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The Governance of Quality: The Case of the Agrifood Brand Names

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Abstract

This paper argues that the governance mechanism is essential for promoting end product quality. Hierarchy facilitates conformance quality but decreases efficiency in terms of incentives. One incentive-enhancing solution might be to move from a hierarchy towards more market-oriented organizational forms. This would solve the problem because, as residual claimants appear along the value chain, they automatically balance both quantity and quality to maximize their residual income. However, such hybrid solutions hinder

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conformance quality because they do not achieve such efficient coordination as hierarchy. The governance mechanism must therefore be complemented by a set of safeguards designed to improve coordination amongst the parties. Resulting mechanism of governance is more complex but it is also more useful for promoting high quality. We find empirical evidence in a set of international cases of quality brand names. First, we observe that more market-oriented governance mechanisms employ more quality controls to improve coordination than hierarchies. Second, both geographical indicators and quasi-integrations present a larger average price premium than hierarchies.

Key words:

Quality; brand name; mechanisms of governance; safeguards; agrifood.

JEL codes: D23, L14, L15, Q13

THE GOVERNANCE OF QUALITY: THE CASE OF AGRIFOOD BRAND NAMES

1. INTRODUCTION

Economic and business literature has extensively analyzed the quality problem related to asymmetric information between the producer and the consumer and how it is solved in classic market transactions (Akerlof 1970; Klein and Leffler, 1981; Shapiro 1983; Allen 1984; Milgrom and Roberts 1986; Tirole 1988; Hörner 2002; Kranton 2003 and Noll 2004). These models, however, only consider two independent parties in which one buys (the consumer) and the other sells (the producer). They do not consider what is beyond the seller, *i.e.* how brand name owners organize the vertical chain for yielding a quality end product. This is a serious drawback because the final quality of most products, especially agrifood products, largely depends on decisions made by suppliers and/or distributors at various stages of the vertical chain. Incentive systems, monitoring devices and different organizational forms affect the behavior of economic agents in these chains and, ultimately, final quality.

The aim of this paper is to explore how governance affects quality. We analyze how different mechanisms of governance, such as hierarchy, quasi-integration and geographical indicators, affect the quality of the end product.¹ Our argument is that the governance mechanism is essential for promoting final product quality. Hierarchy performs good conformance quality because it easily coordinates activities, but it reduces performance incentives because it is costly to replicate the high-powered incentives of the market within the firm. If we change towards hybrid forms as a solution to this problem, the incentive system effectively

¹ In 1992, the European Union created systems known as Protected Denomination of Origin (PDO) and Protected Geographical Indicator (PGI) to promote and protect food products. They continued and harmonized several EU members' laws and traditions which were anchored in their legislation long time ago. A PDO covers the term used to describe foodstuffs that are produced, prepared and processed in a given geographical area using recognized know-how (for instance Champagne). In the case of the PGI, the geographical link must occur in at least one of the stages of production, processing or preparation. We label both systems as Geographical Indicators. As we will develop later on, these labelling systems rest on particular governance structure. See Castillo (2002), and Bureau and Valceschini (2003). Although this kind of organization is hardly important in the US, it is important in the agrifood sector in the EU. Currently 700 products are registered as PDO or PGI and many more are pending registration (European Communities 2006).

improves because several residual claimants share the value chain. They balance both quantity and design quality to maximize added value from the consumer point of view. However, hybrid solutions hinder conformance quality because they do not achieve such efficient coordination as hierarchy. Consequently, the governance mechanism must be complemented by a set of safeguards designed to improve coordination amongst the parties.²

Foodstuffs have been selected as the main sector for our analysis for several reasons. First, the agrifood sector, especially fresh food products, is characterized by the natural variability and heterogeneity of raw products that result in uncertainty for consumers about product quality. This leads to a sequential interdependence of stages, according to Thompson's terminology (1967:54). Second, several crises (such as "mad cow disease" or bird flu) have damaged consumer confidence. Not only have these triggered new reflections on product quality regulations (Law and Libecap 2003), but they have forced many firms to look for devices to improve their product quality and restore confidence. They need to understand how the governance mechanism they are using interacts with quality. Third, we observed a shift from price-based competition among firms to more quality-based competition in most agrifood sectors in developed countries.

