2010). In international supply chains, the horizontal and vertical co-opetition strategies of SMEs (Vanyushyn *et al.* 2009; Granata 2012) allow the generation of new capabilities and improve efficiency (Wong 2011), thus implying improved export activity (Jankowska 2011; Zhang, Dai 2013). In this line, our first hypothesis states:

H1: The SMEs' international marketing activity will be enhanced by the supplier-supplier and buyer-supplier relationships of cooperation among competitors.

The choice of supply chain in international markets is also a determining factor for the success of export operations (Wong 2011). Importer market knowledge, the generation of competitive advantages and the outsourcing of value-chain stages depend on the co-opetitive strategies of SMEs with other businesses in the supply chain that have greater market power (Czakon 2009). For instance, in food supply chains, as expounded above, different types of clients (wholesalers and retailers) possess differing market power, and this may affect not only the stability of exporting activities, but also the competition and collaboration with suppliers in order to improve export capabilities (Pérez-Mesa, Galdeano-Gómez 2010; He *et al.* 2012). Considering that hierarchical chains involve international retailers and non-hierarchical ones involve wholesalers and other buyers, the following hypothesis would complement the previous one:

H2: The effects of co-opetition on a SME's international activity will be greater due to the buyer-supplier relationships in hierarchical channels, i.e. international retailers as main buyers.

The review of the literature reveals that internationalisation and the export orientation of the firm is a driver for developing co-opetitive strategies, particularly for SMEs (Jankowska 2011; Zhang, Dai 2013). Businesses are motivated to cooperate with competitors regarding exports in order to gain scale economies, share risks and reduce uncertainty (Vanyushyn *et al.* 2009). This implies that, from a dynamic perspective, the

intensification of exporting activities can enhance inter-organisational relationships in terms of intensity and diversity. For instance, once the firm has adopted new technologies to enhance its exports potential, it is not likely to abandon the international supply chain due to the high cost involved (He *et al.* 2012). In other cases, this maintenance of co-opetitive strategies is due to the variety of buyers involved. As indicated by authors as Wilhelm (2011) for the automobile industry, this situation is due to the influence of certain buyers and to the firms' branch specialisation, which allows it to collaborate regarding some specific products while competing as regards others. In the case of Andalusian food industry, the firms analysed are confronted with different types of buyers and with new market conditions; in this scenario, some of the firms find themselves cooperating on, say R&D projects to develop novel pre-prepared products for a new market or specific buyer, while at the same time competing with respect to more traditional products. Therefore, the third hypothesis states:

H3: The simultaneous strategies of cooperation and competition of SMEs, in terms of intensity and diversity, will be enhanced by their international marketing activity.

Not only does the type of channel influence exporting activities, but it may also have an additional effect, intensifying or moderating the influence of international activity on co-opetition (Wong 2011; Jankowska 2011; Granata 2012) depending on the different market power enjoyed by the buyers in foreign markets. An environment of hierarchy, e.g. with the presence of a hub firm (Wassermann, Fauts 1994), may imply a greater incentive to develop their co-opetition relationships (Czakoń 2009). For instance, exports via retail chains constitute a more hierarchical channel and may be more influential in increasing co-opetitive strategies (Pérez-Mesa, Galdeano-Gómez 2010). Thus, to complement the previous hypothesis we state:

H4: The influence of international marketing activity on co-opetition strategies among SMEs will be higher in hierarchical channels, i.e. retailers as main buyers.

