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Abstract: A wide literature on economics and management analyses the determinants of firms' decisions on export. However, few contributions investigated the role knowledge flows across firms co-localised within clusters play on decisions about export destinations. This paper investigates the link between multiple network relationships across firms and their decisions about countries of export destination. The analysis is based on data collected through interviews and the administration of a questionnaire to 41 wineries in the Montefalco wine cluster, Italy and data are examined using Social Network Analysis and Exponential Random Graph Models. Results show that the friendship network, the professional network, and similarity in terms of size and experience are relevant drivers of firms' decisions about where to export. The work suggests novel insights on research on export, on clusters of co-located firms and on the wine industry.

Keywords: export; wine industry; network; cluster; ERGM; Italy.

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1 Introduction

A wide literature on economics and management analyses the determinants of firms' decisions on export. A relevant part of trade theorists stresses the role played by country level factors (Krugman and Obstfeld, 2009). They argue that firms are more likely to export their products in countries where there is no chance of producing the same products (e.g., for legal or natural reasons) or similar products are produced, but they are less competitive in terms of quality or cost (Hallak, 2006). Others claim that characteristics of importer countries, as their wealth (e.g., GDP per capita) or population, their belonging to trade associations, the strength of their currency etc. can influence trade decisions (for a review, see Kepaptsoglou et al. 2010). Another stream of the same literature takes into consideration relational aspects of pairs of countries, proving that different kinds of proximities (e.g., geographical, cultural, religious, or linguistic closeness) have a critical role in explaining trade (Felbermayr and Toubal, 2010; Melitz and Toubal, 2014).

However, several contributions also prove that firm level attributes play a critical role in explaining their decisions on export. Particularly, scholars mainly focussed on individual level characteristics affecting trade, such as size, experience, amount of investment in export driven R&D, managerial decisions, or general propensity to export (Cavusgil and Nevin, 1981; Bernard and Jensen, 2004).

In this framework, the study of local relational aspects influencing firms' decision on where to export is still scholarly debated (Silvente and Gimenez, 2007), even if spatially proximate firms can be a critical source of information on foreign markets or, on the other way around, they can observe other firms' exporting experience. Particularly, inter-firm interactions and personal communications can influence the perception about profitability and risks of some regions of export (Cavusgil, 1984), particularly, for small and medium sized firms (Reid, 1984). This is of particular interest for small and medium sized firms because they may be less likely to invest in research on export strategies that may suggest where to export and that can have an insufficient monetary capital to initiate export operations (Paul et al., 2017). Consequently, focussing on the wine industry is salient. In fact, even though wineries' decisions on where to export are largely driven by

destination countries' awareness about wine (Cusmano et al., 2010), their purchasing power (Crescimanno and Galati, 2014), legal and cultural issues (Parcero and Villanueva, 2011), and also non-financial aspects (Nowak and Anderson, 1999), little is known about local relational aspects that affect the choice of export markets.

Local networks play a relevant role in the wine industry. In fact, if on the one hand, wineries' individual characteristics and their interactions influence innovation and economic performance of spatially co-located wineries and regions where they are embedded (Giuliani, 2007; Morrison and Rabellotti, 2008); and on the other hand, export is more and more a critical determinant of revenues and employment in the wine industry (Galati et al., 2017); the combination between local wineries' interactions and their decisions on foreign countries of export is under-investigated.

Since Porter (1998) investigated the California wine region in terms of a cluster, research over around the last two decades applied several methodologies to identify and study different perspectives of wine clusters and several contributions suggested that relational patterns within wine clusters play a critical role in understanding structures at the basis of their performance and sustainability.[1]

Carpenter et al. (2012) argued that there are two main levels of network investigations. First, research on outcomes of networks; second, research on patterns of network structures and dynamics. In the present paper, we focus on export decisions as critical consequence of interactions among clustered firms and on networks of firms co-located within clusters as fundamental determinants of decisions about countries of export destination.

Investigating the relational functioning of decisions about where to export is also relevant to shed light on a critical driver of firms' performance (Mueller et al., 2006; Mann et al., 2018).

Our analysis is based on data collected through interviews and the administration of a questionnaire to 41 wineries, reaching around 80% of the total population of local wine producers in the Montefalco wine cluster, Italy. Using Social Network Analysis (SNA) and Exponential Random Graph Modelling (ERGM), we investigate the role multiple kinds of relationships play concerning firms' countries of export destinations.

The next section presents a literature review combining literatures on export and local economic development with a network perspective and it provides five relevant hypotheses for our study. Section 3 describes data collection, the implemented methodology and variables construction. Section 4 shows findings of the analysis. Section 5 concludes with a discussion of the results and it shows some theoretical, managerial and policy implications.

2   Literature review

Export largely influences firms' performance (Sousa, 2004) and; particularly, it is one of the most common ways for small and medium sized firms to enter international markets because it needs fewer resources than other foreign direct entry modes and it implies less risks and costs (Bilkey and Tesar, 1977; Leonidou et al. 2010).

A relevant stream of the internationalisation literature investigating the role of networks stressed the critical role played by connections among exporters and different categories of economic actors like foreign intermediaries, alliance partners, customers, suppliers, trade facilitators, administrations abroad (Welch and Welch, 1996; Johanson and Mattsson, 2015).

Moreover, networks play a critical role for export performance and strategies because – among other aspects – interacting agents can exchange information, knowledge and resources, they can create and improve individual and collective images, they can promote their activity abroad through interactions (Welch et al., 1998; Musso and Francioni, 2015; Vissak et al., 2017).

Sousa (2004) proposed 50 indicators explaining export performance covering important dimensions in exports. Later, several perspectives were introduced into the literature to capture the multidimensional aspects and measure the export performance and success in export markets (e.g., Zhou et al., 1998; Lages et al., 2005; Karelakis et al., 2008). Other authors also consider that non-financial measures are important to assess performance in exports (e.g., Nowak and Anderson, 1999). However, He and Wei (2013) suggested that export market location decisions and performance are related aspects, even if they focus their study on external networks comprised by heterogeneous actors as suppliers, customers, competitors and governments.

In fact, the literature on the role played by networks for export is scholarly debated. Even if a very few contributions propose a *negative side* of networking for export strategies due to co-operation problems related to their interactions (Karelakis et al., 2008), they are mainly focussed on cases where relations under studies are not between productive firms; but for example between export suppliers and export buyers (Matanda and Freeman, 2009) or between organisations linked by subcontracting links (Ghauri et al., 2003). Regarding the few investigations about negative effects for export of relationships between productive firms, recent research discovers that problems mainly happen in case of the presence of firms with a passive attitude in interactions (i.e. initiatives are taken by other actors than the manager of the firm) for internationalisation (Nunes and Franco, 2015).

Perception of risk in export activity plays a fundamental role in driving export decisions. It can be related to the entrepreneur's risk-taking behaviour (Dana et al., 2016), but it can be also greatly reduced because first-hand information is available from other firms about opportunities in a particular foreign market, the trends of demand, and major problems about exporting. Localised networks can play a relevant role in easing export-related knowledge flows because they reduce perception of risk due to the fact that interactions make it available first-hand information on specific foreign markets, drivers and constrains of demand (Silvente and Giménez, 2007).

