Governance of the Agri-food Chains as a Vector of Credibility for Quality Signalization in Europe

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Abstract: For many agricultural products, the quality of the final products strongly depends on different stages of the productive chain. This stresses the importance of relationships between quality signal owners and suppliers in the vertical chain. Based on a New Institutional Economics analysis, the goal of this paper is twofold: (i) to design a framework to study the links between quality signaling, coordination in the supply chains and the institutional environment, (ii) to conduct a comparative analysis to identify, compare and explain the modes of organization implemented for the governance of different quality signs. The general hypothesis is that, in order to assure the credibility of a quality signal, there must be an efficient alignment between quality characteristics and governance of the supply chain. To test this general hypothesis, we have conducted a comparative analysis of 42 case studies in 3 sectors (processed meat, cheese, fruit and vegetable sectors) from 7 European countries. This diversity allows us to compare the organizations designed to govern different quality signals in different institutional environments and to test the matching between quality signals and governance structures.

Keywords: alignment, credibility, governance structures, quality signals.

JEL Classification : L14, L15, L22

1. Introduction

For many agrofood products, the consumer is not always aware of the quality of the product, or the accuracy of the information regarding the product characteristics. Economists, following Akerlof (1970) have shown that the experience and confidence goods (or characteristics) are liable to a very strong adverse selection problem when the price is the only information available on quality. The use of quality signals may mitigate the adverse selection problem. By improving consumer information, the creation of a quality signal restores part of the efficiency of the market. For the purpose of this paper, quality signal is defined as: (i) a distinctive name that differentiates one product from another, either vertically, or horizontally, (ii) a name that provides consumers with (sometimes implicit) information about characteristics of the product, these characteristics being summarized in a logo or a name.

From an empirical point of view, there is a diversity of quality signals. The brand name is probably the most well known. A second type of quality signal that plays an important role in the European agri-food sector is the denomination of origin, either because the area of origin actually signals significant differences in the characteristics or because of its symbolic content. In Europe, Protected Denomination of Origin (PDO) and Protected Geographical Indication (PGI) link products to their geographical origin and provide an official certification on some products' attributes (for instance traditional methods of production). There is now a huge amount of literature on quality signaling and labeling (see for instance, Caswell and Mojduszka, 1996). However, only a few studies deal with the contractual and organizational issues of a product's quality (Caswell, Bredhal and Hooker, 2000, Hueth, Ligon, Wolf and Wu, 1999).

In the same time, there is also a diversity of organizational forms that support quality strategies. Following Mighell and Jones (1963), scholars emphasized the diversity of vertical coordination in the food industry (see for instance Frank and Henderson, 1992, and Peterson and Wysocki, 1998, for a description of vertical coordination in the US). However, to our knowledge, no systematic studies on the vertical coordination in the European agri-food sectors exist.

We expect that the choice of vertical coordination within the supply chains depends on the quality strategy adopted by one or several agents (in the case of a collective brand) of a supply chain. This is due to the fact that quality signaling in the final markets involves higher contractual hazards in the downstream transactions with suppliers. If the quality of the final product sold under a quality signal depends on the behavior of several agents in the chain (owner of the signal and suppliers), there is a moral hazard problem. How can it be guaranteed that the quality of the goods sold under a brand name will remain constant and homogeneous? This is the credibility problem of the quality signal.

In this paper, the governance of transactions in the supply chain is studied as a way to support the credibility of quality signals. We therefore assume that the governance structures that are designed in the vertical chain try to guarantee the quality to the final consumer. Quality signaling may lead to the adoption of hybrid forms or vertical integration rather than a spot market to cope with these hazards. We then expect to see a covariation between the characteristics of quality signals and the governance mechanisms in the supply chains. Using a sample of case studies in several European agri-food chains, our goal is twofold: (i) to

characterize the diversity of organizational forms in our case studies, (ii) to explain this diversity by the heterogeneity of quality strategies. Different quality signals give rise to different credibility issues and contractual hazards that in turn imply different governance structures. In order to test the general hypothesis, we present the methodology used to conduct a discrete structural analysis of 42 case studies in three different agri-food sectors (cheese, processed meat, fruit and vegetables sectors) in seven European countries (France, Germany, Greece, Italy, Netherlands, Spain, UK). This population covers the diversity of quality signs that one can find in the agri-food sectors (retailer label, processor's individual brand name, official quality sign, etc.).

Compared to previous literature on quality signaling and organization, this ongoing research is the first cross-national study that attempts to compare alternative modes of organization governing different quality signals. Only a few studies deal with the issue of backward coordination induced by quality strategy using the New Institutional Economics (NIE) framework (see e.g., de Azevedo and dos Santos Silva, 1999, Hobbs and Young, 2000, Ménard, 1996). We also investigate these questions from a Transaction Cost Economics perspective (Williamson, 1991, 1996). The cross-national nature of our sample allows us to take into account the influence of institutional environment on governance choices (North, 1990).

