

## **Internal vs. external R&D teams: evidences from the Italian wine industry**

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### **Abstract**

R&D teams' internationalization attracts interests from different research-streams. However, the decision on what type of R&D structure is more convenient to invest in may differ, based on several factors, such as risk-taking propensity and internal resource availability. With an aim to enrich the extant literature and to provide practical insights for managers working in the wine industry, this case study explores the determinants of an Italian family-owned winery that attempts to keep a balance between its internal and external R&D teams' decision, using an integrated theoretical framework based on the transaction costs and the resource-based view theory. The optimal R&D solution based on an accurate costs vs benefits analysis leads the firm to hire highly qualified staff to manage its internal R&D unit, as well as to complement the unit with *complementary* resource that can be accessed through external R&D knowledge sources.

**Keywords:** Transaction costs, Human capital, Resource-based view, In-house investments, Reputation, Tangible and intangible resources, Case study.

### **1. Introduction**

The internationalization of a Research and Development (R&D) team is increasingly recognized as an important strategy for firms to foster their capabilities that can result in a better competitive advantage (Chen et al., 2012). The key reference in the scientific literature on internationalization of R&D teams has been mainly centred on multinational companies (MNCs) to explain why MNCs disperse their R&D activities globally (Diestre, 2018; Bakher et al., 2018; Ferraris et al., 2017; Jiménez-Jiménez et al., 2014; Ambos and Schlegelmilch, 2004; Iwasa & Odagiri, 2004; Odagiri, 2003), which offers interesting results with regard to the differences between home and host country-oriented firms, and between manufacturing and service-oriented multinational firms (Ferraris et al., 2016). A phenomenon of the internationalization of a R&D team that is highlighted by Bresciani et al. (2016a), involves several European MNCs with R&D units in Asian developing countries, with a direct effect that can be measured based on the increase of sale of innovative products in the international markets. As any R&D investment decision, independently from the company structure, ever reflect a risk-taking propensity and resource endowment (Chen and Hsu, 2009), top management involved in a decision making process about to invest or not should carefully consider several factors. Indeed, as emphasized by Diéguez-Soto et al. (2018), the combination of internal and external R&D activities may become disadvantageous if firms do not examine thoroughly its internal resource-base before external R&D is acquired. In this way, they analysis of how internal and external resources should be redeployed to achieve a better combination compared to competitors' strategies. If MNC processes and

related impacts derived from R&D investments have been widely studied, the same cannot be said from the perspective of the family firms (FFs), namely, a powerful business model that worldwide is acting as a relevant economic force. **Data on the positive economic performance of FFs, in particular in the wine industry, as confirmed more recently by Broccardo et al. (2015), who showed how FF wineries outperform non-FFs in economic performance (ROE and ROA), being also more proficient in profit generation.** Even if with a less attention than MNC scholars, recently some authors have focused on the relation between family firms and R&D investments, however, discordant results. On one hand, some of these studies underline a negative relationship between family ownership and R&D investment, recalling specific peculiarities of family firms (FFs). Chen and Hsu (2009), for instance, found that this negative association is a direct effect of family firms' short term orientation, while Muñoz-Bullón and Sanchez-Bueno (2011) attribute this result to a lower investments on R&D as a consequence of the reluctance of FFs on recruiting non-family professional managers able to manage such tasks as well as to a significant risks aversion which lead managers on putting at the top of the agenda the intergenerational succession of their business (Chen & Hsu, 2009; Muñoz-Bullón & Sanchez-Bueno, 2011). Conversely, other authors found a positive relationship between family ownership and R&D investment. In particular, by taken into account the association among R&D investment, competitive advantages and long-term oriented managers characteristics, Miller and Le Breton-Miller (2005) agree that family managers are more inclined to invest in R&D for the long run. Focusing the attention on the effective management processes of family firms, Thrassou et al. (2018) found that family firms are more innovative than non-family firms, above all thanks to a huge investment on human, social and marketing capitals. The same results were, inter alia, widely discussed by Sirmon and Hitt (2003) and Llach and Nordqvist (2010), which added new insights on the relevant role of external social capital as important family firms' strategic asset.

Given the ambiguity characterizing this research field yet, a need to go on in this domain is widely comprehensible, also by taking into account the relevant roles played by both R&D teams in the innovation path of a company and the FFs on the whole economic land (Del Giudice et al., 2013). To support this, from an economic point of view, some data showing the significant economic role that FFs (the majority of whom are also Small and Medium Enterprises – SME) are playing can be useful. With a focus on the Italian context the AUB Report (2017) states that the Italian economy is mainly driven by SMEs, 85% of which are family firms, exceeding the average value of the European Union equal to 60%. However, the greatest family firms' growth, in terms of industrial segment has been recorded in the Food and Beverage one, where the amount of family firms passed from 6.9% in 2007 to 8.7% in 2017. Inside the Food and Beverage industry that of wine is one of the most relevant sector both in economic and social terms (Bresciani et al., 2016b; Vrontis et al., 2016; 2018; Contò et al., 2015). In particular, 54.8% of the aggregate shareholders' equity of Italian wineries is attributable to family control. Adding to this share the cooperative legal form which collects about 37,500 members, an additional 20.7% share is added, bringing the total of the family net assets in the Italian wine industry to 75.5% (Mediobanca, 2018).