There are two important precedents to this paper. First, Nicholas Economides (1999) offers an attempt at explaining the relationship between the governance mechanism and quality but he considers companies as monopolies. He theoretically demonstrates that disintegrated monopolists will provide products of lower quality than a single integrated monopolist. However, he does not explain what will change in other market structures. The second attempt comes from Steven Michael (2000, 2002). This is a closer approach, but he focuses on a particular, hybrid mechanism of governance —franchising. He observes that *i*) higher-quality outlets are more likely to be integrated (2000), and *ii*) it is more difficult for franchise chains to coordinate the marketing mix (price, advertising and quality) than for corporate chains (2002). He explains his findings using the different incentives yielded by each mechanism of governance. Franchisees have high-powered motivations to exert effort but are perversely motivated to coordinate each other's efforts. We consider that this argument may also be applied to more general situations.

² James (2000) also argues that transactions can be organized in two part decision-making. First it is chosen the mechanism of governance and then the specific characteristics of the contract.

This paper is organized as follows. First, we describe quality as a measurement problem and study the intensity and types of quality. Second, we describe the role of the governance mechanism in both motivation and coordination. Third, we analyze the influence of the form of governance (hierarchy, quasi-integration and geographical indicators) on quality by emphasizing additional problems that may affect quality as perceived by consumers (externalities and common-pool resource allocation). Fourth, we explain the methodology. Fifth, we describe in detail the cases used to test our research propositions, we show how brand name organization must be adapted to offer high-quality products, and we offer a first attempt to assess quality differences among types of organization. Finally, we conclude.

2. QUALITY ASSESSMENT AS A MEASUREMENT PROBLEM

Measurement problems arise because it is costly to obtain accurate information on product characteristics (Barzel 1982; Foss 1996) and such information asymmetries give rise to uncertainty concerning performance of the contractual obligations. Quality-related contractual hazards may be considered a particular situation of measurement problems. Given that information is not symmetrically allocated among transactors for different reasons (knowledge, expertise, opportunity cost of time, natural skills, etc.), less-informed parties should bear search and information costs to mitigate this disadvantage. Otherwise opportunistic sellers may take advantage of their informational advantage typically, in our context, by decreasing quality. Akerlof (1970) showed throughout the used automobile market that this is a classic marketing problem because the seller usually has more information about the product than the buyer.³ This problem may even prevent profitable transactions from taking place and thus reduce total surplus in the transaction.

Consumers usually consider two different dimensions when assessing quality (Juran, 1989): the average or expected quality of a producer or brand and the deviation of each product within a brand from that average value. The former refers to qualities consumers may notice in the different attributes that form the product and the way they value them (Ishikawa 1985). This is often called “subjective” or “design” quality and is

³ According to Barzel (1982), “Virtually, no commodities offer for sale is free from the costs of measuring its attributes” (p. 28).

related to the degree to which the attributes satisfy the customer's preferences. They are usually the more limited and difficult-to-obtain attributes, at least among regular or experienced consumers. This means that each company should look for the attributes that are most highly valued by consumers and find the way to offer these. The second quality dimension refers to homogeneity amongst products from the same producer, or under the same brand. This is related to the degree to which the pre-established design conditions are observed and is often called "objective" or "conformance" quality. It refers to the exact replication of the production process to avoid variance in the product attributes (Crosby 1979:15).

3. THE ROLE OF MECHANISMS OF GOVERNANCE

In view of the potential loss of trade gains and total surplus due to measurement costs, parties have incentives to mitigate these transaction (measurement) costs by investing resources in safeguards and governance mechanisms (Williamson 1991, 1996). This can be done in two ways.⁴ First, they try to facilitate the measurement of product attributes and the disclosure of hidden information. They may use mechanisms such as grading systems and standards, specialists in quality assessment, homogeneous and standardized inputs, etc.⁵ Second, they may seek to create situations in which the informed party has no interest in taking advantage of her private information. They may use a very broad set of mechanisms whose main aim is to align the interests of all parties. Investment in developing reputational capital (brand name) to be employed as a hostage for fair behavior is probably the most well-known solution (Klein and Leffler 1981 and Shapiro 1983) but is not the only one.