The remainder of the paper is organized as follows. In the next section, we will present our population of case studies, develop a simple taxonomy of quality signals and a typology of governance structures in the vertical chains. In the last section the arguments concerning the links between quality strategy and governance of the supply chain are developed. We will design a reduced form framework to study the diversity of quality signs and governance modes. The conclusion follows.

2. Governance Structures for Quality Signaling: Empirical Analysis

In this section, we present our population. We mainly focus on the analysis of the two main set of variables we would like to link: on the one hand the quality strategies and, on the other hand, the governance of transactions in the supply chains. Our goal is to describe and compare the different governance structures and quality strategies in the chains. We choose the case studies in order to cover a broad range of quality strategies and governance structures. We develop the analysis in two subsections. In (2.1), after a brief description of the data and methodology, we provide an overview of the different quality strategies we have in the population. In (2.2) we analyze the governance of transactions in our population. We use Williamson' works (Williamson, 1991, 1996) on governance structures to describe and compare the several bilateral governance structures we observed. We then try to assess the governance of each supply chains by designing an aggregate measure of the extent of vertical integration in each case study.

2.1   The Diversity of Quality Strategies

Our empirical study is based on a population of 42 case studies (two cases of three sectors in 7 European countries[1]), in three different agrofood sectors: (i) Processed meat, (ii) Fresh fruit and vegetables, (iii) Cheese products. The research is based on an in-depth description of case studies. To facilitate the comparative analysis, investigations were conducted with a

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[1] France, Germany, Greece, Italy, Spain, The Netherlands and United Kingdom

common questionnaire for all the case studies. The information included in all the case studies is given in annex.

In order to ease the comparison of quality signals in each case studies, we create several clusters of quality signals according to two main criteria related to the legal statute of the quality signal:

• The legal statute of the quality signal: private brand (individual or collective), denomination of origin (PDO/PGI), certification brand (vertical axis).
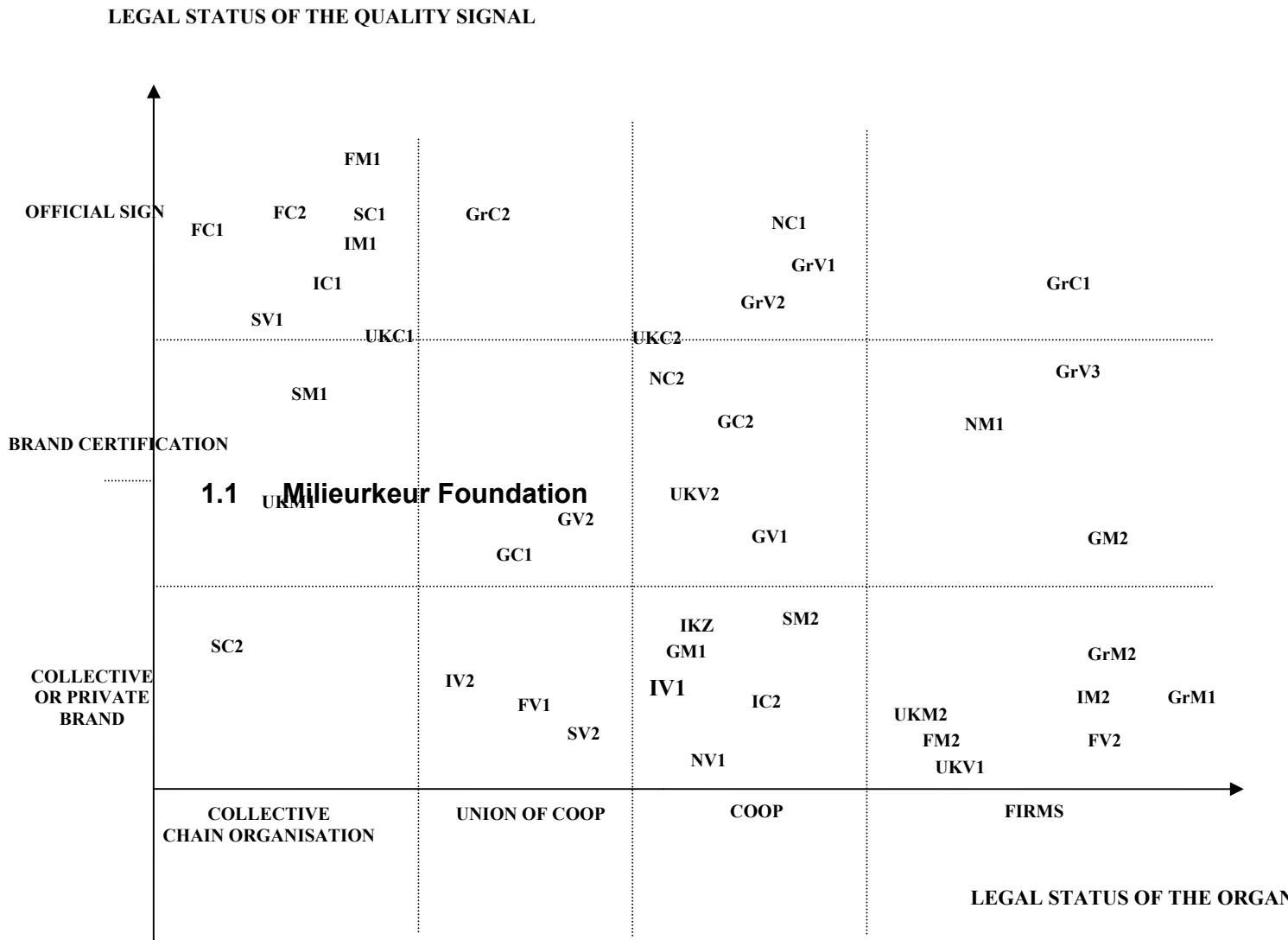
The main differences between the three clusters of quality signals rest on (i) the definition of quality and, (ii) the quality control mechanism. For the official quality signal, even if the definition of quality comes from the agents in the supply chain, this definition must be approved by the state in last resort. For the other two set of quality signals, the definition of quality is in the hand of one or several agents in the supply chain. On the quality control issue, the PDO system is based on an official certification (by the state or delegated to an approved third party). External certification is also a necessary element of the brand certification system. For the private brand (individual or collective), external certification is not a regulatory requirement but a strategic choice of the brand's owner. One possible interpretation of the vertical axis is the relative importance of legal support or constraints defined by the institutional environment for each of these quality strategies.

