ALMA MATER STUDIORUM
UNIVERSITÀ DI BOLOGNA

ARCHIVIO ISTITUZIONALE
DELLA RICERCA

Alma Mater Studiorum Università di Bologna
Archivio istituzionale della ricerca

Do institutional networks affect winery survival?

This is the final peer-reviewed author's accepted manuscript (postprint) of the following publication:

Published Version:
Fernandez-Olmos M., Gargallo-Castel A.F., Malorgio G. (2021). Do institutional networks affect winery survival?. BRITISH FOOD JOURNAL, 123(7), 2478-2491 [10.1108/BFJ-09-2020-0836].

Availability:
This version is available at: https://hdl.handle.net/11585/827109 since: 2021-06-30

Published:
DOI: http://doi.org/10.1108/BFJ-09-2020-0836

Terms of use:

Some rights reserved. The terms and conditions for the reuse of this version of the manuscript are specified in the publishing policy. For all terms of use and more information see the publisher's website.

This item was downloaded from IRIS Università di Bologna (https://cris.unibo.it/).
When citing, please refer to the published version.

(Article begins on next page)

17 August 2024

This is the final peer-reviewed accepted manuscript of:
Fernández-Olmos, M., Gargallo-Castel, A.F. and Malorgio, G. (2021),
"Do institutional networks affect winery survival?",
British Food Journal, Vol. 123 No. 7, pp. 2478-2491.
The final published version is available online at:
https://doi.org/10.1108/BFJ-09-2020-0836.

Terms of use:
Some rights reserved. The terms and conditions for the reuse of this version of the manuscript are specified in the publishing policy. For all terms of use and more information see the publisher's website.

This item was downloaded from IRIS Università di Bologna (https://cris.unibo.it/)
When citing, please refer to the published version.

Do institutional networks affect winery survival?

Journal:	*British Food Journal*
Manuscript ID	BFJ-09-2020-0836.R1
Manuscript Type:	Research Paper
Keywords:	winery survival, DOC RIoja, networks with institutions

Do institutional networks affect winery survival?

Abstract

Purpose

The present study aims to provide new evidence regarding the factors that determine the survival of firms in the Spanish wine industry and to improve the understanding of sector dynamics.

- **Design/methodology/approach**

The empirical analysis, conducted over a representative sample of wineries in the DOC Rioja wine industry, is based on non-parametric (Kaplan-Meier graph) and semi-parametric survival models (Cox proportional hazard model).

- **Findings**

Our empirical model finds that wineries with a greater number of networks with institutions enjoy better prospects of survival. This study also shows that a winery's previous performance affects its probability of survival. Consequently, wineries that have been successful in the past have a lower hazard of exit. Although spending on R&D and exporting are factors likely to improve wineries' efficiency and competitiveness, these factors did not contribute significantly to the survival of DOC Rioja wineries.

- **Originality**

This paper makes a significant contribution to the understanding of the determinants of wineries' survival and has important policy implications. In order to raise the probability of survival, policy makers should promote the networks that link wineries and institutions. Moreover, this study is based on survival analysis which, although frequently used in medical and behavioural sciences, has rarely been applied to wine economics. Finally, it uses a unique data set obtained from primary data collection, which previous studies have not analysed in relation to the probability of winery survival.

Type of article: Research paper

Keywords: winery survival, DOC Rioja, networks with institutions

Introduction

The wine sector, which is mainly composed of SMEs, represents an important agricultural segment of the EU (Vrontis et al., 2016; Pomarici and Sardone, 2020). The European wine sector is the top EU agri-food exporter, with almost €12.8 billion in exports in 2019 (www.ceeuv.es). Nevertheless, European wineries currently face a variety of challenges, including the coronavirus recession in the global economy, the rise of concerns regarding sustainability and competition from new wine-producing countries. In this respect, European wine producers will be motivated to collaborate with institutions and this will be crucial for their survival. In this conceptual framework, the effect of networks with institutions on winery survival is an important issue in the future of the European wine sector (Fernández-Olmos and Malorgio, 2020).

The topic of firm survival has been researched extensively in the theoretical and empirical literature. A number of factors that influence the probability of a firm's survival in the market have been empirically evaluated, including size, age, productivity, innovation at firm level, quality policy, agglomeration and industry concentration at industry level (Blanchard et al., 2004; Dimara et al., 2008; Bontemps et al., 2012; Wang et al., 2014). The role played by institutional networking has been largely ignored in these studies. Nevertheless, the institution-based view has recognized the importance of institutional factors for understanding firms' competitive advantage (Garrido et al. 2014), and in the agri-food sector particularly the role of networks is a research subject that merits additional investigation (Camanzi and Giua, 2020).

To fill this gap, the present paper attempts to shed light on the link between institutional networks and winery survival by focusing on wineries operating in the DOC (Designation of Qualified Origin) Rioja wine sector.

This paper provides the first analysis of key factors that explain the survival of a sample of wineries in the DOC Rioja industry. Specifically, this study analyses how internationalization and networks with institutions, as well as other factors, may be associated with the decisions of wineries to remain in the sector. On the one hand, our study differs from most previous studies on survival in that it not only examines the

main determinants of firms' survival based on firm and industry-specific characteristics, but also the role of institutions under the institutional network approach. Our results suggest that institutions play an important role in wineries' survival by providing learning and knowledge regarding domestic and foreign markets, as well as promoting their wines. Moreover, this study shows that a winery's previous performance affects its probability of survival. Consequently, wineries that have been successful in the past have a lower hazard of exit.