Given that final quality relies heavily on decisions made by suppliers and/or distributors at various stages of the vertical chain for most final products, the mechanisms governing the production process affect product quality. They determine both coordination and individuals' motivation along the vertical chain and the parties' interest in achieving quality. Transaction Cost Economics, and particularly Williamson (1991), argues that mechanisms of governance are

⁴ This simplified way of clustering quality solutions is taken from Milgrom and Roberts (1992).

⁵ The ISO system of quality normalization and certification is an example of such device (see Guler *et al.*, 2004).

chosen according to their economizing capacity on transaction costs given a particular context.⁶ This capacity depends basically on their coordination and incentive competences, which must be considered as relevant factors in the choice of a governance mechanism. Choice of the appropriate mechanism of governance is a tool which the owner of the brand name may manipulate to reduce the chances that wrong or “bad” products reach end consumers.

3.1. Coordination

According to standard economic theory, the most efficient coordination mechanism is the market, i.e. the price mechanism. Adam Smith’s invisible hand organizes the division of labor and the exchange of resources in such a way that they end up under the control of the agent who valued them highest. Williamson (1991) calls this adaptation among agents “autonomy” because each agent decides (on prices) without taking into account the other agents’ decisions. However, there is another type of adaptation within the firm (Chandler’s visible hand) that takes into account other information to achieve coordination among decisions taken by individuals within the firm (Chandler 1977). For example, if a multi-farm firm is offering high-quality meat under its brand name, it makes no sense for one farm to unilaterally change to a poorer-performing, but cheaper breed. Given that breed defines many of the quality features of the end product, such a change would reduce the homogeneity of the product sold under the same brand and de-value it. Williamson (1991) defines this adaptation as “cooperation”. The added value of the end product depends on perfect cooperation among all individuals related to the firm. If they were to react separately, there would be less added value because of the heterogeneity and variability of the end product from the consumer perspective.

Thompson (1967:54-56) emphasized the importance of coordination to both guarantee adequate performance of the organization and avoid jeopardizing the total organization. It seems reasonable to extend this argument to promote high quality (Gitell 2002). One of the most common problems in foodstuffs is product heterogeneity, especially in fresh products. This mainly affects conformance quality and reduces the consumers’ perception of the product because it causes uncertainty about the real quality of their purchases. Consequently, if the mechanisms that improve coordination reduce the heterogeneity, it follows that coordination will also improve

⁶ See Shane (2001) and Nickerson and Silverman (2003) for empirical analysis stressing the effects of governance decision on firms’ performances.

perceived quality, especially conformance quality. These aspects were not traditionally a concern in the agrifood sector, being more typical of industrial products. However, the success of products considered to be of low quality but very homogeneous—such as hamburgers and sausages—shows the importance that the consumer of foodstuffs gives to product homogeneity, regardless of their organoleptic attributes.

Coordination within the firm is costly. It is not an automatic process directed by the invisible hand. On the contrary, managers, owners or directors have to plan and design internal organization to solve the same problems as the market does through the price system (Chandler 1977; Jensen and Meckling 1992; Brickley et al. 2001:262-267; and Vazquez 2004). Firms must also ensure that decision-makers manage the right information. This is the managerial task of internal organization by itself. For example, if end consumers value tenderness and taste, and natural feeding of the calf is essential for both these attributes, then this information should be given to each local worker who feeds animals so that they do not use other products. Milgrom and Roberts (1992:91-92) define this type of adaptation as design problems. They are characterised by *i*) the existence of much *ex ante* information about the optimal solution, and *ii*) failing to reach the optimum means the greatest loss of value. Design problems are the most important for conformance quality.