• The legal statute of the owner of the quality signal: collective chain organization, cooperative or unions of cooperatives, private firm (processors or retailers) (horizontal axis).

This axis split the different case studies according to the legal form of the owner. The ranking of legal forms from chain organization to private firms suggests the existence of an increasing degree of centralization of the brand name ownership. In PDO/PGI, the quality definition is in the hand of a collective chain organization (at least in the majority of European countries) whereas the owner of a private brand is the only one who can modify the definition of its products' quality. The cooperative (unions of cooperatives) case is in between these two polar forms. The collective management of the quality signal is not a regulatory requirement but reflect the internal organization of the owner.

The following figure describes the sample of case studies with the previous dimensions of the legal statute of the quality signal and of the legal form of the owner of the signal.

Figure 1: A description of the diversity of case studies[2]

LEGAL STATUS OF THE QUALITY SIGNAL

	COLLECTIVE CHAIN ORGANISATION	UNION OF COOP	COOP	FIRMS
OFFICIAL SIGN	FC1 FC2 SC1 FM1 IM1 IC1 SV1	GrC2	NC1 GrV1 GrV2	GrC1
	UKC1		UKC2	
BRAND CERTIFICATION	SM1 1.1 UKM1	Milieurkeur Foundation GV2 GC1	NC2 GC2 UKV2 GV1	GrV3 NM1 GM2
COLLECTIVE OR PRIVATE BRAND	SC2	IV2 FV1 SV2	IKZ SM2 GM1 IV1 IC2 NV1	GrM2 IM2 GrM1 UKM2 FM2 FV2 UKV1

LEGAL STATUS OF THE ORGAN

First letter: country (F: France / G: Germany / Gr: Greece / I: Italy / N: Netherlands / S: Spain / UK: UK)
Second letter: sector (C: cheese / M: meat sector / V: fruit and vegetables)

Without being at the core of our analysis in this paper, the diversity of quality strategies according to our criteria partly reflects institutional differences among countries. It illustrates the importance of differences in institutional environments among European countries (North, 1990). There is for instance strong differences in the implementation of official quality policy among European countries. France, Greece, Spain and Italy have a strong tradition of government supports to help producers to create a quality differentiation strategy. On the other hand, the provision of these strategic instruments is relatively new in United-Kingdom or the Netherlands[3]. Second, differences in the implementation of PDO systems exists even in countries with a strong tradition of official supports. In some countries, individual firms are subject to the compulsory adhesion to a collective organization (like in France, Italy and

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[2] For confidentiality reason, the name of the case study does not appear.
[3] The same is true for the institutional support for the development of producer's organization.

Spain) whereas in other countries this is not the case (Greece). The sample of case studies includes both situations.

In most of the case studies, several quality signals co-exist for the same product (60% of the case studies in our population). A lot of products have at least two different labels (for instance a private brand and a PDO). This points out the importance of complementarities between collective and individual strategies (see Fernandez Barcala, Gonzales-Diaz and Arrunada, 2001 for an analysis in the Spanish meat sector). The methodology focussed on the quality signal that we judged the most important regarding the final communication to the consumers.

2.2   Governance in Supply Chains: a Taxonomy

We now turn to the description of the governance of transaction in each case study. We start with the description of bilateral governance structures for each transaction in all the case studies. We use this description to analyze the governance of the set of transactions in each case.