This ambiguity characterizes the current management literature about the relationship between R&D investment and family firms' business entity, in relation to understand manager's behaviour and the main mechanisms, which drive their choice to internalize or outsource specific R&D activity. In particular, the research is conducted through the analysis of a case study on a historical Tuscan winery that retains the character of FF. The reason behind the selection of a targeted share of FF that are operating in the wine industry, relies upon a specific "uncommon" consideration which highlights that in the wine industry *knowledge* is of particular relevance and, as a direct consequence, where wineries are engaged in a continuous upgrading of both product and process (Hira & Swartz, 2014). Indeed, despite the common thought of wine as a commodity with well-refined production processes, Hira and Swartz (2014) suggest how, in the reality, wine production processes entail several technical methods that would be suitable for consideration in any economic analysis. **A continuous improvement, involving both products and processes that also entails the full achievement of greener behaviours (Bresciani et al., 2016c).**

The originality of the study is double. First, it focuses on the wine industry from a theoretical point of view i.e. the transaction costs theory (TCT) and the resource based view (RBV) to understand the behavior of wine FFs towards their investment on R&D teams (internal/external) for innovation scopes. Second, based on an in-depth exploration of a particular productive sector, the wine one, it intends to reduce the gap currently exists in this field where the majority of studies focused on MNCs and with regards to FFs considers the latter as a homogeneous group, without properly taking into account the heterogeneity that exists inside these groups (Diéguez-Soto et al., 2018).

Results shall aim to propose targeted insights for managers working in the wine industry on *how* and *why* to profitably manage R&D investments and to arrange proper strategies that would be able to take into account the related costs and tangible and intangible firm's resources in the best possible manner.

**The paper is structured as follows. First, a review on transaction costs theory and resource based view applied to the R&D field. Second, we describe the method and the selection criteria of the case study. Third, we present the case study, and evidence on the main features of the winery under investigation as regard of the discussed theories. Finally, we discuss the implications, limitations and conclusion of the study, and suggest the future research areas.**

## **2. Conceptual framework**

### **2.1. Transaction costs theory (TCT) and the R&D field**

The decision to rely on TCT to investigate the present case study is double. First, this choice is linked to the "abstract" level of the subject to be investigated and, in such situations, TCT is a useful theory to achieve a better clarification (Williamson, 1979). Second, investigating the role of R&D teams by employing TCT is intrinsically linked to the fact that this subject is strictly related to a *transaction*. TCT is based on the analysis of transactions between the organization and parties outside the organization (Williams, 1985a). In previous studies, and according to the theoretical basis of this theory, where Ronald Coase and Oliver Williamson are the main representative, transaction cost can be categorized into ex-ante and ex-post (Williamson, 1985b),

fixed and proportional transaction costs (Goetz, 1992; Key et al., 2000; Vakis et al., 2003) and into information (costs for evaluating offshoring partners), negotiation (cost related to the negotiation agreement) and monitoring costs (costs to ensure obligation fulfilment) (Hobbs, 1997; Kyeyamwa et al., 2008; Royer, 2011; Woldie&Nuppenau, 2011; Galati et al., 2015). The analysis thus must be executed by analysing what is better for a firm. The approach indicates that this decision is made in the cost axis basically, implicating that firms need to make decision, based on cost comparison between the options of performing a specific activity within their own organizations and getting it from a supplier enterprise. Considering the assumption of Klein et al. (1978:297), the analysis here proposed starts from the consideration that “...*profit maximizing firms will undertake those activities that they find cheaper to administer internally than to purchase it in the market*”(Klein et al., 1978, p 297).In such choices, firms often rely on hybrid solutions. Therefore, cooperation models represent an option and, among them, the alliance types are the one of the most recalled when dealing with R&D company’s decisions. When applied in regard to R&D activities, TCT underlined problems related to uncertainty and the risk of opportunistic behaviour by alliance partners (Khvatova et al., 2016; Rutten et al., 2016; Del Giudice, 2012; Williamson, 1991; 1985b), as the main considerations that a manager should take into account with priority. According to Beverland’s (2000) findings, alliance formation in the wine sector is likely to be found when a company operates in both highly competitive and uncertain markets, with the aim to sharing knowledge with partners and, at the same time, gain market access. An alliance formation could reduce costs for research, promotion and market access (Beverland, 2000). In the same direction are the results of Amoroso (2014) who, applying TCT on a sample made up by several manufacturing companies, including agri-food ones, found that a firm’s probability to conduct R&D or to introduce an innovation increases with the level of productivity, but only when this activity is shared with a research partner. Moreover, the author adds how R&D costs of innovating are smaller when cooperating, also thanks to a risk sharing model preferred by managers during market uncertainty (Amoroso, 2014). The need to cooperation is also stressed by Della Peruta et al. (2018), according to which regional networks could support a firm on accessing a wider set of complementary capabilities, skills, and expertise to ensure a risk sharing objectives. Authors starting from the assumption deriving from Cai et al. (2009), who combining transaction cost analysis (TCA) and resource dependence theory (RDT), define quasi-integration “*as a hybrid governance mechanism that enables two organizations to protect specific assets, adapt to uncertainty, obtain resources, and efficiently coordinate transaction and interaction between them*”, reconfirm the importance of cooperation. Quasi-integration also means that the financial risks of R&D and investments are shared, and transactions costs are reduced.

In this domain, an important contribution is the study of Brockhoff (1992), where the author lists specific factors characterizing the transaction costs in R&D cooperation, in terms of joint research projects, such as uncertainty of the project, the specificity of the assets employed, and the frequency of the transactions. The author concludes that inappropriate coordination between each partner involved can undermine the success of a R&D project, adding that costs, in turn, are also affected by exogenous independent variables, such as the

formality of the agreement, previous experience with R&D cooperation, internal competence and the stage in the technological life cycle.

In this context, from a specific perspective, R&D cooperation allows firms to share costs and/or to reduce the risks of innovation, confirming the “cost sharing motive” (Della Paruta et al., 2018; Thrassou et al., 2018; Simeone et al., 2017), where the TCT perspective is useful in order to properly consider other aspects before exploring effective insights.

This review can be then concluded by making reference on the suggestion of Yilmaz & Bedük (2014) that addressed to the opportunity to outsource R&D activities, underlining how this choice allows firm to reduce transaction costs and resource dependency, leading to a reduction in capital and fixed investment, such as technology and equipment expenditures, which is a condition that allows company to use their existing resources in a more efficient manner on their basic capabilities.

