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VALUE CREATION AND VALUE APPROPRIATION IN NETWORKS: AN EMPIRICAL ANALYSIS OF THE ROLE OF GEOGRAPHICAL INDICATION IN THE WINE INDUSTRY IN VALE DOS VINHEDOS, RS, BRAZIL

Criação e Apropriação de Valor em Redes: Uma Análise Empírica Sobre o Papel da Indicação Geográfica na Indústria Vinícola do Vale dos Vinhedos, RS

ABSTRACT

This article investigates the impacts associated with the introduction of a Geographical Indication registry in a network which operates within the wine agroindustrial system in the South of Brazil. The network is formed by wineries, grape growers, hotels, restaurants and artisans. Within this complex system, several collective actions take place, highlighting the introduction of a Geographical Indication (GI) registry for fine wines. Although the GI was supposed to affect the many actors of the collective system, its actual impact is unknown. Thus, this study aimed at identifying: (i) whether the GI enables the creation of value for the different agents which operate within the agroindustrial system, and (ii) how the appropriation of value generated by the GI occurs. Based on interviews and questionnaires conducted with wineries and grape growers, the authors performed panel estimations. The main results point to a scenario of value creation in the investigated network. Regarding the value appropriation, the estimations suggest that the wineries are capable of appropriating greater created value within the network.

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RESUMO

Investiga-se, neste artigo, os impactos associados à introdução de um registro de Indicação Geográfica em uma rede que opera dentro do sistema agroindustrial do vinho, na região Sul do Brasil. A rede é formada por vinícolas, produtores de uva, hotéis, restaurantes e artesãos. Dentro desse sistema complexo ocorrem várias ações coletivas, destacando-se a obtenção de um registro de Indicação Geográfica dos vinhos finos. Embora suponha-se que tal registro afete os diversos atores do sistema coletivo, seu impacto real é desconhecido. Assim, este estudo tem como objetivo identificar (i) se a Indicação Geográfica permite a criação de valor para os diferentes agentes que atuam no sistema agroindustrial e (ii) como ocorre a apropriação do valor gerado pela Indicação Geográfica. Baseando-se em entrevistas e questionários realizados com produtores e vinícolas, os autores realizam estimativas em painel. Os principais resultados apontam um cenário de criação de valor na rede investigada. Em relação à apropriação de valor, as estimativas sugerem que as vinícolas são capazes de se apropriarem mais do valor criado dentro da rede.

Keywords: Geographical indication, collective system, grape growers, wineries.

Palavras-chave: Indicação geográfica, sistemas coletivos, produtores de uva, vinícolas.

1 INTRODUCTION

Important changes have occurred in the institutional environment of organizations since the early 1980s, especially in developing countries. Among these changes, new forms of economic relations have become prominent, such as strategic alliances and interorganizational networks. Although the emergence of new organizational forms is impressive, the study of

networks, in particular, needs to be further explored in order to allow broader empirical analysis (MÉNARD, 2004; ZYLBERSZTAJN; FARINA, 2006). In line with this proposition, the present paper makes a specific contribution to the literature by investigating the impacts associated with the introduction of a Geographical Indication (GI) in a network that operates within the agro-industrial system of wine production in Vale dos Vinhedos, the South region of Brazil.

The wine sector in Vale dos Vinhedos encompasses a production network made up of wineries, grape growers, hotels, inns, restaurants, and craftworkers. Within this network, there are several collective actions, with emphasis on the implementation in 2002 of a Geographical Indication (GI) regarding fine wines¹. Even though the GI is said to have affected several actors within the network, its actual economic impact is unknown. This study specifically investigates the economic impact of the IG on two agents: wineries and grape growers.

In broader terms, the present paper intends to foster a greater understanding on the role played by the implementation of certifications within production networks. To this end, some questions guide the research: What is the role played by the Geographical Indication on value creation within the network? How can the distribution of value generated by the Geographical Indication be characterized? Following Lavie (2007, p. 1192), the article examines separately the value creation and the appropriation of income. This aspect is relevant because “the proliferating research on strategic networks has focused almost exclusively on the value-creation effects of alliances while overlooking value appropriation considerations”. The current article brings up two particular contributions to the discussion: (i) the paper examines the influence of a specific coordination mechanism on value creation (i.e., the IG) and (ii) in contrast to the work of Lavie (2007), the article focuses on the operation of a network – not a strategic alliance^{2,3}.

This paper is organized in nine sections including this introduction. Section 2 presents a theoretical review of networks and collective action, and section 3 describes the fundamentals of Geographical Indication. Considering this basic framework, section 4 examines specifically the Geographical Indication scheme that operates within the network of wine production of Vale dos Vinhedos. Section 5 introduces the hypotheses of the research and describes the methodology of the study. Based on interviews and questionnaires conducted with wineries and grape growers, the authors then perform on section 6 panel estimations

in order to investigate the creation and appropriation of value within the network. Section 7 discusses the broader implications derived from the introduction of a GI in Vale dos Vinhedos and section 8 analyzes the appropriation of value within the network. Section 9 presents the conclusions.

2 THEORETICAL REVIEW

In order to frame the research problem addressed on this paper, the authors examine in this section three interconnected streams of the literature; they are: the basic aspects of network organization (section 2.1), the interdependence between collective actors (section 2.2), and how collective actions can be structured on networks (section 2.3).

2.1 Complex Organizational Forms – Emphasis on Networks

The complex systems have received attention from researchers from different areas, such as Sociology, Management and Economics. Several approaches are recognized within the literature of complex systems. Networks, clusters, supply chain systems, netchains, joint ventures and alliances are all concepts usually used to describe these organizational arrangements.

Specifically in relation to networks, one of the pioneering authors is the American sociologist Mark Granovetter. Granovetter (1973) affirms that basically, two kinds of ties (strong and weak) exist within a social network. Strong ties exist for a long period, representing a relation of effort, confidence and reciprocity. People who share strong ties in general participate of the same highly clustered circle or social group. Granovetter asserts that such ties can aggregate little value to companies: due to firm homogeneity within the network, companies tend to obtain the same set of information and the same resources.

Conversely, the individuals who integrate a network with weak ties develop punctual transactions among themselves, so that issues like confidence and reciprocity show little importance. These relations are justly important because they work as a “bridge”, allowing the individuals to be connected to several other social groups. Thus, Granovetter (1973) evidenced that the so-called weak ties can be more important in the maintenance of the social network than the strong ties, for which greater importance used to be given by the sociologists. The weak ties are likely to generate new information and aggregate value to the relationship, since they can connect each actor of the network to other agents, sharing different sources of information. Furthermore, when the same individuals

¹Although the Geographical Indication is widespread in developed countries, only recently it started to be adopted in developing countries. It is noteworthy that the Indication of Origin of the fine wines of Vale dos Vinhedos was the first to be granted in Brazil.

²Lavie (2007, p. 1188) examines alliance portfolios, which “refers to a firm’s collection of direct alliances with partners. It is akin to the notion of the egocentric network, which encompasses the focal firm (ego), its set of partners (alters), and their connecting ties”. In contrast, the network of wine production in Vale dos Vinhedos is not an egocentric network.

³Gulati and Singh (1998) also analyze appropriation aspects in strategic alliances.

transact for a long period – something that occurs in strong ties relations –, the relationship can get strained and the possibility of innovation becomes smaller and smaller.