2.2.1 Bilateral Governance Structures

In this section, we study the bilateral governance structures in the supply chains. To be able to take into account the diversity of the case studies in our population, we have established a template of supply chain that integrates five main transactions. It should be note that each case study can have different chains of transactions. For instance, the transaction between the first and second processing steps does not exist for the majority of case studies in the fruit and vegetables sector whereas the cheese industry always has two separate processing steps. The length of each chain of transactions varies mainly from sector to sector. This technological description of the transactions in the chain corresponds to very vast categories[4]. The relevant transactions are the following:

- transaction between farmers and their input suppliers (**T.1**),
- transaction between farmers and the first transformation step (**T.2**),
- transaction between the first and the second transformation steps (**T.3**),
- transaction between the last transformation step and wholesalers (**T.4**),
- transaction between wholesalers or the last transformation step and the retailers (traditional retailers and supermarket/hypermarket chains) (**T.5**).

In order to analyze the governance of transactions in the chains, we designed a typology of bilateral governance structures for each transaction. This typology is inspired by the one used in Williamson (1996). This reference is useful because it allows us (i) to disentangle different contractual relations and, (ii) to rank these relations on a Market – Hierarchy axis. We use however a more detailed classification to take into account the diversity of the situations (different sectors, different products, different quality signals, etc.). With regard to Williamson's typology, more detail is given for the category of hybrid forms. We distinguished six different bilateral governance structures. Some of the definitions we use hereafter come from Milgrom and Roberts (1992):

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[4] Depending on the sector studied, the term "first processing" refers to different activities. In the case of the fruits and vegetables sector, we consider this stage to correspond mainly to the packaging of the products (sorting, selection, aggregation, packaging, stocking, etc.). In the cheese sector, the first level of processing corresponds to a real physical transformation of the product.

① *The spot market contract* (**S**). A contract for the immediate exchange of goods or services at current prices. The identity of the party is irrelevant,

② *The relational bilateral governance* (also implicit contract) (**S+**). A non-written (non legally enforceable) contract that specifies only the general terms and objectives of the relationship. This governance introduce the idea of repeated relations with the same agents,

③ *The relational bilateral governance with "qualified partner(s)"* (**S++**). This structure is close to the previous one. However, agents are not free to choose their partners, but have to select a "qualified" transactor (accredited for instance by a collective organization),

④ *The formal (written) bilateral contract* (**C**). A legally enforceable set of promises that defines all or part of each party obligations,

⑤ *The financial participation in the ownership of the partner(s)* (**JV**). In this case, buyer (respectively seller) is a stockholder of the other but stay legally independent from the seller (respectively buyer). Joint-venture is a canonical example of this type of governance structure,

⑥ *Vertical integration* (**VI**). Bringing two or more successive stages of the supply chain under common ownership and management.

The following table shows the correspondence that exists between Williamson's typology and ours. It also specifies the criteria that allows us to distinguish between the different governance structures.

Table 1: typology of bilateral governance structures

Governance Structures					
TCE typology	**Market**		**Hybrids**			**Firm**
Detailed typology	**Spot market (S)**	**Long term relations (S+)**	**Long term relations with "qualified suppliers" (S++)**	**Bilateral written contract (C)**	**Equity participation (JV)**	**Vertical integration (VI)**
Criteria						
Impersonal relations	Yes	No	No	No	No	No
Ex ante restrictions on choice of a partner	No	No	Yes	No	Yes	Yes
Formalization	No	No	Yes / No	Yes	Yes	Yes
Duration	Short	Long	Short	Variable	Long	Long
Enforcement	Courts	Reputation	Certification / courts	Reputation / courts	Courts	Hierarchy
Financial participation	No	No	No	No	Yes	Yes
Degree of vertical integration						

Three main comments can be made on this typology. First, it describes and ranks the different bilateral governance structures. It shows a diversity of governance structures for the

same or for different transactions. As we moved from spot market to vertical integration, the property rights of individual agents, *i.e.* the rights to decide on each agent's asset, become more constrained by explicit commitments. Second, the relational governance with "approved partners" is introduce here to take into account the possible influence of a "collective governance structure" in a chain that interact with bilateral governance. Third, these bilateral governance structures are not exclusive from each other. In different case studies, several bilateral governance structures are used simultaneously for a transaction. Four mixed combinations of governance structures for a particular transaction are possible in this typology.

- Combination of different governance structures in the same group of governance structures,
- Combination of market governance and hybrid governance,
- Combination of market governance and vertical integration,
- Combination of hybrid governance and vertical integration

2.2.2   From Bilateral to Multistage Governance: an Identification of Organizational Forms

We turn now to a synthetical presentation of the governance of transactions in the case studies. The previous table shows the diversity of bilateral governance. We would like to have a more aggregate view of the governance in each case in order to ease the comparison. As we defined a quality strategy by case study, we also would like to define a governance mode by case. To differentiate this more aggregate level of governance from the previous description, we consider the governance of the whole supply chain in each case as an organizational form. We defined an organizational form as a set of interstage transactions along the chain. Consequently, each organizational form brings together two or more bilateral governance structures. In order to classify these organizational forms, we defined a common criteria, the degree of vertical control by one of the agents (mainly the owner of the quality signal) on the chain.