## **2.2. Resource based view and the R&D domain**

Several studies on operation and strategic management use the RBV theory, because it is an effective approach to explain the way in which internal resources can be combined to generate a sustainable competitive advantage (Shams, 2016a; Galati et al., 2017), which is different from the vision that the external market forces and the positioning of the same company in the market exert a relevant influence on the possibility to create a competitive advantage (Porter, 1985). The RBV theory is based on both traditional assumptions adopted in other strategic management theories, such as that firms are profit-maximizing entities and that managers in firms are rational, and introduce two additional assumptions: resource heterogeneity, that incorporate two attributes of firms' resources, which are linked to the scarcity and non-substitutability, and resource immobility (Barney, 1991). The RBV categorizes internal resources in a different way, distinguishing among physical, human and organizational capital resources (Barney, 1991), between tangible and intangible resources (Barney, 2001). As emphasized by Barney (1991), firms operating in the same sector differ in terms of internal resources that in order to create a sustained competitive advantage must meet a series of criteria, including value, rarity, imitability and organization (VRIO framework). In particular, if tangible resources are often easier to imitate, the intangible resources, linked to the human capital within the company and their competences or based on the company reputation in the market, are often more difficult to imitate, and thus, be able to contribute to an effective and sustained competitive advantage. For these reasons, scholars agree that human resources (the collective knowledge, skills and abilities) as the intangible asset and the brand as a quite similar intangible asset constitute the most important resources available to firms (Scuotto et al., 2017; Del Giudice et al., 2015; Capitello et al., 2014; Stokes & Oiry, 2012). Irrespective to the category in which the resources fall they are organized and coordinated by firms so that they enable the firm to plan and implement efficient strategy that results in gaining a competitive edge (Del Giudice & Straub, 2011; Galati et al., 2017). **A finding from the wine industry plays a crucial role, as De Salvo et al. (2017) put in evidence in exploring how human capital affects wineries' performances, to this end suggesting political measures to wider invest in this area.**

The RBV is useful to explain why some companies outsource certain activities or resort to outsourcing in order to achieve higher performance, in comparison to the competitors. In other words, the company compares the internal capabilities with the competences of its competitors and, on this basis, decides to resort, or not, to the outsourcing of some activities (Huo et al., 2016; Beaugency et al., 2015; Langlois & Robertson, 1995). The outsourcing decision is affected by the ability of a firm to invest in developing a capability and sustaining a superior performance in the capability, relative to competitors (McIvor, 2009). In this sense, the company will resort to outsourcing only for those activities for which it has not developed internal expertise, because it did not find it advantage to invest. In the latter case, R&D outsourcing can complement or substitute the resources and capabilities of the firm (Beaugency et al., 2015; Spithoven & Teirlinck, 2015). This means that firms increasingly outsource activities that are crucial to the competitive advantage of the firm. McIvor (2009) uses a case study approach in order to verify the opportunity to use both the RBV and the TCT to explain the outsourcing decision, highlighting how the logic underlying the RBV has had a greater weight in the choice. In particular, although the company was aware of the capabilities of its suppliers, it decided to maintain the internal design process by investing further to develop a critical area for competitiveness. A different point of view is that the VRIO-competent internal resources at the core of the firm are to be integrated with resources acquired outside the company and capitalized internally contributing to create a superior performance. Consistent with this view, Spithoven and Teirlinck (2015) found that outsourced R&D is complementary to the internal resources, because they represent a way to enlarge the firms' knowledge base (Grant, 1996). In particular, firms strengthen their internal R&D intensity when engaging in R&D outsourcing, which means that the cost factor is less important and suggest that broadening the knowledge base is more important, in order to contribute to the competitive advantage of the firms (Stenius et al., 2016; Cavaliere et al., 2015; Lee & Wong, 2015; Spithoven & Teirlinck, 2015). In addition, Tidd and Trehwella (1997) argue that R&D outsourcing is a better and faster option than building the skills required internally, where adequate internal capabilities are lacking. Furthermore, they suggest that through outsourcing and therefore sharing and using the complementary resources between partners can maximize the value of a firm's internal resources (McMillan, 2016; Gkypali et al, 2017). The resource heterogeneity is one of the basic assumptions of the RBV theory, which leads companies to develop external teams, in order to capitalize with the different skills and competencies between partners (Holcomb & Hitt, 2008). Santoro et al. (2017), focusing on the Food and Beverage industry, highlighted the importance of internal R&D in terms of its absorptive capacity for the firm benefit. The role of R&D internal teams can then ensure a capitalization of the external input, acquired through external knowledge sources, to be then translated into innovation process. In such circumstances what prevails is the relevance of the *complementarity* among internal and external resources that generates a competitive advantage for the company, as a consequence of a combined effect of the resources that exceeds the sum of the benefits provided by the individual (internal) resources. **Today, as underlined by Bresciani et al. (2017b), the evolution of modern firms depends on their capability of finding and exploiting relevant knowledge within and across the firms' boundaries to develop new products and processes. In this context, the**

contribution from Bresciani et al. (2017a) is relevant in showing several cases where open, networked and dynamic innovation processes are, more and more, becoming new business models also in the Food & Beverage sector, further revealing the competitive potential of being involved in knowledge access and acquisition processes to gain economic advantage, as Sefiani et al. (2018) recently confirmed.

Following the discussion thus far on TCT and RBV, we propose that the choice between internal or external R&D teams is, at first, strictly linked to the quality of the available internal resources, with a particular reference on intangible ones (Figure 1). Moreover, in this process, also the assessment of the connected transaction costs can impact on such choices. As a direct consequence, the advantage of investing and thus managing internal or external R&D teams strategically depends on the result coming from a cost-benefit analysis that able to make available for firm's managers' useful inputs for a managerial choice aimed at achieving the best in line with the internal business scopes.