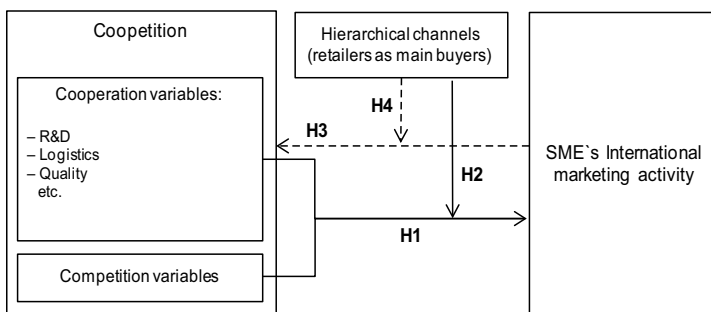


Fig. 1. Main relationships of the analysis

2. Methods

2.1. Sample

As previously indicated, the reference set for the empirical analysis consists of the marketing firms in the Andalusian food industry which has experienced considerable growth in exports to traditional and new foreign markets (Rodríguez-Rodríguez *et al.* 2012). These firms specialise in the commercialisation of citrus fruits and horticultural produce mainly dealing with large European retail chains and wholesalers. The small-scale nature of these exporting firms means that they must deal on the one hand with a certain asymmetry of bargaining power, and on the other with a scenario in which they are often required to cooperate with their competitors to satisfy the demand of international clients (De Pablo-Valenciano *et al.* 2007). For instance, many of these firms are members of sector-wide associations that provide a number of common services, such as collaborations in joint research projects and technical assistance in applications for subsidies (Pérez-Mesa, Galdeano-Gómez 2010). Cooperation initiatives are also being carried out in the field of marketing logistics, for instance: joint promotion in major markets (e.g. the German market) and opening commercial offices in emerging markets (such as Canada, Poland or the Czech Republic).

The data regarding the firms' cooperation activities were gleaned from annual surveys from the period 2008–2012 carried out by business associations that are members of Hortyfruta (Interprofessional Organisation of Fruit and Vegetables in Andalusia). These reports reveal that the cooperation between the firms in the sector is on logistics, R&D, management quality, promotion and subsidy applications¹. Information on the type of buyers in export activity, i.e. percentage of sales to retail chains and wholesalers, was obtained from original surveys for this analysis. The financial data of individual firms were obtained from the SABI (Iberian Balance Sheets Analysis System). From an initial sample of 164 firms included in the surveys of Hortyfruta, 17 denied cooperating with other firms in the sector, while 2 shut down during the course of this research, and 9 did not provide the sales percentages to buyers as requested. The final sample is made up of 136 firms (which account for 64.7% of the sector's international marketing) and a total of 680 observations were used to construct panel data for the empirical analysis.

2.2. Effects on SMEs' marketing internationalisation

Two variables are considered as indicators of the firm's internationalisation: i) export sales as a percentage of the company's total sales (EXP), which is a common indicator of export intensity or propensity (e.g. Verwaal, Donkers 2002; Wagner 2007); ii) sales to new foreign markets (NEWM), as these markets imply new challenges and adapta-

¹ Most of these cooperation variables are frequently considered in co-opetition studies, particularly in SMEs' strategies, such as R&D (e.g. Gnyawali, Park 2009; Park *et al.* 2014), management and quality improvement (e.g. Bigliardi *et al.* 2011; Granata 2012) and logistics (e.g. Song 2002; Song, Lee 2012). The others, namely promotional activities and subsidy applications, are more specific to this food industry. In addition, some analyses on this sector also show several implications of most of these actions on SMEs' international competitiveness (e.g. Pérez-Mesa, Galdeano-Gómez 2010; De Pablo *et al.* 2007).

tion to a new market environment, e.g. different buyers (Jankowska 2011; Zhang, Dai 2013). The aim is to determine the influence of competition and cooperation strategies on these variables, which will allow us to test hypotheses H1 and H2. Regarding the explanatory variables, the following groups are considered:

1. Actions of cooperation with competitors cover both supplier-supplier and buyer-supplier relationships, i.e. horizontal and vertical collaborations within the international chain (Wu *et al.* 2010). In accordance with the sample data, the main types of cooperative actions considered, taking the number of actions undertaken by each firm, are as follows: promotion of sale in international markets (PROM), coordination of quality systems (QUAL), export logistics (LOGIS), subsidy applications (SUBS) and collaborative research and development (R&D).
2. In order to obtain a measurement of competition (COMP) we consider the percentage of participation of each firm in the sector's sales. This is frequently used as an indicator of firms' competitive behaviour (Gnyawali *et al.* 2006) and of their relative market power in the international supply chain (Czakon 2009).
3. In order to determine whether governance in the supply chain in a co-opetitive environment is predominantly hierarchical or non-hierarchical (Wilhelm 2011), we analyse the main buyers of the firms in the sample: where sales to retail chains predominate, the channel is considered hierarchical (HIERCH), whereas if the majority of sales are to other buyers (mainly wholesalers) the channel is deemed non-hierarchical (N-HIERCH) (He *et al.* 2012). The influence of these variables allows hypothesis H2 to be tested.
4. Several control variables are considered: a productivity indicator (PROD), measured as the business's labour productivity (profit per worker), which is often considered as a variable of efficiency in firms' export analyses (Wagner 2007); a size variable (SIZE), measured as the firm's total assets, and a variable related to the experience in international activity (YINT), i.e. the number of years the firm has sold to foreign markets; the latter two are also frequently considered as determinant of SMEs' international activity (van Beers, van der Panne 2011; Rodríguez-Rodríguez *et al.* 2012).