We operationalized this degree of vertical control with the definition of a vertical control *index*. This index is established as follow: for a given chain we add up all the governance structures that imply a financial links among the partners (equity participation - JV - and vertical integration - VI - in the previous table) then divided by the number of transactions in the chain. For instance, if two transactions (out of four) in a supply chain are governed by vertical or equity participation governance, the value of the integration index is 0,5 (*i.e.* 2/4). This calculus allows us to avoid the fact that the length of the chains in our case studies are not homogeneous when we consider the number of transactions. Doing so, the vertical control index measures the relative extent of vertical integration. It gives the degree of authority this owner will have on the participants in the chain. In the following table, we give an example of the description of the governance structures and organizational forms for the cases studies in the meat sector (33% of the whole population).

Table 2: Governance structures in the meat supply chains

Transactions Case studies	T.1	T.2	T.3	T.4	T.5	Index of vertical control
F.M.1 (chain org.)	S++	S++	NR	S+	S+	0
I.M.1 (chain org.)	S+	C / VI	VI	S	S	0.2

N.M.1 (chain org.)	S+	C	NR	C	S	0
N.M.2 (chain org.)	NR	S++	NR	S	S	0
S.M.1 (chain org.)	?	S / S+	NR	S / S+	S / S+	0
UK.M.1 (chain org.)	S++	S++	?	S++	S++	0
S.M.2 (coop)	VI	VI	VI	VI	C	0.8
G.M.1 (coop)	JV	JV	JV	VI	VI / S+	0.8
F.M.2 (firm)	S++	C	VI	NR	C	0.25
G.M.2 (firm)	S++	C	VI	NR	S	0.25
Gr.M.1 (firm)	S	VI	VI	C	C	0.4
Gr.M.2 (firm)	S+ / S++	VI	VI	S+	S+	0.4
I.M.2 (firm)	S	C	VI	S	S	0.2
UK.M.2 (firm)	S	C	C / VI	NR	S++	0

From this *vertical control index*, we define four organizational forms

- No vertical integration (*decentralized organizational form*): integration index $\in$ [0 - 0,2],
- Weak degree of vertical integration (*mainly decentralized organizational form*): integration index $\in$ [0,2 - 0,4],
- Intermediary degree of vertical coordination (*weakly centralized organizational form*): integration index $\in$ [0,4 - 0,7],
- Strong degree of vertical integration (*centralized organizational form*): integration index $\in$ [0,7 - 1].

The repartition of case studies by organizational form (as defined below) shows a wide diversity. Two case studies have a centralized organizational form, eight are of the very decentralized type and four are of the mainly decentralized type. It seems that in the case studies in the European meat sector, the decentralized form of organization is the predominant one. Similar description and ranking can be made for the rest of the population.

We identified different quality signs and different governance structures. We now present our conceptual framework which links the diversity of quality signs with organizational forms.

3. The Credibility Issue : Linking Quality Signals and Governance of the Supply Chain

This section relates the mechanisms that make a quality signal credible to consumers. Our goal is to explain the expected relation between quality strategies and governance of the supply chain. This analysis is carried out with the consideration that a quality signal is a contract between the consumers and the owner of the signal. The advantage of this contractual analogy is to focus on the enforcement issue. We develop the analysis in two subsections. In the first subsection, we develop a conceptual framework to link quality strategies and governance of the transaction in the supply chains (3.1). In the second one we study the credibility issue when the owner of the signal is the only one able to modify the quality of the products. Then we will then show that, when the quality of the products sold

under a quality sign depends on the behavior of various agents in the production chain, the governance of transactions in the vertical chain is a central element for the credibility of the quality signal (3.2). We provide some preliminary evidences form the case studies in the meat sector (3.3).

3.1 A General Framework: Linking Quality Strategies and Governance of the Supply Chains

The analysis investigates the backward or upward coordination (governance of the vertical chain) induced by the creation of a quality signal. Following Transaction Cost Economics, the analysis is essentially comparative (Williamson, 1991). This imply an analysis that would allow for comparison of the different governance methods. It is necessary to study all the variables that can influence the choice of governance methods. The case studies that we have carried out are very diverse. We therefore need a framework that allows for the integration of this diversity. Five series of variables or parameters are adopted to try to explain the choice of governance structures. The following figure represents the links between all these items. We mainly develop the analysis of the link between quality signal and governance structures (labeled "credibility issue" in the figure).