[InsertFigure 1]

### 3. Methodological approach

#### 3.1. The case study

In the present work, "family firms" is defined as "*a business governed and/or managed with the intention to shape and pursue the vision of the business held by a dominant coalition controlled by members of the same family or a small number of families in a manner that is potentially sustainable across generations of the family or families*" (Chua et al., 1999; Bresciani et al., 2013). While it is true that the majority of FFs are SMEs, Thrassou et al. (2018) highlight that what constitutes a family firms is much more than size, given that in some cases bigger company are also family managed (as is the case study investigated in this work). Other variables indeed made FFs different from the non-family firms, as for example the capability of a successful combination between innovation and tradition as a winning tool to remain competitive in the market, in this way never hidden the family origin, as Giacosa et al. (2017) pointed out in their recent work.

In order to understand the main mechanisms that guide the choice to internalize or outsource specific R&D activities in a FF, the approach of the case study has been adopted. The choice of a single case design, although is a risky option for business and management researchers (Remenyi et al., 1998) due to its inability to provide a generalized conclusion; however, case study offers the benefit of studying phenomena in detail and in context, particularly in situations where there are many more variables of interest than there are observations (Rose et al., 2015). Furthermore, why a case study method is employed is linked to several reasons. First, because it is an approach that allows researchers to analyse relationships and social processes that are not easy to analyse through a quantitative approach (Miles & Huberman, 1994). Second, the case study method allows to obtain high quality and quantity of data (Gummesson, 1991). Finally, it is especially useful when a 'how' or 'why' question is being asked about a contemporary set of events over which the investigator has little or no control (Yin, 2003). In particular, Yin (1984: 23) defines the case study research method "*as an empirical inquiry that investigates a contemporary phenomenon within its real-life context; when the boundaries between phenomenon and context are not clearly evident; and in which multiple*

*sources of evidence are used*". Taking into consideration that the main issue related to the single case study design is the generalizability, the adoption of a triangulation technique which requires data from multiple sources of evidence, using multiple data collection techniques is useful to confirm the validity of the process, helping to remove any biases induced by researcher's subjectivity (Teegavarapu & Summers, 2008).

Thus, the case study approach is particularly suitable for explaining a little explored phenomenon, which is the case of FF and their decision to internalize or outsource specific R&D activities. We chose the case of one of the most prestigious entrepreneurial company operating in the Italian wine industry, the Marchesi Frescobaldi winery, which has consolidated over the centuries, and has developed trade relations in international markets, as well as exhibits an organizational model very similar to a manufacturing company. The choice of the wine industry is linked to the fact that in the recent years the wine industry has been characterized by a process of strong concentration, internationalization and a growth in size of companies, aimed at seeking greater competitive advantages (Cardinali et al, 2010; Presenza, 2015; Vrontis et al., 2018). The expansion of international markets has led to a profound transformation of the wine industry, with the emergence of advanced production systems characterized by the presence of companies operating with managerial models, comparable with those already developed and consolidated in industrial companies, based on a link between the territory-companies-local actors that has spread through the creation of reciprocal social capital networks (Shams and Kaufmann, 2016; Pizzorno, 1999). The chosen case study is a good example of this profound process of transformation of the wine industry and that can allow to understand the entrepreneurial choice between internal versus external R&D teams to sustain a vantage point in the domestic and international markets. The choice of this case also enables us to bypass another issue of the single case study design that is a variant of what is known as selection bias that can bias the findings of the research excluding cases that contradict a favoured theory.

### **3.2. Data collection and analysis**

The analysis of the case study was carried out using both primary and secondary data, the latter obtained from multiple sources. The primary data collection is based on a semi-structured interview using a questionnaire that has been developed on the basis of the economic literature and served as an interview guide. The interview questionnaire was constructed using quantitative and qualitative variables associated both to the internal resources of the firms according to the RBV approach and the transaction cost economics. In particular, this survey instrument is organized in two different thematic sections. First, it is aimed at capturing several information related to the physical, human capital and organizational resources of the company, and a second purpose is to capture information about the three main transaction cost components incurred by the company, which is proposed by numerous authors (Hobbs, 1997; Royer, 2011; McIvor, 2009; Diez-Vial and Fernández-Olmos, 2014; Galati et al., 2015). Through the interview, we wanted to analyse the experience of the company in the processes of internalization or externalization of specific activities in relation to transaction costs incurred to manage relations both internal and external to the company and to tangible and intangible resources that characterize it. The interview was carried out with the

marketing manager of the firm involved in the formulation of the strategy. In addition, we collected other information contained both on the winery website and in specialized magazine articles from which it was possible to acquire additional secondary data that are useful for understanding the strategies adopted by the winery under investigation in order to preserve their competitive positioning in the international arena.

The case study was, therefore, developed using the interview and data collected from informative articles and information reported on the company website in order to detect the presence of variables associated with transaction costs and the RBV in the decision of the company to internalize or outsource specific activities. This method uses a variety of information on the same topic, as triangulate dataset in order to ensure the validity of the research and especially capture different dimensions of the same phenomenon. The use of multiple sources of evidence allows triangulation of findings which is a major strength of the case study design (Yin, 2009).

#### **4. The case study background and findings**

##### **4.1. The case history**

The name of the Marchesi Frescobaldi family started to be familiar, both in the local and international wine industry since the 1300, when the Frescobaldi Family received the authorization to commercialize wines. In that period, Frescobaldi Family was already a well-known name, also because the family collected notorious bankers, who were mainly concentrated in the North-West part of Italy, precisely in the Tuscany region. Thanks to their excellent ways of working, the Great Britain Realm recognized to the Frescobaldi Family, the title of Treasurers of the Great Britain Monarchy. During the Renaissance, the Frescobaldi activities more and more grown in terms of relevance, as proved by their involvement in the construction of important monumental buildings, such as the Santa Trinità Bridge and the Cathedral of Santo Spirito, in Tuscany.