Within this perspective, the view of Burt (1992) is of particular interest. Burt (1992) examines the emergence of structural holes within networks, i.e., the existence of groups of people who do not know each other or do not share information among themselves, although being part of the same network (absence of ties). In order to understand Burt's argument, one can imagine that the individuals within a network can be disconnected from each other. In this setting, the structural hole represents an opportunity for handling the information flow that exists within the network. Burt (1992) argues that the actors within the network who have strategic positions of centrality and connection can benefit more from structural holes. This, in turn, opens space for opportunistic actions.

In another work, Granovetter (1985) suggests that actors in general do not behave or make decisions out from a social environment, since the human behavior has strong rooting within a system of ties or social relations. As a corollary, it might not be correct to interpret behaviors and institutions as independent elements of the social relations, meaning that every action or economical behavior is rooted ("embedded") on social relations.

According to Larson (1991), the issue of embeddedness can play a significant role on a company's decision to form an alliance with another firm. In making this kind of decision, organizations tend to consider the position of their partners within the social structure of the network, that is, their level of embeddedness. The mechanism of embeddedness enables the organizations to identify complementary, reliable partners. This, in turn, can reduce the risks of the cooperation, raising the efficiency and competitiveness of the alliance.

Accordingly, the embeddedness of networks is usually seen as a strategic resource for the companies. The conduct and the performance of the companies are directly influenced by the embedded relationships. The relations are simultaneously competitive and cooperative, and the rent appropriated by the firms is dependent on its own resources and on the structure of the network in which it is embedded (GULATI et al., 2000).

2.2 The Interdependence Between Collective Actors

Saes (2009) discuss the existence of multiple bonds of interdependence between networks agents, based on the study of Thompson (1967). According to Saes (2009), there are three basic coordination types for

the solution of value creation problems. The coordination types can be associated to the complexity of the problem at hand.

The first coordination type is called joint interdependence. In this organization form, each agent of the system has a contribution defined for a specific task. The relationships between the agents are sparse and the social bonds between them can be considered weak. In this type of interdependence, the prices reflect all the required incentives. However, the agents involved have little influence on the products prices, which are set by the market. This is a low-complexity problem, in which the appropriate vertical governance structure is the market.

The second type of interdependence is the sequential type. In this case, an activity sequentially precedes the other and the process involves several actors. According to Saes (2009), the type of solution regarding the complexity of the problem in this case is of average complexity; however, the hierarchy-based authority is necessary so that strategic information are not scattered. In terms of result, this structure can be more beneficial to the agents than the joint interdependence, since there is the creation of a value to be negotiated.

Finally, the third type is called mutual interdependence. Each agent is mutually dependent on the choices and actions made by the other agents, since the actions of one affect the activity of others. In this case, the co-specialized knowledge occurs (LAZZARINI et al., 2001). Regarding decision rights in mutually interdependent arrangements, they are distributed among the agents, involving a complex process of value distribution and appropriation. For Saes (2009), due to the complexity associated to mutual interdependence, the resources created in this system are difficult to imitate and, consequentially, can improve the appropriation of the margin by the agents involved. However, as there are several actors, there may be opportunistic behaviors, such as free-riders. This type of interdependence is close to the networks approach, thus being the stylized configuration of the viticulture network investigated in the present study. In Vale dos Vinhedos, the mutual interdependence possible occurs when wineries have contracts only with the network growers and, likewise, when the wine growers exclusively hire processing firms that are part of the network. Next, we present a discussion on the complexity of the collective organizational forms, based on an understanding of the opportunities and risks existing in these structures.

2.3 Collective Actions in Networks: Costs and Opportunities for Value Creation

One of the most cited works in the literature of collective action is *The Logic of Collective Action*, published by Mancur Olson. His approach has made significant contributions to the subject. By investigating the collective actions logic, Olson (1999) analyzed the rationality of individuals, examining individual rationality versus the collective rationality. For the author, the collective benefits are insufficient to motivate the individual contribution, and in most cases, the collective agents do not tend to behave in a rational way to achieve the common goals for the group.

In his theory of social groups, Olson (1999) analyzed the influence of group size for the collective behavior. The author showed that smaller groups are more efficient than large ones, because the larger the group, the less it would promote the common interests. In addition, he identified the presence of free-riders on the group formation, and, in large groups, the actors tend to tolerate their presence more easily than in small groups. Overall, Olson (1999) argues that individuals hardly seek the collective wellbeing. Even sharing the same interests, the agents do not tend to act collectively, because they believe their effort is greater than the benefit they would achieve with the collective action. In the author's view, agents need incentive mechanisms to overcome the problem of non-participation in collective endeavors. These incentives can be economic, social, or psychological and include prestige, respect, and friendship. Olson (1999) distinguishes two types of incentives: positive, meaning private benefits that are offered to the collective agents; and negative, punishments for individuals who do not contribute to collective actions. Both serve as motivation for individual contribution to the collective action.

Another significant contribution to the collectivity subject is presented by Ostrom (2007). The focus of his theory lies in understanding why individuals cooperate in a social dilemma, when they can take advantage of the contributions of other group members. In general, the author agrees with Olson's view, by affirming that even though the actors have common interests, there are forces opposed to a collective action, as they may think their effort would be greater than the benefit of joint action. Moreover, it is important to recall Burt's perspective (1992) on the structural holes existing in the collective system. Structural holes give an opportunity for opportunistic action.

Nevertheless, despite the existence of cooperation costs and the possibility of opportunistic behaviors in

collective systems as networks, one can assumed that agents only adopt these structures when gains exceed losses. In this perspective, it is essential to identify the potential sources of economic value creation for networks and collective arrangements. For such, an investigation effort was carried out, based on authors of different theoretical perspectives. It was found that different theoretical perspectives recognize five major sources of value creation of complex systems⁴:

- a) Innovation – the creation and combination of unique resources (GRANDORI, 2009; GRANOVETTER, 1973; KIM; MAHONEY, 2006; LARSON, 1991; PETERAF, 1993; POWELL, 1990; SAUVÉE, 2002);
- b) Reduction of Monitoring Costs (CLARO, 2004; GULATI; GARGIULO, 1999; LAZZARINI et al., 2001; WILLIAMSON, 1996; ZYLBERSZTAJN; FARINA, 2006);
- c) Positive Externalities (ECONOMIDES, 1996; GULATI et al., 2000; LAZZARINI et al., 2001; ZYLBERSZTAJN; FARINA, 2006);
- d) Reduction of Transaction Costs (CLARO, 2004, 2009; MÉNARD, 2004; SAUVÉE, 2002; WILLIAMSON, 1996; ZYLBERSZTAJN; FARINA, 2006);
- e) Generation of Knowledge and Exchange of Information (CLARO, 2004, 2009; GRANDORI, 2009; LAZZARINI et al., 2001).

3 GEOGRAPHICAL INDICATION

Companies from different sectors have come to realize the role played by Geographical Indication (GI) as an opportunity for adding value to its products and business. GIs, which may be indications of precedence and/or designations of origin, represent an important strategy for the development of agribusiness systems, as they allow adding value to products. According to Fagundes et al. (2012) GI is a way to add value and credibility to a product, giving it a differentiated image in the market based on the characteristics of its place of origin.

Chaddad (1996) notes that the strategy based on GI may be even more interesting for specialized agribusiness units, which work with differentiated products with high value added, lower production volume and niche market production. In the same sense, Lalin (1991) states that indications of origin may be an important component of competitive strategy of product differentiation. The accreditations enable the improvement and the monitoring of the quality of food,

⁴This finding is in accordance with Lazzarini et al. (2001) by noting that complex organizational models may create value from different sources.

increasing the income of farmers and inserting them into the global market.

