

RAISING RIVALS' COSTS STRATEGY AND LOCALISED AGRO-FOOD SYSTEMS IN EUROPE

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Abstract

For some **Localised Agro-Food Systems (LAFS)**, for ex. Comté in France, Gruyère in Switzerland, the cheese and milk prices are above average whilst others as for example the Cantal from France are similar or even below average. The objective of this paper is to shed light on levers which the agents activate to assure their uniqueness is irrevocable, and uphold the benefits of their LAFS. Raising Rivals' Costs Theory gives interesting point of view about the behaviour of firms which could make use of the collective rules to raise the costs of their competitors in the particular case of LAFS oriented to the production of traditional cheeses. This will be explored through two cases studies. In the first case (territorial collective governance mode of the local supply chain), the conditions are met to conclude that the raising costs strategy corresponds to requirements which are based to a corresponding quality which meets consumers' expectations and willingness to pay. In the second case (sectoral governance mode), few firms have taken control on the supply chain and have imposed with the time a model based on costs leadership. As conclusion, a case-by-case in-depth approach is necessary to assess whether strategy to raise costs of the rivals damages consumers welfare in the case of PDO supply chains.

Keywords— PDO, localised agro-food system, Raising Rivals' Costs, governance of LAFS.

1 Introduction

With the Common Agricultural Policy's (CAP) shift (abandonment of the milk quota system and redefinition of the CAP) the future of dairy production in mountain regions raises numerous questions for private and public stakeholders. Dairy farmers in mountain regions tend to turn toward cheese production with distinctive product quality schemes based on localised agro-food systems (LAFS).

The objective of this paper is to explain the price differences while analysing the regulatory mechanisms of the concerned LAFS. It leads to the discussion on market power at the different levels of the supply chain (producers, processors, etc.) and on the way they organise themselves collectively for setting and controlling production requirements which impact price mechanisms.

We will first present the analytical framework for the regulatory modes of the PDO supply chains based (2) and then expose the empirical results (3). We will then discuss the relevance of our analytical framework to explain the diversity of regulatory modes used in PDO cheese supply chains and their linkage with the price level at farm gate (4) before concluding (5).

2 Analytical framework for the regulatory modes and methods

2.1 Hypothesis

With regard to PDO cheese supply chains, the collective regulation relies on the collective governance mode (territory or sectoral) based on (i) added value creation depends on the mechanisms set to efficient collective governance and to indicate product differentiation (Barjolle, 2006); (ii) cost control as a lasting competitive advantage does not necessarily aim at reducing, but depends on the production requirements and the collective organisation's ability to have them applied by all agents. The collective ruling and control of the code of practices can be understood as a strategy to raise competitor's costs and therefore prevent them from imposing another production system mostly based on cost leadership (Porter, 1985); (iii) the distribution of value along the supply chain depends on the presence of an institutionalised guidance mechanism of upstream prices according to downstream product quality (Marty, Sylvander, 2000).

PDO supply chains exemplify LAFS as the production and processing must, by legal definition, take place in a specific territory. PDO is a property right recognised at European Union (EU) and World Trade Organisation (WTO) levels which allows the protection of geographical names under strict conditions, like a real link between certain specific qualities of a product or its reputation and its geographical origin. This analytical framework highlights the diversity of the states' role when delegating its ruling power for economic affairs to collective organisations which can control legal regulation mechanisms (for instance: contracts, code of practices, production planning and control). These initiatives show variable success with regard to milk production price. Some are considered as success stories (Protected Designation of Origin (PDO) Comté in France, PDO Gruyère in Switzerland, PDO Parmigiano Reggiano in Italy) (Perrier-Cornet, 2009), others (for instance PDO Cantal) do not show benefit while showing some of the lowest prices for raw milk at farm gate (Barjolle, Réviron, Sylvander, 2007).