We focus on Rioja because it is Spain's leading Designation of Origin with more than 600 wineries and 14,800 grape growers. It produces the largest number of barrels in the world. Rioja wines are present in 139 different countries (https://www.riojawine.com/es-es/).

Wines from DOC Rioja are internationally recognized, not only due to the control of the quality of the grapes and the winemaking process, but also because of the region's exceptionally long history and cultural background. As an example, two Rioja vineyards are in the top 50 of the World's Best Vineyards to Visit 2020 (https://www.worldsbestvineyards.com/).

The evolution of the main economic indicators in DOC Rioja shows the growth of this sector in the last three decades. Qualified production increased 300%, sales nearly tripled and the number of wineries grew six-fold (Barco, 2018). Thus, the DOC Rioja wine sector is strategic not only because of its potential to produce high-quality wines, but also as a source of employment and wealth in the region that is difficult to substitute with other economic activities. However, this industry has an important group of SME wineries that face the pressures of competition at home as well as in international markets, which can slow the sector's growth (Barco, 2018). Given the crucial socio-economic role that the DOC Rioja wine sector plays, it is necessary to understand the factors that determine the survival of wineries to improve our understanding of sector dynamics. The paper's objective is to contribute to the analysis of these factors.

This study demonstrates the usefulness of survival analysis in understanding the decisions by wineries to remain in the industry. Our study makes three important contributions to understanding winery survival. First, by studying the factors that affect the exit decisions of wineries, this paper makes a significant contribution to the understanding of the determinants of winery survival. It also has important policy

implications given that in order to develop effective policies to achieve a sustainable wine sector, it is crucial to have a better understanding of wine producers' behaviours and the factors influencing their decisions to exit the industry. In particular, our results suggest that in order to raise the probability of survival, policy makers should promote the networks between wineries and institutions. Our second contribution is the use of survival analysis which, despite being a well-known methodology in medical and behavioural sciences, has rarely been applied to wine economics. Third, this study differentiates itself from previous research on survival strategies by using a unique data set obtained from primary data collection, which previous papers have not analysed in relation to the probability of winery survival. One advantage of using this database is the availability of individual winery data regarding their networks with institutions and information on their level of social capital, as well as comprehensive internationalization information and other winery characteristics.

This paper is divided into four sections, with the first being the Introduction. The second section presents the literature relevant to the analysis of winery survival. The empirical results are presented and discussed in section three. Finally, the last section contains concluding remarks and proposes avenues for further research.

2. Theoretical framework

Literature review of networks

The adoption of institutional networks (i.e., network associations with institutional partners such as governments, research institutions, advisory and support offices, agencies for international development, and so on) has been recognized to be a key element in firm performance because it helps SMEs overcome the limitations of their internal resources (Kontinen and Ojala, 2011; Hernández-Carrión et al., 2017).

In the specific case of the wine industry, institutional networking has been identified as a key success factor in their bid to expand into international markets (Fernández and Malorgio, 2020). Despite the above evidence, the role of institutional networks has been largely neglected with respect to firm survival (Che et al., 2017).

While the issue of firm survival is of central importance in the agri-food industry (Hough et al., 2003; Blanchard et al., 2004; Teratanavat et al., 2005; Cruz et al., 2010; Bontemps et al., 2012; Grashuis et al., 2020), there are relatively few empirical studies

of the determinants of survival for SME wineries. An exception is Valette et al. (2018) which examines the survival rates of cooperatives in the French wine industry.

Traditionally, the main determinants of firm survival analysed in the empirical literature in the agri-food sector have been related to firm- and industry-specific characteristics, such as individual productivity, age, size, innovation effort, and industry maturity (Blanchard et al. 2004; Dimara et al., 2008; Bontemps et al. 2012).

As shown by Broccardo et al. (2015) and Vrontis et al. (2016), family businesses are common in the wine sector. According to the AREF (Asociación Riojana de Empresa Familiar) [Rioja Family Business Association], family firms comprise around 88% of all business enterprises in Rioja.

The family nature of the business may affect the likelihood of survival of wineries because an important concern of family firms is to ensure the survival of the business across generations as a family firm (Broccardo et al., 2015). It is well known that first-generation family wineries are more risk averse than non-family wineries, which explains their desire to see the wine business handed on to the next generation (Kellermanns and Eddleston, 2006; Kellermanns et al., 2008).

As the top management team of family wineries plays a central role in deciding strategy and differs from teams in non-family wineries, we examine the composition of the top management teams in wineries. In particular, we measure the number of family members holding managerial positions in proportion to the total number of members.

Wineries entering the market on a relatively large scale may benefit from cost advantages and greater facilities in accessing capital markets. They have more bargaining power with customers and suppliers, as well as easier access to international markets compared with small firms (Sellers and Alampi-Sottini, 2016). In a sample of 723 Italian wineries, Sellers and Alampi-Sottini (2016) find that size has a positive influence on the economic performance of wineries. Bontemps et al. (2012) examine how EU regulations of quality food products affect the survival of cheese firms from 1990 to 2006 in France. They conclude that smaller firms still have a lower survival rate compared to larger ones and that this cannot be compensated by the quality label effect. As in Hessels and Terjesen (2010), firm size is measured by the logarithm of employment.