The French wine industry is a sound example. Some products which have GI and which have been recognized for their quality are the Bourgogne and Bordeaux wines (BADCOCK; CLEMENS, 2004), the champagne, and the red wines from Bordeaux (TREJO-PECH et al., 2010). As noted by Zylbersztajn and Miele (2005), companies all over the world are producing wines with Geographical Indications in order to get a globally recognized brand. Both traditional countries and new comers have made significant investments in quality systems of wine production.

In more general terms, Giordano (2009) states that certifications at large improve the image of organizations and facilitate the purchasing decision of consumers. The certification process presents itself as an efficient mechanism given the hectic life of consumers and sellers who generally do not have time to conduct product inspections and verifications. The certification then ensures the attributes of the product or process. According to Giordano (2009), because certifications can provide benefits to multiple stakeholders (producers, exporters, government and consumers), collective action to foster the development of certification processes can generate positive externalities for different actors involved in the system.

The Brazilian intellectual property law, which regulates the Geographical Indications, dates from the year 1997. The National Institute of Industrial Property – INPI is the official organization responsible for setting standards of procedures relating to the granting of GIs. According to INPI, a Geographical Indication is comprised of two levels: the Indication of Origin (IO) and the Designation of Origin (DO). Because GIs have no expiration date, the interest in this certification is increasing.

It bears emphasizing that the Indication of Origin (IO) and the Designation of Origin (DO) show affinities because both reveal the source or geographical origin of the product. However, some differences are worth highlighting. Both IO and DO are linked to the principle of truthfulness, reflecting the exact origin of the product, as opposed to a brand, for example. However, DO goes beyond the purely geographical aspect, indicating that a specific qualitative aspect of a given region of origin is met.

As highlighted by Trentini (2006), any type of product is entitled to receive a DO, however, products that usually receive this designation are those natural or manufactured products in which the geographical element is important or even have a decisive influence on its quality

or typicality. It is noteworthy that this designation is of a collective nature, being exercised by all producers in a given locality, region or territory. In contrast, IO only makes mention of the geographical name to differentiate the product, not requiring the fulfilment of specific quality requirements.

The number of GIs that can be found in traditional wine countries gives us an idea of its importance: 351 in France, 245 in Italy, 235 in Germany (FALCADE; MANDELLI, 1999). In Brazil, INPI had granted until the year 2013, only 38 Geographical Indications, 30 of which were Indications of Origin and the remaining were Designations of Origin. However, it is worth mentioning that Brazilian legislation has a differential with regard to other countries: in Brazil, it is possible to obtain geographical indication for services (NIEDERLE, 2011).

It is also interesting to note that the IO for wines and sparkling wines from Vale dos Vinhedos was the first to be granted in Brazil. In 2012, the region also got the DO of its wines. This is a differentiation strategy with an emphasis on quality wines, since the vast majority of wineries and canteens in the country produce ordinary wines with low quality and low price, and end up competing for only the domestic market.

4 THE CERTIFICATION OF FINE WINES IN VALE DOS VINHEDOS

Vale dos Vinhedos is situated in the mountain range of the State of Rio Grande do Sul, in the south region of Brazil. The region was originally colonized by Italian immigrants in the 19th century. The winegrowing activity began in 1876, and the wine production was started in 1895. Nowadays, the wine segment encompasses a production network made up of wineries, grape growers, hotels, inns, restaurants, and craftworkers.

Until the end of the 1980s, the wine production in the region was ruled by a small number of companies, along with two cooperatives and some small winegrowers who used to keep informal wineries in their properties. In the beginning of the 1990s, due to economic depression in the winegrowing segment, the different agents started to consider the introduction of a differentiation strategy based on a GI for the wine produced in the region. Two components then played a pivotal role: (1) the general movement of verticalization in the production and trade of wine and grape juice; and (2) the creation of Aprovale, the Association of Winegrowers from Vale dos Vinhedos. Inspired by European initiatives of value addition in wine production, Aprovale was created with the express purpose

of designing a Geographical Indication for the fine wines produced within the region of Vale dos Vinhedos. This GI was eventually approved by INPI in 2002.

In order to obtain the original approval for the certification for fine wines, some pre-requirements had to be observed: (a) the origin of the grapes, the wine production process and the bottling process had to be assessed⁵; and (b) the wines had to be submitted to analytical and organoleptic tests, as well as experts' tasting. After the granting of the certificate by INPI, the wineries located in Vale dos Vinhedos founded an agency entitled "Control Regulatory Council" with the purpose of managing the certification process. The council has established a Indication of Origin, which is granted exclusively for the wines and sparkling wines elaborated from the grapes proceeding from Vale dos Vinhedos and bottled in its original production site. All the rules and procedures of the certification are established by this council, which is responsible for conceding or denying the Certificate to the wineries that apply for it.

It is interesting to note that the investments necessary for the introduction of the certification in the region were primarily made by the wineries. Nowadays, the wineries play a key role on defining the conditions of production organization. Grape producers have also played a role in the success of the certification strategy through the accomplishment of specific investments on their farms. Particularly, producers made a restructuring on their vines, planting new cultivars. In terms of return, data made available by Associação dos Produtores de Vinhos Finos do Vale dos Vinhedos - APROVALE (2010) shows that in 2008 approximately 2,000 bottles of wine received the Certification, which is equivalent to 1,500 liters of fine wine. In 2008, Vale dos Vinhedos was responsible for 20% of the production of fine wines and 35% of the production of sparkling wines in the state of Rio Grande do Sul.

Gollo and Castro (2008) studied the indications of origin in Brazil and worldwide. The authors conclude that in regions where there are certified products with indication of origin, significant changes tend to occur. The changes include: (a) greater satisfaction on the part of the producer, who shall evaluate its own products as instigators of the characteristics of the region; (b) investment in local production, (c) raising of the technical level of the producer; (d) qualitative improvement of products, (e)

increasing in the added value of products; (f) generation of a more stable product demand due to consumer loyalty.

Accordingly, there is evidence that GI presents a potential positive impact on wine production and wine sales volume in the region. This gain may generically spread through the production network by means of collective sales and purchases, information and knowledge sharing, and informal partnerships. Despite this general rationale, the actual economic impact of the certification to the creation and appropriation of value for the different actors involved is unknown. The next sections further examine these issues.

5 EMPIRICAL ANALYSIS

5.1 Construction of the Study Hypothesis

The present paper investigates the impact of GI on value creation and value appropriation for the local wineries and grape producers in Vale dos Vinhedos. Based on the literature review, the paper's central assumption is that networks are potential sources of value creation. This assumption outlines the main hypotheses of the study, as discussed below.

Hypothesis 1: The network of wine production in Vale dos Vinhedos allows the value creation for wineries and grape growers.

Despite the costs of cooperation and the possibility of opportunistic behavior in collective systems such networks, it is believed that agents will only adopt these structures if the gains outweigh the losses. That is, given that collective actors are free, it is assumed that in cases where there is no gain by cooperation, collective action is not sustainable in the long term. Networks represent structures of competitive advantage, because it enables the building of several sources of value: innovative products and processes; reduction of monitoring and transaction costs; positive externalities and generation of knowledge and information. In the specific case of a Geographical Indication:

Hypothesis 1a: The GI for fine wines implemented in the network has a positive, significant impact on value creation.