While focusing on the collective strategies and coordination mechanisms, it will be explored how the regulation's levers can influence and prevent the entry to rivals (new entrants) who would not apply the rules. The implementation of the collective strategy can explain the noticed gap in the milk price even though other factors intervene like the official recognition and therefore protection of the PDO name, consumers' preference, consumption trends, the strength of competition and substitution products, etc. (Barjolle, Chappuis, Dufour, 2000).

The production systems or organisations, in order to increase their competitive advantage, seek to control the creation of economic value, how this value gets distributed among the stakeholders. The cost level control helps to impose a certain level of costs to new entrants. However, the fair distribution of the economic value along the chain is linked to the market power repartition between the different firms.

We propose to use two analytical grids to explain the differences of performance in the case of two supply chains:

- On one side, an analytical grid of the production system will include three key elements: the creation of added value, the distribution between the stakeholders along the value chain from agricultural production to the end product, and its protection with a cost control mechanism.
- On the other side, an analytical grid of the governance modes (sectoral vs. territorial) of the supply chain (Allaire, Sylvander, 1997) ; (Marty, Sylvander, 2000). It sheds light on the relations between the stakeholders, in particular on the delegation of power to an institutionalised and administrated authority (supply chain organisation, product organisation) that plays an essential role for the collective management of the product.

2.2 First analytical grid: production system and its regulation

The grid explores each organisation and its related PDO supply chain in three different dimensions: (1) creating value; (2) distributing value (remuneration of the production factors); (3) setting-up of a lasting competitive advantage.

2.2.1 Creating value

The first dimension is about value creation within the supply chain. Two elements play a role on the level of creating value.

- The first element involves the stakeholders' capacity to take advantage of the specific resources on their territory to feed into the differentiation strategy (Mollard, 2001). We refer to local know-how which creates product's uniqueness linked to origin (cattle feed, local practices, seasonal dimension, etc.). To acknowledge specificity, the practices will be officially registered in the PDO protocols and will be communicated in the media campaign of product promotion (individual or collective).
- The second element is about production control and monitoring (Marty & Sylvander, 2000). Indeed, the supply system should not go through over or underproduction periods in order to balance supply with demand, restrain price volatility, and optimise the quality and sales of the product. In theory, there are multiple ways for managing cheese supply. It may include (non-exhaustive list): the quota system (allocation of annual rights to produce cheese); the control of market opening (campaign planning); the control of the territory where production takes place including the reduction of the zone; the financing of redirecting milk overproduction to standardized markets; as well as the implementation of export support measures. Quality management through cheese selection and downgrading is an effective tool when the cheese reprocessing industry can take advantage of the downgraded quantities.

2.2.2 Distributing value

The distribution of added value through the different levels of the supply chain is the second factor, which have been identified thank previous research (Barjolle & al., 2007). Outsourcing indeed affects the remuneration of production factors. The extent of the distribution of the value between the levels of the

supply chain can be measured by analysing milk and cheese price settings. In theory, the bilateral price setting mechanism between stakeholders can be institutionally guided by the PDO supply chain organisation.

Several options can be considered. Price policy sets the terms for bilateral transactions. For instance, upstream price setting can be based on the real cheese value obtained on the market. Price calculation may result out of market data which are made publicly available (cheese price depending on quality and weighed by volume). This mechanism might be formalised with a standard contract approved by the stakeholders of the supply chain. In other instances, the milk price at farm gate may be set without relation to the selling price of cheese originating from each individual delivery point. Price negotiation may then refer to more general data on national or European market prices for dairies (CNIEL grid in France). Negotiation may as well happen through mutual agreement based on market leader's price level, rather than considering the real performance of the milk buying company. Further measures (quality based price following a grid set up by the supply chain inter-professional organisation, equalisation fund, and direct payment) can be put in place to support the price setting mechanism.

2.2.3 Setting-up of a lasting competitive advantage

The analytical framework refers to the domain of "Laws and Economics", based on the observation of "law in action" using direct legal sources. This discipline aims at analyzing and understanding the economic consequences of operating legal mechanisms (Kirat, 2005). The legal elements form the relevant dimensions for the stakeholders for setting and implementing an economical strategy while seeking to influence their institutional environment and the relations between the economic stakeholders.