Taking the variables described (for each firm k and time t) in logarithmic form, the models to estimate are as follows:

$$\begin{aligned} \ln \text{EXP}_{kt} = & \alpha_0 + \alpha_1 \ln \text{PROM}_{kt} + \alpha_2 \ln \text{QUAL}_{kt} + \alpha_3 \ln \text{LOGIS}_{kt} + \\ & \alpha_4 \ln \text{SUBS}_{kt} + \alpha_5 \ln \text{R \& D}_{kt} + \alpha_6 \ln \text{COMP}_{kt} + \alpha_7 \ln \text{HIERCH}_{kt} + \\ & \alpha_8 \ln \text{PROD}_{kt} + \alpha_9 \ln \text{SIZE}_{kt} + \alpha_{10} \ln \text{YINT}_{kt} + \varepsilon_{kt}; \end{aligned} \quad (1)$$

$$\begin{aligned} \ln \text{NEWM}_{kt} = & \beta_0 + \beta_1 \ln \text{PROM}_{kt} + \beta_2 \ln \text{QUAL}_{kt} + \beta_3 \ln \text{LOGIS}_{kt} + \\ & \beta_4 \ln \text{SUBS}_{kt} + \beta_5 \ln \text{R \& D}_{kt} + \beta_6 \ln \text{COMP}_{kt} + \beta_7 \ln \text{HIERCH}_{kt} + \\ & \beta_8 \ln \text{PROD}_{kt} + \beta_9 \ln \text{SIZE}_{kt} + \beta_{10} \ln \text{YINT}_{kt} + \varepsilon_{kt}. \end{aligned} \quad (2)$$

2.3. Influence on simultaneous cooperation and competition strategies

In order to construct a variable of co-opetition, the interaction between each firm's cooperation and competition actions is considered (Luo *et al.* 2006). Bearing in mind that several cooperation variables are considered for the analysed sector, they are grouped in a cooperation index. The number of actions of PROM, QUAL, LOGIS, SUBS and R&D are termed n_1 to n_5 , respectively. This allows us to calculate (Ferrier *et al.* 1999; Gnyawali *et al.* 2006):

1. Blau's heterogeneity index as an indicator of cooperation diversity²: $d_k = 1 - \sum_i p_{ik}^2$,

where p_{ik} is the annual proportion with respect to collaboration category i of firm k .

2. An index of cooperation intensity $v_k = \sum_{i=1}^5 n_{ik}$, which is the sum total of actions from all categories over one year. Both indicators are normalised in a Z-score using mean and standard deviation. They are then combined in a single value $COOP_k = d_k + v_k$. This allows us to consider cooperation in terms of intensity and diversity in order to reflect the complex relationships between firms in a co-opetitive environment (Wilhelm 2011)³.

3. Finally, we determine the interaction between cooperation and competition (the COMP variable defined in the previous section) for each firm in the sample as (Luo *et al.* 2006): $Co-opetition_k = COOP_k * COMP_k$.

In this way we aim to determine the bearing of international activity variables (EXP and NEWM), the variables related to type of channel and the control variables on the co-opetition variable, as this will allow us to test hypotheses H3 and H4. Hypothesis H4 has also considered the interaction effects between international activity and the type of governance in the supply chain (INT*HIERCH and INT*N-HIERCH), in order to estimate in greater depth how the type of channel affects the influence of internationalisation on co-opetition (Pérez-Mesa, Galdeano-Gómez 2010; Wilhelm 2011).