Particularly, substantial literature suggests a positive relation between local networks and their decisions in export strategies. For example, Dalmoro (2013) investigated the relationship between firms' export and formal inter-firm networks intentionally created for promoting commercial activities abroad and he found that networks positively influence the internationalisation process of affiliate firms. Particularly, he claimed that formal networks for export can help firms to 'overcome difficulties, such as limited resources to market internationally, lack of information about the international market, and the need to create an image…' (Dalmoro, 2013, p.108). Nunes and Franco (2015), in a study about the internationalisation process of Portuguese wineries in the USA, discovered that, in addition to formal networks, also informal networks comprised of

firms and other economic and institutional agents facilitate the internationalisation process. Francioni et al. (2017) added that other firms, family members, friends, expatriates and some business partners play a relevant role in networks for internationalisation for wineries.

Thus, we propose the following research hypotheses:

Hp1: a friendship network has a positive influence on the likelihood firms export in the same countries.

Hp2: a professional network has a positive influence on the likelihood firms export in the same countries.

Moreover, a relevant stream of the economic literature suggests that also encounters due to the exchange of machinery and local labour mobility can be relevant drivers of industry specific knowledge exchange among firms (Welch and Welch, 1996; Giuliani, 2007; Beebe et al., 2013). Particularly, on the one hand, the exchange of machinery among co-located firms mainly happens through face-to-face meetings (Giuliani, 2007); on the other hand, the mobility of workers among them is another relevant source of the direct exchange of knowledge due to the fact that a worker hired in a new company brings with her/him previously absorbed knowledge (Bonaccorsi, 1992; Silvente and Giménez, 2007). In this framework, they can be both vehicle of the exchange of specific advice, among which, export related issues play a central role (Aylward and Zanko, 2006).

Thus, we propose the following research hypotheses:

Hp3: a network based on the exchange of machinery has a positive influence on the likelihood firms export in the same countries.

Hp4: a network based on local labour mobility has a positive influence on the likelihood firms export in the same countries.

However, individual attributes of firms critically influence export (Cavusgil and Nevin, 1981; Bernard and Jensen, 2004). Particularly, a significant stream of literature argues that firms' size is a relevant factor influencing their export and number of years operating in a sector can affect export decisions since this aspect is strictly linked to export related knowledge (Katsikeas and Morgan, 1994; Majocchi et al., 2005). Furthermore, strategic decisions like pricing can directly affect foreign sales because it drives products' competitiveness in export markets (Sousa and Bradley, 2008; Barisan et al., 2015).

Particularly, different degrees of similarity of firms' individual characteristics can affect performance-related achievements of clusters (Morrison and Rabellotti, 2008; Giuliani, 2013). In this context, similar firms can be more likely to have similar export attitudes since they have similar commercial potentialities and barriers (Suarez-Ortega, 2003), and due to the fact that some firms' attributes are also linked with the competencies available to assess the export strategies (Bianchi and Wickramasekera, 2013).

Thus, we propose another research hypothesis:

Hp5: the more firms share similar individual attributes, the more they are likely to export in the same countries.

3   Data and methodology

3.1   The context

The wine industry drives several places to obtain better economic performance, longer sustainability, and higher competitiveness than other nature-based industries in rural regions (Cvijanović et al., 2017). Moreover, wine producers co-localised within wine clusters are more likely to interact and to discover and share export-related knowledge (Carneiro Zen et al., 2011; Musso and Francioni, 2015; Devigili et al., 2018). Especially, horizontal networks of wineries can foster the creation and exploitation of synergies with operational (in terms of both cost savings and knowledge diffusion regarding export process) and strategic (in terms of both export decisions and competitiveness on the foreign market) benefits (Chetty and Wilson, 2003; Dalmoro, 2013).

Particularly, Italy is among the leading countries in this sector in terms of wine production, wine consumption, lands with productive vineyards and export performance (Anderson et al., 2017). Italian wine bottles are worldwide recognised as medium and high-quality products for several reasons. First, Italy has a widespread wine-related tradition on both the demand and the supply side that dates back to the Etruscan and Roman period (Barisan et al., 2015; Aversano et al., 2017); second, Italian wineries invest for product and process innovation and for promoting their own wine region (Contò et al., 2015; Vrontis et al., 2016); third, Italian local natural characteristics (e.g., climate, soil compositions, etc.) make excellent wine productions possible in several heterogeneous places (Stasi et al., 2011).

Such a well-established perception about the quality of Italian wine bottles plays a fundamental role in local wineries' economic performance and it critically drives marketing strategies (Corduas et al., 2013; Cacchiarelli et al., 2016). For example, it leads to a general increase of bottles' prices (Galati et al., 2018), it drives Italian wine tourism (Colombini, 2015), and it stimulates regional wine-related sectors (Bregoli et al., 2016). Particularly, it affects export performance of local wineries and export-related decisions (Bardají et al., 2014) and it makes export as an established option also for medium-small sized wineries (Alonso et al., 2014; Galati et al., 2017).

Moreover, over about the last three decades, globalisation has influenced the wine sector in general, making it a global industry (Nosi, 2009) and fostering the export in the wine industry (Anderson et al., 2003; Anderson and Pinilla, 2018), and export has begun to be a critical element of wineries' economic sustainability and performance (Alonso et al., 2015).

Few contributions investigate the role relational patterns play on structures and functioning of cluster mainly specialised in the wine industry (Dana and Winstone, 2008). For example, Dana et al. (2013) focused on the role of co-opetition in the evolution of a regional wine cluster in New Zealand. They find that both competition and collaboration are simultaneously necessary for a successful co-opetitive strategy and the development of collaborative relations across competitors progressively represses competition over time. Granata et al. (2018), in a study of the Pic Saint Loup wine area in France, add that the management of both competitive and cooperative relationships is formalised also across micro-wineries and it requires a distinction between cooperation and competition governed by a collective organisation among competitors. However, scholars made less research effort in studying the role knowledge flows across wineries co-localised within wine clusters play on decisions about export destinations.

The paper is based on surveys administered across wineries in the Montefalco wine cluster (Umbria region, Italy). To the best of our knowledge, the wine industry in Umbria is under-investigated by scholars interested in issues focused on managing wine-related businesses and economics (for an exception, see Couderc and Marchini, 2011) and no previous contributions on the Montefalco wine cluster has been elaborated in such a perspective.

This area is well-known for the production – among other local varieties – of the autochthonous *Sagrantino* grapevine, whose name originates in ancient Latin *sacer* (sacred) since monks produced wines for religious rituals and several documents attest that a wine production existed in this area around the year 1000. More recently, the Montefalco wine region obtained the Denomination of Controlled Origin (DOC) label in 1979 and the Denomination of Controlled and Guaranteed Origin (DOCG) label in 1992, after a few producers started investing in quality wine production based on *Sagrantino* since the '60 s (Montefalco Consortium, 2019) and in line with trends of several other European wine regions (Samoggia, 2016). Nowadays the production area covers the hilly region in province of Perugia comprised with the Montefalco municipality and a portion of four surrounding municipalities.