As do many other economic sectors, the European milk and dairy sectors are marked by the rising power of big industrial groups creating a situation of quasi-oligopoly. Their position is mostly based on large economies of scale. These economies of scale also depend on the way the value chain is organised, allowing to reach low cost levels while reaching broadening markets. The value chain refers to the whole group of products and producers contributing to the market supply.

According to Porter (1986), the value chain analysis allows to find the contribution of each activity to obtain a competitive advantage. In order to lower their costs, big industrial groups continuously arbitrate between in-house production and outsourcing, as well as spatial integration or splitting.

The implementation of these strategies constitutes massive competition attacks that result in eliminating competitors that do not succeed in developing alternative strategies. Large industrial dairy groups mostly set up their processing plants within the major milk producing regions. Some companies remotely guide their whole supply chain while seeking a competitive advantage through cost leadership strategy. Vertical integration of suppliers (and horizontal integration of competitors) is a result of large groups' strategy for reducing production costs (Morvan, 1991). By this mean, economies of scale are achieved as fix costs get distributed on bigger production batch.

Following the line of Coase (1937), Williamson (1985) developed the idea that vertical integration depends on the potential achievement of economies of information resulting from the integration of economic relations. According to his theoretical framework, companies tend to integrate their suppliers based on their asset's specificities and the transactions' frequency (contract's specificity), in other words, on the potential reduction of transaction cost that companies can expect.

The seeking for market power can be founded on a strategy of raising competitors' costs without necessarily cutting one's own production costs.

The *Raising Rivals' Costs theory* (Salop, Scheffman, 1983; Scheffman, Higgins, 2003) analyses the behaviour of searching market power. It states that suppliers' integration or exclusive contracting with suppliers enables the specific stakeholder to impose, at supply level, higher costs to competitors while weakening their position. The "predatory" company seeks to take control of suppliers that are indispensable for the competitors, and induce higher prices for the intermediary goods or services compared to the cost the company bear. Competitors face an induced market power and see their profits being reduced by the cost increase and the pressure put by the predatory firm on the selling price of the end products. Focusing on the factors leading to vertical integration, this approach reverses the analysis as

it suggests that suppliers' integration does not allow lowering the production and/or transaction costs but instead imposing higher costs to weaken competition while integrating or taking control of their suppliers.

2.3 Second analytical grid: governance

Promoting an original way to manage businesses, the governance of the supply chain (in this case PDO supply chains) results from the capacity of the different agents (Baron, 2003) (who have decision power) to collectively set the goals, the means and the actions' rules. In order to highlight the heterogeneity of the PDO supply chains with regard to their linkage to the territory, some authors (Allaire, Sylvander, 1997; Marty, Sylvander, 2000) draw the distinction between territorial and sectoral governance. We propose an analytical grid inspired by this analysis of territorial versus sectoral governance and crossed with our grid of the regulation of cheese production systems .

Sectoral governance is understood as business management by a group of firms defending their interests in the name of their sector. Over time, these companies mostly merge with their competitors over time. As a result, the power relations between the economic agents of the sector mainly consist in negotiations between dairy farmers and the industrial level in the framework of an authority that is, in France, supported by the government.

Territorial governance by managing organisation is a business management mode for collective matters that can be set off by the state. This organisation mode can take the form of a supply chain inter-professional organisation. Whereas in the territorial governance, the organisation's mission is to represent and defend the production system's interests (the products and its agents). The supply chain organisation enables the agents to coordinate the regulations and the actions between them and which will take the form of inter-professional agreements containing the code of practices, the collective marketing of the products, the definition of the production zone, and the setting of the dues for the organisation. The organisation relies on this policy for acting. The power relations between the stages are set up within the organisation creating an institutionalised place for consultation.

