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Abstract

Facing market globalization and volatility, farmers find in agricultural cooperatives a secure way to sale their products, especially in wine sector (strong crisis before 2010). In the same time, cooperatives members and employees became more and more vertical organization averse and look for collaborative decision making process.

In this context, traditional corporate governance models based on the classical agency theory appear not to be accurate for agricultural cooperatives governance. Considering a multi paradigmatic model with three dimensions (disciplinary, partnership and cognitive governance), we focused on the link between governance and overall corporate performance.

We studied Languedoc-Roussillon wine cooperatives which represent 70% of the output of this huge wine-growing area and we analysed how they overcame their financial difficulties thanks to the involvement of their stakeholders. We used original data, coming from COOPERFIC®, a specific decision aid tool designed and managed by Coop de France Languedoc-Roussillon.

The results showed the crucial role of the partnership dimension of cooperative governance via stakeholders' and especially grape growers'members involvement (directors role). Top financial performance fitted partnership relations inside wine cooperatives, whereas disciplinary and cognitive governance seemed less relevant. Moreover, the three dimensions of agricultural cooperative governance appeared partially interconnected.

1. Introduction

Cooperatives represent a specific way of organization rooted in Industrial Revolution and association movement during XIXth century. They often emerged on crisis period and so appear as defensive structures, the famous economist and sociologist Charles Gide called them “filles de la misère”.

But in fact they are seen more and more as dynamic and even sustainable organizations, taking a great part of the growth of the non-profit sector, especially in agricultural and agri-food chains. The agricultural cooperative pact is really singular and is based on a *double commitment* of the members: economic, in terms of activity, and financial, in terms of capital subscription. If this user-owner principle (Krivokapic-Skoko, 2002) is essential and constitutes the central point of the cooperative governance, we can also consider that it is only the tip of the iceberg because of the huge society and mentalities evolution for decades.

Facing first recurring and increasingly frequent crisis, and then globalisation and market volatility, agricultural cooperatives had to adapt to new contexts without denying their principles. In this context, different types developed like agricultural cooperative groups and it is thus impossible to deal with a single cooperative model (Iliopoulos, 2015). Cooperatives members as well as employees became more and more vertical organisation averse. Aspiring to a more collaborative economy, they look forward flat hierarchies, involvement and horizontal way of governance. In fact, these internal stakeholders search for a social and participative approach of cooperative governance in order to give greater meanings to their action.

This question of cooperative governance evolution leads us to investigate inside the ‘black box’ of agricultural cooperatives. Are these firms, which are traditionally farmers oriented and vertically governed, and are integral part of social economy, not only economically and environmentally performant, but also socially performant, thanks to an active participation of employees in the decision making process ?

That is what we are going to examine in studying Languedoc-Roussillon wine cooperatives. Bearing in mind that 45% of these coops have disapeared by mergers in 15 years, we aim to evaluate the influence of a more balanced governance beetween members and employees on their economic performance.

In this perspective, we will deal with theoretical aspects of cooperative governance and performance, then we will propose a model, describe the sientific methodology and test this model thanks to an empirical study. Finally, we will show its theoretical and managerial implication.

2. Theoretical framework of cooperative governance and performance

2.1 A complex way of governance influencing cooperative performance

Cooperatives were considered for a long time as atypical organizations which were very difficult to define and characterise because of their proper nature, rather impossible to classify in a standard type of firm. This statement is certainly due in a great part to the user-owner principle: no other form of organization is made of "shareholders" (the farmers in an agricultural cooperative) who are in the same time its suppliers or customers with a long term commitment. In France, agri-coops are moreover *sui generis* societies, at mid-way between commercial law and civil law.

In this perspective, Staatz (1989) pointed out that economists studied agricultural cooperatives using four very different visions:
- cooperatives as a consequence of vertical integration by farmers members who run independent companies, leading to the vision of the cooperative as a transparent structure (dépourvue) without a proper existence (Philipps, 1953) ;
- cooperatives as real and effective firms with specificities (producers owned firms) and differences from investors own firms (Helmberger and Hoos, 1962) ;
- cooperatives as a coalitions' puzzle with different groups of members, confronting and bargaining their objectives (Pichette, 1972) ;
- cooperatives as a nexus of contracts relying the actors by power and agency relationships (Deshayes, 1988).

So we can see and understand the extraordinary complexity of the cooperative governance that leaded authors to consider the various co-ops faces as different facets of a precious stone… The agricultural cooperative reality is thus not unique and can be declined to infinity. Cornforth (2004) shares this point of view and, after analysing the main theories, shows that every association and cooperative governance theoretical framework is one-dimensional and cannot sum up a more nuanced reality of this collective form of organization. He thought that a new and synthetic conceptual framework must be build up to achieve a more relevant approach.