It is believed that a major factor that positively influences the value creation in the wine production in Vale dos Vinhedos is the GI, which represents a collective action initiative. The theory of collective systems suggests that through joint actions, agents are able to access resources that would otherwise be difficult to obtain (GULATI; GARGIULO, 1999; HAKANSON; SNEHOTA, 2006; OSTROM, 2007; POWEL, 1990). The synergy present

⁵This aspect emphasizes the need of collective actions between the wineries and the producers, since to obtain the certification the grapes must be from local origin.

in the joint action, resulting from complementary core competencies, may generate competitive advantages. Thus, the partnerships become mutually advantageous for the agents involved in the network, so that the higher the level of cooperative behavior among the agents, the higher the income level available to the network as a whole. In addition, other studies (FAGUNDES et al., 2012; GOLLO; CASTRO, 2008; NIEDERLE, 2011) examine the geographical indications as ways of adding value in agribusiness in various regions of the world, especially in European countries.

Hypothesis 2: Wineries are able to appropriate a larger amount of the value generated by the GI of fine wines implemented in Vale dos Vinhedos.

Because the certification of fine wines implemented in Vale dos Vinhedos was an initiative set by the wineries, and it is up to them to determine the conditions of production organization, one may state that the wineries are able to appropriate more of the value created within the network. Additionally, wineries are supposed to have more information about the collective process as a whole – i.e., grape production cost, asset specificity, future strategies for the sector –, which can lead to a better bargaining position vis-à-vis grape producers. This hypothesis is further supported by the fact that GI of fine wines not only restricts the grape varieties that producers are supposed to sow, but also limits the yield per area; both requirements entail transaction and production costs for grape producers.

This hypothesis is also grounded in previous studies on the distribution of value in agribusiness (DAVIRON; PONTE, 2003; MORISSET, 1997; SILVA, 2010). The results indicate that the primary sector tends to have a smaller share of the total value generated in the agribusiness chain.

5.2 Methodology of the Study

In order to achieve the proposed objectives, the research makes use of quantitative and qualitative approaches, basing on two types of analysis: econometric and descriptive. The econometric estimations, carried out using Stata software, were designed to investigate whether value creation occurs within the network, both for the case of wineries and for the case of producers. Descriptive analysis was used in order to interpret the semi-open questions of the survey instruments, as well as the interviewees' statements, since there was direct personal contact with all subjects studied.

In terms of the data, this empirical research involved the collection of primary data, obtained through

surveys and questionnaires accomplished next to grape growers and wineries (wine processing companies) of Vale dos Vinhedos⁶.

In total, 31 wineries operate within the geographical area of Vale dos Vinhedos; of this group, 25 wineries are associated to Aprovale, thus being part of the certification scheme. Three producers did not collaborate with the research, so it was possible to interview 22 wineries. During the interview process, however, it was verified that two wineries were created a few months prior to the field study. Accordingly, both wineries fail in providing historical data, and the authors examined data for 20 wineries.

Regarding the growers, the authors used the information from the 2006 census of grape growers provided by Embrapa Grape and Wine. According to Embrapa there were 308 growers in Vale dos Vinhedos in 2006 (EMPRESA BRASILEIRA DE PESQUISA AGROPECUÁRIA - EMBRAPA, 2010)⁷. The authors then conducted a survey in loco throughout the Valley region, through visits to the residences of the producers. One hundred and nine producers were interviewed. During the field research, it was found that the number of agricultural establishments operating in Vale dos Vinhedos is less than 308. Perhaps this is because Embrapa has only 2006 data. Furthermore, it was found that there may be more than one record of a producer in the same establishment since farmers often register the father, son and wife, which makes it possible for a single property to have two or three entries in the census. Thus, in light of this inconsistency in the exact number of producers, it was not possible to work with sampling, and the territorialization was the more appropriate technique to the research context⁸.

6 RESULTS

6.1 Value Creation for the Wineries

The purpose of this section is to identify whether the network of wine production in Vale dos Vinhedos enables the value creation for the wineries; the main intention is to discuss the influence of the GI of fine wines on value creation. As described above, the authors collected data from twenty wineries that specifically operate in the region. The data is organized annually from 1999 to 2008.

⁶A pre-test was accomplished in August, 2009 with both the wineries and the producers. The definitive data gathering took place in September, 2009.

⁷The authors were unable to get updated data regarding the number of establishments producing grape in the region.

⁸See Falcade and Mandelli (1999).

This period was chosen to make possible a comparative analysis on the performance in wine sales before and after the introduction of Geographical Indication in Vale dos Vinhedos. Two estimates were made, considering different dependent variables. Table 1 gives a more detailed description of the variables.

As Geographical Indication is considered a marketing strategy (FAGUNDES et al., 2012), it is expected that the volume of sales of fine wines and of common wines be greater after the introduction of the GI. Accordingly, the GI variable is of great interest to the present investigation, representing the most significant collective action developed within the network of wine production of Vale dos Vinhedos. Regarding the ways of acquiring grapes, it is expected that the option “only having suppliers from Vale dos Vinhedos” is the one with greatest positive impact on sales volume of fine wines, since it represents the strongest degree of interdependence between wineries and grape growers. Regarding corporate size, it is expected that the larger the company, the greater the opportunities for investment such as industrial adjustments in relation to the certification and the marketing of products.

The estimation results are presented in Table 2. Initially, estimates were made considering fixed and random effects. The Hausman test was then performed to determine which of the two estimates would be the most appropriate (see Table 3). Additionally, three conditions were analyzed: the presence of heteroscedasticity, serial autocorrelation, and the independence between cross-section units. Results indicated a strong presence of heteroscedasticity and the presence of serial autocorrelation. Because the panel is unbalanced, the test for the existence of independence between cross-section units could not be calculated; thus, it was supposed that the cross-section units are not independent.

Considering the results above, Table 2 also presents an estimation based on Prais-Winsten method. By this method, one accounts for the presence of heteroscedasticity, contemporaneous correlation between cross-section units and autocorrelation AR (1) specific. The difference between the panel estimation and the method of Prais-Winsten is that the latter is based on a specific correction for the standard errors of the ordinary least squares (OLS) estimate⁹. Additionally, since the temporal dimension of the panel (10 years) is lower than the number of cross-section units (20 wineries),

⁹For further details of the method, see Beck and Katz (1995).

the Prais-Winsten model is preferred compared to the standard Model of Generalized Least Squares (GLS)¹⁰. Table 1 shows the evolution of all steps taken; however, the discussion that follows considers only the Prais-Winsten estimation.

The GI – network’s collective action – presents a positive impact on the sales volume of fine wines. Whereas the certification strategy is pioneer in Brazil – despite being widely used in other countries – it is possible to say that there were still several questions regarding its performance, mainly among the agents operating within the network. This uncertainty could be noticed during the interviews, as some of the wineries’ owners were not sure on the actual impact of the GI on the economic performance of their firms¹¹.

As the certification is the most significant representation of the complex structure of Vale dos Vinhedos, this result *partially* answers the main inquiry of the research. One should note that it only reflects the economic performance of the wineries, to which the network structure allows the value creation. However, the impact of the network for the grape growers remains unknown. In any case, the result suggests that the wineries’ investment – search for local raw materials, quality, and monitoring – is worthwhile for the firms.