2.4 Data sets of our 2 case studies

To discuss this framework, two different PDO cheese supply chain strategies were studied (Cantal in France and Gruyère in Switzerland) at the different stages (dairy farmers, cheese-makers, and cheese-ripeners) using three major sources: (i) One source for characterising the dynamic of each cheese supply chain over a long period of time. The characteristics and the evolution of the productive structures at the different stages were analysed in order to recreate the agents' paths. To obtain the data, we conducted a survey among the stakeholders and also used documentary sources (Meyer, 2009); (ii) One source for characterising the protection strategy of the production systems based on the analysis of the legal documents of each PDO. These documents sets the content of the PDO's codes of practices and throw light on the production's organisation and the constraints put on competitors ; (iii) One source for analysing the value creation and the mechanism for its distribution among the different stages of the supply chain. We have identified the specific resources used, the productive structures of the supply chains (technical and social division of labour between stakeholders), the mechanisms for managing supply, as well as the fundamental inter-professional agreements that set the payment modalities for cheese.

3 PDO Cantal and Swiss Gruyère: two different strategies for protecting production systems based on tradition and terroir

The discussion of the analytical framework aiming at explaining the milk price differences is made in comparing two contrasted contexts (PDO Cantal and PDO Swiss Gruyère). For each supply chain, we present the productive and structural characteristics and the governance mode, so that to come up with explanations for a higher (or lower) price level compared to substitute products.

3.1 The Cantal supply chain: a French PDO cheese supply chain dominated by industrial cheese-makers

3.1.1 An industrial cheese supply chain

Agriculture in the mountains of the centre of France is strongly dedicated to milk production that feeds into cheese supply chains benefiting from a legal recognition through an official quality label (several PDOs: Cantal, Saint-Nectaire, Bleu d'Auvergne, Fourme d'Ambert, Salers). These products originate from the Auvergne Region, grouping, in 2007, around 8'000 dairy farmers producing more than 1'200 millions litres of milk. Among them, 2'800 farmers produce milk necessary for 17'800 tons of Cantal. Since 1990, the Cantal production is stabilized around 18'000 tons.

From a historical perspective, the PDO Cantal was the most important vector to the organisational development of the cheese supply chain in the Cantal department, based at the beginning on a specific technical and social division of labour before a modernisation turn during which some industrial cheese-making units have taken control over the supply chain. As a result, they have drastically gained in market power, having reached the quasi-exclusive access to market. Today, two industrial processors control around 70% of the PDO Cantal production. Finally, industrial cheese-makers impose a changed production system mostly based on cost leadership strategy to increase their competitive advantage. As a consequence, the dairy farmers have lost their negotiation power toward their buyers.

3.1.2 A powerful industry as channel captain

Three steps mark the construction process for obtaining the protected denomination of origin.

The initial **first step** aimed at obtaining the territorial exclusivity for the product. The Cantal indeed benefits from a PDO's protection with a ruling of the Magistrates' Court of Saint-Flour in 1956.

The **second step** consisted in collectively setting the production standards defining the production system. Large industrial dairy groups mostly set up their processing plants within the Cantal department. Under the influence of industrial dairy processors, the agents together fixed the requirements for the dairy farmers of the land zone who were included in the initial PDO zone. The code of practices successively evolved towards fewer requirements to promote intensive agriculture practices based on corn silage feed for the Prim'Holstein breed, leading toward to exclude linkage to the *terroir*. Farmers became standard dairy suppliers and had the same price of their non-specific milk as French standard milk. At the same time, all the rulings of the code of practices focused on promoting large-scale dairy units (heating treatment for the milk and robot for the processing activities were allowed). Therefore, it forced small dairy processors involved in the supply chain to reduce their costs at dairy stage by increasing the production, and numerous of them couldn't accept and disappeared. Large industrial dairy groups realised vertical integration of suppliers (and horizontal integration of competitors) to impose a production system mostly based on cost leadership strategy.

The **third step** for dairy farmers face an induced industrial and market power, and see their milk prices being continually low consisted to change the conditions of production. Since 2007, thank a new code of practices, the dairy farmers are able to highlight again their contribution to the product quality and specific link to the geographical origin. The implementation of the code of practices (GMOs' prohibition, land load limitation ratio of one hectare fodder per milking cow, cows' grazing mandatory) impacts the production costs and excludes from the production system the milk producers adopting intensive agricultural practices.