3.2. Motivation

Coordination alone is insufficient and it is necessary for individuals to be motivated to produce high-quality output. Coordination places the right information at the decision-maker's disposal but the latter should also be interested in taking the right decisions, the ones that add most value. This is the motivation task: ensuring that individuals are also interested in making the most value-added decisions. Agency Theory suggests that this should be solved by aligning the interests of the different parties (Jensen and Meckling 1976; Baker et al. 1988; Milgrom and Roberts 1992). So, in order to promote quality, individuals should find a situation in which all of them are better off when the targeted quality is reached. Linking compensation to an estimator of quality seems the logical solution, as an analogy to an incentive scheme promoting quantity.

However, incentive theory suggests that incentives for quality should not be very high-powered (Milgrom and Roberts 1992:214-239), which may explain why empirical research does not often observe explicit incentives for promoting quality (Jelovac and Macho-Stadler 2002). The reason is threefold. First, quality is usually costly to measure (Barzel 1982) and noise would

be introduced in workers' wages if they were linked to an estimator of quality. Such a variance in wages is costly for risk-averse agents. This limits the use of explicit incentive systems in which performance is directly related to an estimator of quality.

Second, the relationship between quality improvements and incremental benefits is not always clear. For example, in piece-rate payment, each marginal piece is valued at a pre-determined rate, say, 100€ Assume that the firm is the price-taker. It knows the incremental benefits of each additional piece because it knows the market price. However, a quality-rate payment would require a highly-standardized product or a very well-defined quality scale (e.g. commodities as steel, corn, etc.) because, otherwise, the company would not know the incremental benefits of a quality improvement. This is true for both design and conformance quality. It is not easy to estimate how consumers value homogeneity or improvements in products attributes, especially for non-commodities. A very high-quality steak may be not valued by consumers because they are unable to perceive its attributes. This is a typical situation in the agrifood industry, where high organoleptic attributes are not easy to perceive for regular consumers. Consequently, quality is valued only if firms are also able to credibly signal the attributes toward target consumers.

Third, providing incentives for quality is more complex when there is a trade-off with, for instance, quantity. According to the multi-tasks agency model, the design of incentive contracts is more difficult when several tasks have to be promoted (Holmström and Milgrom 1991, Milgrom and Roberts 1992). If efforts toward output quantity and quality are substitutes (which seems reasonable), the incentives for agents should be "balanced" in order to avoid the allocation of effort toward only one of the two tasks. Given that measurement costs for quantity are usually lower than for quality, a "quantity-purpose incentive system" would be most appropriate.

Alternatively, market relationship between parties would partially solve these incentive problems, allowing quality to be promoted. This is because prices automatically balance quantity and quality in each transaction between two independent agents belonging to the vertical chain. They, as residual claimant, have the optimal incentives to decide the combination of quantity and quality that maximize their residual income. There is an automatic adjustment to client preferences and it is not distorted by any *ex ante* incentives schema. This may be a reason to move from hierarchy to another mechanism of governance more market-oriented.

4. MECHANISMS OF GOVERNANCE AND THEIR EFFECTS ON QUALITY

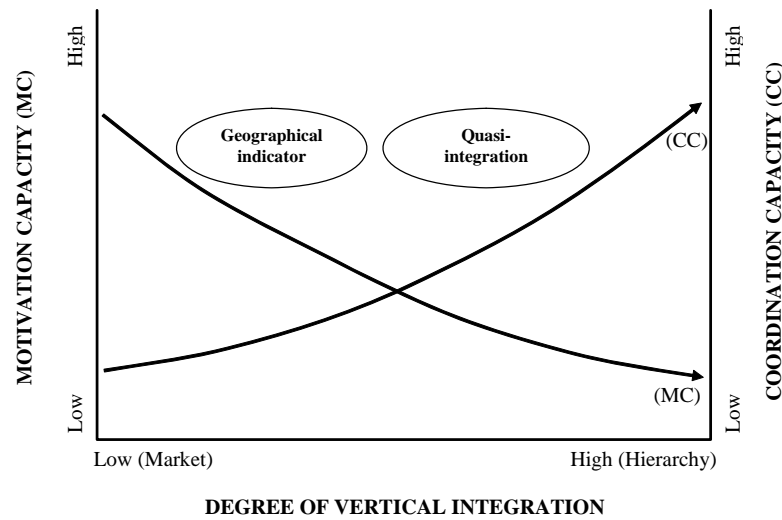
Each governance mechanism offers different features regarding coordination and motivation. We now analyse how these features affect quality.

