

Rules, Organizational Structures and Economic Performance: The case of Prosecco Cooperative Wineries in the Treviso Area

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Abstract

The study performs an economic analysis of the rules that govern the organization of production within Prosecco cooperative wineries in the Treviso area, in order to assess the economic impact on the wineries performance and the ability of the institution to minimize transaction costs. We first present an economic discussion of qualitative and quantitative information gathered for the 16 cooperative wineries in the Treviso area. Then we present a theoretical framework for the economics of transaction costs of the cooperative wineries. Despite the “fame” of the cooperative winery of an inefficient, assistance-based institution, it emerges the profile of a complex structure, which seeks to incorporate the values of social and cultural cohesion and competitiveness in the markets, within the mission of a company. There is a strong link between regulation of quality standards and impacts on the winery economic performance. In the case of the winery, achieving mutualism is paradoxically favored by the maximization of profits and the ability to do business.

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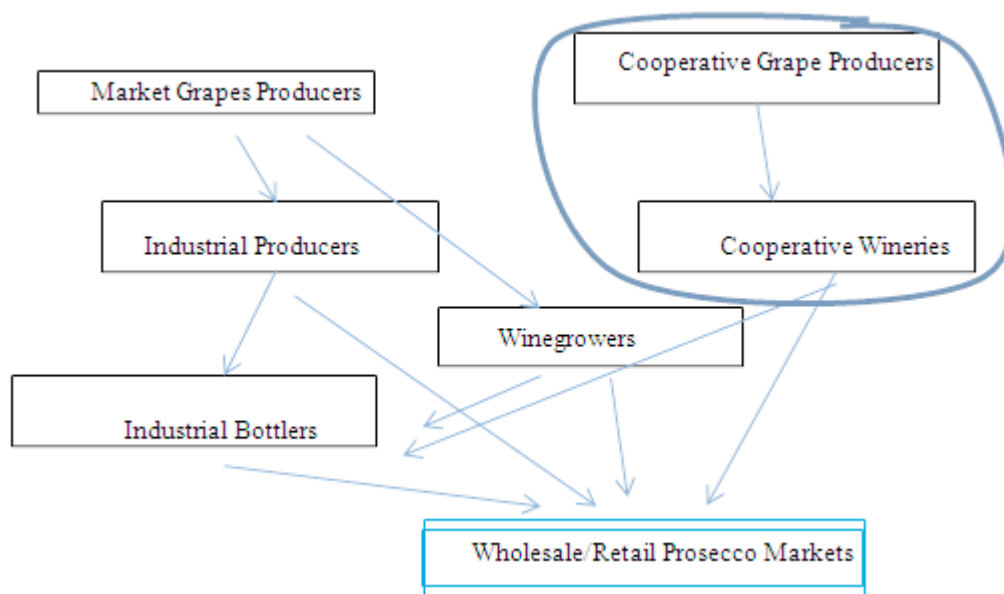
Introduction

The production of Prosecco wine is mostly concentrated in a limited geographical area around the Treviso province, but is organized in very different ways and characterized by different governance structures (Rossetto et al., 2011; Boatto, Barisan, 2014a; Boatto, Barisan, 2014b). For instance, as couple of non-exhaustive examples, a group of producers integrates production from the stage of grape cultivation to that of final marketing at retail level. In other cases, producers purchase grapes from external suppliers, produce the wine

and sell it to final “bottlers” (*imbottigliatori*), who label the product with their brand and market it. In a third case, producers just bottle the wine and market it at wholesale and retail level. Production, very similar for technological characteristics and costs structures¹, is carried on in different “institutions”, spanning from single firms to cooperative wineries (*cantine sociali*): from winegrowers, local firms of small dimensions, to large producers, facing international demand.

The different governance structures are regulated by a nexus of very heterogeneous (formal and informal) contracts and rules. It emerges a heterogeneous institutional organization, as illustrated in Figure 1.

Figure 1. The Organization of the Prosecco Market



The apparent paradox sketches a whole world of negotiations and transactions aiming at producing a product with “similar” features and marketed at “similar” (average) prices (with some exceptions). The production of such “quasi-homogeneous product is carried on in very different institutions. The objective of the present study, therefore, aims at analyzing and solving the “puzzle” of organizational governance structures of the Prosecco wine, by concentrating on the cooperative wineries².

¹ The technology of production is relatively inexpensive, characterized by constant marginal productivity of most inputs, and allows producers to market the product at low (average) prices. Prosecco is produced with the *Charmat* method, a less costly, alternative method to the more “famous” *Champenoise* procedure used for producing sparkling wines.