In fact, we can consider that three mains governance theoretical streams come to the front and explain the agricultural cooperatives way of governance in an increasing collaborative approach that reflects internal stakeholders' aspirations: disciplinary, partnership and cognitive dimensions of governance can be stressed (Saïsset, 2016).

First and foremost, the formal and legal features of cooperative governance must be underlined and correspond to the agency theory which can apply classical capitalistic forms of firms as well as producers owned firms like cooperatives. The agency theory (Jensen and Meckling, 1976) explores firms as a combination of contracts relying principals (shareholders) to agents (managers) by whom the former delegate responsibilities and so decision making authorities to the latter. In an agricultural cooperative, members (in Annual General Meeting) delegate authority to Board of Directors (BoD) which can delegate part of their power to the Executive Board and then to Chairman and General Manager.

Pozzobon (2011) dealt with vertical conflict of interests in agricultural cooperatives related to this relationships showing that asymmetric information is a real source of agency costs and making decisions issues. Deshayes (1988) described the central and strategic role of BoD in

the cooperative governance and its interactions with employees (operative function) through the manager.

Moreover, even if cooperatives are characterised by “ill defined property rights” (Cook, 1995), a few researchers tended to prove their internal governance mechanisms can influence their economic and financial performance. Deshayes (1988) shared this statement and analysed value creation coming from agency relationships members/cooperative thanks to obtained value and shared value concepts.

With this purpose in mind, Buress et al. (2011) analysed the impact of agency relationships in US agricultural cooperatives on financial performance. They found there is a significant impact of governance process indicators and pointed out that cooperatives model must take into account “patron driven” aspects and specific property rights.

As far as manager’s role is concerned, Rebelo et al. (2010) underlined that it frequently leads to capturing revenues, as proved by the high level of equity, and to a lower farmer’s remuneration per ha. But external stakeholders playing an important role in the internal governance – charters accountants and auditors - have also a significant influence on the decision making process and particularly on the final price paid to the winegrowers (Bianchini et al., 2008).

Despite these findings which show the crucial point of agency costs theory and disciplinary governance coming from it, this approach is not accurate enough to grasp the complexity of agricultural cooperatives governance: informal, due to farmers’ vision and mentality, is really important and must be taken into account. Moreover, even if agricultural cooperatives are a good mean to reduce transaction costs, in today’s society there is a shift to more egalitarian decision making process. So flattest governance models like partnership and cognitive ones can be shown as more adapted to existing cooperatives.

In a first glance, we can stress that raising partnership inside cooperatives governance is a way to help co-operation, seen as collaborative action, becoming a reality. From this point of view, stakeholders theory (Freeman, 1984) seems to be very interesting and fits with cooperative reality. Internal stakeholders appear as essential and having active relationships with firm level: shareholders, employees, customers and suppliers. More distant and external stakeholders do exist and have an indirect influence on the firm (medias, consumers, concurrence, government), according to Freeman et al. (2007). In this context, firm is managed from all its stakeholders’ vision, leading to corporate social responsibilities, far beyond single profit objective.

Financial researches increasingly include this theory in their models due to society and firm’s management evolution, looking forward to answer value creation and sales issue (Freeman et al., 2010). However this conceptual framework was particularly developed by Charreaux and Desbrières (1998) who pointed out that value creation model must be enlarged to partnership value creation. This approach is based on managerial and human capital, giving a more systemic and global dimension to value creation towards all stakeholders and particularly employees, customers and suppliers.

As far as cooperatives are concerned, Koulitchizky (1999) analysed and rebuild the “Desroche Quadrangle”, that stressed tensions/relations between Managers, Directors, Members and Employees (Desroche, 1976), showing the crucial importance of connivances networks all

around the cooperative firm. Interactions between internal stakeholders are part of cooperatives day-to-day operations and can imply competitive advantage when they lead to efficient decisions (Pedrosa Ortega, 2010). Furthermore, Filippi (2013) underlined the importance of cooperative members shareholders who support the collective project and make it grow. She stressed that quality level of farmers'governance is at the origin of agricultural cooperatives performance and value sharing between cooperative-firm and farmer's firms.

This crucial point about the influence of internal stakeholders is pointed out by Desroche (1976). He showed that a vertical division of his quadrangle, coming from opposite objectives and misunderstanding between employees and members, can ruin communication and relationships inside the cooperative and can lead to deeply difficulties, even degeneration and bankruptcy.

Finally, the third dimension of agricultural cooperatives governance relies on cognitive aspects and seems to be particularly important because it represents a kind of mental process which is not directly included in the two others dimensions.

This approach is quite new and is a relevant mean for analysing the complexity of cooperative governance mechanisms. Cornforth (2004), whereas dealing with six different theories of governance about cooperatives and mutual associations, ignored this concept, even though Deshayes (1988) sensed its interest decades before.