Several new *vinification* techniques have been introduced because of consistent investments in innovation and in order to preserve such an ancient wine tradition and to increase the overall quality of wine bottles. In fact, according to the *Vintage Quality Evaluation* provided by the wine consortium there has been a relevant increase in terms of quality production from 1975 till now and with several years labelled as *outstanding* and *excellent* vintages (Montefalco Consortium, 2019).

Within this framework, wine tourism in the area increased by around 20% since 2013, production of Sagrantino tripled over the last ten years reaching 1.5 million bottles (Fordham, 2015), and the entire wine region is increasingly export oriented (Howard, 2018).

3.2   Data collection and methodology

As already outlined, the present paper aims at investigating the link between multiple network relationships across firms and their decisions about countries of export destination. Non-quantitative research strategy is quite often adopted to investigate this type of relationships. This is particularly due to the flexibility of these methods and to facilitate the building of new theories and the formulation of fine-grained policy suggestions (Dana and Dana, 2005). However, as discussed by Dana and Dumez (2015) the debate on qualitative versus quantitative research is inconsistent. The authors suggest adopting terms like 'comprehensive research' judging them more appropriate in comparison to traditional 'qualitative research'. They analyse three risks involved in comprehensive research, which derive from: beings of reason, circularity and equi-finality. They also illustrate the scientific contributions that can be expected from this approach: highlighting mechanisms, building typologies, and redefining concepts or theories.

For these reasons, the collection of data followed a strict procedure. Three pilots have been conducted in order to verify to what extent questions can be understood by interviewed people and telephone calls have been made before the survey administration to increase the response rate. 41 surveys have been conducted with owners, agronomists,

oenologists or technical professionals, reaching around 80% of the wineries on the total population of local wine producers operating at the time of the investigation as indicated in a roster provided by the wine consortium. Particularly, 30 surveys based on structured questionnaires have been administered directly within wineries in the Montefalco region between December 2017 and January 2018 with face-to-face interviews and 11 questionnaires have been filled out on-line. This was also due to visit and consider the importance of the 'context' where the wineries where located (Welter, 2011). An interview with an agent of the local wine consortium assured that we cover all the most relevant wine producers operating in the Montefalco wine region.

In this way, we collected different typologies of data. On the one hand, we collected firm-level data like size, experience, average price of wine bottles, and export-related information; on the other hand, we collected network data on different kinds of interactions among wineries.

Particularly, we combine a free-recall method and a fixed-choice method (Wasserman and Faust, 1994) to collect relational data. After naming the list of local wineries, we asked to generate a maximum of five names among those listed in the roster with which the winery where the respondent is employed has relevant relations in terms of friendship, professional interaction, exchange of wine-related machinery, or if a current colleague of her/him was previously employed in another local winery.

The following step consisted into the analysis of the information gathered through the 41 surveys conducted. Data characteristics, the heterogeneity of information, and the number of agents under study allow us the adoption of recent and advanced methodologies as SNA and ERGM.SNA is a powerful tool to examine relational data where *primitives* are ties (relations) between two nodes (actors) (Wasserman and Fasut, 1994). SNA allows us to graphically represent networks and to analyse their relevant structures based on different statistical measures.

Other contributions about networks in clusters implemented SNA techniques (e.g., Giuliani, 2007; Morrison and Rabellotti, 2008; Abbasiharofteh and Broekel, 2020; Maghssudipour et al., 2020) demonstrating their value in the investigation of relational settings in clusters comparable to the one under study, also in terms of the number of surveyed firms. Moreover, taking into account the survey response rate of the case under investigation (80% of the population), we are confident regarding the robustness of the findings of the implemented methodology since network properties are preserved with a response rate higher than 70% (Kossinets, 2006).

ERGM (Robins et al., 2007) is one of the most advanced methodology to investigate networks in case of the presence of relational data in one point in time and to study which characteristics can influence the probability that actors form ties (Snijders et al., 2006). Particularly, they are increasingly implemented for the investigation of clusters of co-located organisations (Broekel et al., 2014).

ERGMs consider the observed network as one realisation of the possible set of ties among a given set of nodes and it is based on a probability density function to obtain the probability of a network configuration in terms of some sub-structure. One of the preferable techniques to implement this model is a Markov Chain Monte Carlo Maximum Likelihood Estimation where the ERGM-related equation is solved when parameters that maximise the probability that the observed network is identical to the

simulated network are identified (Snijders, 2002). More specifically, random graphs are generated starting from parameter values that are gradually improved getting closer the random and the observed networks. The process moves on step by step till the parameter estimates stabilise.

3.3   *Variables construction*

SNA-related techniques are built with two *primitive* elements. *Nodes* are actors linked (or not) to others. *Ties* are edges between two nodes. Ties may be state-based (e.g., co-location, co-membership, shared attributes, etc.) or event-based (e.g., flows of information, interactions through emails, etc.).

Our variables can be grouped in three main categories. First, the dependent variable is based in the co-occurrence of export destination of two firms. A tie is present when two firms export in the same country, otherwise no connection is present. The dependent variable was originally a two-mode network (Borgatti and Everett, 1997). Two mode networks are usually set of relationships involving two different categories of actors (e.g., organisation and projects). In our case, a two-mode network is created with firms and export destinations (countries). Consequently, we represent these data in a matrix of size *n x m* where columns are firms and rows are foreign countries. In the intersection between columns and rows there is a '1' if the respondent of the survey states that the firm where she/he is working exports in that country, otherwise there is a '0'. For computational reasons related to the duality between the one-mode network structure of the relational independent variables and the two-mode network structure of the dependent variable, we needed to transform the latter in a one-mode network of size *n x n*.

Second, our core independent variables are different networks built on the same set of nodes (in our case wineries). Particularly, a friendship network, a professional network, a network based on the exchange of machinery, and a network based on labour mobility. Ties are interconnections in the form of friendship in informal settings in the 'Friendship net' variable. Ties are interactions in a professional and formal setting in the 'Professional net' variable. Ties are sales or rental of machinery, raw materials, or semi-finished products in the 'Machinery net'. Finally, ties represent the fact that a current employ of a firm was previously employed in another local firm in the same sector in the past in the 'Labour mobility net' variable. Our independent network variables are in the traditional form of a squared one-mode network of size *n x n* where both rows and columns are firms and cells are filled with a '1' in the presence of a tie, otherwise with a '0'.

Third, we control for several relevant variables based on similarities of node-level characteristics. The similarity effect control to what extent ties are more likely to exist between nodes that are more or less similar in terms of a node characteristic. Particularly, 'Size similarity' is an effect based on data computed on the number of employees. 'Experience similarity' is a similarity-effect based on data calculated as the number of years a local firm is working in that industry in that region. 'Avgprice similarity' is a similarity-effect based on data regarding the average price of firms' products.

Table 1 summarises operationalisation of variables.

Table 1 Variables used in the study

Variables	Operationalisation
Dependent variable	Co-occurrence of export destination of two firms.
Friendship net	Friendship in an informal setting.
Professional net	Professional interactions in a formal setting.
Labour mobility net	Previous employment in another local firm in the same sector.
Machinery net	Sell or rent of machinery, raw materials, semi-finished products.
Size similarity	Similarity in terms of number of employees.
Experience similarity	Similarity in terms of numbers of years since entry in the industry.
Avg price similarity	Similarity in terms of average price of products.

Source: Our elaboration.