²By the Italian law “A cooperative is an autonomous association of persons united voluntarily to meet their economic, social and cultural needs and aspirations through the creation of a company jointly owned and democratically controlled.” The cooperative is a company formed by several people (at least 9, or 3 in the case of natural persons) that combine to satisfy a common need. It fails to distinguish the owner/employee because, in a cooperative, all members equally affect the choices of the company and the human element tends to prevail on the economic one (see Zamagni, 2010).

We adopt the framework of the economics of transaction costs (TCE), for which the existence of different institutions and governance structures depend on the different amount of costs that characterize a transaction/exchange. Williamson (1979) shows that asset specificity increases the uncertainty and complexity of the transaction, and therefore transaction costs. The higher asset specificity, the higher the uncertainty and complexity of the transactions, the lower the reliance on the (neoclassical) market mechanism, (that does not guarantee the minimization of transaction costs) and the higher the reliance on long-term contracts or other complex institutional structures. There are "*costs of using the price mechanism*" (Coase, 1937, p. 3), and the more complex the transaction the higher the price of the market mechanism. In this framework, we interpret cooperative wineries as transaction costs "adapting" governance structures. Cooperatives are organizations, in which the degree of specificity of investment and uncertainty in the exchange are not particularly high. The investment of the cooperative in relation to the pursuit of its mission is characterized by an average level of specificity, because though bound to the production of wine, it can turn into a business *for profit* or it can produce, with little investment other products (e.g. oil). The uncertainty of the production process is average/low because is mostly impacted by climatic conditions, which are not controllable by human remedies, and can only be mitigated or adapted. Demand for Prosecco is growing worldwide and this lowers the uncertainty in the exchange. The indicator complexity is low relative to the ability to identify with certainty the product offered, which is recognizable and well-regulated. The regulation of relations between members, the mutual purpose, and in general all that nexus regulating the relations of human capital, present the most important levels of complexity that might increase transaction costs.

Although a complete literature review goes beyond the scope of this paper, in the context of agricultural economics, applying TCE to cooperative firms is a well-known approach that dates back to Cook (1995), who takes a property rights perspective to explain the cooperative structures. Our research follows that research stream and differentiates for the specific application to the Treviso wineries and for taking a different institutional approach, looking at the impact of regulation on economic performance of the cooperatives. The study, in fact, performs an economic analysis of the rules that govern the organization of production within cooperative wineries in the Treviso area, in order to assess the economic impact on the wineries performance and the ability of the institution to minimize transaction costs. The work is organized as follows: section 2 presents an economic discussion of qualitative and quantitative information gathered for the 16 cooperative wineries in the Treviso area. Section 3 presents a theoretical framework for the TCE of the cooperative wineries. Section 4 concludes.

Performance and Rules of the Prosecco Cooperative Wineries in the Treviso Area

The paragraph presents an economic discussion of qualitative and quantitative information gathered with respect to the 16 cooperative wineries in the Treviso area. In order to find a relational link between rules and economic performance, we looked for: (1) the analysis of the winery Statutes, (2) the analysis of the winery internal Regulations and finally (3) the analysis of the questionnaires submitted in order to get quantitative data on production key variables.

The rules that govern the 16 cooperative wineries are very similar. The Statutes mostly regulate the objective, the shareholders rights, obligations and value of shares and the institutional governance, organization and decisional bodies and procedure. Statutes tend to homogenize their provisions to the common regulation provided by the law on cooperative firms in Italy, with few references to the specific case of the winery³. The internal Regulations contain key provisions for the organization of wine production and identify more clearly the nature and objectives of this particular form of enterprise. In particular, the Regulations set very stringent qualitative standards for the grapes the shareholders are allowed to confer. Those standards are stricter than the general standards required by the disciplinary. Table 1 summarizes the main provisions of Statutes and Regulations and discusses the provisions in economic perspectives.

The questionnaires were incompletely fulfilled, especially with regard to data on profits, cooperative costs and returns. Table 2 shows the summary statistics for the available information, related to the production year-2013.