A second issue of interest refers to the influence of the interdependence level on value creation. The authors specifically examine the influence derived from the raw material (grapes) supply for the production of wine. In this subject, as previously shown in Table 1, four cases were analyzed: a winery may have (a) network suppliers; (b) suppliers from outside the network; (c) own production (vertical integration), and (d) a mix between own production and both types of suppliers (from Vale dos Vinhedos and from other regions).

The theory leads us to believe that the option that creates more value is the first one, representing the mutual interdependence between the agents and enabling the certification acquisition¹². This governance option is followed by the vertical integration option as it is also an alternative that completely allows the certification acquisition.

¹⁰As observed by Beck and Katz (1995), the generalized least squares model may generate overconfident standard deviation estimates, leading to a greater probability of rejection concerning the insignificance hypothesis of the estimated coefficients.

¹¹This may explain why 20% of the interviewed companies had never requested the certification for their fine wines.

¹²As noted by Powell (1990), agents within networks have a strong interdependence of resources; as a result they tend to renounce their own interests over the interests of other agents.

TABLE 1 – Description of Variables - Value Creation by wineries.

Variable	Description
<i>Trading Volume of Fine Wines</i> ¹³	Volume of fine wine (liters) sold by each company. (dependent variable of the first regression model)
<i>Trading Volume of Common Wines</i>	Volume of common wine (liters) sold by each company. (dependent variable of the second regression model)
<i>Certification</i>	Certification of fine wines from Vale dos Vinhedos. Dummy variable
<i>Supplier from Vale dos Vinhedos Only (*)</i>	Dummy variable. Value 1 corresponds to the characteristic of possessing exclusive grape supply from Vale dos Vinhedos.
<i>External Supplier Only (*)</i>	Dummy variable. Value 1 corresponds to the characteristic of possessing exclusive grape supply from outside Vale dos Vinhedos.
<i>Own Production Only (*)</i>	Dummy variable. Value 1 corresponds to the characteristic of possessing own production only.
<i>Microenterprise (**)</i>	Dummy variable. Value 1 corresponds to micro enterprise.
<i>Small enterprise (**)</i>	Dummy variable. Value 1 corresponds to small enterprise.
<i>Medium enterprise (**)</i>	Dummy variable. Value 1 corresponds to medium enterprise.
<i>GDP per capita</i>	Brazilian annual per capita gross domestic product (GDP). Source: Fundação de Economia e Estatística - FEE (2009)
<i>Volume of Fine Wines Import</i>	Volume of imported wines (liters) per year in Brazil. Source: União Brasileira de Vitivinicultura – UVIBRA (2010)
<i>Brazilian consumption of wine per capita</i>	Consumption of wine (liters) per year per Brazilian inhabitant. Source: UVIBRA (2010)

(*) A winery has four modes of obtaining grapes: a) only from suppliers in Vale dos Vinhedos; b) only from external suppliers; c) having its own production only; d) a mix between own production and both types of suppliers. It is noteworthy that to obtain the GI it is necessary that the products to be made with at least 85% of grapes grown in the demarcated geographical area of Vale dos Vinhedos. (**) According to Brazilian census, a company can have four possible classifications of size (micro, small, medium and large). The authors constructed three dummies variables, being the basis for comparison the large company. The variables were designed based on the number of employees of each company. Source: Serviço Brasileiro de Apoio às Micro e Pequenas Empresas - SEBRAE (2010).

It is interesting to note, however, that the estimation results contrast with the theoretical presumption. The first three cases were all significant, but it adversely affects the value creation. The results then suggest that there may be opportunities for wineries that have a low performance in comparison to the estimation alternative, that is, having a mix between own production and both types of suppliers. This result leads us to believe that the diversity of options for the supply of grapes is crucial and it is more advantageous for the wineries to have a wider choice of fine-grape suppliers than to rely on just one specific

supplier or to simply rely on its own production. One can also infer that it is important that firms work with certified wines, but not exclusively, since the grapes acquired from outside Vale dos Vinhedos cannot be certified¹⁴.

In addition, another aspect shall be highlighted: during the empirical research, it was found that there is a size disparity between the wineries in the network, which raised question about the influence of firm size on value creation. The estimation indicated that intermediate-sized firms have a higher level of wine sales in contrast

¹³The initial purpose of the research was for the dependent variable to be the annual revenue of the wineries. However, several companies did not provide this information, hindering such a proposal. Sales volume was then selected as a proxy.

¹⁴It is worth to point out that the option of *obtaining grapes from external suppliers only* (15% of the wineries interviewed) and *vertical integration only* (40% of the wineries interviewed) are respectively the alternatives that present the worst performance for the wineries. This reinforces the idea that the network structure creates value for the wineries.

TABLE 2 – Estimation for wineries – Fine wine sales.

Dependent variable:	Trading Volume of Fine Wines		
Cross-section units	20		
Time	1999 – 2008		
Number of observation	158		
[Standard error in brackets]			
	Fixed Effects	Random Effects	Prais-Winsten
Microenterprise	-	-631548.2	-652732.8
		[155522.1] *	[59793.32] *
Small enterprise	-8769.70	-397973.8	-443897.2
	[76487.65]	[168232.4] **	[89654.41] *
Medium enterprise	-27283.79	1393963	1892427
	[173030.4]	[205583.3] *	[115889.3] *
Certification	32052.1	88610.98	93818.25
	[59369.75]	[90810.33]	[41092.8] **
Supplier from Vale	143348	-103136.7	-69590.27
	[156990.7]	[98620.57]	[21350.17] *
External Supplier	149108.1	-158533.6	-106934.5
	[221838.5]	[96636.33]	[30594.5] *
Own Production	16609.91	-135553.2	-94827.91
	[97735.91]	[76370.88] **	[31394.48] *
GDP per capita	-3.41	-8.83	-8.46
	[17.16]	[26.30]	[11.82]
Volume of wines import	-0.00038	0.0006	0.0006
	[0.003]	[0.004]	[0.0021]
Consumption of wine	46723.97	23316.36	-13260.36
	[158129.6]	[241651]	[113364]
Constant	151913	722089.9	752213.5
	[264293.2]	[425310] **	[197823] *
R-squared	0.052	0.85	0.86
Wald-Chi2 (10)		262.40	22936.61
Prob. > Chi2		0.000	0.00

* significance at 1%; ** significance at 5%; *** significance at 10%.

Notes:

1. Fixed effects test: $F(19, 129) = 48.70$; $\text{Prob} > F = 0.00$
2. Random effects test: $\text{chi}^2(1) = 3.27$; $\text{Prob} > \text{chi}^2 = 0.0707$
3. Test for heteroscedasticity: $\text{chi}^2(20) = 1.2e+35$; $\text{Prob} > \text{chi}^2 = 0.0000$
4. Wooldridge test for autocorrelation: $F(1, 17) = 710.785$; $\text{Prob} > F = 0.0000$

to micro and small firms. This result may come with no surprise, as some of the survey's respondents from small and micro enterprises were particularly concerned about their companies' performance.

Finally, one should note that the control variables present no significance. Even though it was not the research focus, it was believed that the external factors analyzed had influence on the sales volume of fine wines. Among them, there was a strong belief on the importance of volume of wine imports, especially because this factor was identified as critical in the interviews with the entrepreneurs from the wineries. However, the apparent non-significance of this control variable may be explained because the wines that represent strong competition are exactly those acquired in a clandestine manner; they are thus not considered in this survey.

As mentioned in the beginning of this section, another estimate was performed for the wineries, considering *the sales volume of common wines* as the dependent variable. At first, this analysis may seem inappropriate as the certification only refers to the fine wines of the region. However, the purpose in this case is to verify whether the collective actions undertaken in the network create positive externalities for the wineries, specifically regarding the sales of common wines.