The model to estimate is as follows:

$$\begin{aligned} \ln Co-opetition_{kt} = & \lambda_0 + \lambda_1 \ln EXP_{kt} + \lambda_2 \ln NEWM_{kt} + \lambda_3 \ln HIERCH_{kt} + \\ & \lambda_4 \ln INT \cdot HIERCH_{kt} + \lambda_5 \ln PROD_{kt} + \lambda_6 \ln SIZE_{kt} + \lambda_7 \ln YINT_{kt} + \varepsilon_{kt}. \end{aligned} \quad (3)$$

² The number of each type of cooperation action with competitors is used to construct this index. The Blau's index reveals the extent or range of the efforts in cooperation, i.e. the index will be high if the company undertakes a wide range of actions across many different domains: logistics, quality, R&D... (Gnyawali *et al.* 2006). A high index is also related to the difficulty competitors encounter when they attempt to imitate such actions, which will result in greater competitive advantage for the firm in question.

³ In a previous approach the estimations were made using separate indices, considering cooperation diversity and cooperation intensity (e.g. Gnyawali *et al.* 2006), to determine the effects on two dependant variables of co-opetition. Another option was to consider the combined effects of intensity and diversity (Wilhelm 2011), which were added, as calculating Z-score implies that both positive and negative values exist depending on the situation compared to the mean. Although in all three cases the estimations results were quite similar and the main findings were not altered, the aggregate index showed a better fit (R2-adjusted) to the estimations.

3. Results

The models have been estimated using the ordinary least squares method to determine to what extent the data support our hypotheses. We considered a model of common fixed effects⁴, tested with the F-test, for all the firms in the sample, taking the observations as a pool of data (Hsiao 2002). In order to account for possible time effects, temporary dummy variables are introduced. To test the hypotheses regarding the influence of the type of supply channel the hierarchical regression equations⁵ method has been followed.

Table A.1 in the Appendix presents the descriptive statistics of all the variables and the correlation analysis. The intercorrelations present no problems of multicollinearity among variables, with the indicated exception of variables related to the type of channel.

3.1. Estimations of the influences on SMEs' marketing internationalisation

Table 1 shows the estimations corresponding to the variables EXP and NEWM. The cooperation variables PROM and QUAL, related to actions with buyers, have significant and positive parameters ($p < 0.05$ and $p < 0.01$, respectively) in the estimation of models I and IV, providing evidence of the positive effects of such co-opetitive actions on SMEs' marketing in the food industry (Walley, Custance 2010; Granata 2012). Also, the variables related to cooperation with other suppliers, LOGIS and R&D show positive and significant effects ($p < 0.01$ and $p < 0.05$) on both EXP and NEWM, revealing the implications of these actions (e.g. Song 2002; Gnyawali *et al.* 2006) on SMEs challenges in international efforts. While the SUBS variable has non-significant coefficients in the two models (I and IV)⁶. The competition variable, COMP, presents negative parameters and these show significant effects ($p < 0.05$) on NEWM; although competition is usually related positively with export propensity (Wagner 2007), other studies by Alsleben (2005) and by van Beers and van der Panne (2011) reveal the existence of negative effects when there is tougher competition between SMEs for specific resources in the industry, such as skilled workers or the specific produce for marketing; also, this can be interpreted as indicating that an increase in market power enhances the firm's autonomous behaviour (Gnyawali *et al.* 2006), e.g. with respect to other suppliers, having negative effects on international marketing in a scenario of co-opetition in the supply chain. These results support hypothesis H1.

⁴ To determine the most suitable method, previous tests have been carried out. The Breusch-Pagan test indicated the existence of firm's individual effects (considering the Lagrange multiplier ratio). Following the Hausman test, the hypothesis that these effects are random variables is rejected. In addition, the ordinary least square method and within group methods were compared by R^2 -adjusted. These estimations are available upon request.

⁵ The variables indicating hierarchical and non hierarchical channels are introduced alternately in order to avoid problems of multicollinearity in the estimations, since they show an intercorrelation coefficient of -0.87 . Most of the exports of the firms in the sample are conducted via retailers and wholesalers.

⁶ This may be a consequence of the reduced amount of subsidies received by this sector (Aznar-Sánchez *et al.* 2011). Le Cren, Lyons and Dana (2009) also indicate the absence of government support as an incentive for co-opetition in New Zealand's dairy industry.