In 2013, the 16 cooperative wineries in the Treviso area have produced a total of 2,224,567 quintals of grapes. The individual contributions vary across wineries, according to their dimensions and it spans from a minimum of 10,004 to a maximum of 409,021 quintals, with an average of 158,898 per cooperative winery. The liquidation price of the grapes shows a marked difference between the various wineries, which depends on the performance. The average price of liquidation of grapes equal 84.35 Euros per quintal, with a minimum of 70 and a maximum of 128 depending on the winery. Meeting with experts has emphasized that the liquidation price is higher than the market price of grapes, that on average is around 65/70 per quintal (Treviso Chamber of Commerce, 2014).

³ The cooperative statutes are often standard forms, provided by associations and consultants. They are customized only if necessary, to fit special cases. The common characteristics (mutuality, dividends, open membership.) are law requirements and/or requisites for tax advantages. Cooperative law requires specific stipulations in the statutes.

Table 1: Economic Analysis of the Cooperative Wineries Statutes and Regulations

STATUTES	
Norm	Economic Analysis and Impacts
Purpose and objectives of the winery	All wineries reaffirm their mutual vocation, recalling it constantly in the Statutes. The distribution of dividends is limited and tied to the achievement of the mission. The three most important social objectives (mutual vocation, distribution of returns and dividends and cooperative winemaking) are regulated in much the same way in all the statutes. There are slight differences. As for the regulation of technical support services, for instance, not all wineries include such activity in the performance of the mutual activities. Provide technical assistance involves the benefit of coordination and strengthening of mutual concepts. Also it involves the cost of a potential loss in the event of erroneous or incomplete or inefficient care. The wineries that do not provide for technical assistance and leave the cooperative shareholder free to use their own professional reference, could greatly reduce the transaction costs related to the social responsibility of the company in case of error. This is a clear example of how the rules might affect economic performance
Number of Cooperative Shareholders	The number of cooperative shareholders is unlimited, open, and consistent with the available organizational and technical possibilities of the cooperative winery. Since the cooperative is by juridical nature an "open entity", if an applicant is eligible for admission under the law, then it cannot be ruled out. However, there exist a clear economic barrier to attracting new members and is represented by the achievement of maximum technological and production capacity of the cooperative
Value of Shares	In most Statutes, " <i>the share capital is variable and is divided into shares with a value of EUR 25.00,</i> " and " <i>the number of shares of each shareholder is related to the amount of his grapes conferment.</i> " There was some exceptions: the value of the shares amounted to € 50.00, for two wineries and amounted to EUR 200, eight times higher than the majority, for one. This latter differs greatly from the media because the cooperative is more recent than the others.
Financier Shareholders	Some cooperatives (75%) allow for the presence of investor members, whose contributions in cash must be used to finance development plans and business modernization. Those shareholders are bound for a period of time related to the realization of the plans. Statutes specify the value of the shares (spanning from 25 to 500 Euros), the minimum number of shares (spanning from 100 to 1500) and the type of contribution. The figure of financing member could be interpreted as a form of internalization alternative to external recourse to financial and capital markets, which often are volatile and risky. Companies deciding to enlarge the scale, rather than resorting to the external capital markets, internalize entering capital through the creation of a legal entity (financier shareholder), which provides liquidity to fund it, through the purchase of shares. On the other hand, cooperative wineries that do not provide for funding members might be characterized by high efficiency in terms of transaction costs and production costs, such as not to require the placing of additional capital.
Duration	The Statutes specify the duration of the cooperative. The duration is mostly defined around 50 years for all cooperatives. In TCE perspective, the duration of a contract is a very important indicator that often reveals the degree of intensity of the three key variables that affect transaction costs and related governance. In this view, the rule that provides for a term of more decades could be interpreted as an efficient and effective attempt to minimize transaction costs generated by the complexity of organizing and coordinating all the relationships and activities inside the social cooperative. A long time horizon could also be interpreted as an incentive for the cooperative shareholders to the commitment to the mutual purpose. At the same time, the possibility of subsequent entry or exit accorded to shareholders is a renegotiation provision that provides flexible adaptation (in view of transaction costs minimization) to the long term agreement.