Figure 2: The analytical framework
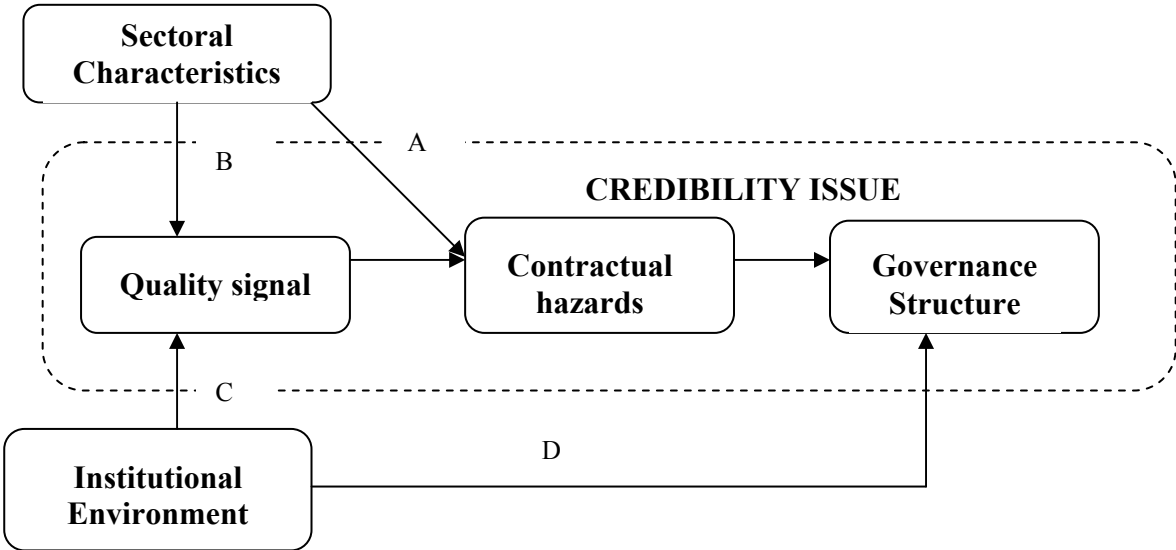
Hereafter, we briefly explain the relations (A), (B), (C), (D).

Relationship between sectoral characteristics, quality signal and contractual hazards (A) (B)

The sector characteristics partly determine the credibility problems that must be dealt with. For example, these characteristics inform us of potential problems related to supply and quality management. Many sectors are characterized by considerable fragmentation of the agricultural production and transformation. There exists potential heterogeneity of the quality that is important to the owner of the quality signal (in particular if he sells his products under a commercial brand name). The study of the production process in a given sector also gives us information regarding the quality management problems in the chains. For example, in the fresh fruit and vegetable sector, a strong heterogeneity of the raw materials will exist *a priori* (in space and in time).

Relationships between institutional environment, quality signal, and governance structures (C) (D)

Following North (1990), institutional environment is defined here as the "rules of the game". Due to their cross-national nature, the differences in institutional environments and market structures must be included in our analysis because they can influence the governance design (Williamson, 1991, 1996). They encompass differences in terms of development of the collective producer's organization, the development of official quality signaling and certification, etc. We try to evaluate the heterogeneity at the institutional level between different countries.

3.2 The Quality Signal as a Contract: the Credibility Issue

The credibility of a quality signal can be studied by taking into consideration that a quality signal is a contract between the producers and the consumers. Credibility is defined as the respect by the owner of the sign to (sometimes implicit) promises made through the quality signal. The interpretation of a quality signal as a contract was suggested by Klein and Leffler (1981). This is a useful analogy as it allows for the study of the diversity of enforcement mechanisms used to support the credibility of the quality signals. This commitment problem depends on the considered situation. We first consider the case where the owner of a quality signal is the only one who can influence the level of quality. Next, we introduce agency considerations by allowing several agents of the supply chain to influence the products' quality.

3.2.1 The Reference Case: Credibility as an Exclusive Function of the Owner Behavior

In this section, we assume that the owner of the quality signal is the only one that can influence the quality[5]. Consequently, the problem of enforcement of the brand name contract rests exclusively on his decisions. The only relevant transaction is between the owner of the quality signal and the consumers.

There now exists a great amount of literature that deals with the incentives of an individual producer to respect his commitments with regard to the quality of the products. For a producer to have an incentive to continuously produce high quality, a price premium must exist as a reward for high quality (Klein and Leffler, 1981, Shapiro, 1983). It represents the economic value of the individual producer's reputation. It is therefore the threat of termination of the relationship by the consumer and the loss of the quasi rent that makes the implicit brand name contract self-enforcing.

Other mechanisms of quality safeguarding are also available to guarantee the quality of the products. The certification by a third party is an example. This third party can be a private or public intermediary. In the case of a public intermediary, official certification is necessary. The denomination of origin in the European Union (PGO / PGI) rest, for example, on an official certification by a third party. These polar forms of quality enforcement consumers co-exist for numerous products. It is therefore frequent that a company will use an official quality signal that rests both on the origin of the products and on the private commercial brand name.

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[5] One can alternatively think of a situation where there is a (perfect) complete contract between the owner of the quality signal and all other agents who can influence the products' quality.