Table 1. Regression analysis on SMEs' internationalisation variables

| Explanatory Variables | Dependant variable: EXP | | | Dependant variable: NEWM | | |
|-------------------------|----------------------------|-----------------------------|------------------------------|-----------------------------|----------------------------|-----------------------------|
| | Model I (Hypothesis H1) | Model II (Hypothesis H2) | Model III (Hypothesis H2) | Model IV (Hypothesis H1) | Model V (Hypothesis H2) | Model VI (Hypothesis H2) |
| Constant | 12.104*** (4.128) | 9.511*** (3.783) | 10.027*** (3.805) | 17.048*** (5.019) | 14.511*** (4.583) | 16.109*** (4.904) |
| PROM | 1.703** (2.216) | 1.615** (2.190) | 1.592** (2.173) | 1.216** (1.992) | 1.294** (2.054) | 1.258** (2.033) |
| QUAL | 3.016*** (2.983) | 2.792*** (2.860) | 2.534*** (2.681) | 2.181** (2.308) | 2.028*** (2.611) | 1.993** (2.351) |
| LOGIS | 2.510*** (2.907) | 2.407*** (2.812) | 2.241*** (2.659) | 3.007*** (3.100) | 2.682*** (3.014) | 2.580*** (2.890) |
| SUBS | 0.218 (0.679) | 0.381 (1.026) | 0.306 (0.972) | 0.311 (1.140) | 0.269 (1.074) | 0.237 (1.042) |
| R&D | 0.915** (1.992) | 0.859** (1.970) | 0.793** (1.958) | 0.605** (2.008) | 0.581** (1.984) | 0.539** (1.979) |
| COMP | -0.786** (-2.114) | -0.821** (-2.271) | -0.805** (-2.206) | -0.913** (-2.031) | -0.904** (-1.993) | -1.027** (-2.091) |
| HIERCH | | 2.086*** (2.780) | | | 1.822*** (2.647) | |
| N-HIERCH | | | 1.714** (2.215) | | | 1.390** (2.086) |
| PROD | 1.250** (2.138) | 1.604** (2.390) | 1.319** (2.277) | 1.503** (2.062) | 1.570** (2.107) | 1.465** (2.019) |
| SIZE | 0.622* (1.773) | 0.691* (1.852) | 0.592* (1.806) | 0.319* (1.653) | 0.349* (1.688) | 0.338* (1.660) |
| YINT | -0.210 (-0.790) | -0.184 (-0.635) | -0.158 (-0.452) | -0.406 (-1.118) | -0.392 (-1.065) | -0.451 (-1.208) |
| Year dummies | Included | Included | Included | Included | Included | Included |
| Adjusted R ² | 0.441 | 0.507 | 0.483 | 0.415 | 0.476 | 0.442 |
| ΔR^2 | | 0.066 | 0.042 | | 0.061 | 0.027 |
| F change | | 6.530** | 2.859* | | 6.217** | 3.058* |

Notes: The t-statistics are given in parentheses: *** = $p < 0.01$; ** = $p < 0.05$; * = $p < 0.1$.

Including the variables related to co-opetition governance in the supply chain (HIERCH and N-HIERCH) reveals that in hierarchical cases, i.e. firm's sales to retailers (Models II and V), the positive effects of cooperation with competitors on internationalisation variables are higher than in non-hierarchical channels, i.e. firm's sales to wholesalers (models III and VI); this supports the idea that hierarchical channels have a greater positive influence on exports (Wong 2011; He *et al.* 2012), e.g. providing the networks within the supply chain with more stability (Wilhelm 2011). Thus, the F change of ΔR^2 in Model III with respect to Model I ($p < 0.05$) and in model V with respect to Model

IV ($p < 0.05$) indicate that the effects of co-opetition on EXP and NEWM are greater when firms sell to retailers, which also supports Hypothesis H2.