Table 1 (continues): Economic Analysis of the Cooperative Wineries Statutes and Regulations

REGULATIONS	
Norm	Economic Analysis
Quality of the grape conferment	<p>There is a great deal of attention to the quality of the grapes conferred even within cooperatives.</p> <p>The Regulations set disincentives and punishments (for the shareholders who do not deliver high quality grapes or do not respect schedules and procedures) that are more rigid than the General Disciplinary. For instance:</p> <p>Grapes affected by different diseases, spoiled by climatic agents like hailstorm, mold, or dryness are not purchased by the cooperative.</p> <p>Grapes must contain a precise (decided by the regulation) have the level of acidity respect the regulation norms on the level acidity and sugar content:</p> <p>Grapes must be conferred in respect to the prescribed annual yields (and proportional to the land hectares)</p> <p>The grapes harvest has to respect the timetable (day and hour) set by the cooperative. If this ' does not occur the grapes are not purchased by the cooperative.</p> <p>Controls can be visual and technical. The grapes that are not accepted for prime rate winemaking can be bargained upon, case by case, and purchased for other purposes.</p> <p>Those shareholders that present a temporal path of virtuous behavior (in terms of conferment of grapes that reflect high quality standard can be admitted in the Quality Club.</p>
Liquidation Price	<p>The regulations define the way to compute the liquidation price of grapes, (based on a series of parameters, the most important of which is the quality of the grapes). The liquidation price is the cost of the input-grape, and is higher than purchasing grapes in free market. But the difference with the cost of inputs purchased in the free market, should not be interpreted only in terms of lost efficiency but above all as gains and benefits in terms of social cohesion.</p> <p>Incentives and disincentives set in the Regulations aim at preserving the efficient organization of production. These provisions may be interpreted as a vocation to do business in an organized and effective way.</p>

Table 2. Summary Statistics for Production Data

	Mean	Standard	Minimum	Maximum
Total Quantity (quintals)	158,898	110,414	10,004	409,021
Liquidation Price	84.35	15.6	70	128
% of Prosecco Grapes	43.35	7.5	30	54
Prosecco Wine	46,639	30,793	2,181	110,757

The cooperative wineries pay a higher price for the input grapes. This might be interpreted as decrease in technological efficiency, recovered by an increase in X-efficiency, since shareholders are very motivated and bound to the mission of the cooperative. Most grapes are destined to the production of Prosecco⁴ wine, with an average 43.35% of conferment. The rest of the grapes is mostly destined to the production of *Pinot grigio*. The 2013 average production of Prosecco wine is 46,639 hl per winery, with a minimum of 2,181 and a maximum of 110,757 hl, depending on the strategy and the dimension of the plant. It

⁴ Although Glera has been cultivated around the Conegliano and Valdobbiadene hills since the 18th century, more than 25,000 ha of Glera vineyards, and more than 350 million bottles are produced annually. Prosecco wine can be differentiated into Prosecco Controlled Denomination of Origin (CDO), and the Prosecco Controlled and Guaranteed Denomination of Origin (CGDO), depending on the geographical area where the grapes are cultivated.

is though worth noting that the 16 cooperative wineries on average supply 40% of the total Prosecco yearly production, where the firms in the province of Treviso produce 90% of total supply.

Economics of the Cooperative Winery

The scarcity of economic data and the homogeneity of regulation presented in section 2 has hampered the possibility to perform econometric analysis of the relationships among transaction costs, governance and economic performance⁵. However, the present section presents a simple framework in order to highlight and discuss the main relations and variables that synthesize the winery's objective achievement through the setting of rules that (in our interpretation) are transaction costs minimizing. The cooperative winery's objective is the maximization of the remuneration to the cooperative shareholders. In our framework, $R_{t,i}$ represents the remuneration for each cooperative shareholder. They depend on the "transformation value" (*valore di trasformazione*), that is the profits derived from the sale of the wines produced and commercialized by the cooperative winery. In our framework the transformation value ($TV_{w,t}$) is defined in Equation 1:

$$(1) \quad TV_{w,t} = \pi_{w,t} [Q_{w,t}, \bar{P}_{w,t}, C_{w,t}(\alpha, Q_{g,t-1}, p_{g,t-1})]$$

Where $\pi_{w,t}$ are the profits generated from the sale of the wines produced and commercialized by the cooperative winery (w) at time t ⁵. Profits depend on the quantity of wine produced and commercialized $Q_{w,t}$. Profits also depend on the vector of prices practiced by the winery for its wines $\bar{P}_{w,t}$ (with $\bar{P}_{w,t} = (P_1, \dots, P_n)$) and on the production costs $C_{w,t}$. Production costs, in turn, depend on $Q_{g,t-1}$ (with $Q_{g,t-1} = (q_1 + q_2, + \dots + q_n)$, e.g. the total quantity of grapes is the sum of the grapes provided by each individual shareholder). $Q_{g,t-1}$ is the total quantity of grapes delivered by all cooperative shareholders in the period $t-1$, since the harvest is precedent to the wine-making procedure. Total production costs also depend on the "liquidation price" $p_{g,t-1}$ the price paid to the shareholder for the purchase of the grapes in the period $t-1$.