4 Results

4.1 Descriptive statistics

Table 2 presents descriptive statistics on export data of the Montefalco wine cluster. Particularly, data are winery-based and they report hectolitres of wine sold in 2016, the percentage of hectolitres sold abroad and, consequently, the relative amount in term of hectolitres sold abroad. At the time of the data collection, around 75% of the respondents declared to export abroad more than 20% of their wine production and around 30% of them declared to sell more than the half of their wine production on foreign markets.

Table 2 Wineries' export statistics for the Montefalco region

| Winery	Hectolitres sold 2016	Foreign markets (%)	Hectolitres foreign markets	Winery	Hectolitres sold 2016	Foreign markets (%)	Hectolitres foreign markets
F1	800	20	160	F30	150	20	30
F4	500	5	25	F31	750	30	225
F5	2300	30	690	F33	300	90	270
F6	6500	40	2600	F34	11	30	3.3
F8	6500	5	325	F35	400	30	120
F9	300	50	150	F36	1000	70	700
F11	1000	20	200	F38	350	75	262.5
F12	1400	15	210	F39	350	30	105
F13	60	5	3	F40	300	20	60
F14	40	60	24	F41	1700	30	510
F15	100	20	20	F42	190	5	9.5
F16	200	50	100	F43	448	30	134.4
F19	750	10	75	F45	900	50	450
F20	2200	50	1100	F46	700	40	280

Table 2   Wineries' export statistics for the Montefalco region (continued)

Winery	Hectolitres sold 2016	Foreign markets (%)	Hectolitres foreign markets	Winery	Hectolitres sold 2016	Foreign markets (%)	Hectolitres foreign markets
F21	300	30	90	F47	800	1	8
F24	83	50	41,5	F49	250	30	75
F26	500	80	400	F51	130	20	26
F27	600	40	240	F53	25	50	12.5
F28	900	60	540	Avg	913.16	34.89	277.69

Source: Authors' own data.

Figure 1 reports relevant export destination for the Montefalco wine cluster. Data are calculated considering the number of times the interviewee cited a foreign country as a relevant export destination for the company where she/he is working. Local wineries seem to export mainly in North America, in North and Central European countries and in the Far East. Moreover, less relevant export destinations are Australia, Brazil and countries of Central-Est Europe.

Figure 1   Map of relevant export destinations for the Montefalco cluster (see online version for colours)
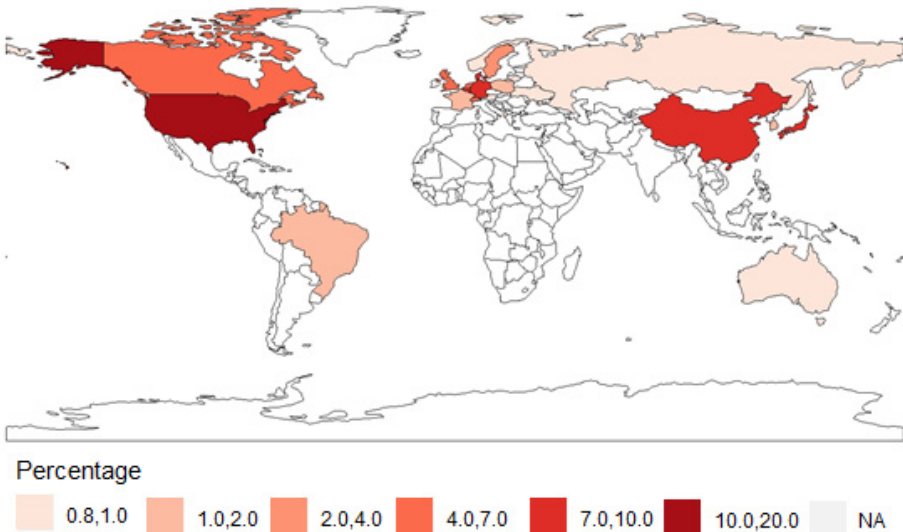
Source: Authors' own data.

The network presented in Figure 2 is comprised with firms (red nodes) and countries of export destination (blue nodes). The two ends of a tie are firms and countries indicated by a firm as a relevant export destination, respectively. Size of countries indicated degree (number of ties). The bigger is a blue node, the higher is the number of times a country has been indicated as a relevant destination for export (e.g., USA) and vice-versa (e.g., Albania).

Figure 3 shows the network of export destinations where nodes are countries and ties represent the circumstance that at least one firm lists countries (represented at the two ends of a tie) as relevant foreign markets for their products. The size of every node shows degree while the size of ties shows how many firms co-export in the same countries. For example, a large number of firms declare to export both in the USA and in Belgium, while only one states to have Albania and Poland as relevant countries of export.

Figure 2 The export network of firms and countries

Notes: Countries are blue nodes, firms are purple nodes. Countries are indicated by official international abbreviations; Authors' own data.

Figure 3 Network of export destinations

Notes: Countries are indicated by official international abbreviations; Authors' own data.

4.2 *Empirical results*

We implement ERGM using R-software with the STATNET-ERGM package (Handcock et al., 2008). Table 3 presents results of the ERGM. Model 1, Model 2, Model 3 and Model 4 include the traditional structural variable that investigates the tendency towards interactions ('Edges') and respectively the four core network variables of our study ('Friendship net', 'Professional net', 'Machinery net' and 'Labour mobility net'). Model 5 includes the similarity effects of the three variables built on individual characteristics of firms ('Size similarity', 'Experience similarity' and 'Avg price similarity'). Finally, Model 6 includes all the relational variables and all the similarity effects, all together.

Table 3   ERGM results

		Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
		Est. *(S. E.)*	*Est.* *(S. E.)*	*Est.* *(S. E.)*	*Est.* *(S. E.)*	*Est.* *(S. E.)*	*Est.* *(S. E.)*
	Edges	−0.774*** (0.059)	−0.763*** (0.057)	−0.747*** (0.058)	−0.740*** (0.058)		−1.382*** (0.207)
Network	*Friendship net*	1.362*** (0.398)					1.069* (0.434)
	Professional net		1.551** (0.543)				1.174° (0.600)
	Machinery net			0.421 (0.597)			−0.247 (0.687)
	Labour mobility net				−0.839 (1.090)		−1.321 (1.191)
Attributes similarity	*Size similarity*					0.022*** (0.003)	0.021*** (0.003)
	Experience similarity					0.005** (0.002)	0.005* (0.002)
	Avg price similarity					0.003 (0.006)	0.002 (0.005)
	AIC	1724	1724	1736	1735	1669	1663
	BIC	1714	1734	1746	1746	1690	1704

Notes: Significance level: 0 '***' 0.001 '**' 0.01 '*' 0.05 '°' 0.1; Elaboration on authors' own data.

Coefficients of the models are the change in the log-odds likelihood of a tie for a unit change in the predictor.

In all the models 'Edges' presents a negative and statistically significant result in line with other empirical results involving ERGMs (Broekel and Hartog, 2013; Capone and Lazzeretti, 2018). This is due to the fact that it represents the density of the network in log-odds if other effects are excluded, thus there are less ties in the real network than in the simulated one because actors are less likely to have ties in the former than in the latter.