The interest on the wine industry started exactly in 1855, since the beginning of innovation paths. Indeed, in 1855 Marchesi Frescobaldi was the first company in Tuscany in planting grapes of Cabernet Sauvignon, Merlot and Black Pinot. Few years later, in 1894, the company built the first Italian winery, which was able to take advantage of the natural gravity force addressed to decant wines from bottles. In the same year, the Marchesi Frescobaldi was also able to distinguish its activity from the competitors thanks to the introduction of the “specialized vineyard”.

Year by year, the Frescobaldi FF achieved important economic results, confirmed by the continuous growth, in terms of both turnover and number of employees, which account for 530 staff units. By focusing the attention on the last ten years, turnover amounts have exponentially grown (Figure 2).

**[Insert Figure 2]**

As for the penetration in to the foreign markets, the Frescobaldi firm has been engaged in that effort since more than three centuries, thanks above all to the well-known positioning of its name at national level but also worldwide, as a consequence also of the linkage with the British Monarchy. Today, its presence in foreign markets is absolutely confirmed, with export shares of 65-70% out of the overall production. Main

countries of destination are United States of America, Germany, Canada, Switzerland, and in recent years' relevant end market are United Kingdom, Japan, China, and Russia. Often, the overall foreign market demand can't be satisfied, and for that reason each year, specific and detailed overall supply decisions are arranged in order to select in advance which foreign market(s) will receive the bigger amount, so as to definitively fully meet its market demand. The company's presence in the international arena is confirmed by the participation to national and international wine exhibitions, among which Vinitaly and Merano Wine Festival in Italy, ProWein in Germany, Vinexpo in France. The particularity is that the firm does not mention only commercial and business scopes directly linked to the participation in such events while providing, as main motivation, the importance to be present in such exhibitions giving the relevance of the own brand and the economic role at the National and International level.

The Marchesi Frescobaldi philosophy is "*Cultivating Tuscan Diversity*", in this way underlying the strict linkage between family and territory, by adding high quality and innovation focus in all the production process. In this thought, the commitment from the President Mr. Lamberto Frescobaldi is resumed in the following few words, extracted from a longer interview:

*"...A thousand years of history of this family are for me a unique and unrepeatable treasure of knowledge and traditions; my duty is to share and pass on to future generations respect, passion and love for these places and for these hills ... The goal is the highest level of quality in the absolute respect of the typicality of our grapes, which are the expression of the territory. This commitment is our daily challenge"*

*President, Lamberto Frescobaldi*

The business story of Marchesi Frescobaldi also changed over the years, in order to better express the linkage with the Tuscan land, putting this aspect behind all others ones. This commitment began in 2016, when the Marchesi Frescobaldi arranged an intense change in the company marketing strategy, through several actions, such as changing the firm logo, deleting the noble title and the relating family emblem. However, the winery decided to modify its historical pay off, from "*700 anni di grandivinitoscani*" (700 years of great Tuscan wines) to "*Cultivating Tuscan Diversity*".

Such changes have been also followed by a wider social investment, in terms of firm's presence, in the regional territory. To this scope, the commitment of the firm towards socio-cultural activities strictly linked with the social context of Tuscany became more and more diffused, as confirmed by two important initiatives arranged in this field, such as "*Artisti per Frescobaldi*" and wine joint production with disadvantaged people. In particular, "*Artisti per Frescobaldi*", an event held every two years, artists around the world compete through artistic works, and the best will become the image of a limited series of wine bottles (around 999 bottles). While, the second activities, the one involving disadvantaged people, the commitment is concretized through the joint production of wines and oil respectively inside the Tuscan prisons of Gorgona and Sollicciano, with the active collaboration of prisoners, for social integration scopes.

#### **4.2. The Marchesi Frescobaldi internal resource management**

Always remaining as a family firm, the Marchesi Frescobaldi's philosophy has also impacted on its internal management. *"Focusing on excellence in human resources' competences and skills to be ensured from the top to the bottom vertical management structure"* has been always an important belief of its managers. All employees possess a degree in the pertinent sector of work, while each family member willing to work for the firm has to spend a targeted period abroad, attending targeted higher training courses as well as practicing work experience in a foreign country so as to acquire know-how and market rules differently from the domestic ones, to be then integrated with firm knowledge. The internal management structure is also confirmed by the company's organizational chart that includes all strategic figures, both ordinary and innovative ones, being also in this area a firm up with times. At this regard, the organizational chart includes the production manager, the marketing manager and the sale manager, but also the digital marketing specialist, the external and international relations manager and a quality manager.

#### **4.3. Managing R&D team inside a family-owned winery**

The Marchesi Frescobaldi has been always active in the innovation of both product and processes, and also for that reason inside the company, a targeted R&D teams has been hired, made up by highly qualified staff units. Despite that, external collaborations to support the company's internal activities are often taken into account in order to improve innovation outcomes, above all in the agronomic field (also confirmed by its membership to the Consortium of Integrated Agriculture, since 1994).