The α parameter represents the high qualitative standard of the grapes supplied by each cooperative shareholder. The α parameter affects both the quantity accepted and bought by the cooperative winery and the purchase price, as explained afterwards. The α parameter

⁵ As one referee correctly points out, a key element in the model is the link between Qg at time $t-1$ and the profits at time t . This means that profits today depend on grape quantity and prices of previous year. In many cooperatives this link is purposely attenuated using a system based on provisional down payments and final installment (*anticipi in conto conferimento* and *saldi*). Inventory evaluation (i.e., *valutazione delle rimanenze*) is also used to break the inter-temporal link. These practices determine accounting profits, not the economic one and are not embodied in the model, but it is important to mention them.

also affects the final profits, since a high qualitative standard of the grapes positively affects the quality of the produced wines, their price and marketability possibilities⁶.

The liquidation price ($LP_{t,i}$) is the price paid by the winery for the grapes. It is the ratio between the transformation value in Eq. (1) and the total quantity of grapes (g) supplied by all cooperative shareholders $Q_{g,t}$ (with $Q_{g,t} = (q_1, \dots, q_n)$), as described in Equation (2).

$$(2) \quad LP_{t,i} = \frac{\pi_{w,t}[Q_{w,t}, \bar{P}_{w,t}, C_{w,t}(\alpha, Q_{g,t-1}, p_{g,t-1})]}{Q_{g,t}}$$

Remunerations ($R_{t,i}$) to each cooperative shareholder can be described by Equation (3).

$$(3) \quad R_{t,i} = \frac{\pi_{w,t}[Q_{w,t}, \bar{P}_{w,t}, C_{w,t}(\alpha, Q_{g,t-1}, p_{g,t-1})]}{Q_{g,t}} \cdot q_{g,t,i}(\alpha)$$

Liquidation price of the grapes supplied by each cooperative shareholder i

The annual remuneration $R_{t,i}$ of each cooperative shareholder i at time t depends on the liquidation price of the grapes (as defined in equations (1) and (2)); on the cooperative shareholder's grapes that the winery is willing to purchase $q_{g,t,i}$ and again on the quality parameter α . It is important to highlight that the supplied total quantity at the denominator also depends on the α parameter, since it is a sum of individual shareholder's conferment. Quality matters in the selection and purchase of grapes from single shareholders.

Equation (3) shows and summarizes the choice of the cooperative wineries (and each cooperative shareholder) and the mutualistic nature of the firm. In fact, remunerations increase when the (previous year) profits of the cooperative winery increase and when the quantity of supplied grapes (by each cooperative shareholder) increases. Remunerations decrease when the total quantity supplied by all cooperative shareholders increases. Remunerations may also increase or decrease according to the quality of the supplied grapes, as measured by the α parameter. This not only affects the present computation of remunerations at time t , via the qualitative assessment of the cooperative shareholders individual and total supplied grapes, but is also affected by the performance of the cooperative winery in the previous period $t-1$. The quality of the supplied grapes at $t-1$ is a variable that enters the production costs and affects the performance of the winery, since the high qualitative standard of the grapes contributes to positively affect the quality of the produced wine. The better is the wine, the better the winery performance, the higher the profits, and therefore, the returns for each cooperative shareholder.

The formulation described in Equation (3), though algebraic simple, is very effective in its economic interpretation. There is a clear interdependence between the performance of the

⁶ In the paper the quality parameter α is treated as exogenous, since the outcome of the problem is, by authorial choice, only the optimal quantity of grapes, purchased from each single shareholder by the cooperative winery that is required to maximize the remuneration to the cooperative shareholders. The criteria to assess the quality of grapes are legally defined (at various levels) and predetermined with respect to the moment when the grapes are purchased. They are mostly time and criteria invariant, since to change the criteria, the cooperative should change several internal regulations through various legal procedures. The quality parameter affects, though, the purchased quantity, and in turn affects the remuneration to the shareholders.

cooperative winery and performance of the single cooperative shareholder. They all depend on the qualitative features of the supplied grapes; on the economic performance in terms of profits of the previous considered period and on the total quantity supplied by all shareholders.

For the sake of simplicity, we can rewrite Eq. (3) as follows:

$$(4) \quad R_{t,i} = LP_{g,t,i} \cdot q_{g,t,i}(\alpha)$$

where $LP_{g,t,i}$ is the liquidation price as defined in Equation (2).