Model 1 and Model 2 present positive and statistically significant coefficients of 'Friendship net' and 'Professional net'. Consequently, they confirm our Hp1 and Hp2. These results suggest that networks based on friendship and on professional interactions positively impact on the likelihood of firms to export in the same country. In Model 3

and Model 4 we cannot confidentially interpret the estimation of the 'Labour mobility net' and the 'Machinery net' variables since they do not present statistically significant coefficients. These results also imply that we have no evidence on Hp3 and Hp4.

Model 5 includes new variables at the individual level, controlling for their similarity. The 'Size similarity' and the 'Experience similarity' variables have positive and statistically significant coefficients. These findings confirm Hp5. This means that firms with a similar number of employees and firms with a similar number of years working within their industry in the cluster are more likely to export in the same countries. However, 'Avg price similarity' has not a statistically significant result, thus, we cannot confidentially interpret the estimation of this variable.

Model 6 simultaneously includes network variables and variables computing a similarity effect. In this case, the significant variables of Model 1 ('Friendship net') and Model 5 ('Size similarity' and 'Experience similarity') retain the same sign, confirming the results already acknowledged, while the core variable of Model 2 ('Professional net') results barely significant. Also, not statistically significant variables of Model 3 ('Machinery net'), Model 4 ('Labour mobility net'), and Model 5 ('Avg price similarity') are still not statistically significant.

5   Discussion and conclusions

Relations among local firms influence clusters and firms there co-located in terms of economic development, competitiveness and sustainability (Porter, 1996; 1998; Karlsson and Stough, 2005). In this paper, we investigate how interactions among co-located firms within cluster contexts are related with their decisions regarding where to export and which typology of interactions plays a larger role taking a multiple relational perspective. In fact, on the one hand, export strategies are critically driven by foreign market opportunities and constrains; on the other hand, they are influenced by the local diffusion of export-related knowledge among firms.

From a producer point of view, decisions about where to export are taken in an environment of incomplete information (Reid, 1984; Christense, 1991; Alonso et al., 2014). Thus, agents within firms may interact with others working in co-localised companies to gain export-related knowledge even if they are direct competitors (Crick, 2018).

Investigating on different typologies of relations among co-located firms, we studied the relationship between inter-firm networks, firms' degree of attribute-based similarities, and decisions on export destinations. Implementing SNA and ERGMs we discovered that both the friendship network and the professional network are relevant drivers of export decisions in terms of country destinations. Once controlling for other firm-level factors, results show that firms similar in terms of size and experience are more likely to choose the same destination for export.

This work has both theoretical and practical implications. From the theoretical point of view, it sheds new light on scientific research about local productive systems as clusters from a relational perspective. Networks are critical ways to organise and coordinate the economic activity of co-located small-medium sized firms even if they are often direct competitors on the same markets and they can be less likely to share specific knowledge on foreign market issues because of the fear of losing individual identity and tendency towards marked individualism (Chetty and Wilson, 2003). Within this

framework, our results suggest that networks are critical drivers of decisions on export destinations, thus, they operate in a cluster or district-like environment driven by simultaneous competition and cooperation. Our results also show that not only formal networks made with professional interactions are relevant channels of knowledge diffusion for export, but also informal networks based on friendship play a critical role. For both social and professional interactions, trust plays a critical role to stimulate the exchange of knowledge. Whether it affects the intention to perform according to an informal deal or to a formal agreement, it is fundamentally present in local productive systems like clusters where local operators often know each other's and are aware of the fact that if they disregard trust, they can be disciplinable in the short term.

More than other issues, this study provides novel insight on research on export; particularly, the one involving small and medium sized firms. Specifically, results propose networks and a relationship building process as critical components of the *stimuli to exporting* concept (Leonidou et al., 2010) that is 'finding out the internal or external forces of a reactive or proactive nature that influence the firm's decision to initiate and subsequently sustain export activities' (Leonidou et al., 2010, p.86). Small and medium sized firms have fewer resources to invest in searching for export opportunities, thus other co-localised firms can be a relevant source to learn about profitable markets abroad.

Moreover, our research expands directly on network analysis, implementing an advanced SNA methodology with an extension on a two-mode network comprised with firms and countries of export destination. In this way, we statistically analyse not only what are critical firm-level drivers of the decision of heterogeneous wineries to export in some countries and not in others, but also what are relevant relational patterns that operate as channels of knowledge diffusion for export.

Also, practical implications are twofold. First, we investigated the network of countries of export destinations where relations are represented by the case that a firm chooses two countries as relevant destination for export. Thus, this network suggests a strategy to make export decisions for firms linked through the *export co-occurrence*. In other words, a firm is more likely to make profits in foreign markets that are *related* to the ones already exploited than in other that are not linked. From the managerial point of view of firms, this picture shows that local relations and, thus, local exchange of knowledge may affect export strategies and may suggest future export decisions. In this way, firms may discover profitable foreign markets following export decisions of other wineries with whom they already share a market. Moreover, these late entrants may benefit from all the efforts other firms have already made to enter new markets and, at the same time, they have a lower risk to enter in market with poor chance of financial return.

Second, regarding the whole cluster level, some policy implications emerge. In fact, proximate firms are often members of local forms of institutions (e.g., wine consortiums in the case under study) that protect, regulate, and promote several aspects from the production process to the final sale of products. Such organisations and trade associations may invest in facilitating the entrants of local firms in strategic foreign markets where one or a few pioneers are already making profits. In this way, they can help firms in reducing risks in decisions about export strategies and; particularly, in which countries they can be more likely to find foreign markets ready to buy their products (Felzensztein et al., 2019).

Also, our results suggest that local institutions may foster both professional and social interactions since they emerged as two relevant drivers of decisions about export. They play a critical role in this respect since they can attenuate competition among rival co-located firms (thus fostering relations), however by supporting discovery process and innovation that can be endangered by too much co-operation.

This contribution has also implication for operators in the wine sector where wineries often operate in regions where other wineries are proximate in space. In fact, in such a context, wine operators often meet in informal contexts, sometimes on a random basis. Consequently, they can be more likely to share tacit and scarcely codifiable knowledge that can be more difficult to be understood by actors external to the region, but that can be of critical relevance for export-related strategies. However, findings suggest that also professional interactions play a relevant role. Knowledge shared by these kinds of interaction can be easier to be understood and can be related to local official rules and explicit systems of incentives.

Furthermore, this work suggests some managerial and policy implications specifically for wine clusters in Italy. The latter and the firms (wineries) composing them are potentially different from other exporters operating within other wine regions or in other sectors. In fact, the Italian wine industry is largely comprised by small firms that may suffer budgetary constraints. They can overcome this problem if they operate with a cooperative attitude with other co-located agents.

Moreover, several foreign countries are identified as promising locations for wineries' export. They are countries with a wine tradition established in modern times (e.g., the USA) or in less recent years (e.g., Germany), countries with a very emerging wine tradition (e.g., China), countries with a relatively recent story in terms of wine consumption (e.g., Denmark) and countries with an old tradition in consumption and production of alcoholic products, but with more recent experience with the wine world (e.g., Japan). This is particularly interesting for the wine industry in general due to the fact that so called *new world* of wine production (e.g., USA, New Zealand, Australia, South Africa, Chile, etc.) and *emerging* ones (e.g., China, Russia, Brazil, etc.) are becoming established in the wine world and they are affecting profits and strategies of more traditional regions of wine production.