In fact, Charreaux (2002) was one of the first to show the key role of shareholders as providing cognitive resources. He broke away from the too restrictive agency theory that he considered as simplistic and proposed to develop a more realistic approach. From his point of view, strict separation between management and property rights is an oversimplified vision, too far from reality. That is why he proposed a cognitive model of corporate governance made of more spontaneous and specific mechanisms, stressing the knowledge based role of the firm and particularly manager one.

Wirtz (2006) went further and completed this work by dealing with cognition inside start-up firms. He pointed out crucial cognitive issue bearing in mind the aim of reducing mentoring costs - that is to say converging managers' and main stakeholders' cognitive structures – in order to share knowledge and skills. On the opposite, large companies are managerial agency costs preeminent and have non reductible residual cognitive costs. We can say that cooperatives are mid-way between these two situations because they are created by farmers with a particular vision and then evolve to more complex structures with growing number of members. So, even if they don't look like fast growing entrepreneurial firms where cognition process is part of the governance (Wirtz, 2011), agricultural cooperatives show strong cognitive governance dimension as their managers and directors have to understand each other, exchange views and share ideas before taking decisions.

This complex and bargaining process is stressed by Forbes and Miliken (1999) inside board of directors. In a purely theoretical approach, they argued that demographic features, as well as knowledge and skills, can lead to cognitive conflicts and beneficial effects as far as board cohesiveness and corporate performance is concerned. Huse et al. (2005) showed in the same way the cognitive face of agricultural cooperatives governance, underlying its effects on long term value creation. These virtuous mechanisms are more particularly based on confidence, numerous exchanges, directors implications and time-consuming debating ideas. A more

vicious circle relies on “cooperative illusion”, underlined by Deshayes (1988) and leading to financial risk, even bankruptcy one.

So, at the end of this overall analyse, we can paint the picture of a multifaceted cooperative governance which results from three different levels or dimensions – disciplinary, partnership and cognitive - and appears to be a driver of value creation for agricultural cooperatives. It is therefore essential to take a close look at the performance concept and its specificities to complete our approach.

2.2 A specific performance measurement model

“Cooperatives, like IOFs[1] buy, sell and produce goods and services, but cooperatives, unlike IOFs, aim to provide a service to their members-patrons rather than earn a return on an investment” (Lerman and Parliament, 1990, p.1). Thus the cooperatives have not the same objectives as the other firms, suggesting questioning the right way to measure their performance. It is much more complex to evaluate if a cooperative has achieved its objectives than assessing the IOFs’ performance by using financial measures (Cook, 1994; Soboh & al., 2009). It is therefore often difficult to define objective measurement of cooperative performance (Dess and Robinson, 1984).

Consistent with the theory of cooperative behaviour (Sexton et al., 1989; Zusman, 1988), differences exist between cooperatives and IOFs concerning performance indicators and more particularly profitability, capital structure and operating efficiency. Concerning the profitability, the challenge is not to guarantee members a direct return on investment, but to allow them some advantages and services, such as lower input prices and marketing facilities. In terms of capital structure, cooperatives present a huge part of debt, due to the absence of a cooperatives shares second market, which reduces the opportunity to receive financial investments from non-members. The non-negotiable shares character justifies the need to measure cooperative performance according other measures than financial (Sexton and Iskow, 1988; Katz, 1997). This large part of debts is also the consequence of the cooperative principle of risks sharing and collective responsibility, which is considered as the guarantor in case of operating loss. At last, cooperatives are known to engage in investment high levels what affects their operating efficiency. As members do not require a direct return on equity investment, they tend to over-invest by undermining the investment opportunity cost.

Contrary to the cooperative behaviour theory mentioned above, Lerman and Parliament (1990) demonstrated that cooperatives of the US agribusiness sector (fruit and vegetables processing and dairy industries) perform as well as, or better, than IOFs in terms of profitability, leverage and interest coverage measures. Basterretxea and Martinez (2012) did not demonstrate differences in management and innovation capabilities between cooperatives and IOFs.

Other researchs analyzed the potential determinants of cooperatives performance. Considering that cooperatives pursue, in the same time, a double objective of organizational performance and members satisfaction (Soboh et al., 2009), Benos et al. (2016) suggested to integrate the members perception in the way to measure the organizational performance. They also demonstrate that strategic attributes (market and brand orientation), and to a lesser extent organizational attributes (ownership, control, cost/benefit allocation), impact the

[1] Investors-owned-firms

organizational performance. Becchetti and Pisani (2015) examined also the determinants of outreach performance of social cooperatives and have demonstrated a positive impact of the cooperative age, innovation trend, managerial turnover, target programming and shareholder variety, but also of the human capital and the local GDP[2]. On the contrary, they showed a negative impact on performance of shareholders meetings and of the numbers of volunteers and contracts. They justified these results according to the neo-institutional perspective (Hasmann, 1996), under which *"productive organizations which are more fit to survive are those which minimize transaction costs of all (controlling and non-controlling) stakeholders"* (Becchetti and Pisani, 2015, p.3). They also considered that cooperatives benefit from a competitive advantage by satisfying the human needs.