A robustness check of these results was carried out using structural equation modelling, which also allows the comparison of alternative models. We present only the estimation for the EXP variable due to limitations on space. The estimation of model I gave similar results to previous estimations (influence on export propensity), obtaining the following fit indexes: (χ^2/df) = 2.72; CFI = 0.96, GFI = 0.91, AGFI = 0.89, and RMSEA = 0.06. Reestimation of the results of model II indicated that the fit indexes are (χ^2/df) = 2.52; CFI = 0.97, GFI = 0.91, AGFI = 0.88, and RMSEA = 0.05; and the fit indexes for Model III are (χ^2/df) = 2.69; CFI = 0.95, GFI = 0.92, AGFI = 0.87, and RMSEA = 0.06. Regarding the latter two estimations, Model II fits the data better than Model III, supporting the regression analysis of Table 1, and thus the greater influence of co-opetition on exporting in hierarchical channels.

Additional tests were carried out in order to check the adequacy of the estimated models and the stability of the parameters. The χ^2 differences test was applied to ascertain whether a more parsimonious model, eliminating the non-significant variables (SUBS and YINT). The values of χ^2 differences obtained were significant (e.g. for Model I and IV compared to their restricted models: $\chi^2 = 34.21$, $p = 0.002$; $\chi^2 = 32.86$, $p = 0.004$, respectively), which shows that it is suitable to maintain fuller models with all the variables. The Chow test was applied to compare the parameters estimated using two data sub-samples, 2008–2010 and 2011–2012, obtaining non-significant F-statistics (e.g. for the estimated parameters of Models I and IV: $F = 2.334$, $p = 0.0971$; $F = 2.621$, $p = 0.0815$, respectively) and accepting the hypothesis of equality of regression coefficients (α_i and β_i , respectively) in both sub-samples.

3.2. Estimations of influences on simultaneous cooperation and competition

The results obtained in Table 2 show positive and significant effects ($p < 0.01$ and $p < 0.05$) of internationalisation variables EXP and NEWM on the interaction between cooperation and competition strategies. Thus, in the firms analysed the increase in exports over total sales and also expansion into new markets constitute drivers to cooperation with competitors according to other studies in this line (Jankowska 2011; Zhang, Dai 2013) and on the food industry in particular (Le Cren *et al.* 2009; Granata 2012). In this specific industry, studies also point out the frequent changes in the relationships within international supply chains due to the variability in supply and prices (De Pablo-Valenciano *et al.* 2007), which implies ongoing adaptation to marketing conditions e.g. via co-opetition strategies. These results are in accordance with Hypothesis H3.

Regarding the variables related of type to the co-opetition governance, Models II and III, indicate that the effects of cooperation and competition strategies are similar, proving positive and significant ($p < 0.05$) for sales both via retailers, HIERCH, and via wholesalers, N-HIERCH. The effects of interaction with internationalisation variables⁷

⁷ The NEWM variable is used for this interaction, and the variables were mean-centered before creating the interaction to reduce problems of collinearity (Aiken, West 1996).

are also positive and significant ($p < 0.1$). Consequently, there is no evidence to support Hypothesis H4. This finding implies that the environment in international markets has a bearing on the adoption of co-opetitive strategies whether main buyers are retail chains or wholesalers. This may be due to the strong effect of increasing international activity on co-opetition strategies (Pérez-Mesa, Galdeano-Gómez 2010). For instance, exports to new markets may require a degree of specialisation and changes in co-opetition strategies in order to adapt to the new buyers (be they retailers or wholesalers) Nevertheless, future research could aim to identify more specific measures in order to look into this question in greater depth.

The robustness check carried out using structural equation modelling indicates the following fit indexes for model I: (χ^2/df) = 2.89; CFI = 0.95, GFI = 0.92, AGFI = 0.86, and RMSEA = 0.06. This reestimation found similar results to those previously obtained in Table 2 in terms of the influence of internationalisation variables on co-opetition.