3.2.2 Credibility and Governance of the Supply Chain: a Reduced Form Framework

The framework that we propose is a reduced form insofar as we consider that the choice of quality strategy is exogenous. In a more general model, the choice of quality strategy and the governance of the vertical chain are both endogenous variables that depend on external variables. This methodology is close to the one used by Williamson to study the choice of governance structures. In most parts of his analysis, the attributes of the transactions are considered to be exogenous variables used to predict the organizational choices from the alignment hypothesis between the attributes of the transactions and the governance structures. From figure 2, we now mainly focus on the relations between quality signals, contractual hazards and governance structures.

Figure 3: The reduced form framework
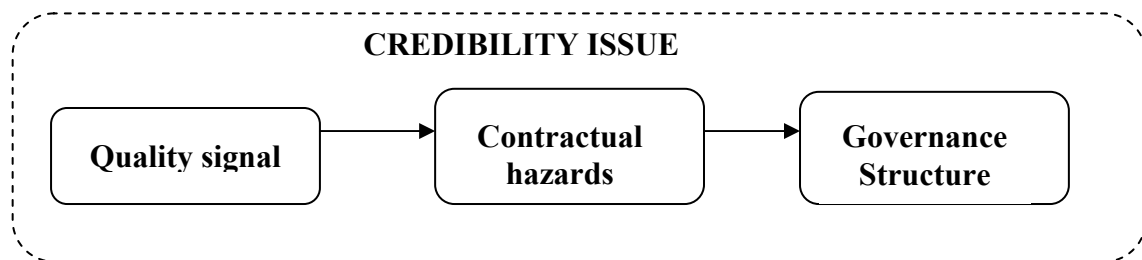
Why do study the relationship between product quality and governance of the vertical chain? Because, for many products, the quality of the final product sold under the quality signal greatly depends on different stages of the vertical chain. Several quality attributes signaled to the consumers (and so the credibility of the quality signal) depend on prior stages, from processors to, sometimes, farmers or input suppliers.

The general hypothesis is that the governance structures that are designed in the vertical chain try to guarantee the quality to the final consumer. The governance structures are therefore studied as a safeguard for the credibility of the quality signal. The reputation of the quality signal is a specific asset that procures a quasi rent for its owner (for example, in the form of a price premium for his products). The profitability of this asset (for example, the price premium) depends not only on the behavior of the owner but also on the behavior of the other agents in the vertical chain (suppliers and/or distributors). It may be necessary to adopt certain governance structures in the vertical chain that offer greater control over agents who strongly influence final quality. If the suppliers must satisfy certain specifications in order to be the supplier of the owner of the quality signal (for instance, specific characteristics of the raw material), these requirements may increase the degree of asset specificity.

The natural attributes of the technology and of the products also determine the nature and the intensity of the credibility problems. Certain products, such as fresh vegetables, are subject to strong climatic uncertainty that influences both the quality and the quantity of products available. They are also subject to strong perishability constraints. These different elements imply a strong uncertainty for the owner of the quality signal and some form of asset specificity (for instance temporal specificity as pointed out by Pirrong, 1993). The problems relating to supply management, to quality and quantity, would be different if the products are transformed and sold, for example, in cans.

The creation of a quality signal therefore modifies the attributes of the transactions. Asset specificity and the degree of uncertainty concerning quality are important factors but

are not the only ones. When a quality signal is used by several legally autonomous producers (for instance for PDO / PGI products), each individual producer has incentives to encourage the others to make the costly investments required to maintain quality while shading one's own effort to do so and free riding on the collective reputation. Each producer, being legally autonomous, is a residual claimant and tries to maximize the profits of his company. The individual behaviors toward profit maximization can have harmful effects on the other producers that use the same quality signal (see Lafontaine and Raynaud, 2001, for an application to franchising).

The creation of a quality signal leads to a modification of contractual hazards in the vertical chain (different intensity or a new type of hazards). The owner of the sign will therefore implement governance structures that can reduce contractual hazards (Furquim de Azevedo and dos Santos Silva, 1999, Hobbs and Young, 2000). The quality signal would then be considered credible if an efficient alignment exists between the governance of the vertical chain and the contractual hazards that arise from the strategic choices for a particular quality definition.

3.2.3 Some Preliminary Evidences in the Meat Sector

In the meat sector, the organizational forms varies greatly, from very decentralized to centralized organizational forms. A few preliminary comments may be done regarding the case studies. In some case, the decision holder is a chain organization (quoted chain org. in table 2), in some other case, the decision holder is an individual firm or a cooperative. In the first case, the quality signal used is mainly an official denomination or origin whereas the firms and cooperatives mainly use a private brand. We suggest that the main difference between organizational forms is to be found in the choice and span of authority instruments. While the chain organization relies mainly on the price system through a market governance of the S, S+ types (see table 2), private firms and cooperatives use more hierarchical means such as compulsory internal rules or direct control mechanisms implemented by formal contracts and / or vertical integration.