Belonging to the social economy, cooperatives are thus supposed to pursue different organizational objectives that should justify another way of measuring their performance. It seems necessary to develop a specialized measure of the cooperative performance, favourable to a standardized, uniformed and dynamic model (Dayanandan, 2012). Following Couderc and Marchini's work (2011), the intention of this paper is to test whether the governance, and more particularly the way of governance, namely disciplinary, partnership and cognitive ones, is a determinant of agricultural cooperatives performance. Moreover, according to Salmi and Martikainen (1994), we share the opinion that financial measures are not entirely representative of cooperatives global performance.

Like Soboh et al. (2009), we think that it is necessary to take into account agricultural cooperatives are owned and controlled by their members who are also those obtaining the economic profit. It is therefore important to balance cooperatives performance and farmers welfare (Staatz, 1989). From this point of view, Saïsset and Rivière-Giordano (2015) deepened wine cooperatives performance measurement. They stressed existing dilemma between upstream short run objectives of wine growers' members (price paid and remuneration per hectare cultivated) and downstream long term objectives (cash flow at the cooperative level). With another approach, Franken and Cook (2015) shared the same idea of a multi-dimensional performance, showing financial performance must be completed by "patron service" (patron satisfaction or competitive position) in order to manage overall performance.

Soboh et al. (2009) underlined that stakeholders' oriented cooperatives were more aware of the need to conciliate members profit and cooperative one, and even value creation for each stakeholder. These aspects concur closely with partnership approach of Charreaux and Desbrières (1998), as mentioned before.

Thus, our theoretical model must take into account these two levels of agricultural cooperatives performance analysis (upstream/members level and downstream/firm level).

2.3 Theoretical model

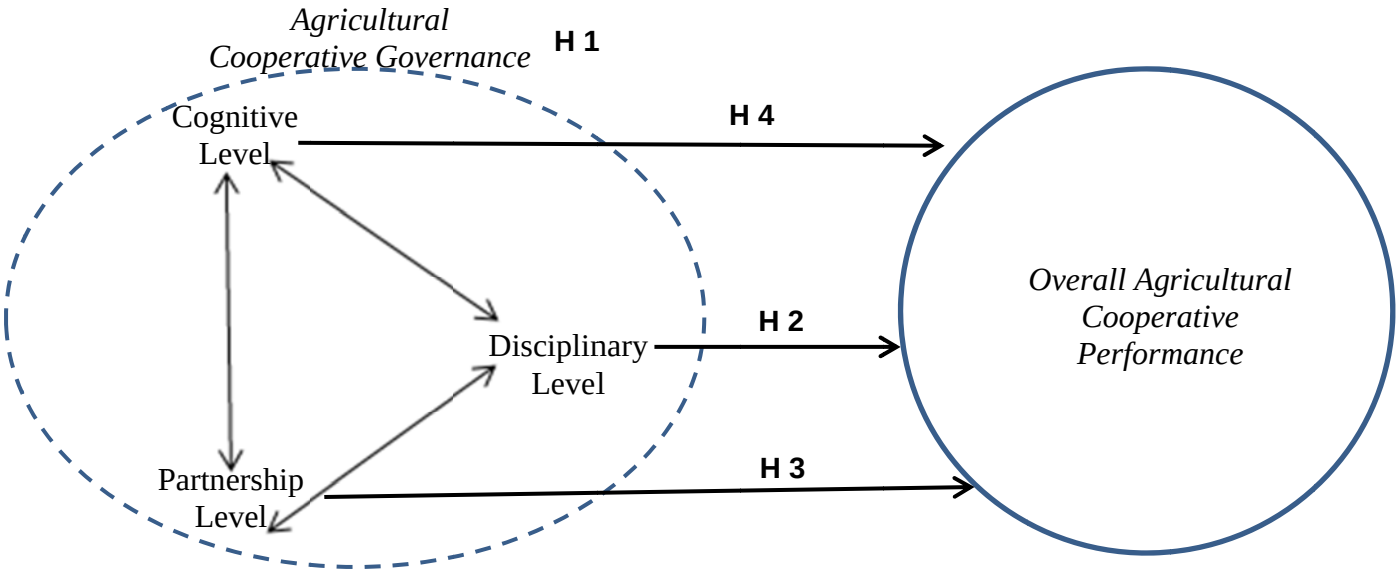
According to our literature review, we can propose an original theoretical framework to analyse the links between tri-dimensional governance of agricultural cooperatives and their specific performance (figure 1).

[2] Growth domestic product

This model is first and foremost particularly rooted in the complex and multi-paradigmatic aspect of cooperative governance (Cornforth, 2004). It is also built on the qualitative statement that agricultural cooperatives are made of three complementary levels (Saïsset, 2016), where stakeholders and namely internal ones play an important role.