Table 2. Regression analysis on simultaneous cooperation and competition

| Explanatory variables | Dependent variable: co-opetition | | |
|-------------------------|----------------------------------|-----------------------------|------------------------------|
| | Model I (Hypothesis H3) | Model II (Hypothesis H4) | Model III (Hypothesis H4) |
| Constant | -29.064*** (-6.151) | -26.508*** (-5.720) | -26.710*** (-5.815) |
| EXP | 2.117*** (3.226) | 1.859*** (3.091) | 1.822*** (2.960) |
| NEWM | 1.634** (2.358) | 1.373** (2.116) | 1.401** (2.247) |
| HIERCH | | 0.841** (2.462) | |
| INT*HIERCH | | 0.408* (1.790) | |
| N-HIERCH | | | 0.817*** (2.594) |
| INT*N-HIERCH | | | 0.436* (1.688) |
| PROD | 0.540* (1.802) | 0.512* (1.833) | 0.493* (1.752) |
| SIZE | 0.257 (1.003) | 0.304 (1.217) | 0.331 (1.290) |
| YINT | -0.482** (-2.064) | -0.468** (-1.980) | -0.475* (-1.852) |
| Year dummies | Included | Included | Included |
| Adjusted R ² | 0.371 | 0.406 | 0.410 |
| ΔR^2 | | 0.035 | 0.039 |
| F change | | 3.709** | 4.058** |

Notes: The t-statistics are given in parentheses: *** = $p < 0.01$; ** = $p < 0.05$; * = $p < 0.1$.

The fit indexes for Model II are (χ^2/df) = 2.75; CFI = 0.96, GFI = 0.91, AGFI = 0.90, and RMSEA = 0.06; while those for Model III are (χ^2/df) = 2.73; CFI = 0.95, GFI = 0.93, AGFI = 0.90, and RMSEA = 0.05. The results of Models II and III indicate a similar fit of the data. These additional estimations support the results of Table 2, indicating no conclusive findings about the influence of channel type (hierarchical or non-hierarchical) on cross effects of cooperation and competition.

Additional tests were carried out in order to check the adequacy of the estimated models and the stability of the parameters, as described in the previous sub-section.

Conclusions

Simultaneous strategies of cooperation and competition, known as co-opetition, in international supply chains constitute key determinant of exporting activity for SMEs. At the same time, the dynamic competitive environment of international markets also implies changes in the strategies of horizontal and vertical relationships in the supply chain. For instance, the need for constant innovation or changes in the supply chain structure means that co-opetition involves multilateral relationships that undergo changes determined by the fluctuations in the firm's international marketing.

This paper aims to understand these issues better by developing an empirical analysis based on several indicators of cooperation and competition, as well as the interaction of both.

On the one hand, the results show that when suppliers cooperate with either buyers or other suppliers, most of their actions have positive effects on SMEs' capabilities to sell to new markets and to export. In particular, the findings reveal the influence of cooperation in logistics, management quality and R&D on the firms' internationalisation in this Spanish food industry; at the same time, they show the importance of collaborative strategies in reducing the negative effects of traditionally tough competition and reduced bargaining power with the main buyers. It can also be seen that the effect of such strategies may be greater in the case of hierarchical chains (as a result of the retailers' greater market power) as they may improve the stability of networks in the supply chain.

On the other hand, the findings show that the interaction effects of cooperation and competition are affected positively by the increase in international marketing activity of the firms in the study. This indicates that internationalisation challenges are a driver to the adoption of co-opetition strategies. In this case, however, the influence of the hierarchical or non-hierarchical channel does not imply relevant differences, possibly due to the large number of SMEs in this food industry in comparison to the size and number of buyers, and/or due to the firms' adaptation and changes in strategy, for instance when exporting to new markets.

Several limitations of the present study should be mentioned. In the main these are related to the specific features of SMEs analysed. The international supply chains in this food sector present multiple relationships, which the present study has attempted to analyse from different perspectives, but which may require analysis by more specific measures. For instance, the effect of governance, hierarchical and non-hierarchical, in

the supply chain may require a more dynamic and specific data analysis. Furthermore, this work has not analysed certain aspects which may be of interest in this research line, namely the dominance of different cooperation and competition strategies on the variables of business internationalisation. Though it may prove to extrapolate many of the results, the empirical analysis carried out provides evidence of the effects of co-opetition on export capabilities, and the drivers for simultaneous strategies in internationalisation efforts, can be used as comparative evidences to direct future research towards other supply sectors that are based on SMEs in the context of international markets.

The empirical approach provided by this work on firms' simultaneous cooperation and competition relationships, may prove useful to develop further research works regarding internationalisation strategies for SMEs.