In line with other work on innovation in the wine industry (Doloreux and Friges, 2019), the research on dynamic capabilities predicts that those wineries that are able to

successfully innovate are able to establish and maintain a competitive advantage in the wine market since innovation activity enables wineries to deal with new technologies and continuously improve their existing capabilities. Despite the importance of innovation in the growth of the wine industry, empirical research devoted to innovation and survival in the sector remains scarce. Following the previous literature, which has empirically corroborated investment in R&D at firm level as a determinant of survival (Hall, 1987; Esteve-Pérez et al., 2004), we expect that a winery's innovative effort, measured as R&D expenditure, plays an important role in shaping the survival of wineries.

In response to falling domestic consumption in Old World countries (France, Italy and Spain), exporting has become a necessary strategy to succeed in this highly competitive market (Campbell and Guibert, 2006). When a winery exports, it diversifies risk by spreading sales over different markets. In particular, exports might provide Spanish wineries with a chance to substitute sales at home, where wine consumption has decreased in previous years, with sales abroad. Thus, we expect that a winery's export experience should have positive effects on its probability of survival. Corroborating this argument, empirical evidence has found that the exporting status of a firm is positively correlated with its probability of survival (e.g., Greenaway et al., 2008; Dai et al. 2016).

Based on previous literature (e.g., Chen, 2008; Maclean et al. 2014), we argue that wineries with a history of superior performance may have a greater probability of survival. Past successes could provide wineries with sufficient resources to adopt innovative behaviour, which may help them adapt to evolving consumer needs and expand into new international markets. Indeed, Sellers and Alampi-Sottini (2016) consider that winery managers should be aware of the importance of controlling their economic performance in order guarantee survival in the long term. In short, past success can enable wineries to discover and exploit opportunities to maintain sustainable survival. Based on this reasoning, we predict that wineries with better performance will survive more easily. As Lee and Habte-Giorgis (2004) suggested, this study employs different items to measure performance.

As we mentioned earlier, the traditional literature on firm survival has analysed firm exits with particular attention to the effects of firm and industry characteristics, while it las largely ignored institutional effects. In recent years, however, researchers

applying the institution-based view have started to emphasize the role of institutions as a factor affecting firms' strategies (Garrido et al., 2014).

With a focus on the wine industry, Giuliani et al. (2011) demonstrated that universities and scientists contribute to innovation in wine firms by providing new technological processes and know-how, which can be used to meet the new demands and increase their sales. Likewise, other papers have shown the relevance of bridging organizations (e.g., industrial associations and/or public organizations) for innovation in the food and beverage industry (Dries et al., 2014; Bresciani, 2017; Santoro et al., 2017). Recently, Monticelli et al. (2018) found that formal institutions are the most important players in the promotion of cooperation between firms in the Brazilian wine industry.

However, investigating the relationships between institutions and firm survival is an important approach that has received little attention (Che et al., 2017). To fill this gap, we aim to understand the role that institutions play in driving the survival of wineries in DOC Rioja.

DOC Rioja wineries are an appropriate subject of study because both public and private institutions have a strong presence in this sector. Institutions play a crucial role in the wine activity, reducing uncertainty (North, 1990), and have become a benchmark for partners involved in the wine value chain.

In order to figure out what the effects of institutions are, we need to understand what happens to wineries after they establish networks with institutions. These relationships increase the competitiveness of the domestic wine market by developing learning and relationship networks, reducing transaction costs, and facilitating internationalization (Monticelli et al. 2018). Moreover, the networks formed by the winery can strongly influence the perceived quality of its wines within the market (Guibert, 2006).

The concept of survival (time-to-event) analysis is a method developed to analyse the time to an event of interest, taking into account the presence of censored data (Hough et al., 2003). In our study, it occurs whenever the time until the firm exits the market cannot be observed exactly. This methodology has been widely used to analyse how firm characteristics can influence firm survival in the agri-food industry (e.g., Cruz et al., 2010; Bontemps et al., 2012; Akhundjanov et al., 2019), but not to analyse institutional networks, which may be a key driver of wineries.

The empirical analysis, conducted over a representative sample of wineries in the DOC Rioja wine industry, is based on non-parametric (Kaplan-Meier graph) and semi-parametric survival models (Cox proportional hazard model).

3. Empirical analysis

3.1 Data collection

Before explaining the survival analysis, we shall describe the data employed. The DOC Rioja context was used to test the survival of wineries. The data for this research came from a single study of DOC Rioja wineries.

The main data sources used to obtain the list of wineries in the target population were the directories drawn up by the Regulatory Council of the Rioja Designation of Origin (the number of wineries in this directory numbered 580). The data for this study were collected using a structural survey. The questionnaires were sent and the information contained in them was collected depending on the preferences of the winery: by phone, email or internet. In the collection via the internet, the winery itself logged onto a web questionnaire directly. In a first phase, the questionnaire was sent by mail to the wineries together with the cover letter. Subsequently, wineries that had not responded were contacted by telephone. The survey targeted the wineries' president (or the highest-ranking corporate officer) because he or she participates directly in the winery's business and is considered a reliable source of information (Alayo et al., 2019).

To be included in the sample the wineries had to meet the following requirements: (1) they belong to the Rioja Designation of Origin, (2) they manage the full winemaking process from grape to bottle, and (3) they are obliged to present accounting information to the authorities. In total, 123 valid questionnaires were obtained, with a response rate of 21.21%.

The variable of interest is the time (in years) until the occurrence of some event, to which we generically refer as the exit from the wine activity. This is the length of time that elapses from the time of observation, in our case from the time a winery begins in the wine activity, until its exit (complete observations) or until the end of the study, 31 May 2020 (right-censored observation). In this last group are, therefore, wineries that

continue in the industry after the study is finished. Wineries that changed names were treated as continuing entities. Thus, survival time, in our case, is the length of time that a winery remains active in the wine industry, i.e., the period between its entry and exit in the case of complete observation or until the end of the study, in the case of right-censored observation.