As far as performance measurement is concerned, our model greatly relies on financial performance (members' level and firm/cooperative level) but also on more qualitative features (investments projects and recruitment projects). Overall agricultural cooperatives performance is so a crucial part of the model.

Figure 1. Theoretical model of agricultural cooperatives governance and performance



In this context, we hypothesize as follows:

- Hypothesis 1 (H1) …… agricultural cooperative governance is based on three levels which are the facets of a same reality and interact, affecting each other
- Hypothesis 2 (H2)…… an increasing level of of agricultural cooperatives disciplinary governance influences their overall performance
- Hypothesis 3 (H3)…....an increasing partnership level of agricultural cooperatives governance leads to a better overall performance
- Hypothesis 4 (H4) ……. an increasing cognitive level of agricultural cooperatives governance permits to ameliorate their overall performance

We can now operationalise and measure these different concepts thanks to our empirical survey about wine cooperatives that we propose to detail in following pages.

3 Methodology

3.1 Sample studied and representativeness: wine cooperatives in Languedoc-Roussillon

This analysis of agricultural cooperatives governance and performance is based on an ad hoc sample of 87 wine cooperatives which took part of COOPERFIC® database[3]. Among the 211 winery coops in Languedoc-Roussillon, 87 of them accepted to integrate this database a really collaborative and collective decision aid tool for directors and managers. In the following tables we describe the main features of this sample:

Table 1. Sample surveyed size related to whole population of wine co-ops in LR (2010)

Criteria	Sample surveyed	Whole population	%
Number of cooperatives	87	211	41.2%
Acreages (ha)	72,592	154,965	46.8%
Output (hl)	4,225,777	8,666,254	48.8%
Turnover (€)	411,261,666	900,000,000	45.7%

Sources : Diane – Bureau Van Dijk - COOPERFIC® - Coop de France LR – French Wine Growing Observatory-FranceAgrimer-CVI - DGDDI

First we can stress that the size of our sample is correct (sampling fraction superior to 40%) and enables a good description of the whole population as far as financial aspects are concerned. Furthermore, the economic weight is more important and closer to 50% considering production and sales.

We must point out the great diversity of the sample studied, as far as output and marketing system are concerned, even if rather big wine cooperatives (more than 40 000 hl) answered, because of small one's lack of time and interest.

In any event, we have consistent and rather homogeneous sample which must enable us to make accurate and interesting statistical analysis.

3.2 Choice of indicators and statistical analysis

We selected governance and performance indicators bearing in mind the singular complexity of agricultural cooperatives and more particularly wine ones. So we took into account theortical approach as well as economic reality of wine sector and based our selection for a great part on Saïsset's work (2014).

As far as governance is concerned, we divided this concept into the three distinct dimensions described above and finally selected 32 variables with a gradient of complexity, from formal to informal aspects, in increasing horizontal and collaborative ways of governance :

- first disciplinary governance level mainly made up of legal and structural/formal indicators;

[3] Economic observatory managed by Coop de France LR

- then partnership governance level composed of interactions indicators between external and internal stakeholders, relying on a mix of formal and unformal features;
- and finally cognitive governance level mainly based on directors action, informal aspects and process indicators concerning governing bodies.

Each item/indicator was standardised and quoted from 0 to 1. Then we affected a coefficient to each of them in relation with its proper importance for the governance level concerned. So final measurement of each of the three dimensions/levels resulted from a weigthed average of the related indicators.

Concerning performance measurement, we made a selection of indicators based on the specific agricultural cooperatives characteristics, applied to wine cooperatives, and more precisely on short run/long run objectives balance, as described above (Soboh et al., 2009; Saïsset and Rivière-Giordano, 2015). Considering that most part of classical profit indicators was not relevant and had to be disregarded, we can classify tte ones we selected as follows :

- quantitative and financial short run indicators, as grape grower's remuneration;
- quantitative and financial long run indicators, as cash flow or gross value added;
- qualitative and non financial long run indicators, as investment project or recuitment.

Moreover, data (for quantitative variables) were averaged over six years (vintages 2005 to 2010) in order to mitigate possible ‘exceptional’ yearly financial result.

In order to test our assumptions, we used clear and synthetic means of statistical analysis, taking into account the sample surveyed is of limited size and its distribution do not always cope with linear relations between concepts we studied.

In this context, we made two different types of analysis as far as the tri-levels governance model is concerned (H 1). First, we used correlation test of Spearman which is non parametric and allowed us to study correlation's rank even if relations between wine cooperatives governance dimensions were not linear. Secondly, we also tested links thanks to Pearson's correlation coefficients to verify if linear relations existed inside cooperative governance between the three defined levels.

For the other hypotheses which deal with the influence of governance on cooperative performance, we choose to test the links (H 2, H 3 and H 4) thanks to Student’s test. This statistical analysis, consisting in a test of means, is very useful and relevant to compare populations. Dividing sample into two parts on either side of the median (less performant/more performant), the question is to know if two parts are significantly different and to what extent.