Taking first order derivative with respect to the key choice variable Qg,t , allows to better capture the interrelation between the mutualistic and for profit objectives of the cooperative winery on the other.

$$(5) \quad \frac{\partial R_{t,i}}{\partial Q_{g,t}} = \frac{\pi_{w,t}[Q_{w,t}, \bar{P}_{w,t}, C_{w,t}(\alpha, Q_{g,t-1}, p_{g,t-1})]}{Q_{g,t}^2} = \frac{VT_{t-1}}{Q_{g,t}^2}$$

Equation (5) has the form of a hyperbolic function. The differential for the transformation value is treated as a constant since it is realized and predetermined in the previous period. It is though important to highlight that the amount of that value depends on the performance in the Prosecco wine market expressed by positive profits, which in turn also depend on the quantity and quality of grapes supplied by each cooperative shareholder in the previous period $t-1$. A marginal increase in total quantity increases marginal remunerations less than proportionally. This marginal impact corroborates the idea that cooperative wineries have a mutualistic objective with a view to the profits and the markets. In fact, the total quantity equals the (weighted by α) sum of the quantity of grapes supplied by each individual cooperative shareholder, with $Qg,t = [(\alpha)q_1 + (\alpha)q_2 + \dots + (\alpha)q_n]$. Total quantity depends on the individual supply that is somehow rationed and controlled for quality of the grapes, through strict procedures and rules established by the winery internal regulations. Controlling for quality is an indirect way to rationing supplied quantity as an efficient way to maximize remunerations in two directions. First, a good quality of the grapes allows to producing a better wine. This in turn is translated into a higher probability to market the wines and, therefore, to earn higher profits. Second, linking the returns of individual cooperative shareholders to a quality assessment of the grapes they supply to the cooperative winery generates incentives to overcome moral hazard, to increase X-efficiency and to strengthen the mutualistic purpose. Those shareholders that do not provide grapes with high qualitative standards are "punished" in terms of present and future payoffs, since a bad quality of the grapes might negatively affect the future performance of the whole winery at time $t+1$. In this perspective we can find a strong link between rules on quality standards and impacts on the winery economic performance and interpret it as transaction costs minimizing.

Finally, Table 3 shows results of correlation analysis among selected variables, in order to provide the model with some sort of "empirical" testing.

We found, among other results, a low correlation coefficient (-0.20) for the relationship between total quantity and liquidation price. This signals a weak relational interdependence

and might be interpreted at the light of our theoretical framework. The liquidation price, in fact, is not determined through strict market criteria and strongly incorporates valuations (i.e. the α parameter) that are not computed in the correlation matrix and depend on regulations of quality. Such coefficient is negative. This implies a “movement” of the two selected variables in opposite directions, as expected by the theory.

Table 3: Correlation analysis.

	Total Quantity (quintals)	Liquidation Price (Euros)	% of Prosecco Grapes over the total conferred	Prosecco Wine (hectoliters)
Total Quantity (quintals)	1.00			
Liquidation Price (Euros)	-0.20	1.00		
% of Prosecco Grapes over the total conferred	-0.42	-0.096	1.00	
Prosecco Wine (hectoliters)	0.95	-0.22	0.87	1.00

Conclusions

The paper has analyzed the link between economic performance, rules and governance in the cooperative wineries operating in the Treviso area, with a view to the Prosecco production. Despite the “fame” of the cooperative winery of an inefficient, assistance-based institution, it emerges the profile of a complex structure, which seeks to incorporate the values of social and cultural cohesion and competitiveness in the markets, within the mission of a company. Social cohesion emerges in an attempt to provide a steady income to cooperative shareholders (by purchasing the grapes produced by shareholders). The long-term stability of income to the cooperative members aims to minimizing the risks and volatility of the exchange in free markets. In addition, social cohesion involves the strengthening of territorial belonging and sharing, including relationships with local institutions. Despite the mutual purpose, however, it emerged is a clear willingness of the cooperative winery to implement a strategy that valorizes the quality of the input, even at the costs of the punishment of the individual shareholder, that deviates from the required standard. The quality parameter α , defined in the simple framework in section 3, is fully implemented by the internal regulation. There is a strong link between regulation of quality standards and impacts on the winery economic performance. In the case of the winery, achieving mutualism is paradoxically favored by the maximization of profits and the ability to do business, which Treviso cooperative wineries appear to do very efficiently.

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