The barriers to entry which are raised by the code of practices for milk processing are protecting the specificity and link to the *terroir* founding the competitive advantage of the product. The creation of values is not effective because the cheese-makers don't agree on the crucial elements determining quality differentiation, identity, image and long-term reputation at the consumers' level. This value results also of the capacity to control the volume of production to avoid cheese shortage, overproduction and price volatility.

3.1.3 A mechanism for distributing surplus adapted from a the national standard grid

Both price for milk and grid to pay milk according to its quality are negotiated between farmers, cheese-makers, within the national dairy inter-professional organisation (CNIEL). The CNIEL provides recommendations which are mostly followed by the agents of the supply chain with adaptation according the regional context. The original aspect lays in the establishment of the *recommended price for cheese*.

The final value of the final product (cheeses, milk powder, butter...) is used as a reference for calculating the *milk price*. In Cantal region, milk price and quality grid are set for the whole region whatever industry or product was concerned.

This regional price is disconnected to the PDO Cantal cheese market price, because the farmers in the supply chain do not know in which product is processed their milk. The milk price depends as well on the negotiation skills of the dairy farmers when discussing with the cheese-makers. Due to the fact that milk producers are just suppliers, their negotiation abilities are restricted. Moreover, the cheese-makers mustn't declare their sales' volumes and selling prices for cheese to the inter-professional organisation. The organisation don't publish reference prices of Cantal cheese, which could help market transparency.

Consequently, over the last 15 years (excepted 2007) the milk price for PDO Cantal is the same as standard milk and reaches a 20% lower price compared to some French PDO (PDO Comté or PDO Morbier).

3.2 The Swiss Gruyère PDO: a common differentiation strategy between milk producers, cheese-makers and cheese-ripeners

3.2.1 A growing industry

With a tonnage of 28'206 tons in 2008, the Gruyère amounts for 16 % of the Swiss cheese production and 41% of the Swiss PDO volume. In the 1990's, the Gruyère production was around 24'000 tons and reached over 29'000 tons in 2009, almost taking over the production of Emmental in the decrease since 1990 (going from 56'600 tons to 30'000 tons in 2009). About 2'800 dairy farmers produce 340 millions litres milk yearly processed in 180 cheese-making facilities and 52 alps (grazing season). The production of 29'000 tons of Swiss Gruyère (including 800 tons of organic cheese and 490 tons of Alp cheese) are sold to 9 cheese ripeners who manage the sales outside the supply chain. In 2009, 40% of the Gruyère volume was exported and 7% went to the reprocessing industry (non-PDO cheese). The Swiss Gruyère supply chain is based on a great number of dairy farmers, small-scale cheese-making entities and a few cheese ripeners. The cheese-makers control the processing and only marginally sell cheese onsite for local customers.

According to the inter-professional organization, the ripeners ensure a better market access and higher value for the cheese as they hold high volumes which give them a better position for negotiating. However, the role of the cheese-makers remains crucial as the cheese wheels mature for three and half months in the cheese-maker's cellars, inducing additional costs at cheese-making level (the minimal duration of maturation is five months). The ripeners have exclusivity for the market access and do not interfere in the cheese production. The surplus resulting from the PDO collective organisation is based on the negotiation of production and trade conditions for milk and fresh cheese while setting stringent traditional technical requirements in the terms of reference. Number and distribution of the cheese-makers within the zone generate a great cheese diversity through the sourcing (plain or mountain) and the ripening duration. This diversity is comparable to the Cantal area.

3.2.2 From a public to private governance modalities

In the beginning of the 90's, the Swiss Federal Department of Public Economy started a consultation procedure for a new agriculture bill suppressing price guarantee for milk, opening borders to some cheeses import and reducing subsidies for agriculture goods exported to the European Union to enforce the GATT agreements signed in 1994. The federal legislation then opened new opportunities for the agro-food sector in defining collective organisation to which stakeholders could freely adhere.