These preliminary investigations help to better understand the link between the choice of organizational forms (seen as multistage governance structures) and the way quality is managed along the chain. We suggest for instance that the dichotomy in two subgroups (centralized / decentralized organizational forms) reflects the use of dissimilar means of vertical coordination (market versus contract versus equity alliances or integration). Other determinants are also possible. For example the degree of quality variability may vary from one chain to another : the need for quality control and standardization is thus different. This is particularly relevant for a cross sector analysis. Future research will be conducted on incentive instruments for quality requirements. Different organizational forms will probably implement different incentive instruments. Whereas the price system is at the core of the decentralized form, more formal allocation of the quasi rent emerge in more centralized system of quality management (for instance through contractual provisions).

The impact of the institutional environment could also be taken into account. Williamson (1991) shows that the rules in the institutional environment will influence the choice of governance structures in modifying the level of transaction costs. In our analysis we put forward the idea that the choice of governance structure in the vertical chain of production is a means for the owner of the sign to control the quality of products at all the stages of this chain. Thus, when participants in the chain influence significantly the quality of products, the owner of the sign will rely on governance structures closest to vertical integration. But the institutional environment may influence this choice by imposing external

control mechanisms over participants in the chain (especially for official signs). Consequently the need for direct quality controls by the owner could be reduced. We put forward the hypothesis that the choice of a governance structure is closest to vertical integration when the only quality sign in the case study is a private brand, versus the case studies with simultaneously a private brand and an official sign.

This hypothesis in our population is confirmed in the processed meat sector. From this population, six case studies are chain organizations using an official quality signs, eight are cooperatives and unions of cooperatives using mainly private brands. Table 2 shows that the index of vertical control is higher in the first subgroup than in the second one. This give qualitative supports the previous hypothesis, at least in this population.

4. Concluding comments

The agrifood sector of many European countries are witnessing moves towards quality signaling and food safety issues. Based on several case studies, this article analyzes the consequence of these quality strategies on the governance of transactions in supply chains. It is shown that when an agent creates a quality signal whose value can be influenced by several other agents in the supply chains, he will design the governance of transactions in order to assure product quality and improve the credibility of his signal. We expect the governance of the supply chain to be aligned with characteristics of the quality signal. We develop a hypothesis linking the governance of the supply chains and the institutional environment and conduct a preliminary test which support the hypothesis.

From a more normative point of view, the study of mechanisms designed to safeguard quality in the supply chains can also be useful for antitrust evaluation, when some vertical restraints seem necessary. This raises the question of compatibility between specific contractual restraints and antitrust law (see Joskow, 2001 for an application of Transaction Cost Economics to this topic). One can suggest that, far from reducing competition, some restraints result from the search for an efficient alignment between contractual hazards and governance in a competitive context.

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ANNEX

DATA AND QUALITATIVE INFORMATION COLLECTED IN THE RESEARCH

Quantitative data and qualitative information have been collected at different levels. A first level gives information about the general environment (both competitive and institutional environments). This general environment defines the constraints and resources surrounding individual or collective strategies and actors (part A). A second level provides information about specific quality strategies and their organizational support through a case study research. Each case study research gives the main economic and institutional components of a strategy/structure interplay at a chain level (from input suppliers to retailers) (part B).

A- GENERAL ENVIRONMENT AND QUALITY STRATEGIES : A SURVEY

1- Industrial structure and institutional environment
The objective is to describe the diversity of competitive and institutional situations at hand in the three selected sectors, processed meat, cheese, fruit and vegetables. Specificities in market structure and vertical/horizontal organization of the agrofood chains, different historical backgrounds, specific institutional rules overarching the national agrifood sectors will lead to particular conditions that will influence the definition by actors within the chain of their quality strategies. In order to assess these specificities, some quantitative and qualitative indicators provides the main characteristics of this general environment.

2- Survey on the present quality systems and strategies developed in each national sectors
The aim is to identify general differences in the types of quality strategies developed in each country for the selected agri-food sectors. Divergences may result from shift in consumer behavior and their demand for information about food quality.

B- ORGANIZATIONAL FORMS, QUALITY STRATEGIES AND GOVERNANCE OF THE QUALITY SIGNS

The general objective of this part is to provide qualitative and quantitative indicators about governance structures supporting different types of quality strategies. A set of variables deal with the general characteristics of the quality signs and performance. Then the organization of control along the supply chain is surveyed, mainly on a qualitative basis. Finally, the organizational modes supporting these strategies are define through a common grid. This grid is based on Willimason's typology of governance structures (market, hybrid and hierarchy) used with some adaptations, considering the fact that our case studies implement multistage governance structures.

1- General characteristics of the quality signal (date of creation, information delivered to consumers, quality specification, etc.),
2- Performance of the quality sign (market share, price trends, reputation, etc.),
3- Organization of quality control in the supply chain (frequency of controls, who controls what),
4- Contractual relations in the chain and governance of the quality sign (type of bilateral governance structures in the chain, price / quantity determination, etc.)