4 Results and analysis

4.1. Governance levels in wine cooperatives

4.1.1. The disciplinary governance level

The table below describes the 8 disciplinary governance indicators which compose the overall disciplinary governance level of the agricultural cooperative governance. We divided this

governance dimension into five parts from very general aspects (external advices and AGM) – having a light weight in overall governance (coefficients 1 or 2) - to deepener and more important features (BoD, Executive Board and duo Chairman/Manager: coefficients 3 to 5).

Table 2. Indicators of disciplinary governance level - Average scores

Disciplinary Governance Level	***Mean***	***SD***	***Coeff***
Chartered-accountant implication	0.77	0.33	0.5
Auditor implication	0.67	0.24	0.5
External advices	***0.72***	***0.20***	***1.0***
Attendance rate in Annual General Meeting (AGM)	0.51	0.17	2.0
Operation of the AGM	***0.51***	***0.17***	***2.0***
Size of Board of Directors (BoD)	0.73	0.23	1.0
Attendance rate in BoD	0.80	0.10	1.0
Frequency of BoD meetings	0.62	0.12	1.0
Operation of the BoD	***0.72***	***0.09***	***3.0***
Size of Executive Board	0.75	0.23	2.0
Frequency of Executive Board meetings	0.35	0.34	2.0
Operation of the Executive Board	***0.55***	***0.18***	***4.0***
Nomination of a Manager	0.86	0.34	1.7
Frequency of relationships between Manager & Chairman	0.69	0,29	1.7
Presence (implication) of the Chairman	0.24	0.24	1.7
Operation of the tandem Chairman/Manager	***0.58***	***0.18***	***5.0***
Overall Disciplinary Governance Level	**0.60**	**0.09**	

SD: standard deviation
Coeff: coefficient

These global statistics show us that the 87 wine co-ops sample studied apply a pretty good overall disciplinary governance (score = 0,6 on 1), which is very homogeneous between cooperatives (SD = 0,09 representing only 15% of the average score). We can notice that the disciplinary governance level is characterised by the importance of at less an indicator for each stage of this dimension. It is so rather well balanced and mainly supported by chartered-accountant implication, the attendance rate in the BoD, the size of the Executive Board and the nomination of a Manager.

It can be also underlined that Executive Board meetings and implication of the Chairman have a very high level of coefficient of variation (SD/mean), reaching 100%. The variability is so particularly strong for such discriminatig criteria (heterogeneous practices).

4.1.2 The partnership governance level

Following the same logic of dividing the global governance level in different stages or categories as in the disciplinary dimension, the partnership governance level is divided into three parts. On one hand, it deals with governance related to external stakeholders (auditors, advisers, banks, customers, suppliers, professionnal organizations, collectivités territoriales and administrations), and on the other hand, it is made of governance related to internal stakeholders, itself divided into members stakeholders and employees stakeholders.

Firts and foremost, we can point out that the partnership governance level seems less developed than the disciplinary one (score = 0,3). It is also less homogeneous from a wine cooperative to another (SD = 0,11 representing 37% of the overall average score). Situations are so quite different, reflecting the diversity, even the disparity of the governance practices.

Table 3. Indicators of partnership governance level – Average scores

Partnership Governance – External stakeholders	***Mean***	***SD***	***Coeff***
Openness of the AGM	0.28	0.14	1.0
Openness of the BoD	0.11	0.10	1.0
Openness of the Executive Board	0.03	0.07	1.0
Partnership Governance – External stakeholders	***0,14***	***0,07***	***3,0***
Partnership Governance - Members	***Mean***	***SD***	***Coeff***
Average duration of the AGM	0.42	0,05	1.0
Average duration of the BoD	0.57	0.15	1.0
Average duration of the Executive Board	0.33	0.29	1.0
Partnership Governance - Members	***0,44***	***0,16***	***3,0***
Partnership Governance - Employees	***Mean***	***SD***	***Coeff***
Profit-sharing	0.15	0.36	1.0
Frequency of the work meetings	0.15	0.23	1.0
Employees decision taking	0.67	0.47	1.0
Partnership Governance - Employees	***0.32***	***0.23***	***3.0***
Overall Partnership Governance Level	**0.30**	**0.11**	

SD: standard deviation
Coeff: coefficient

Considering the three partneship governance stages, there is an upward tendancy: members oriented governance is substantially higher than the employees oriented one, which is itself much more developed than the external stakeholders one. Moreover, these three stages are more or less heterogeneous, standard deviation representing from 36% to 72% of the average score.

Finally, we can notice that some practices are really very disparate: openess of the BoD, profit-sharing and employees decision taking. The partneship governance intensity varies thus widely from an aspect to another.