Measurement of variables

We examined previous literature to measure all variables. Table 1 provides a brief description of the variables used in this study. Table 2 presents the means, standard deviations, and Spearman correlations for the variables employed in the model.

INSERT TABLE 1 & TABLE 2

The econometric technique

The focus of our study is to analyse what factors affect wine firm survival and, particularly, how the influence of networks with institutions, previous performance, as well as other factors, may be associated with the decision by wineries to remain in the wine sector.

To analyse whether the likelihood of winery survival is invariant to these factors, we use survival analysis[1], which allows us to estimate the time until failure. Survival analysis is used to process censored data that represent situations where the response of interest (the exit of the winery from the sector) has not yet occurred, and it is only known that the winery has survived for at least a given period t. Therefore, the time-to-event is known for only a portion of the sample of wineries. Because of the nature of the dependent variable, ordinary least squares regression can yield parameter estimates that are biased and inconsistent, thus being inappropriate for this type of analysis. For this reason, we estimate a semi-parametric Cox proportional hazard regression, in which the hazard function is assumed to be of the form

$$\lambda(t|z) = \lambda_0(t) exp^{\{z_i' \beta\}}$$

[1] In previous studies, the terms, such as event history analysis, duration model, hazard model and failure-time model have often been employed interchangeably.

Where β is the vector of regression coefficients, z is the vector of measured explanatory variables, and $\lambda_0(t)$ is the baseline hazard function[2] which represents the probability of failure conditional on the winery surviving until time t.

In the context of the Cox model, if the hazard ratio for a predictor is close to 1 then that predictor does not affect survival. If the hazard ratio is less than one or negative, then the predictor is associated with improved survival. If the hazard ratio is greater than one, then the predictor is associated with decreased survival.

Although the model is semi-parametric (i.e., no particular shape is assumed for the baseline hazard), the proportional hazard assumption requires testing that the hazard ratio is constant over time. This was checked using Schoenfeld residuals ($\chi^2(6) = 2.96, Prob > \chi^2 = 0.8142$).

3.2 Results

The results of the Cox regression model are presented in Table 3. This model presents a satisfactory indicator of overall significance, with a chi-squared value corresponding to levels of significance lower than 0.05 (Prob > Chi^2=0.0245).

To assess whether a fitted Cox regression model adequately describes our data, we have to confirm that continuous covariates are linear. We calculated the Martingale residual to assess nonlinearity and the goodness-of-fit was assessed for the model using the Gronnesby and Borgan test. We obtained an insignificant p-value (Prob> Chi2=0.4208), which suggests good model fit.

INSERT TABLE 3

Although the presence of family members in management teams and on the board of directors (FAMILY_BOARD) is a factor that is likely to affect wineries' efficiency and competitiveness, this factor did not contribute significantly to the model. This indicates that this variable is not the most crucial factor for the survival of DOC Rioja wineries in the period analysed.

A possible explanation is that those family winery owners who do not have heirs wishing to continue their wine activity prefer to close down rather than hand control of the winery to an outsider (Santarelli, 2001).

[2] No particular shape is assumed for the baseline hazard; it is estimated nonparametrically

Similarly, the estimated coefficient for size is not significant. The possible explanation for this finding is the sample of wineries used in this study. Winery size influences survival only insofar as it is associated with economies of scale, which will affect efficiency relative to the viticulture activity. However, it is difficult to exploit economies of scale in DOC Rioja due to their differentiation strategy and the small size of vineyards, which makes the mechanization of viticulture tasks difficult.

The impact of the crisis on purchasing power, increasing regulations for certification, and the need for cost reductions to increase competitiveness, are pushing wineries to boost R&D investments. However, the results of the regression do not confirm that R&D is a driver of winery survival. This may be because R&D is highly complex and offers unclear rates of return (Doloreux and Frigon, 2019). Other researchers suggest that only the combination of the winery's tradition values and innovation will maintain its competitive advantage (Vrontis et al., 2016; Giacosa et al., 2017).

Although exporting activity is considered in the literature as a determinant of wineries' success, we find no significant results for the relationship between exporting experience and wineries' survival. We have replicated[3] the model with other alternative variables of exporting, such as export intensity (Maurel, 2009) or the degree of internationalization (Fernández-Olmos, 2011) and have obtained similar results. In a similar vein, Valette et al. (2018) found that exports, measured by the ratio of exports to total sales, do not improve the survival probability of cooperatives. In line with López (2006), exporting, per se, does not seem to increase wineries' survival.

As new exporting wineries face the dual challenge of overcoming the liabilities of newness and of foreignness (Stinchcombe, 1965; Dunning, 1981; Zaheer, 1995; Autio et al. 2000), it is interesting to analyse the extent to which a winery is able to accumulate social capital in the international market in which it exports. Based on the definition of Bourdieu and Wacquant (1992), social capital comprises the sum of resources that a winery can access or mobilize by virtue of possessing a durable network of relationships. By applying general knowledge-based theory to the study of winery exports, we propose that the greater the international social capital of the winery, the greater its knowledge will be (Yli-Renko et al., 2002). In particular, international social capital allows foreign market knowledge to be shared and acquired in relationships

[3] Results are available upon request

between new exporting wineries and their partners in the foreign target markets. Therefore, international diversification will be faster and survival will increase.