Agents active in specific product supply chains gathered and developed inter-professional organisations while completing the horizontal structures (producers' organisation, dairy association, cheese-wholesalers and exporters' association). New forms of solidarity arose on the base of specific products link to their *terroir*. The regulation on inter-professional organisations leads the Swiss Confederation to enforce quality promotion and product marketing measures as well as supply management mechanisms based on market demand. Strict conditions were defined as to which organisation was entitled to receive a mandatory power for enforcing its decisions (Boisseaux, Barjolle, 2004).

At the same time, the Swiss Gruyère supply chain was facing the potential development of industrial dairies. In the 1990, a firm together with several cheese-makers, planned to set up an industrial Swiss Gruyère production facility (milk collection every second day, shortened ripening duration, large volumes, technical changes at several steps in the production process). Severe challenges in marketing the Swiss Emmental cheese indeed led some Emmental cheese-makers to plan to switch production for Gruyère. These attempts were threatening the authentic character of the Swiss Gruyère and the supply chain welfare in the cantons where production was historically founded. Still in the 90's, the Gruyère production originated for 95% from the cantons Vaud, Fribourg, Jura, Berne, Jura and Neuchâtel. Several stakeholders started a recognition process for the future PDO Gruyère and took steps to defend the local and traditional practices and to counter the development of the production outside the traditional zone.

These circumstances led, in the 90's, the stakeholders to structure their approach successively through a Charter, an Inter-professional Body, and finally to a code of practices for the PDO. Led by the Swiss Gruyère supply chain, the creation of the Charter followed by the PDO protection set the ground to maintain a traditional production within a context of industrialisation and State disengagement. Finally, the Swiss Gruyère was recognized as Protected Designation of Origin in 2001 and registered in the Geographical Indications' Register of the Federal Office of Agriculture.

The conditions of production and processing were more detailed, based on main technical features determining the quality of the final cheese and especially its ability to maturation and long-term storage. Feeding silage was banned (hay as a main feed for cold periods) and the milk could not be treated (except cooling). Milk processing should take place in copper tank within 18 hours after the last milking. The cheese-maker had to use rennet with home-grown milk bacteria and could not reincorporate whey cream. The ripening process had to last minimum 5 months before sales. Only the first and second milking can be mixed together for processing Gruyère. Milk tanks should be open and made out of copper with a maximal content of 6'600 litres and can be used for another cheese type production after washing. Besides, the distance between the cheese-making facility and the dairy farmer has to be smaller as a ray of 20 km, and milk has to be delivered twice a day after milking.

The code of practices implicitly limits the size of the processing units and the structures on the zone. Any new entrant could anymore develop a strategy based on cost leadership through rationalisation of the production process, production volume expansion, shortening of the ripening duration, production facilities' expansion, or relocation of the activities.

The Swiss Gruyère production follows a decentralised model maintaining an important economic activity through the 232 cheese-makers in the plain and the Alps included in the PDO zone. The code of practices defines a high quality product, which refers to small to medium sized cheese factories. Larger industrial groups that might be interested in entering the Gruyère production and market have to cope with all the quality standards and techniques, and cannot propose the product respecting the rules for a much lower price, taking advantages of lower labour costs than delocalisation, or lower process costs than drastic economies of scales.

3.2.3 A mechanism of value distribution from upstream to downstream

Since a small decade, the price gap between milk meant for PDO Swiss Gruyère and milk meant for instance for Swiss Emmental production is about 20 %. Though the State supports specifically all the producers delivering milk for non-pasteurised cheese production with a subsidy of 0.15 CHF/litre and the price gap can be traced back in the surplus. The other Swiss cheese supply chains, even the other Swiss PDO, do not achieve in paying such a high price for milk like the Swiss Gruyère. The reason is to be

found in the specific shaping and organisation of this supply chain. The inter-professional Swiss Gruyère organisation plays an important role for creation of surplus as it hosted the negotiations resulting in setting quality criteria and using diverse management tools.