The same procedures regarding the estimation method were conducted, that is, the fixed and random effects were firstly estimated, and they were both significant. Then, the conditions regarding the presence of heteroscedasticity, serial autocorrelation and independence between the cross-section units were analyzed. Results are presented in Table 3.

According to the Prais-Winsten estimation, the certification performs a positive influence on the sales volume of common wines. This result suggests that after the introduction of the certification, the average sales of common wines have also increased, which means that the *certification generated positive externalities*. This result is in accordance with the Network Theory, which suggests the positive externalities as one of the sources of value creation of complex systems.

Considering the results of the estimations above, it becomes clear that the introduction of the certification of fine wines allowed the creation of value for wineries that operate within the viticulture network of Vale dos Vinhedos. The next section presents the results of the research conducted with the grape growers in the same region.

6.2 Value Creation for Growers

Similar to the wineries case, this sub-section discusses the influence of the certification on value

creation for grape growers. The analysis is based on data from 100 producers¹⁵ from 1999 to 2008. Once again, data were organized in a panel and the variables are present in (Table 4)¹⁶:

In general, even though the certification represents an innovation fashioned by the wineries, it is expected to have a positive influence on the income per hectare of grape growers since it represents a collective action developed within the network. Regarding to sales possibilities, the option of "*delivering grapes to Vale dos Vinhedos only*" may be the one providing the best performance to growers since it represents the alternative showing greatest interdependence between the wineries and the producers in the region. Additionally, the grower cultivating *fine grapes* is supposed to report a higher performance, due to the economic effect derived from the certification of fine wines. Finally, the *property size* may also have a positive effect on growers' income: the larger the property, the higher the income per hectare of the surveyed growers.

Estimates were made considering fixed and random effects (Table 5). The presence of heteroscedasticity, the serial autocorrelation, and the independence between cross-section units were then analyzed. Results suggest the presence of heteroscedasticity and serial autocorrelation. The Pesaran test indicated that the cross-section units are dependent. As the temporal dimension of the panel (10 years) is lower than the number of cross-section units (100 growers), the authors also performed a Prais-Winsten estimation.

As a fundamental result, one may note that the certification of fine wines has a positive impact on the income per hectare of grape growers. After the certification, the income per hectare increased on average 1,340 BRL¹⁷. Along with this result, the estimation introduces some interesting questions: What is the relationship between the certification and the income of growers who do not grow fine grapes? And what about the income of those who do not deliver their production to the wineries in Vale dos Vinhedos?

¹⁵From the 109 interviews, 9 questionnaires fail in providing all the information required.

¹⁶The purpose of this research was to use two control variables: the average annual price of fine grapes and the average annual price of common grapes. However, the representative institutions of the sector provide no information on average prices, arguing that the price paid for the grapes is exclusive to each company. These institutions only provide information on the minimum price of grapes, as determined by the Brazilian National Supply Company (Conab). This particular information is not significant to the analysis because each winery sets its own price, which varies according to a number of specific aspects and the exclusive negotiation with each producer.

¹⁷This evidence may be relevant for the producers, since several growers reported during the interviews that in their perception the certification generated more requirements than benefits.

TABLE 3 – Estimations for wineries: Common wine sales.

Dependent variable:	Trading Volume of Common Wines		
Cross-section units	20		
Time	1999 - 2008		
Number of observation	158		
[Standard error in brackets]			
	Fixed Effects	Random Effects	Prais-Winsten
Microenterprise	-	-100923.9	-104875.7
		[532312.9]	[17755.91] *
Small enterprise	256518.4	39083.37	-358934.1
	[170802.7]	[545258.8]	[40750.64] *
Medium enterprise	311244.5	-42648.71	-738841.5
	[386389.9]	[608642.9]	[79717.8] *
Certification	234108.8	227937.2	180726.4
	[132577.1] ***	[130.553] ***	[76938.7] **
Supplier from Vale	-3159.69	-178342.4	-612965.8
	[350572.1]	[230405.5]	[78116.67] *
External Supplier	-10879.98	-261103.9	-541079.3
	[495382]	[273466.6]	[65458.53] *
Own Production	-82588.58	-192474.5	-568789.1
	[218251.7]	[172107.3]	[73910.12] *
GDP per capita	-33.04	-30.80	-23.15
	[38.32]	[37.78]	[20.80]
Volume of wines import	0.0040	0.0038	0.00271
	[0.007]	[0.0069]	[0.0037]
Consumption of wine	159680.6	152056.6	119035.5
	[353115.4]	[347448.6]	[195403.4]
Constant	-140429.3	84761.25	535336.8
	[590186.6]	[782528.8]	[324547.4] **
R-squared	0.0026	0.062	0.2176
Wald-Chi2 (10)		6.46	535.55
Prob. > Chi2		0.77	0.00

* significance at 1%; ** significance at 5%; *** significance at 10%.

Notes:

1. Fixed effects test: $F(19, 129) = 13.85$; $\text{Prob} > F = 0.00$
2. Random effects test: $\text{chi}^2(1) = 250.3$; $\text{Prob} > \text{chi}^2 = 0.00$
3. Test for heteroscedasticity: $\text{chi}^2(20) = 1.1e+34$; $\text{Prob} > \text{chi}^2 = 0.00$
4. Wooldridge test for autocorrelation: $F(1, 17) = 3.277$; $\text{Prob} > F = 0.08$

TABLE 4 – Description of Variables - Value Creation of growers.

Variable	Description
<i>Income per hectare</i>	Annual income (R\$) for each grower per hectare of grape
<i>Certification</i>	Certification of fine wines from Vale dos Vinhedos. Dummy variable
<i>Delivery to Vale dos Vinhedos only (*)</i>	Dummy variable. Value 1 corresponds to the grower's characteristic of delivering their production to wineries from Vale dos Vinhedos only.
<i>Delivery to external wineries only (*)</i>	Dummy variable. Value 1 is assigned to the grower that delivers its production only to wineries outside the network.
<i>Produces Fine Grapes</i>	Dummy variable. Value 1 is assigned to the grower who produces fine grapes.
<i>Property Size</i>	Property size (hectares) of each grape grower
<i>Production volume of common grapes</i>	Annual volume of common grapes produced per grower (kg)
<i>Production volume of fine grapes</i>	Annual volume of fine grapes produced per grower (Kg)

(*) There are three possibilities for the delivery of grape production: a) selling grapes exclusively to wineries from Vale dos Vinhedos, b) selling grapes exclusively to wineries outside Vale dos Vinhedos; and c) selling grapes to wineries both in and out Vale dos Vinhedos.

In the first case, as suggested in the estimation (Table 5), the introduction of the GI in the region may have caused the wine sales to increase, stimulating the demand for both the wine grape varieties and the common grape varieties. In the second case, regarding growers who currently do not negotiate with the wineries of Vale dos Vinhedos, we can say that the recognition of the collective action implemented within Vale dos Vinhedos has created an appreciation of the grape production from the region, increasing the price paid for grapes even by wineries that are not part of the network – i.e., wineries that are not specifically interested in seeking the certification, but who are looking for high quality grapes¹⁸. Overall, it seems that the certification has played an important role for the income of agricultural farms within Vale dos Vinhedos, suggesting that the collective action has been favorable for the value creation of the agents. This result confirms Hypotheses 1 and 1a, for both wineries (previously confirmed) and growers.