The company has an internal R&D team, for the majority of the R&D projects specific three-year contracts with external University Consortium are in force. Also in the R&D sector, it is possible to see a preference towards the local and regional stakeholders (from both academic and market areas). At this regards, Marchesi Frescobaldi adopts motivates this choice highlighting the deep and historical linkage with the local context that represents the main reason ensuring trust relationships and the high level of satisfaction for expected outcomes. In the management of R&D activities, the core and related expected results of the research are proposed by the firm itself and, once approved by the overall R&D consortium, activities are jointly executed. On an average, the firm annually allocates about 1% of the turnover to its internal R&D research unit, which is responsible to collect and validate information from the market, in order to inspire new possible R&D investments. So, the knowledge access process is internally managed, and after the drawing up of project proposals and once received the definitive approval from the internal board, the negotiation phase can be arranged. This phase, hence, being supported by the firm itself, which have clear in minds its research objectives and above all expected outcomes, which will guide in the selection of the external stakeholders to be contacted and involved, and with whom sign any related agreements to regulate the activity. The conclusion of the negotiation phase sees the start of R&D joint work. During the project execution, monitoring costs are managed internally by the firm, by the R&D team, a balanced model which sees the association with the competencies from the external partners. This internal group is thus responsible for the collection of progress reports from both internal and external researchers in order to monitor the status

of the research. This internal group also participates in coordination meetings with all internal and external people responsible for specific tasks.

Both the selection of research partners and the reliability of them are ensured by historical links between them, allowing Marchesi Frescobaldi to give total trust in the expected results of all R&D activities managed inside the Consortium.

Inside the Marchesi Frescobaldi, the innovation concerns different activities within the winery. In particular, these innovations have been mainly focused on the introduction of renewable energy sources, the adoption of eco-sustainable production processes (also for that belief the firm acquired the AgriQualità certification in 2012), not only in the vineyard but also in the wood land of the company (Frescobaldi was the first subject to obtain PEFC certification in Tuscany), the introduction of sustainable packaging, thanks to which the firm employs glass bottles with a weight inferior to the average one used in the market, ensuring a relevant reduction in CO<sub>2</sub> emissions.

Innovation and R&D efforts are also present in the digital sector. Indeed, not only the firm's official website is one of the top ten of the Italian ranking in digital positioning of wineries but also it is one of the few, in terms of offering translation in more than six different languages. Moreover, its Facebook page has been awarded as the most virtuous page according to the activity index in the Italian Food and Beverage industry (Altagamma, 2018). The management board is now investing in Internet of Things (IoT) and Industry 4.0. In the Information and Communication Technologies (ICT) area, since 1996 Marchesi Frescobaldi has a contract with a high-tech company, thanks to which the main ICT projects have been facilitated. The new project in this sector will be launched in 2019, foreseeing the introduction of IoT for vineyards management. Thanks to this system, it will be possible to monitor rainfalls, analyzing land from an organic side. Moreover, the application of drones will ensure an in depth monitoring of the vineyards.

Apart from these articulated projects, more production oriented process improvements are undertaken, with the aim to improve the internal management resources that the firm invested in digital technologies for both the internal data storage (including cyber security systems) and for the digital monitoring of orders, overseas distribution and sales, ensuring a good control over these tasks in a view of strengthening the overall management effort.

## **5. Discussion**

The present study is developed on the basis of a conceptual framework based on the transaction costs of economics and resource based view theories, with an aim to investigate the main mechanisms that drive the choice of a FF operating in the wine industry to internalize or outsource specific R&D activities. Overall, findings reveal the usefulness of the conceptual framework proposed in understanding the entrepreneurial behaviour demonstrating that there is a willingness to increase internal quality skills, through investments in human resources, limiting the use of external R&D teams only for those cases in which the company lacks specific skills. Our results, on the one hand, confirm how in a big FF operating in the wine industry plays a relevant role, in support of both human and social capitals. Resources on which a manager should

then invest seriously, in a constructive way (long-term orientation), and in a constant way. The same importance that also Thrassou et al. (2018) identified, showing that FF's employees outperform non-family firms in human and social capital. An internal R&D team in FF is well skilled and highly qualified, on which FF should invest so as to be sure of the proper management of R&D projects. But with regards to the R&D internal team, our case study demonstrates that an internal human resources assessment linked to an evaluation of R&D's expected outcomes that would be able to achieve the objective only with higher costs of investment and high risk. This characteristic is however not typical to FF. For that reason, our FF decided to rely on external knowledge sources, as a winning practice that is previously recognized by Santoro et al. (2017) as a strategic tool that would be able to ensure complementarity between internal R&D team and external knowledge providers, ensuring a reduction in transaction costs.

As the case study has shown, Marchese Frescobaldi invests in social relations with external partners establishing in several cases effective in R&D alliances confirming how alliances are able to allow a firm to both invest in R&D and reduce related costs (transaction costs related to R&D performance), ensuring also a risk sharing tendency among partners. These results reinforce what Sirmon & Hitt (2003) found in their work, according to which FF with the aim to compensate their human resources deficit should access these complementary sources in other ways, such as through alliance models. By analyzing a heterogeneous sample of agri-food companies, Amoroso (2014) and more recently Della Peruta et al. (2018) stress the need for complementarity thanks to strict cooperation models between internal R&D resources and external knowledge sources.

The predominance of local relations of Marchese Frescobaldi with other firms, universities, research institutes operating in their territory is in line with the traditional principles according to which FF, above all in the case of the wine industry where the territory's link is the main competitive and inimitable advantage, prefers to look for local/regional partnerships/networks as an important source of company's knowledge. FFs strictly linked to the territory on which they operate with the geographical proximity of external knowledge partners as the main sources through which complement R&D resources to speed up the development of new technologies, helped by their common geography, founding history, and social and professional ties. Our results is consistent with the findings of Della Peruta et al. (2018) which recognizes innovation potential to local/regional networks but also the further reduction in transaction costs belonging to local/regional networks compared to overseas models, also add that FFs, in respecting to their traditional way of doing business, show a greater propensity than other business model, to invest at territorial level, maintaining a stable link with their geographic area also in R&D choices, also for cultural proximity to be seen as positive advantage in cooperation model management, as suggested by (Del Giudice et al., 2012; Shams, 2016b). **A business model would be able to exploit the success potential of the combination between innovation and tradition, as a winning tool to remain competitive in the market as Giacosa et al. (2017) pointed out in their recent work.**