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APPENDIX

Table A.1. Descriptive statistics and correlation analysis of variables

| | Mean | SD | Max | Min | NEWM | PROM | QUAL | LOGIS | SUBS | R&D | COMP | Co-opetition | HIERCH | N-HIERCH | PROD | SIZE | YINT |
|-------------------|--------|--------|--------|------|------|------|-------|-------|-------|------|-------|--------------|--------|----------|-------|-------|-------|
| EXP | 0.52 | 0.43 | 0.96 | 0.12 | 0.47 | 0.34 | 0.26 | 0.22 | 0.47 | 0.32 | -0.32 | 0.28 | 0.30 | -0.31 | 0.03 | 0.42 | 0.24 |
| NEWM | 0.19 | 0.32 | 0.41 | 0.06 | | 0.29 | 0.15 | 0.18 | 0.16 | 0.33 | -0.07 | 0.28 | 0.29 | -0.29 | 0.07 | 0.30 | 0.53 |
| PROM | 11.06 | 3.08 | 16.12 | 7.04 | | | -0.14 | 0.04 | -0.08 | 0.02 | 0.08 | -0.07 | -0.18 | 0.16 | -0.08 | 0.00 | 0.03 |
| QUAL | 15.30 | 5.43 | 18.24 | 9.80 | | | | -0.02 | 0.20 | 0.00 | -0.43 | -0.09 | 0.11 | -0.10 | 0.04 | -0.02 | -0.04 |
| LOGIS | 8.59 | 6.22 | 14.18 | 4.51 | | | | | 0.09 | 0.39 | -0.11 | 0.21 | 0.38 | -0.35 | -0.15 | 0.24 | 0.14 |
| SUBS | 10.11 | 6.93 | 15.27 | 6.38 | | | | | | 0.38 | -0.24 | 0.35 | 0.18 | -0.15 | 0.00 | 0.36 | 0.34 |
| R&D | 9.10 | 7.09 | 14.35 | 4.96 | | | | | | | -0.19 | 0.30 | 0.38 | -0.35 | -0.14 | 0.27 | 0.24 |
| COMP | 0.06 | 0.11 | 0.14 | 0.01 | | | | | | | | -0.12 | -0.29 | 0.27 | 0.00 | -0.12 | -0.12 |
| Co-opetition | 0.09 | 0.12 | 0.21 | 0.04 | | | | | | | | | 0.34 | -0.30 | 0.02 | 0.17 | 0.18 |
| HIERCH | 0.53 | 0.31 | 0.74 | 0.18 | | | | | | | | | | -0.87 | -0.08 | 0.20 | 0.17 |
| N-HIERCH | 0.37 | 0.29 | 0.65 | 0.12 | | | | | | | | | | | 0.07 | -0.16 | -0.16 |
| PROD ^a | 5.70 | 11.18 | 14.03 | 1.94 | | | | | | | | | | | | -0.19 | -0.10 |
| SIZE ^a | 14,572 | 43,083 | 80,320 | 8.72 | | | | | | | | | | | | | 0.31 |
| YINT | 21.20 | 12.35 | 35.20 | 8.10 | | | | | | | | | | | | | |

Note: ^aThousands of €

Emilio GALDEANO-GÓMEZ. He is a Professor in the Department of Economics and Business, Faculty of Economics and Business Administration at the University of Almería (Agrifood Campus of International Excellence, ceiA3) in Spain. He received his BS in Business Administration in 1990 from the University of Valencia and his PhD in Economics and Business Administration in 1994 from the University of Almería. His research interests include business internationalisation, environmental performance and agribusiness management.

Juan C. PÉREZ-MESA. He is an Associate Professor in the Department of Economics and Business, Faculty of Economics and Business Administration at the University of Almería (Agrifood Campus of International Excellence, ceiA3) in Spain. He received his BS in Business Administration in 1997 and his PhD in Economics and Business Administration in 2003 from the University of Almería. His research interests include transportation management, supply chain and agribusiness management.

José A. AZNAR-SÁNCHEZ. He is a Lecturer at the Department of Economics and Business, Faculty of Economics and Business Administration at the University of Almería (Agrifood Campus of International Excellence, ceiA3) in Spain. He received his PhD in Economics and Business Administration in 2001 from the University of Almería. His research interests include development studies, tourism management and agribusiness marketing.