It is interesting to note that the estimation also indicates that the option of “*delivering to external suppliers only*” has a negative impact on growers' income per hectare. Producers in this situation have an average income that is 635 BRL lower in comparison to the income of growers who deliver to wineries in and

out of the network. The alternative of “*delivering to external suppliers only*” is then the one that generates the worst performance for grape growers, stressing the importance of maintaining and strengthening the interdependence within the network in the case of growers. This result also suggests that the ideal for producers is for them to negotiate production with more than one processing firm and not only with wineries in the network. This result is similar to that found for the wineries, to which the diversity of options in relation to the supply of grapes also seemed to be the most efficient governance alternative.

Regarding the influence of *fine* and *common grape volumes* on the income per hectare, the result is as expected, that is, both variables are significant and have a positive impact on the income, so that the higher the production volume, the higher the income per hectare. However, results point to an intriguing situation: wine grape growers (30% of the respondents) present an income that is approximately 1,400 BRL lower than the income of those producers who only grow common grapes. Since it was previously evidenced that the certification creates value for the growers, one may suggest that the value created is not a direct result arising from the certification, but an externality generated by it, such as the increase in the number of wineries in the region and the recognition of the grape quality.

¹⁸Some growers have reported that they perceive the recognition they are having in other regions due to their production quality.

TABLE 5 – Estimation for Growers.

Dependent variable:	Income per hectare		
Cross-section units	100		
Time	1999 - 2008		
Number of observation	992		
[Standard error in brackets]			
	Fixed Effects	Random Effects	Prais-Winsten
Property Size	588.19	-245.12	-234.47
	[362.47]	[75.972] *	[67.89] *
Production volume of common grapes	0.004	0.0055	0.0036
	[0.0012]*	[0.0012] *	[0.0013]*
Production volume of fine grapes	0.094	0.0890	0.0035
	[0.0058]*	[0.0055] *	[0.0081]*
Certification	226.12	205.78	1340.29
	[288.64]	[293.64]	[678.18]**
Delivery to Vale dos Vinhedos only	-1059.32	154.20	762.37
	[1150.86]	[782.64]	[828.67]
Delivery to external wineries only	-254.71	-524.08	-635.10
	[429.84]	[372.46]	[376.30]***
Produces Fine Grapes	-3786.89	-2223.15	-1396.86
	[1043.76] *	[557.24] *	[723.26]**
Constant	-1291.82	3647.36	7857.60
	[2407.16]	[790.56] *	[665.05]*
R-squared	0.108	0.344	0.1802
Wald-Chi2(9)		821.07	291.60
Prob. > Chi2		0.0000	0.0000

* significance at 1%; ** significance at 5%; *** significance at 10%.

Notes:

1. Fixed effects test: $F(99, 883) = 14.30$; $\text{Prob} > F = 0.0000$
2. Random effects test: (Breusch-Pagan): $\text{chi}2(1) = 1205.13$; $\text{Prob} > \text{chi}2 = 0.0000$
3. Test for heteroscedasticity: $\text{chi}2(100) = 39437.33$; $\text{Prob} > \text{chi}2 = 0.0000$
4. Wooldridge test for autocorrelation: $F(1, 99) = 24.503$; $\text{Prob} > F = 0.0000$
5. Pesaran test for independence of cross-section units = 3.764 ; $\text{Pr} = 0.0002$

Finally, regarding to the *property size*, contrary to the expectations, this variable indicates a negative relationship with the income per hectare. Two reasons may help explain this evidence. First, after a given size growers may have higher production costs (e.g.,

outsourcing costs), while in smaller properties, the work is performed by the family workforce. Second, small properties nearly have their entire area cultivated, which may not occur to larger properties due to the construction of improvements.

Taken as a whole, the findings presented in this section lead to an understanding of value creation for key stakeholders involved in the network of wine production in Vale dos Vinhedos. In order to expand the analysis, one should also consider the potential impacts of the certification on the region as a whole. The next section furthers developed this issue.

7 BROADER IMPLICATIONS DERIVED FROM THE INTRODUCTION OF A GI IN VALE DOS VINHEDOS

This section examines the broader implications derived from the introduction of a GI in the network of wine production of Vale dos Vinhedos. Specifically, the authors list some empirical evidences about the existence of positive externalities for the various agents that operate within the network. These externalities have been identified through interviews with winemakers and grape producers, as well as from secondary data.

The most significant network externality seems to be the increasing number of tourists in the region, as seen in Table 6.

TABLE 6 – Evolution of tourist visits to the Vale dos Vinhedos.

Year	Number of tourists
2001	45.000
2002	60.000
2003	82.000
2004	102.000
2005	115.737
2006	105.617
2007	120.962
2008	153.779
2009	182.229

Source: APROVALE (2010).

In 2001, 45,000 tourists visited the valley, while in 2009 this number increased to more than 182,000. In over eight years, the number of tourists has increased more than fourfold. This result indicates that the development process of the Valley is occurring at an accelerated pace. It is possible that the collective actions undertaken within the network of wine production have contributed to some

degree to these developments, especially initiatives such as the development of tourist itineraries, the participation in wine exhibitions and wine fairs, and the beautification of properties.

As noted by Hall (1996), the tourism in wine regions may involve different attractions, such as visits to vineyards and wineries, festivals, wine exhibitions, life experiences, artistic activities, and wine and food tastings; visitors are most attracted to tastings and the opportunity to enjoy the culture and other attributes of a wine region. Getz (1998) posits that wine tourism has the potential to provide a competitive advantage to the wine regions, generating business for processing firms and other interrelated businesses, thereby positively influencing the economic, social, and cultural values of the territory.

One may then argue in favor of the tourism development in Vale dos Vinhedos as a factor that adds value to the entire region, positively affecting wineries, hotels and inns, restaurants, sellers of artisanal products (jellies, sweets, wines, crafts), and local trade as a whole. In effect, producers reported increases in sales of fresh grapes, wine, and handicrafts, and noted significant improvements in roads in the region. However, the growers also mentioned two negative aspects arising from the increase in tourism activity: increased violence – especially burglary – and a considerable increase in noise and traffic in the rural area.

Another positive externality which was pointed out by both wineries and grape producers is the strong appreciation of properties in the region; 85% of winery owners are very happy about this specific aspect, noting that such appreciation occurred mainly after the increase of tourism activity in the valley and the introduction of the GI. Likewise, many producers reported a significant increase in the value of their property after the national recognition of the region as a wine production area.

After the certification there was a considerable increase in the number of wineries located in the region. Of those associated with Aprovale, seven were established after the year 2002. Similarly, there was a notable increase in the opening of unlicensed bars. The older-established winemakers consider these aspects to be negative due to the new competition within the area. However, one can infer that the increase in the number of companies had a positive impact on the network as a whole with regard to the generation of income and jobs in the area. It is also worth bearing in mind that cooperation and competition between ventures in a complex system can generate extremely beneficial synergies, depending on

the interchangeability of complementarities between firms (SACHS, 2003).

Another network externality is the recognition of the brand name “Vale dos Vinhedos” throughout the country, and even abroad. On this aspect, 90% of the wineries reported that after the introduction of the certification, the Valley’s brand became nationally known. In terms of global projection, 65% of the wineries believe that “Vale dos Vinhedos” has become a recognized name as a wine region; 96% of producers said that after the implementation of the certification, Vale dos Vinhedos has become a recognized region. It is worth mentioning that the increasing participation of wineries in wine exhibitions and fairs, both nationally and abroad, may have contributed to this result. The recognition of Vale dos Vinhedos as a brand name may not represent an important element for companies that are already established in the market since they enjoy individual brand recognition. However, this externality is crucial for small, emergent businesses.