Nowadays, the price for milk and cheese as well as the quality grid are negotiated between farmers, cheese-makers, and cheese-ripeners within the inter-professional Swiss Gruyère organisation. These recommendations are mostly followed by the agents of the supply chain.

The original aspect lays in the establishment of the recommended price. The final value of the final product is not used as a reference for calculating the milk price. Instead of it, the agents set a target milk price to which a margin for the cheese-makers is added, resulting in a price for the Swiss Gruyère on the market. Of course, this price is not disconnected to the market price and it is obvious that the consumers are willing to pay that price since the sells still increase at that level of prices¹. This process is facilitated on the Swiss market by the duopolistic organisation of the retail industry, also involved in the supply chain and, more generally, promoting products *made in Switzerland*.

Dairy farmers could maintain a balance in the power they have in the Swiss case contrary to the French case. The power relation allows weighing on the value distribution between the agents. On one side it brings transparency on the product's price at market stage and supply management mechanisms negotiated within the supply chain's organisation. On the other side, when the value of the final product is communicated, the power relation between the agents is rebalanced through the distribution of the producers' surplus among the agents. A recommended price for the cheese or for the milk is collectively set and its implementation goes through a contract standard adopted by most of the agents.

4 Discussion

Cheese markets governance models Cantal and Gruyère are quite different. They both focus on a product whose name is protected, and rely on agents sharing collective interests and structured in an inter-professional organisation. These are interesting examples of collective action deploying a strategy of competitive advantage based on origin. Cantal focus on cost leadership strategy while Swiss Gruyère focus on product differentiation and specific quality linked to origin. They exemplify what sectoral (Cantal) and territorial (Swiss Gruyère) governance can be.

The analysis of these PDO supply chains allows us to highlight that pricing mechanism depends on three major factors that give ground to our analytical grid for the regulation of production systems (cf. table 1):

- This first factor is linked with the ability of the supply chain of a localised agro-food supply chain to set up a collective level of governance. Along the value building process, the collective organisation decides the use of specific territorial resources and takes control over the quality (quality segmentation, grading, and clearing of low quality cheese towards the reprocessing industry).
- The second factor refers to the legal framework and its implementation. The setting-up and enforcement of strict production rules empower the collective structure, and allow structuring the relations between dairy farmers, cheese-makers and ripeners. However, the public recognition and institutional protection of the geographical indication does not guarantee higher milk prices for the farmers (Barjolle *et al.*, 2007; Meyer, 2009).
- The third factor is linked with the dynamic of the market power between the firms within the supply chain along the time. The distribution of the value added along the supply chain changes over the time according to the market structure.

¹ The milk price comprises a basis price (around 0.50 CHF per litre) to which incentive subsidies meant to guide production are added (PDO Gruyère milk bonus: 0.10 CHF/litre, quality bonus: 0.05 CHF/litre). Moreover, two subsidies depend on the agricultural policy: the bonus for the milk dedicated to cheese-production (0.15 CHF/litre) and the no-silage feed bonus (0.03 CHF/litre).

The conjunction of these three factors explains the price gap between the model based on the differentiation linked to the geographical origin and specificity (Swiss Gruyere case), and the industrial model where the production is controlled by few large dairies (Cantal case).

We draw as conclusion that a collective organisation, with its capacity to master supply with a large range of different tools can be considered in the Swiss case as an institution giving the capacity to the supply chain to deliver and to distribute economic value in a fair manner between the agents while maintaining and protecting the collective organisation over time. It allows the production to increase constantly with the time, as the adjustment between demand and supply are well manage at collective level, like a unique firm could manage a product sold under an unique brand. Nevertheless, as illustrated by the case of the Cantal cheese, this functioning can evaluate with the market dynamic: with the time, market power raised by few firms can allow them to take control on the collective organisation and can reduce its ability to manage quality and supply.

We are though very much aware of the limits of our approach as the hypothesis was only tested on some PDOs and it cannot be generalised. Further research is presently conducted to test this analytical grid of the regulation modes of localised production systems in order to discuss the validity of our preliminary conclusions.