To answer our main question about the effects of international social capital on the survival of exporting wineries, we performed a Kaplan-Meier analysis that makes it possible to compare the estimation of survival over time between two groups of wineries.

The measure of international social capital reflects the number of contacts or the connectivity that the winery has in the international market. In this paper, we have followed the methodologies used in previous studies to measure this variable (Maula et al., 2003; Musteen et al., 2010; Parra Requena et al., 2010; Yli-Renko et al., 2002).

Figure 1 depicts the Kaplan-Meier estimates (Kalbfleisch and Prentice, 2011) comparing wineries with high and low levels of international social capital. The estimated survival function for wineries with high international social capital lies above the one for wineries with low international social capital throughout the period analysed.

The results, taken together, suggest that the exporting process itself can be considered as a process of developing and accessing international social capital, as wineries initiate, establish, and deepen relationships (Johanson and Vahlne, 2006).

INSERT FIGURE 1

Two factors noticeably improve the survival of the DOC Rioja wineries: previous performance and networking with institutions.

Results show that a winery's previous performance, assessed using both financial and growth-based measures, is more closely related to a winery's survival. This result is consistent with the theory that predicts that firm growth is a crucial measure for future value creation (Viguerie et al., 2011). This result suggests that the phenomenon of dynamic increasing returns is present in the DOC Rioja wine industry, and learning through growth can increase growth potential in the long term and can therefore enhance a winery's survival.

More notably, our empirical model finds that wineries with a higher number of networks with institutions enjoy better survival prospects. Many DOC Rioja wineries develop networks with associations such as PROVIR (Asociación Bodegas Familiares de Rioja) ARAEX (Asociación de Exportadores de Rioja Alavesa), ARBOR (Agrupación de Artesanos Bodegueros de Rioja), ABC (Asociación de Bodegas por la

Calidad), FECOAR (Federación de Cooperativas Agrarias de La Rioja), ABRA (Asociación de Bodegas de Rioja Alavesa), AEVZR (Asociación de Empresas Vinícolas de la Zona Rioja), and other institutional partners such as Instituto de Ciencias de la Vid y del Vino, Estación Enológica de Haro, Grupo de Empresas Vinícolas de Rioja, Proyecto Europeo Wine Tech, El Grupo Rioja, University of La Rioja, University of Basque Country-Campus Álava, and/or University of Navarra. These links offer both support services (e.g., a wine producer directory, international business planning, and different marketing and promotion activities) and wine business development opportunities (e.g., wine fairs, trade showcases, and actions to meet the buyer). Thus, our results indicate that using these institutional networks not only creates opportunities for wineries to be competitive in the global wine market but also provides them with links that help them survive.

To check robustness, we performed the analysis again using the Weibull parameterization. Similar results were obtained, which confirms its robustness [4].

4. Conclusions

This study contributes to the growing empirical evidence regarding firm survival by examining the effects of networks with institutions. To date, the significance of networks with institutions for the survival of a winery has been rather neglected. Our results verify the positive effect of networks with institutions on firm survival in the wine industry.

This is one of the first studies to apply survival analysis in the wine industry. This paper also advances our knowledge by presenting a more nuanced perspective of exporting strategy based on the distinction between number of years exporting and international social capital. We thus contribute to the discussion regarding the effect of the internationalization strategy on the firm's survival by showing that the quality of the winery's experience is more important than the number of years it has been exporting. The connectivity that the winery has in the international market is key.

In addition, these findings have important implications. First, this analysis makes it possible to evaluate specific support programs to improve winery survival. Policy makers should promote networks between wineries and institutions as these links have

[4] Results are available upon request

proven to be a crucial element in their survival. In this respect, public policy directed towards exporting without taking into account international social capital may be inadequate. Likewise, policy makers should devote resources to promoting R&D investments taking into account their efficiency.

Our results could be a useful tool not only for policy makers but also for winery managers by offering them the possibility to identify those wineries with a greater risk of exiting the DOC Rioja wine industry. Wineries could thus have a better understanding of their situation and they could then launch initiatives to reduce the hazard of abandoning the market.

The findings also have academic implications since they underline the need for academics to be alert to the fact that survival could be contingent on different combinations of exporting experience and international networks. This argues for taking a broader view of the range of international activities that improve survival in the wine industry.

These results have important implications and present some interesting avenues for future research. The research population includes only Spanish firms belonging to a particular sector. This could be a problem when attempting to generalize the results, but the Spanish wine industry is of strategic importance, not only because it is a source of high-quality wine, but also because it is one of the most important sectors in Spain's agro-economy. Future research could improve our knowledge by looking at other sectors.

Although we believe that our sample of Rioja wineries has numerous advantages because it allowed us to examine network information, this approach limits our investigation to the survival of wineries from one area, DOC Rioja, with cross-sectional data. Wineries from other regions (e.g. New World countries) may have different strengths that they use to deal with the challenges of survival. Future studies should attempt to construct a longitudinal database that cover multiple countries.

References

Akhundjanov, S. B., Pozo, V. F., and Thomas, B. (2019),” Product Recalls and Firm Learning: Evidence from the Food Industry”, *Selected poster prepared for presentation at the 2019 Agricultural & Applied Economics Association Annual Meeting*, Atlanta, Georgia.

Alayo, M., Maseda, A., Iturralde, T. and Arzubiaga, U. (2019), “Internationalisation and entrepreneurial orientation of family SMEs: The influence of the family character”, *International Business Review*, Vol.28, pp. 48-59.