The ability of the Marchesi Frescobaldi to manage relation with external partners in relation to the objectives set by the company may be justified by the need to monitor the relation above

mentioned. Gkypali (2017) suggested to pay attention when selecting external knowledge sources as the diversity of R&D collaboration sources can affect firm innovation performance, through its impact on internal R&D. Authors argued that a negative impact on company performance can result from a wrong selection of such partners, a mistake that could increase the management and transaction costs, caused by the fact that not all knowledge sources are useful for company's benefit, and manager should well scrutinize the needed resources. Our results show that FF being the main responsible of their innovation scientific project design well in advance to select the best partners that should be consulted and included in the network. This control and scrutiny behaviour is however ensured by the existence of an internal R&D team which possess the know-how to support these choices. Hence, to avoid the risks suggested by Gkypali (2017), it is important to know, from the company side that the expected research outcomes according to the proper external knowledge sources. A suggestion in line with what revealed by Santoro et al. (2017), according to which managers should select their partner according to the expected innovation outcomes.

The inspiring corporate principles that Marchesi Frescobaldi resumes in "*Cultivating Tuscan Diversity*" has been then adopted also in the R&D management. An experience that allowed the firm to increase staff competences (the ones employed inside R&D internal teams) in better managing transaction costs, above all as regard those linked to information, monitoring and negotiation activities that the internal R&D team is today able to sustain in a more cost-saving way, and with the support of well-skilled managers. Stable relations with targeted external and local partners, with specific and high quality know-how in agronomic domain, have ensured the diffusion of trust *among* all members participating in a research Consortium (the alliance), working to achieve the expected research outcomes.

## **6. Conclusion and implications**

This study examines the main factors affecting the decision to internationalize or outsource specific R&D activities in a FF operating in a strategic sector such as the wine industry. Following a conceptual framework based on the TCT and RBV theories, findings reveal that the decision to use external or internal R&D teams depends on the assessment of human resources and internal skills of the company. If, in part, Marchesi Frescobaldi uses its own R&D team thanks to specific investments in the human capital of the company, for some specific activities, the use of external R&D teams is necessary, although it is managed so as to contain the costs generated by these relationships with partners outside the company. More in detail, the case study analyzed, through a huge investment in human capital and in social one, has been able to create an internal R&D team so as to effectively manage the related transaction costs linked to such operations. A FF that follows its historical and traditional principles, prefer to invest in local and regional alliances to perform R&D common projects, in this way gaining a competitive advantage, by both integrating new knowledge and sharing transaction risks with the other alliance partners, respecting a combination between tradition and innovation. An important role has been also played by the cooperation model adopted, represented by the integration of external knowledge sources to its internal R&D team, thanks to the FF's usual behaviour, such as strict link with the local context, social capital investment with local stakeholders, brand reputation.

Our findings have a number of theoretical and practical implications. From a theoretical perspective, the research demonstrates the usefulness of the conceptual framework proposed in explaining the entrepreneurial behaviour faced with the choice to using or not to using an external R&D team, which contributes to the management literature on FFs and R&D teams. **The decision to apply both TCT and RBV, indeed, is of relevant importance in explaining how alone an internal cost consideration is not enough to support the decision of investing in external or internal R&D teams. It is necessary to add other considerations, such as the human capital and social one specific to a company and thanks to which it is possible to better calculate and thus reformulate case by case the real transaction costs linked to a strategic decision like the R&D management. In this case study, the family winery, by making an accurate internal resource assessment that invests only in internal R&D team was not a strategic choice, while integrating and complementing the internal team with external resources (knowledge sources) was the winning choice. Moreover, by recalling the FF historical characteristics, the combination between innovation and tradition, resulting by the internal assessment the winery conducted, allowed them to maximize the final outcome so as to not only acquire new knowledge from external sources but also to reduce alliance risks and related costs usually linked to the overall market uncertainty, making leverage on the trust relations established during times at local/regional level.** Our results, however, demonstrate the innovative character of the winery, where targeted measures are in force at corporate level to well manage R&D activities. A result in line with those of Thrassou et al. (2018) which trying to solve the ambiguity currently recorded at scientific level, highlight the relevant innovative character of FF. **Finally, our results enrich the literature also showing that, as in other operations, today companies alone can reach just at the moderate level of growth, while opening the doors to cooperation models, acquiring new knowledge from external sources and arranging compensating mechanisms between external and internal resources can allow the company to achieve better growth levels (Pucci et al., 2018).**

From a managerial point of view, findings are important for today's FFs' managers operating in the wine industry. First, the present case study underlines the attention that all managers should address their human capital development and continuous learning processes, ensuring knowledge sharing opportunities at the same time among employees and, also, with external knowledge sources. If human capital represents an important driver to ensure R&D exploitation for FFs, this factor alone is not enough. Indeed, also in the presence of vertical business integration, the second implication suggests that the work of qualified internal human capital should be integrated and compensated. Investing in social relations with external partners through networking and becoming part of the local/regional cluster, will lead the company to enter in to effective R&D alliances, so as to achieve direct benefit. Collaborative models to be considered by FFs' managers as a useful tool to share risks and reduce transaction costs linked to a R&D investment. So, social links with the local context not only for commercial (selling wines to local consumers) and brand reputation scopes but also to be seen in a new meaning, namely: the creation of structured and trusted alliance for the execution of common projects. Finally, to ensure a reduction in transaction costs, managers should consider the need of

ensuring a continuous control in the R&D activities, avoiding multiple external knowledge access, and selecting them according to the expected innovation outcomes, as suggested by their internal R&D team.