It is also worth noting that the expansion of the network has brought benefits such as increasing concern about environmental preservation, beautification of farms, and the preservation of local culture; 76% of winery owners reported an increasing concern with nature preservation on the part of local residents. Additionally, 66% of farmers mentioned an increased commitment and investment in the care and beautification of their properties after the introduction of the certification and the increase in tourism to the region. The talks held by Aprovale in the valley communities addressing the importance of environmental conservation and the beautification of vineyards may have played a key role.

Regarding the maintenance of the local culture of the Vale dos Vinhedos, which is home to Italian traditions, 80% of winemakers stated that after the formation of the network there was an increase in public concern with the preservation of local traditions. The implementation of the Cultural Program of the Vale dos Vinhedos, being planned by Aprovale, will play a vital role in this aspect.

In general terms, it is evident that the network of wine production of the Vale dos Vinhedos stimulates the emergence of externalities which positively affect different economic agents such as wineries, hotels and inns, restaurants, producers, and local trade, in addition to benefiting visitors and the surrounding population of the valley. Accordingly, the existence of positive externalities envision a scenario for creating value within the network as a whole, mainly as a result of the certification in conjunction with other collective actions undertaken by

the actors. The next section addresses a related issue: the distribution of value within the network.

8 THE APPROPRIATION OF VALUE WITHIN THE NETWORK: ARE THERE DIFFERENTIATED GAINS AMONG THE ACTORS?

This section investigates the distribution of the value generated in the network, especially in relation to the wineries and grape growers. As previously discussed, one may talk in favor of a greater value appropriation by wineries than by grape growers (hypothesis 2 in section 3). It derives from three reasons: (i) the wineries determine the conditions of certification organization; (ii) wineries have a better bargaining position vis-à-vis the producers; and (iii) the GI entails many requirements that imply transaction and production costs for grape producers.

In order to discuss this issue, it is important to review the results found in the estimations. When examining the regression results, one can note that the certification has increased the volume of sales of fine wines by 12.5% and of common wines by 33.7%. For producers, the certification has increased the average gross income per hectare by 17%. So, even being positive for both segments, these results suggest that the wineries may be able to appropriate a higher portion of the value generated by the certification¹⁹. This result was expected since it is the wine industry that coordinates the wine certification process.

As a related issue, the authors investigated the existence of a difference in value appropriation among the players in the same segment. First, an analysis of the winery segment was conducted. It was supposed that the difference in income distribution within the winery segment depends on the level of interdependence between wineries and producers, and the company size. By revisiting the regression results, one may note that the wineries that appropriate a larger amount of value are the ones which have a mix between own grape production and the use of grape suppliers from the Valley and outside the network. This result is counterintuitive since it suggests that wineries with a low level of interdependence - and possible with larger scale production - may appropriate more value. Regarding the influence of firm size on value appropriation, it is evident that large and medium-sized

¹⁹It is known that the measures of the dependent variables in the regression models are not the same: sales volume in the case of wineries and gross income per hectare in the case of producers. Nonetheless, both refer to income generation, and among the available measures these best represent the reality of each production segment.

businesses demonstrate the best performance, a result that is in line with research expectations.

A similar analysis was conducted on income distribution in the producers' sector. Similar to the wineries, it is expected that the higher the level of interdependence and the larger the property, the greater the value appropriation by the producer. Econometric evidences do not confirm the first expectation: the variable that represents the highest degree of interdependence among the actors does not have any statistical significance. However, the governance mode which represents the lowest level of interdependence (external delivery only) shows the worst performance for growers, which is in line with expectations. Regarding the influence of property size, the estimations suggest that the larger the property, the lower the value appropriation by the producer (potential evidence of diseconomies of scale).

Thinking about the most appropriate governance structure, it seems that for both the winery and grape growing segments, the agents having more than one governance alternative are able to appropriate a larger amount of the value generated within the network. It is also worth bearing in mind that the size of the firm or rural property may have an influence on value appropriation, so that large and medium-sized wineries and small grape producers obtain better gains within the network in comparison to other agents in the same segment.

9 CONCLUDING REMARKS

Considering that the study of networks is relatively recent, it is believed that this research has made an important theoretical and empirical contribution to the discussion. This article investigates the influence of collective actions and the level of interdependence within networks. Furthermore, this study provides an original contribution to the Brazilian wine system, since it brings answers to issues such as the creation of value from the indication of origin and the distribution of the value created by the certification among the agents involved.

Specifically, the present paper investigates the impacts associated with the introduction of a Geographical Indication in a network that operates within the Agro-Industrial System of wine production in the South region of Brazil. The certification – which represents a collective action – has a positive impact on the sales of fine wines, besides positively influencing the sale of common wines. This fact characterizes an externality formation scenario. The paper also shows that the certification has a positive effect on the income per hectare for producers in the region.

Furthermore, the certification enables the creation of value for other stakeholders such as hotels, restaurants, shops, inns, and craft sellers. One may note that the certification has had a positive influence on the increase in the number of tourists in the region; the recognition of Vale dos Vinhedos as a brand name; the job creation; the increase on direct sales of wines and grapes; the strengthening of the various commercial establishments in the valley; the rise in land value; and the preservation of the environment and the beautification of rural properties.

In general, this research demonstrated that the gains and the sources of value creation in existing networks outweigh the perceived costs and risks in these collective systems. This result is very important, especially if we consider that the region of Vale dos Vinhedos is a model for other wine regions of the country, since it is a pioneer in terms of geographical indication in Brazil.

Regarding the appropriation of value generated within the network, the available evidence suggests that different agents may enjoy distinct gains. The wineries are able to appropriate more value than the growers; this result was to some extent expected because the wineries themselves created and currently coordinate the wine certification process. In order to gain a better bargaining position, the farmers may need to organize themselves to create strategies which recognize the importance of maintaining the network over the long term.

In terms of managerial implications, the results in this paper suggest that the position in a network may be relevant to the appropriation of value associated with a Geographical Indication (i.e., collective action). More specifically, the control over the processes that operationalize the certificate can play a key role in determining the extent to which a particular agent is able to capture the value generated by the network certificate. The results also suggest that the diversification in terms of governance structure may be a strategy that allows greater aggregate income. This particular aspect can be further developed in future studies, involving other sectors.

In summary, the major contribution of the present research was the design of a survey on the performance of wineries and producers in two distinct periods: before and after the implementation of a Geographical Indication in Vale dos Vinhedos. In this regard, a limitation of this study relates to the fact that in building the research database, the number of years before the label introduction is lower than the number of years after the introduction of the label.

As a general result, one can say that Vale dos Vinhedos region is in line with current market trends,

developing strategies to improve quality and origin of the wine. However, it is essential to find an appropriate solution for better distribution of earnings among the involved segments. Even with regard to the distribution of value generated in networks, future research can be developed, addressing in more deep the theoretical foundations of this particular aspect, since the literature on this topic is still incipient. The authors also believe that further research should be carried out in order to compare the performance of two types of wine regions: networks such as that found in Vale dos Vinhedos, and other regions which lack the implementation of a certification. Such analysis may prove relevant to the identification of particular aspects that may influence the effects described above.

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