Autio, E., Sapienza, H. J., and Almeida, J. G. (2000), “Effects of age at entry, knowledge intensity, and imitability on international growth”, *Academy of Management Journal*, Vol. 43, pp. 909-924.

Barco, E. (2018), *Análisis de un sector: Rioja 4.0*, Edita Consejería de Agricultura, Ganadería y Medio Ambiente, La Rioja.

Blanchard, P., Huiban, J-P., and Mathieu, C. (2012), “The determinants of firm exit in the French food industries”, *Review of agricultural and environmental studies*, INRA Editions, Vol. 93 No. 2, pp.193-212.

Bontemps, C., Zohra, B-m., and Simioni, M. (2012), “Quality Labels and Firm Survival in the French Cheese Industry”, *TSE Working Paper*, 12-335.

Bourdieu, P., and Wacquant, L. J. (1992), *An invitation to reflexive sociology*. University of Chicago press.

Bresciani, S. (2017), “Open, networked and dynamic innovation in the food and beverage industry”, *British Food Journal*, Vol. 119 No. 11, pp. 2290-2293.

Broccardo, L., Giacosa, E., and Ferraris, A. (2015), “The family variable in the wine sector: an Italian perspective”, *International Journal of Management Practice*, Vol. 8 No.3, pp.199-215.

Bugel, O. and Murray, G.C. (2000), “The international market entry choices of start-up companies in high-technology industries”, *Journal of International Marketing*, Vol. 8 No. 2, pp. 33–62.

Cabral, L. and Mata, J. (2003), “On the evolution of the firm size distribution: Facts and theory”, *American economic review*, Vol.93 No.4, pp. 1075-1090.

Camanzi, L., and Giua, C. (2020), “SME network relationships and competitive strategies in the agri-food sector”. *European Business Review*, Vol. 32 No,3, pp. 405-424.

Campbell, G. and Guibert, N. (2006), “Introduction: Old World strategies against New World competition in a globalising wine industry”, *British Food Journal*, Vol.108 No. (4), pp. 233-242.

Che, Y., Lu, Y., and Tao, Z. (2017), “Institutional quality and new firm survival”, *Economics of Transition*, Vol.25 No.3, pp. 495-525.

Chen, W. R. (2008), “Determinants of firms’ backward-and forward-looking R&D search behaviour”, *Organization Science*, Vol. 19 No.4, pp. 609–622.

Cruz, A. G., Walter, E. H., Cadena, R. S., Faria, J. A., Bolini, H. M., Pinheiro, H. P., and Sant’Ana, A. S. (2010), “Survival analysis methodology to predict the shelf-life

of probiotic flavored yogurt", *Food Research International*, Vol.43 No.5, pp. 1444-1448.

Dai, M., Harris, R., Lu, Y., and Liu, H. (2016), "Exports and firm survival: do trade regime and productivity matter?.", *Applied Economics Letters*, Vol. 23 No. (6), pp. 457-460.

Dimara, E., Skuras, D., Tsekouras, K., and Tzelepis, D. (2008), "Productive efficiency and firm exit in the food sector", *Food Policy*, Vol. 33 No.2, pp.185-196.

Doloreux, D., and Frigon, A. (2019), "Understanding innovation in Canadian wine regions: an exploratory study", *British Food Journal*, Vol. 121 No.4, pp. 882-896.

Dries, L., Pascucci, S., Török, Á., and Tóth, J. (2014), "Keeping your secrets public? Open versus closed innovation processes in the Hungarian wine sector", *International Food and Agribusiness Management Review*, Vol. 17, pp. 147-162.

Dunning, J. H. (1981), *International production and the multinational enterprise*. London: Allen & Unwin.

Esteve-Pérez, S. E., Llopis, A. S., and Llopis, J. A. S. (2004), "The determinants of survival of Spanish manufacturing firms", *Review of Industrial Organization*, Vol. 25 No.3, pp. 251-273.

Esteve-Pérez, S., Mánez-Castillejo, J. A., Rochina-Barrachina, M. E. and Sanchis-Llopis, J. A. (2007), A survival analysis of manufacturing firms in export markets. *Entrepreneurship, industrial location and economic growth. Cheltenham etc.: Elgar*, 313-332.

Fernández-Olmos, M. F. (2011), "The determinants of internationalization: evidence from the wine industry", *Applied Economic Perspectives and Policy*, Vol.33 No.3, pp.384-401.

Fernández-Olmos, M. and Malorgio, G. (2020), "The Speed of the Internationalisation Process and the Institutional Networks of Family SMEs in the DOC Rioja Wine Industry", *Wine Economics and Policy*, Vol.9 No.1, pp.43-50.

Fernández-Olmos, M., Diaz-Vial, I. and Malorgio, G. (2020), "Empirical approach to the sequential relationships between generation, relational capital and performance in family wineries in Spain", *International Journal of Wine Business Research, in press*.

Garrido, E., Gomez, J., Maicas, J. P. and Orcos, R. (2014), "The institution-based view of strategy: How to measure it", *BRQ Business Research Quarterly*, Vol.17 No.2, pp.82-101.

Giuliani, E., Morrison, A. and Rabellotti, R. (2011), "Innovation and Technological Catch-up in the Wine Industry: An Introduction," Chapters, in: Elisa Giuliani & Andrea Morrison & Roberta Rabellotti (ed.), *Innovation and Technological Catch-Up*, chapter 1, Edward Elgar Publishing.