## 7. Limitations and future research

Despite the innovative character of the present work, it presents some limitations that future researches should be taken into account so as to provide in depth insights. Unquestionably the choice of a single case study represents a limit of the study that has been partially overcome with the triangulation method, not allowing, however, a generalization of results, which was not a goal of the present study. In fact, the case study analysis enabled to explore a phenomenon until today little explored and complex for the number of variables involved. Further research could go on in this route, collecting more data by taking into account the present results by means of structured research method, so as to achieve results comparability. This can be done at regional, national and international levels. **Including more wineries with different sizes and from different regions/countries will allow achieving a generalizability of our findings.** Moreover, to enrich the literature on FFs and R&D teams, scholars could collect more firm data and make comparison according to other intervenient variables, such as exports, country of destinations, voluntary and or regulated quality standards possessions. **We believe that scholars, making leverage on the numerous results here exposed, could go on for example understanding the reason why some wineries decide to invest in R&D teams (hybrid form or more structured one) and some others prefer to totally externalize this activity, or more, are reluctant to R&D investments. Moreover, future research could be also addressed to analyse this phenomenon during time, exploring the rate according to which transaction costs change during time by investing in hybrid solutions like the one here presented. To these future lines more oriented towards winery's internal data, a second line of research could be addressed to Manager's opinion towards the behaviours the work presents. To this scope, it could be interesting to know which factors influence managers in selecting internal human resources to be hired in R&D teams, which criteria are mainly searched, which expectations from candidates. But also, which are the opinions towards external knowledge sources, how sources are selected and which are the main factors affecting the decision to select a partner instead of another one, checking also if being a native of a specific region/geographical area can make the difference.**

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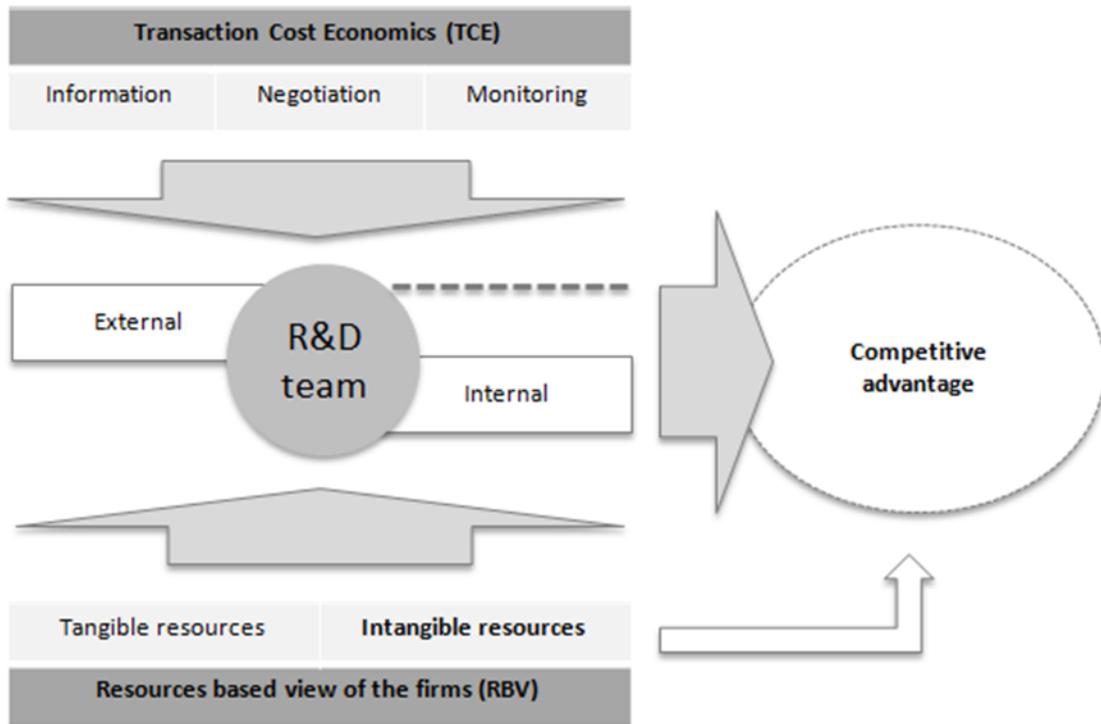
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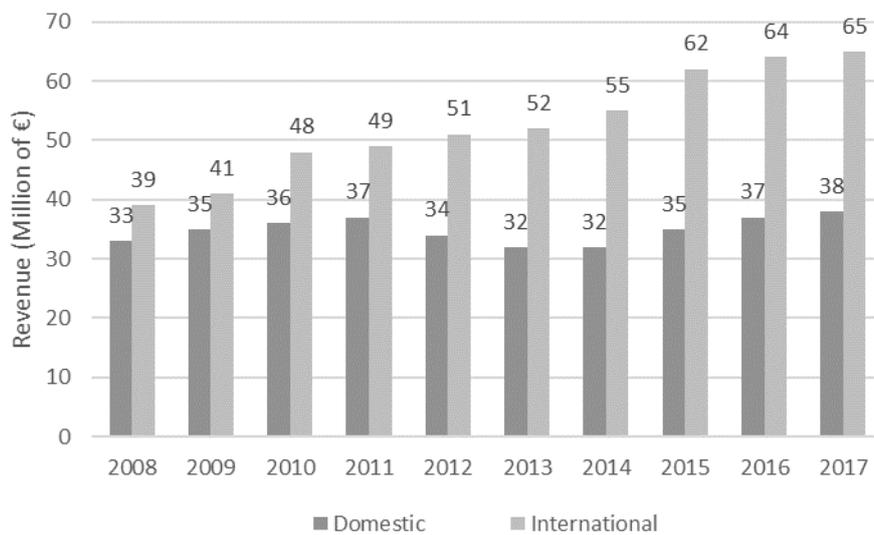
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**Figure 1 – Conceptual framework**



**Figure 2 – Trend of the firm’s revenues**



Source: I numeri del vino, 2018.