4.1.3 The cognitive governance level

As far as cognitive governance level is concerned, it consists of 12 different elements which are mainly unformal and often concerns decision taking process.

The global score shows us an intermediate level between disciplinary governance level and partnership one. We can notice that the cognitive governance is mainly supported by the levels number of internal governance bodies, the education level of the current Manager and, to a lesser extent, by the level of the corporate strategic project and the education level of the current Chairman.

Table 4. Indicators of cognitive governance level – Average scores

Cognitive Governance Level	***Mean***	***SD***	***Coeff***
Level of the corporate strategic project (existence/formalization)	0.57	0.44	2.0
Levels number of internal governance bodies	0.83	0.16	3.0
Number of members meetings (apart from legal meetings)	0.19	0.17	0.5
Directors pluriactive's rate in BoD	0.17	0.19	0.5
«Trainees » directors	0.16	0.22	0.5
Average time spent by each director in governance bodies	0.36	0.20	2.0
Total time spent as BoD members	0.25	0.14	1.0
Total time spent as Executive Board members	0.32	0.34	2.0
Total time spent as committees members	0.37	0.32	2.0
Total time spent in internal governance	0.34	0.22	3.0
Education level of the current Chairman	0.43	0.26	1.0
Education level of the current Manager	0.80	0.24	1.0
Overall Cognitive Governance Level	**0.45**	**0.15**	

SD: standard deviation
Coeff: coefficient

Moreover, there is a much higher heterogeneity level inside this governance dimension than in two others one: the coefficient of variation (SD/mean) varies from 19% to 138% and is most part of the time greater than 55%. This fact clearly refeclts the existing differences and the wide range of practices in terms of cognitive governance. It particularly concerns trainees directors which consist of having non official directors for a certain period in order to make them understand what is the real job and responsibilies of a director. It also concerns the director's pluriactive rate in BoD and the total time spent as executive board members.

We can stress the difference in the level of formal education between Chairmans and Managers, varying inthe ratio from one to two and taht may cause misunderstanding , even cognitive conflicts, source of economical risks for the cooperative.

4.2 Links between the three governance levels

4.2.1 Rank correlation (Spearman’s test)

First, we used this rank test to verify H 1, considering the relation from a level to another can be non-linear, bearing in mind human and behavioural dimension of these concepts are essential.

Table 5. Matrix of the rank coefficients (Spearman)

	disciplinary	partnership	cognitive
disciplinary	1	0.156	0.343***
partnership		1	0.394***
cognitive			1

As a result, this test demonstrates a positive and very significant relationship (at 1%) between cognitive and disciplinary governance levels, but also between cognitive and partnership governance levels. On the contrary, there is no apparent connection between disciplinary and partnership governance levels.

The correlation coefficients are not very high (less than 0,4), but the test shows real and irrefutable links as an horizontal chain of relationships.

4.2.2 Correlation coefficients (Pearson's test)

After correlation rank, this test is also to verify H 1, considering relationships from a level to another as rather direct and linear.

Table 6. Matrix of the corelation coefficients (Pearson)

	disciplinary	partnership	cognitive
disciplinary	1	0.125	0.340***
partnership		1	0.453***
cognitive			1

This Pearson's test confirms the previous results by demonstrating two positive linear relationships. These connections are also very significant and stronger than ones observed with Spearman's test. There is no more link between disciplinary and partnership governance levels. It means that disciplinary governance level intends to satisfy the single objective of owners and not a broader conception of the cooperative model, focused on a wide range of stakeholders.

However, disciplnary governance level seems to be connected to cognitive one: reducing agency costs can lead to trust and collaborative opportunities, allowing to enhance cognitive dimension of cooperative governance (listenning, exchanges of views, knowledge sharing) in order to take appropriate decisions.

At the end of this first test, we can say that H 1 is partially validated: it does exist relationships between the three dimensions of cooperative governance but they are partial. The links among the different dimensions can be seen as horizontal, but is absolutely not circular.

4.3 Impact of gouvernance on cooperative performance

The table below describes the results of the Student's test between wine cooperative governance and performance. It aims to demonstrate if the more successful cooperatives are also the best governed.

In fact, we tested the impact of 6 governance aspects – partnership level being shared into 4 items – on 7 overall performance indicators (4 financial ratios, 2 qualitative and economical indicators).