Grashuis, J. (2020), "Agricultural firm survival: The case of farmer cooperatives in the United States", *Agribusiness*, Vol. 36 No. 1, pp. 79-93.

Greenaway, D., Gullstrand, J., and Kneller, R. (2008), "Surviving globalisation", *Journal of International Economics*, Vol.74 No.2, pp. 264-277.

Guibert, N. 2006, "Network governance in marketing channels: An application to the French Rhône Valley AOC wines industry", *British Food Journal*, Vol. 108 No. 4, pp. 256-272.

Hall, B.H. (1987), "The relationship between firm size and firm growth in the US manufacturing sector", *The Journal of Industrial Economics*, Vol. 35 No.4, pp. 583–606.

Hernández-Carrión, C., Camarero-Izquierdo, C., and Gutiérrez-Cillán, J. (2017), "Entrepreneurs' Social Capital and the Economic Performance of Small Businesses: The Moderating Role of Competitive Intensity and Entrepreneurs' Experience", *Strategic Entrepreneurship Journal*, Vol.11 No. 1, pp. 61–89.

Hessels, J., and Terjesen, S. (2010), "Resource dependency and institutional theory perspectives on direct and indirect export choices", *Small business economics*, Vol.34 No. 2, pp.203-220.

Hough, G., Langohr, K., Gómez, G., and Curia, A. (2003), "Survival analysis applied to sensory shelf life of foods2, *Journal of Food Science*, Vol.68 No.1, pp. 359-362.

Johanson, J. and Vahlne, J. E. (2006), "Commitment and opportunity development in the internationalization process: A note on the Uppsala internationalization process model", *Management International Review*, Vol. 46 No. 2, pp. 165-178.

Kalbfleisch, J. D. and Prentice, R. L. (2011), *The statistical analysis of failure time data*. New York: John Wiley& Sons, Inc

Kellermanns, F. W., and Eddleston, K. A. (2006), "Corporate entrepreneurship in family firms: A family perspective", *Entrepreneurship Theory and Practice*, Vol.30, pp. 809–830.

Kellermans, F.W., Eddleston, K.A., Barnett, T. and Pearson, A. (2008), "An exploratory study of family member characteristics and involvement: Effects on entrepreneurial behavior in family firms", *Family Business Review*, Vol.21, pp. 1-14.

Kontinen and Ojala 2011. Network ties in the international opportunity recognition of family SMEs. Int. Bus. Rev. 20(4), 440-453

Kraiczy, N. D., Hack, A. and Kellermanns, F. W. (2015), "What makes a family firm innovative? CEO risk-taking propensity and the organizational context of family firms", *Journal of Product Innovation Management*, Vol.32 No.3, pp.334-348.

Lee, J., and Habte-Giorgis, B. (2004), "Empirical approach to the sequential relationships between firm strategy, export activity, and performance in US manufacturing firms", *International Business Review*, Vol.13 No. (1), pp. 101-129.

López, R.A. (2006), "Imports of intermediate inputs and plant survival", *Economic Letters*, Vol. 92 No. 1, pp. 58-62.

Maclean, M., Harvey, C., Sillince, J.A.A. and Golant, B.D. (2014), "Living up to the past? Ideological sensemaking in organizational transition", *Organization*, Vol. 21, pp. 543–567.

Maula, M., Autio, E. and Murray, G. (2003), "Prerequisites for the creation of social capital and subsequent knowledge acquisition in corporate venture capital", *Venture Capital*, Vol. 5 No. 2, pp. 117–134.

Maurel, C. (2009), "Determinants of export performance in French wine SMEs", *International Journal of Wine Business Research*, Vol.21 No.2, pp. 118-142.

Minichilli, A., Corbetta, G., MacMillan, I. C. (2010), "Top management teams in family-controlled companies: 'familiness', 'faultlines', and their impact on financial performance", *Journal of Management Studies*, Vol. 47 No.2, pp. 205-222.

Monticelli, J. M., Garrido, I. L., and de Vasconcellos, S. L. (2018), "Coopetition and institutions: a strategy for Brazilian wineries facing internationalization", *International Journal of Wine Business Research*, Vol.30 No.1, pp. 74-95.

Musteen, M., Francis, J. and Datta, D.K. (2010), "The influence of international networks on internationalization speed and performance: A study of Czech SMEs", *Journal of World Business*, Vol. 45 No. 3, pp. 197–205.

North, D. (1990), *Institutions, institutional change and economic performance*, Cambridge University Press.

Parra Requena, G., Molina-Morales, F.X. and García-Villaverde, P.M. (2010), "The mediating effect of Cognitive Social Capital on knowledge acquisition in clustered firms", *Growth and Change*, Vol. 41 No. 1, pp. 59–84.

Pomarici, E., and Sardone, R. (2020), "EU wine policy in the framework of the CAP: post-2020 challenges", *Agricultural and Food Economics*, Vol. 8 No. 1, pp. 1-40.

Santarelli, E. (2001), "Ricambio generazionale e continuità dell'impresa", *L'industria*, Vol.22 No.1, pp. 141–72.

Santoro, G., Vrontis, D., and Pastore, A. (2017), "External knowledge sourcing and new product development", *British Food Journal*, Vol. 119 No. 11, pp. 2373-2387

Sellers, R., and Alampi-Sottini, V. (2016), "The influence of size on winery performance: Evidence from Italy", *Wine Economics and Policy*, Vol.5 No.1, pp. 33-41.