Table 1. Comparison of the regulations of the PDO Swiss Gruyère and the PDO Cantal

	Sectoral Governance PDO Cantal	Territorial Governance PDO Swiss Gruyère
Value Creation	Differentiation based on technology Internal supply control by each individual company (on several products and several locations) Common supply control (storage, intervention)	Take advantage of specific local resources Supply control through managing scarcity : definition of the production zone, quota system, exclusion of low quality cheese and segmentation by quality grading
Value Distribution	Negotiation through mutual agreements between producers and the industry National price grid No relation between the selling price of the end product and the milk payment	Institutional mechanism for setting price based on quality Standard contract Price transparency (monitoring, cheese exchange)
Preservation of the competitive advantage	Cost leadership strategy Individual branding strategy Vertical integration of suppliers Horizontal integration of competitors Geographical disintegration	Differentiation strategy based on product-terroir linkage Barriers of entry for competitors by controlling the code of practices Impose costs to competitors (raising rivals' costs strategy)
Regulation of the production system	Production system is controlled by market leaders (oligopoly)	Power relation set up within an organisation dedicated to managing and protecting the product The state gives power of attorney to the organisation.

Regarding the use of RCC theory, the main points of discussion are the following.

The specific rules in the codes of practices set restrictions so to give decisive advantages to small-scale enterprises than the imposition to their competitors (large dairy industry companies and intensive dairy farmers) specific production techniques and its related costs. This constitutes a lever for imposing to the certain economic agents a certain level of production costs which corresponds to a certain type of producers/processors.

RCC theory helps to answer the question whether the PDO cheese production costs are actually imposed to competitors by the defenders of the local PDO production system.

Indeed, the PDO-regulation allows new entrants, while they respect the code of practices. Therefore, the quality requirements are determined at long term by the willingness of the consumers to pay more for a certain level of quality, because the pressure of the demand pushes the quantities forward continuously.

Within this framework, firms can play an active role while using their influence toward the institutional environment and the organisation of the relations between agents. However, the question is whether this influence increases the producers' welfare against the consumers' welfare.

The two cases studies allow drawing the conclusion that a case-by-case analysis is necessary. The assessment could be made observing if the following conditions are met:

- First condition is that the production costs are permanently challenged by new entrants respecting the common rules.
- Second condition is that the production costs correspond to quality requirements which really meet the consumers' expectations, not only in terms of quality of the final product but also in terms of methods of production which may rely to hand-made process and traditional knowledge.
- Third condition is that the governance among the firm within the collective governance structure respects the interests of each group of firms in a well-balanced manner.

5 Conclusion

Different performances in PDO cheese supply chains can be observed with regard to milk price at farm gate. The two case studies show a price difference around 25% depending years between the PDO products and industrial products.

The analysis of two contrasted cases studies allows identifying the main factors of explanations for the pricing mechanisms: the first factor is the ability of the supply chain to set up of a collective structure of management of the product; the second factor is the legal framework which empower the collective organisation; the third factor is the dynamic of the market power between the firms within the supply chain along the time.

RCC theory gives interesting point of view about the behaviour of firms which could make use of the collective rules to raise the costs of their competitors. The raising of costs is obvious in both case studies but contrasted conclusions can be drawn case.

In the case of territorial collective governance mode (Swiss Gruyere case), the conditions are met to conclude that this strategy of raising costs corresponds to requirements which are based to a corresponding quality which meets consumers' expectations and willingness to pay. Conditions of production correspond to higher prices of production, milk producers and cheese makers are paid according to their costs of production. In the case of sectoral governance mode (Cantal case), few firms have taken control on the supply chain and have imposed with the time a model based on costs' leadership. Quality refers not to a strong link to the geographical origin and no collective management of quality takes place. Milk producers and cheese makers have no negotiation power and cannot argue refereeing to high quality requirements.

As general conclusion, a case-by-case in-depth analysis should be made to assess whether strategy to raise costs of the rivals damages consumers welfare in the case of PDO supply chains.

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