Finally, this study is not free of limitations. First, the work is based on a single case (the Montefalco wine cluster) and this implies some limitations, regarding the possible specificity of the results and the fact that looking to a single wine cluster may imply that findings may be diverse in other clusters or other industries. Second, our research focalises on foreign markets and it does not study opportunities in domestic markets. Third, this research does not investigate the possible role of trade promotion agencies that may influence the economic performance of both individual firms and groups of them on foreign markets (Welch et al., 1998). Fourth, this study suggests future possible export strategies, but it implements a static methodology, thus a second wave of interviews, also involving other firm-level characteristics, different typologies of networks or taking into consideration the frequency of their interactions may validate or criticise our findings.

References

Abbasiharofteh, M. and Broekel, T. (2020) 'Still in the shadow of the wall? The case of the Berlin biotechnology cluster', *Environment and Planning A: Economy and Space*, Vol. 46, No. 3, pp.73–94.

Alonso, A.D., Bressan, A., O'Shea, M. and Krajsic, V. (2014) 'Exporting wine in complex times: a study among small and medium wineries', *Journal of Small Business and Enterprise Development*, Vol. 21, No. 2, pp.345–364.

Alonso, A.D., Bressan, A., O'Shea, M. and Krajsic, V. (2015) 'Perceived benefits and challenges to wine tourism involvement: an international perspective', *International Journal of Tourism Research*, Vol. 17, No. 1, pp.66–81.

Anderson, K. and Pinilla, V. (Eds.) (2018) *Wine Globalization: A New Comparative History*, Cambridge University Press, Cambridge, UK.

Anderson, K., Nelgen, S. and Pinilla, V. (2017) *Global Wine Markets, 1860 to 2016: A Statistical Compendium*, University of Adelaide Press, Adelaide, Australia.

Anderson, K., Norman, D. and Wittwer, G. (2003) 'Globalisation of the world's wine markets', *World Economy*, Vol. 26, No. 5, pp.659–687.

Aversano, R., Basile, B., Buonincontri, M.P., Carucci, F., Carputo, D., Frusciante, L. and Di Pasquale, G. (2017) 'Dating the beginning of the Roman viticultural model in the Western Mediterranean: the case study of Chianti (Central Italy)', *PloS One*, Vol. 12, No. 11, pp.1–15.

Aylward, D.K. and Zanko, M. (2006) 'Emerging interorganizational structures in the Australian wine industry: implications for SMEs', *Proceedings of the 5th Global Conference on Business and Economics*, Cambridge.

Bardají, I., Estavillo, J. and Iráizoz, B. (2014) 'Export performance: insights on the Spanish wine industry', *European Journal of International Management*, Vol. 8, No. 4, pp.392–414.

Barisan, L., Boatto, V., Rossetto, L. and Salmaso, L. (2015) 'The knowledge of Italian wines on export markets: a nonparametric methodology to analyze promotional actions', *British Food Journal*, Vol. 117, Vol. 1, pp.117–138.

Beebe, C., Haque, F., Jarvis, C., Kenney, M. and Patton, D. (2013) 'Identity creation and cluster construction: the case of the Paso Robles wine region', *Journal of Economic Geography,* Vol. 13, No. 5, pp.711–740.

Bernard, A.B. and Jensen, J.B. (2004) 'Why some firms export', *Review of Economics and Statistics*, Vol. 86, No. 2, pp.561–569.

Bianchi, C. and Wickramasekera, R. (2013) 'An exploratory study of the factors enhancing and inhibiting export growth in the Chilean wine industry', *Journal of International Food and Agribusiness Marketing*, Vol. 25, No. 2, pp.85–102.

Bilkey, W.J. and Tesar, G. (1977) 'The export behavior of smaller-sized Wisconsin manufacturing firms', *Journal of International Business Studies*, Vol. 8, No. 1, pp.93–98.

Bonaccorsi, A. (1992) 'On the relationship between firm size and export intensity', *Journal of International Business Studies*, Vol. 23, No. 4, pp.605–635.

Borgatti, S.P. and Everett, M.G. (1997) 'Network analysis of 2-mode data', *Social Networks*, Vol. 19, No. 3, pp.243–269.

Bregoli, I., Hingley, M., Del Chiappa, G. and Sodano, V. (2016) 'Challenges in Italian wine routes: managing stakeholder networks', *Qualitative Market Research: An International Journal*, Vol. 19, No. 2, pp.204–224.

Broekel, T. and Hartog, M. (2013) 'Explaining the structure of inter-organizational networks using exponential random graph models', *Industry and Innovation*, Vol. 20, No. 3, pp.277–295.

Broekel, T., Balland, P.A., Burger, M. and Van Oort, F. (2014) 'Modeling knowledge networks in economic geography: a discussion of four methods', *The Annals of Regional Science*, Vol., 53, No. 2, pp.423–452.

Cacchiarelli, L., Carbone, A., Esti, M., Laureti, T. and Sorrentino, A. (2016) 'Assessing Italian wine quality and prices: de gustibus non disputandumest', *British Food Journal*, Vol. 118, No. 5, pp.1006–1024.

Capone, F. and Lazzeretti, L. (2018) 'The different roles of proximity in multiple informal network relationships: evidence from the cluster of high technology applied to cultural goods in Tuscany', *Industry and Innovation*, Vol. 25, No. 9, pp.897–917.

Carneiro Zen, A., Fensterseifer, J.E. and Prévot, F. (2011) 'Internationalization of clustered companies and the influence of resources: a case study on wine clusters in Brazil and France', *Latin American Business Review*, Vol. 12, No. 2, pp.123–141.

Carpenter, M.A., Li, M. and Jiang, H. (2012) 'Social network research in organizational contexts: a systematic review of methodological issues and choices', *Journal of Management*, Vol. 38, No. 4, pp.1328–1361.

Cavusgil, S.T. (1984) 'Organizational characteristics associated with export activity', *Journal of Management Studies*, Vol. 21, No. 1, pp.3–22.

Cavusgil, S.T. and Nevin, J.R. (1981) 'Internal determinants of export marketing behavior: an empirical investigation', *Journal of marketing Research*, Vol. 18, No. 1, pp.114–119.

Chetty, S.K. and Wilson, H.I. (2003) 'Collaborating with competitors to acquire resources', *International Business Review*, Vol. 12, No. 1, pp.61–81.

Christensen, P.R. (1991) 'The small and medium sized exporters squeeze: empirical evidence and model reflections', *Entrepreneurship and Regional Development,* Vol. 3, No. 1, pp.49–65.

Colombini, D.C. (2015) 'Wine tourism in Italy', *International Journal of Wine Research*, Vol. 7, No. 1, pp.29–35.

Contò, F., Fiore, M., Vrontis, D. and Silvestri, R. (2015) 'Innovative marketing behaviour determinants in wine SMEs: the case of an Italian wine region', *International Journal of Globalisation and Small Business*, Vol. 7, No. 2, pp.107–124.

Corduas, M., Cinquanta, L. and Ievoli, C. (2013) 'The importance of wine attributes for purchase decisions: a study of Italian consumers' perception', *Food Quality and Preference*, Vol. 28, No. 2, pp.407–418.