Stinchcombe, A. L. (1965), *Social structures and organizations*. In: J. G. March (Ed.), Handbook of Organizations (pp. 142–193). Chicago: Rand McNally.

Teratanavat, R., Salin, V., and Hooker, N. H. (2005),"Recall event timing: Measures of managerial performance in US meat and poultry plants", *Agribusiness: An International Journal*, Vol.21 No. 3, pp. 351-373.

Valette, J., Amadieu, P., and Sentis, P. (2018), "Cooperatives versus corporations: Survival in the French wine industry", *Journal of Wine Economics*, Vol. 13, pp.328-354.

Viguerie, P., Smit, S. and Baghai, M. (2011), *The Granularity of Growth: How to Identify the Sources of Growth and Drive Enduring Company Performance*; John Wiley & Sons: Hoboken, NJ, USA, 2011.

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.

Wang, L., Madhok, A., and Xiao Li, S. (2014), "Agglomeration and clustering over the industry life cycle: Toward a dynamic model of geographic concentration",*Strategic Management Journal*, Vol. 35 No.7,pp. 995-1012.

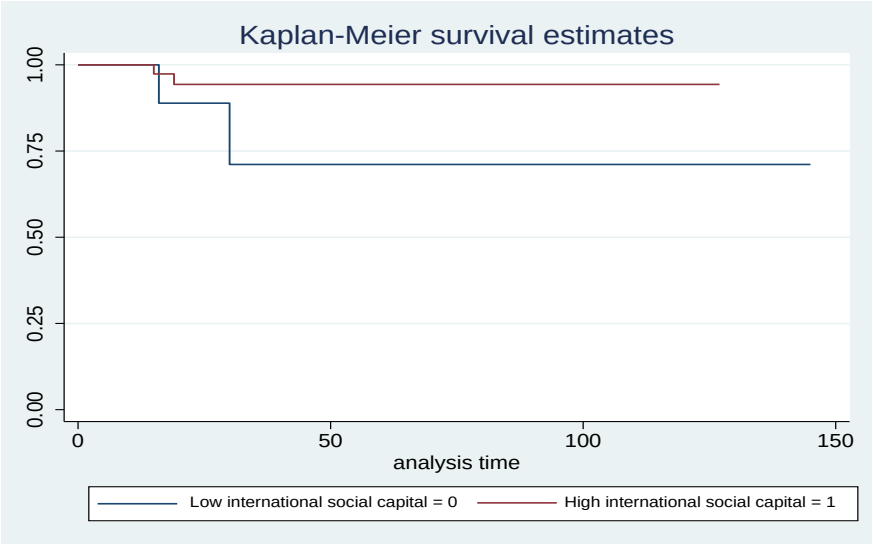
Wu, F., Sinkovics, R., Cavusgil, S.T., and Roath, A. (2007), "Overcoming export manufacturers' dilemma in international expansion", *Journal of International Business Studies*, Vol. 38, pp.283–302.

Yli-Renko, H., Autio, E. and Tontti, V. (2002), "Social capital, knowledge, and the international growth of technology-based new firms", *International Business Review*, Vol. 11 No. 3, pp. 279–304.

Zaheer, S. (1995), "Overcoming the liability of foreignness", *Academy of Management Journal*, Vol.38 No.2, pp.341–363.

British Food Journal

Figure 1: Kaplan-Meker survival estimates



Source: Compiled by the author

Table 1. Measures of variables

Label	Variable	Description
FAMILY_BOARD	Composition of top management team	The percentage of family members in the top management team (Minichilli et al., 2010; Kraiczy et al., 2015; Alayo et al., 2019)
SIZE	Size of winery	The natural logarithm of the number of employees (e.g., Hessels and Terjesen, 2010; Cabral and Mata, 2003)
R&D	R&D intensity	The proportion R&D spending/sales (Esteve-Pérez et al. 2007)
INT_EXP	International experience	Number of years exporting (Bugel and Murray, 2000; Wu et al., 2007)
PREV_PERF	Previous performance	A factor derived from 5 items related to growth in sales, market share, employees, profitability, and ability to finance profit growth (Fernández et al., 2020)
INST_NETW	Networking with institutions	Measures the network of relationships with different formal institutions (Fernández and Malorgio, 2020)

Source: Own elaboration

Table 2. Descriptive statistics and correlation matrix (Bonferroni Correction)

	1	2	3	4	5	6
1. FAMILY_BOARD	1					
2. SIZE	-0.468*	1				
3. R&D	-0.199*	0.285*	1			
4. INT_EXP	-0.293*	0.565*	0.376*	1		
5. PREV_PERF	-0.161	0.365*	0.287*	0.356*	1	
6. INST_NETW	-0.116	0.189*	0.219*	0.238*	0.097	1
Mean	80.018	1.394	1.741	11.577	13.587	0.772
Standard Deviation	34.577	1.168	6.230	17.753	4.123	0.913

Source: Own elaboration

Table 3. Estimation of proportional hazards model

	Regression coefficient	Standard error	p-value	Hazard ratio	Confidence interval
FAMILY_BOARD	-0.009	0.011	0.385	0.991	0.970-1.011
SIZE	-0.402	0.380	0.290	0.669	0.317-1.409
R&D	0.124	0.167	0.460	1.132	0.815-1.571
INT_EXP	0.006	0.028	0.841	1.006	0.951-1.063
PREV_PERF	-0.182	0.082	0.026	0.833	0.710-0.979
INST_NETW	-1.398	0.650	0.032	0.247	0.069-0.884

N=123