Table 7. Student's test between governance and performance levels

	Disciplinary Governance Level	Partnership governance External stakeholders	Partnership governance Members	Partnership governance Employees	Partnership Governance Global Level	Cognitive Governance Level
Gross added value (€/hectare)						
Score for the less efficient	0.599964	0.124358	0.426859	0.286739	0.279318	0.439638
Score for the more efficient	0.599211	0.152349	0.446670	0.353279	0.317433	0.467516
Student	*0.969*	***0.069****	*0.566*	*0.186*	*0.102*	*0.402*
Cash-flow (€/hectare)						
Score for the less efficient	0.599760	0.141149	0.446505	0.328986	0.305547	0.443449
Score for the more efficient	0.597761	0.139753	0.428561	0.303280	0.290531	0.461275
Student	*0.916*	*0.929*	*0.604*	*0.605*	*0.520*	*0.590*
Cash-flow (% of the turnover)						
Score for the less efficient	0.604971	0.149441	0.453806	0.332753	0.312000	0.442403
Score for the more efficient	0.596661	0.131622	0.424767	0.308431	0.288274	0.464650
Student	*0.673*	*0.256*	*0.401*	*0.631*	*0.313*	*0.504*
Grape grower's remuneration (€/hectare)						
Score for the less efficient	0.583856	0.136792	0.408094	0.285879	0.276922	0.421904
Score for the more efficient	0.617383	0.144110	0.470233	0.355306	0.323216	0.489184
Student	***0.085****	*0.642*	***0.070****	*0.168*	***0.047***	***0.040****
Investment project						
Score for the less efficient	0.594640	0.128622	0.382002	0.296305	0.268976	0.418148
Score for the more efficient	0.603266	0.143455	0.456229	0.328513	0.309399	0.465610
Student	*0.664*	*0.366*	***0,038****	*0.528*	*0.107*	*0.199*
Recruitmenet project						
Score for the less efficient	0.605061	0.132341	0.416701	0.298319	0.282453	0.443858
Score for the more efficient	0.595423	0.151067	0.470421	0.354048	0.325179	0.469452
Student	*0.614*	*0.257*	*0.122*	*0.303*	***0.076****	*0.443*
Rate of gross added value attributed to employees (%)						
Score for the less efficient	0.603524	0.144214	0.450053	0.311645	0.301971	0.486653
Score for the more efficient	0.600654	0.137172	0.427167	0.337291	0.300543	0.419191
Student	*0.884*	*0.654*	*0.509*	*0.608*	*0.951*	***0.040****

It appears that partnership governance level is strongly associated with cooperative performance, especially as far as global level (grape grower's remuneration and recruitment project) and members level (grape grower's remuneration and investment project) are concerned. Moreover, wine cooperatives having the best gross added value per hectare (added value + members payment) are characterized by a better partnership external stakeholders oriented governance.

We can point out that cooperatives which best compensate members are also those having the best disciplinary governance, the best partnership members oriented governance, the best global partnership governance and the best cognitive governance levels.

Moreover, wine cooperatives that have investment projects present better partnership members oriented governance and global partnership governance levels than those that do not have such projects.

Cooperatives characterized by recruitment projects are connected to best global partnership governance level. Finally, wine cooperatives which attribute more value to employees are also those with the worst cognitive governance.

At the end of this second test, we can say that H 2, H 3 and H 4 are mainly validated: it does exist relationships between the three dimensions of agricultural cooperative governance and overall performance, except partnership employees oriented governance dimension.

5 Discussion and conclusion

Wine cooperatives studied apply a quite good disciplinary governance, which impacts favourably their performance. The key indicator of this positive relationship is the compensation per hectare. Concerning the partnership governance level, we must stress the decisive importance of internal stakeholders, that is to say members and employees, compared to external ones.

Nevertheless, even if cooperatives claim that they solicit the employees' point of view in the decision taking process, it seems to be very different in practice. Indeed, our analysis shows no significant link between partnership employees oriented governance level and cooperative performance. There is therefore a limited openness to the external stakeholders, even if their implication in the AGM is likely to spark an increase of gross added value. These first conclusions explain why there is not any relationship between disciplinary and partnership governance levels. Indeed, as the partnership governance dimension is greatly members oriented, the proper functioning of disciplinary governance is sufficient to meet members' requirements.

Concerning the cognitive governance, it is clear that the internal governance bodies, such as the Executive Board and the working committees, are essential. They contribute to prepare the main decisions which will be validated later by the BoD. On the contrary, few cooperatives seem to apply a corporate strategic project. Moreover, relationship between cognitive governance level and disciplinary one is justified by the complementarity of respectively informal and formal governance arrangements. The implementation of a cognitive governance influences however negatively the value attributed to employees. This result tends to suppose that the internal governance bodies take mainly into account the single members' welfare and not global internal stakeholders' one. In that way, the link between the cognitive and the partnership governance levels could reflect the debates that shall exist in working committees on members' issues only.

This analysis allows us to better know the complexity of agricultural cooperatives governance and particularly to show the crucial importance of process compared to structural features. It also points out the great role of the unformal aspects of agricultural cooperative governance which can lead to a better performance. In fact, agricultural and wine cooperatives can be seen as a mixed of horizontal and vertical way of governance.

However, our survey of wine cooperatives governance and performance, though limited, constitutes directions for further research: a study over a larger sample of wine cooperatives would strengthen the validity of our analysis, this sort of survey could be carried out in other sectors or other regions to provide external confirmation of the results we obtained.

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