Couderc, J.P. and Marchini, A. (2011) 'Governance, commercial strategies and performances of wine cooperatives', *International Journal of Wine Business Research,* Vol. 23, No. 3, pp.235-257.

Crescimanno, M. and Galati, A. (2014) 'Competitiveness of Italian wines in the international market', *Bulgarian Journal of Agricultural Science*, Vol. 20, No. 1, pp.12–22.

Crick, J.M. (2018) 'Studying coopetition in a wine industry context: directions for future research', *International Journal of Wine Business Research*, Vol. 30, No. 3, pp.366–371.

Cusmano, L., Morrison, A. and Rabellotti, R. (2010) 'Catching up trajectories in the wine sector: a comparative study of Chile, Italy, and South Africa', *World Development*, Vol. 38, No. 11, pp.1588–1602.

Cvijanović, D., Novakovic, D.J. and Vojinović, Z. (2017) 'Wine industry as a source of rural growth and development', *Proceeding of the International Scientific Conference 'Strategies for the Agri-Food Sector and Rural Areas–Dilemmas of Development*, pp.19–21.

Dalmoro, M. (2013) 'The formation of country wineries networks for internationalization: an analysis of two new world wines regions' *Journal of Wine Research*, Vol. 24, No. 2, pp.96–111.

Dana, L.P. and Dana, T.E. (2005) 'Expanding the scope of methodologies used in entrepreneurship research', *International Journal of Entrepreneurship and Small Business*, Vol. 2, No. 1, pp.79–88.

Dana, L.P. and Dumez, H. (2015) 'Qualitative research revisited: epistemology of a comprehensive approach', *International Journal of Entrepreneurship and Small Business*, Vol. 26, No. 2, pp.154–170.

Dana, L.P. and Winstone, K.E. (2008) 'Wine cluster formation in New Zealand: operation, evolution and impact', *International Journal of Food Science and Technology*, Vol. 43, No. 12, pp.2177–2190.

Dana, L.P., Granata, J., Lasch, F. and Carnaby, A. (2013) 'The evolution of co-opetition in the Waipara wine cluster of New Zealand', *Wine Economics and Policy*, Vol. 2, No. 1, pp.42–49.

Dana, L.P., Grandinetti, R. and Mason, M.C. (2016) 'International entrepreneurship, export planning and export performance: evidence from a sample of winemaking SMEs', *International Journal of Entrepreneurship and Small Business*, Vol. 29, No. 4, pp.602–626.

Devigili, M., Pucci, T. and Zanni, L. (2018) 'From firm's brand identity to cluster's brand identity: a web-based analysis of Tuscan wineries', *International Journal of Wine Business Research*, Vol. 30, No. 4, pp.374–393.

Eisingerich, A.B., Bell, S.J. and Tracey, P. (2010) 'How can clusters sustain performance? The role of network strength, network openness, and environmental uncertainty', *Research Policy*, Vol. 39, No. 2, pp.239–253.

Felbermayr, G.J. and Toubal, F. (2010) 'Cultural proximity and trade', *European Economic Review*, Vol. 54, No. 2, pp.279–293.

Felzensztein, C., Deans, K.R. and Dana, L.P. (2019) 'Small firms in regional clusters: Local networks and internationalization in the Southern Hemisphere', *Journal of Small Business Management*, Vol. 57, No. 2, pp.496–516.

Fordham, K. (2015) *Why Montefalco is Italy's Best 'New' Wine Region*, Conde Nast Traveler.

Francioni, B., Vissak, T. and Musso, F. (2017) 'Small Italian wine producers' internationalization: The role of network relationships in the emergence of late starters', *International Business Review*, Vol. 26, No. 1, pp.12–22.

Galati, A., Crescimanno, M., Rossi, M., Farruggia, D. and Tinervia, S. (2014) 'The determinants affecting the internationalisation of the Italian SMEs producing sparkling wines: an empirical study on the RBV of the firms', *International Journal of Globalisation and Small Business*, Vol. 6, No. 2, pp.100–118.

Galati, A., Crescimanno, M., Tinervia, S., Iliopoulos, C. and Theodorakopoulou, I. (2017) 'Internal resources as tools to increase the global competition: the Italian wine industry case', *British Food Journal*, Vol. 119, No. 11, pp.2406–2420.

Galati, A., Tinervia, S., Tulone, A., Crescimanno, M. and Rizzo, G. (2018) 'Label style and color contribution to explain market price difference in Italian Red Wines Sold in the Chinese Wine Market', *Journal of International Food and Agribusiness Marketing*, Vol. 30, No. 2, pp.175–190.

Ghauri, P., Lutz, C. and Tesfom, G. (2003) 'Using networks to solve export marketing problems of small- and medium-sized firms from developing countries', *European Journal of Marketing*, Vol. 37, Nos. 5/6, pp.728–752.

Giuliani, E. (2007) 'The selective nature of knowledge networks in clusters: evidence from the wine industry', *Journal of Economic Geography*, Vol. 7, No. 2, pp.139–168.

Giuliani, E. (2013) 'Network dynamics in regional clusters: evidence from Chile', *Research Policy*, Vol. 42, No. 8, pp.1406–1419.

Granata, J., Lasch, F., Le Roy, F. and Dana, L.P. (2018) 'How do micro-firms manage coopetition? A study of the wine sector in France', *International Small Business Journal*, Vol. 36, No. 3, pp.331–355.

Hallak, J.C. (2006) 'Product quality and the direction of trade', *Journal of international Economics*, Vol. 68, No. 1, pp.238–265.

Handcock, M.S., Hunter, D.R., Butts, C.T., Goodreau, S.M. and Morris, M. (2008) 'Statnet: software tools for the representation, visualization, analysis and simulation of network data', *Journal of Statistical Software*, Vol. 24, No. 1, pp.1–11.

He, X. and Wei, Y. (2013) 'Export market location decision and performance', *International Marketing Review*, Vol. 30, No. 6, pp.559–590.

Howard, P. (2018) 'Montefalco Sagrantino: Tannis, time and transformation', *Wine Alchemy – Wine Reviews and Events*, 28 November 2018.

Johanson, J. and Mattsson, L.G. (2015) 'Internationalisation in industrial systems – a network approach', in Holm, F. and Johanson (Eds): *Knowledge, Networks and Power*, Palgrave Macmillan, London, pp.111–132.

Karelakis, C., Mattas, K. and Chryssochoidis, G. (2008) 'Greek wine firms: determinants of export performance', *Agribusiness: An International Journal*, Vol. 24, No. 2, pp.275–297.

Karlsson, C. and Stough, R. (Eds.) (2005) *Industrial Clusters and Inter-Firm Networks*, Edward Elgar Publishing, Cheltenham, UK

Katsikeas, C.S. and Morgan, R.E. (1994) 'Differences in perceptions of exporting problems based on firm size and export market experience', *European Journal of Marketing*, Vol. 28, No. 5, pp.17–35.

Kepaptsoglou, K., Karlaftis, M.G. and Tsamboulas, D. (2010) 'The gravity model specification for modeling international trade flows and free trade agreement effects: a 10-year review of empirical studies', *The Open Economics Journal*, Vol. 3, No. 1, pp.1–13.

Kossinets, G. (2006) 'Effects of missing data in social networks', *Social Networks*, Vol. 28, No. 3, pp.247–268.

Krugman, P.R. and Obstfeld, M. (2009) *International Economics: Theory and Policy*, Pearson Education, London, UK.

Lages, C., Lages, C.R. and Lages, L.F. (2005) 'The RELQUAL scale: a measure of relationship quality in export market ventures', *Journal of Business Research*, Vol. 58, No. 8, pp.1040–1048.

Leonidou, L.C., Katsikeas, C.S. and Coudounaris, D.N. (2010) 'Five decades of business research into exporting: a bibliographic analysis', *Journal of International Management*, Vol. 16, No. 1, pp.78–91.

Maghssudipour, A., Lazzeretti, L. and Capone, F., (2020) 'The role of multiple ties in knowledge networks in wine clusters', *Industrial Marketing and Management*, Vol. 90, pp.667–678.

Majocchi, A., Bacchiocchi, E. and Mayrhofer, U. (2005) 'Firm size, business experience and export intensity in SMEs: a longitudinal approach to complex relationships', *International Business Review*, Vol. 14, No. 6, pp.719–738.

Mann, S., Beciu, S. and Karbauskas, A. (2018) 'Globalising chains–decoupling grape production, wine production and wine exports', *British Food Journal*, Vol. 120, No. 3, pp.703–713.

Matanda, M. and Freeman, S. (2009) 'Effect of perceived environmental uncertainty on exporter – importer inter-organisational relationships and export performance improvement', *International Business Review*, Vol. 18, No. 1, pp.89–107.

Melitz, J. and Toubal, F. (2014) 'Native language, spoken language, translation and trade', *Journal of International Economics*, Vol. 93, No. 2, pp.351–363.

Migone, A. and Howlett, M. (2010) *Comparative Networks and Clusters in the Wine Industry*, AAWE Working Paper, No. 62.

Montefalco Consortium (2019) *Documents*. Available online at: www.consorziomontefalco.it

Morrison, A. and Rabellotti, R. (2008) 'Knowledge and information networks in an Italian wine cluster', *European Planning Studies*, Vol. 17, No. 7, pp.983–1006.

Mueller, R.A., Sumner, D.A. and Lapsley, J. (2006) '*Clusters of grapes and wine*', *Proceedings of the 3rd International Wine Business Research Conference*, Montpellier, France.

Musso, F. and Francioni, B. (2015) 'Agri-food clusters, wine tourism and foreign markets: the role of local networks for SME's internationalization', *Procedia Economics and Finance*, Vol. 27, pp.334–343.

Nosi, C. (2009) 'The Aussie value innovation: how Australia escaped the red queen of the global wine business', *Mercati e Competitività*, Vol.4, pp.45–70.

Nowak, L. and Anderson, S. (1999) 'The importance of non-financial performance measures in wine business strategy', *International Journal of Wine Marketing,* Vol. 11, No. 3, pp.9–19.

Nunes, A. and Franco, M. (2015) 'Internationalisation process: analysis of a cooperation network in the Vinho Verde sector for the US market', *World Review of Entrepreneurship, Management and Sustainable Development*, Vol. 11, No. 1, pp.34–48.

Parcero, O.J. and Villanueva, E. (2011)'*World Wine Exports: What Determined the Success of the 'New World' Wine Producers?*, CRIEFF Discussion Paper No. 1103.

Paul, J., Parthasarathy, S. and Gupta, P. (2017) 'Exporting challenges of SMEs: a review and future research agenda', *Journal of World Business*, Vol. 52, No. 3, pp.327–342.

Porter, M.E. (1996) 'Competitive advantage, agglomeration economies, and regional policy', *International Regional Science Review*, Vol. 19, Nos. 1/2, pp.85–90.

Porter, M.E. (1998) 'Clusters and the new economics of competition', *Harvard Business Review*, Vol. 76. No. 8, pp.77–90.

Reid, S. (1984) 'Information acquisition and export entry decisions in small firms', *Journal of Business Research*, Vol. 12, No. 2, pp.141–157.

Robins, G., Pattison, P., Kalish, Y. and Lusher, D. (2007) 'An introduction to exponential random graph (p*) models for social networks', *Social Networks*, Vol. 29, 2, pp.173–191.

Samoggia, A. (2016) 'Wine and health: faraway concepts?', *British Food Journal*, Vol. 118, No. 4, pp.946–960.

Silvente, F.R. and Giménez, J.C. (2007) 'Information spillovers and the choice of export destination: a multinomial logit analysis of Spanish young SMEs', *Small Business Economics*, Vol. 28, No. 1, pp.69–86.

Snijders, T.A. (2002) 'Markov chain Monte Carlo estimation of exponential random graph models', *Journal of Social Structure*, Vol. 3, No. 2, pp.1–40.

Suarez-Ortega, S.M. (2003) 'Export barriers: Insights from small and medium-sized firms', *International Small Business Journal*, Vol. 21, No. 4, pp.403–419.

Sousa, C.M. (2004) 'Export performance measurement: an evaluation of the empirical research in the literature', *Academy of Marketing Science Review*, Vol. 1*,* No. 9, pp.1–21.

Sousa, C.M. and Bradley, F. (2008) 'Antecedents of international pricing adaptation and export performance', *Journal of World Business*, Vol. 43, No. 3, pp.307–320.

Stasi, A., Nardone, G., Viscecchia, R. and Seccia, A. (2011) 'Italian wine demand and differentiation effect of geographical indications', *International Journal of Wine Business Research*, Vol. 23, No. 1, pp.49–61.

Vissak, T., Francioni, B. and Musso, F. (2017) 'The role of network relationships in small wineries' internationalization: a case study from Marche, Italy', *International Journal of Wine Business Research*, Vol. 29, No. 1, pp.37–57.

Vrontis, D., Bresciani, S. and Giacosa, E. (2016) 'Tradition and innovation in Italian wine family businesses', *British Food Journal*, Vol. 118, No. 8, pp.1883–1897.

Wasserman, S. and Faust, K. (1994) *Social Network Analysis: Methods and Applications*, Cambridge University Press, Cambridge, UK.

Welch, D.E. and Welch, L.S. (1996) 'The internationalization process and networks: a strategic management perspective', *Journal of International Marketing*, Vol. 4, No. 3, pp.11–28.

Welch, D.E., Welch, L.S., Young, L.C. and Wilkinson, I.F. (1998) 'The importance of networks in export promotion: policy issues', *Journal of International Marketing*, Vol. 6, No. 4, pp.66–82.

Welter, F. (2011) 'Contextualizing entrepreneurship – conceptual challenges and ways forward', *Entrepreneurship Theory and Practice*, Vol. 35, No. 1, pp.165–184.

Zou, S., Taylor, C.R. and Osland, G.E. (1998) 'The EXPERF scale: a cross-national generalized export performance measure', *Journal of International Marketing*, Vol. 6, No. 3, pp.37–58.

Note

1   We assume the perspective that networks and clusters are different but strictly related concepts (Eisingerich et al., 2010), where the former are a relevant part, even if not the totality, of the explanation of competitiveness and sustainability over time of the latter (Migone and Howlett, 2010).