4.1. The Hierarchy as a Reference

The hierarchy is always the reference mechanism of governance in organizational studies.⁷ Williamson (1991) argues that hierarchy facilitates the adaptation process when the needs for coordinated investments and for uncontested coordinated realignments are frequent and significant. This is similar to the statement made by Milgrom and Roberts (1992:88-119) that hierarchy performs better for coordination problems with design attributes. This justifies the shape of the coordination capacity curve (CC) in Figure 1. The reason is that fiat, the typical coordination device in a hierarchy, facilitates this type of cooperative adaptation relative to the market, in which costs and delays may arise due to different readings and reactions to signals by agents. Given that the quality of the end product depends on the right actions being taken by all the agents along the vertical chain (sequential interdependence), this type of adaptation seems essential for achieving homogeneous products (conformance quality). Hierarchy seems the most suitable governance mechanisms for producing conformance quality.

⁷ See, for example, Barnard (1938), Thompson (1967), Williamson (1996) and Kogut and Zander (1996).

Figure 1. Mechanisms of Governance, Coordination and Motivation Capacity



However, as pointed out by Williamson (1985, 1991), the benefits of hierarchy or, rather, deliberate coordination comes at the cost of lower incentives, at least from a theoretical point of view. This is because administrative controls and direct supervision, the typical control mechanism within hierarchy, do not create such high-powered incentives as markets do. Hierarchy may introduce high-powered incentives but it is not able to imitate the incentive intensity that creates compensation with the residual claim (including the right to transfer the position of the residual claimant) (Alchian and Demsetz 1972). Additionally, labour laws and unions usually restrict firing decisions within a firm, which also reduces the disciplinary capacity of dismissals. This explains the decreasing shape of the motivation curve (MC) in Figure 1.

4.2. Quasi-integration

Hybrid forms are intermediate mechanisms of governance between market and hierarchies. In other words, hybrids are organizations that are neither market nor hierarchies (Menard 2004). Their main advantage is that they share features of both, so they perform pretty well in both coordination and motivation aspects (Williamson 1991). Quasi-integration is a hybrid form featured by the legal disintegration of the hierarchy in which several independent companies share out the activities of the value chain. While one company usually specializes in retailing, developing a reputation and brand name, the others focus more on production activities. However, their independence is more formal than economic because all the companies establish a

long-term relationship that allows them to work in a similar way to a hierarchy.⁸ This has been called a *quasi-firm* in some situations (Eccles 1981) and it allows market motivation without losing the coordination capacity of a hierarchy (See Figure 1).

Its drawback is the misalignment of interests that is created by the introduction of several legally-independent decision-makers. The existence of several independent companies along the value chain also creates several residual claimants with their own objectives and the resulting sub-coordination. Franchising is a good example that has been discussed frequently in the literature. It is the franchisees' residual claimant status that generates the tendency of franchisees to maximize their own profit at the expense of the overall chain (Lafontaine and Raynaud 2002). The issue, in essence, is one of externality: the franchisee bears the full cost of maintaining high quality in his outlet, but the benefit of his behavior accrues not only to him in the form of high outlet sales, but also to all others in the chain as well as to the franchisor as high quality in each outlet leads to higher sales overall in the chain. This forces the introduction of safeguards that restrain opportunism on quality in franchise chains. Quasi-integration is not very different.

Unlike hierarchy, quasi-integration needs safeguards to improve coordination in the value chain. This is achieved by devices such as long-term relationships and careful, repeated selection of subcontractors and suppliers. On the one hand, quality is more easily appraised in the long run, particularly for credence and experience attributes (Nelson 1970; Darby and Karni 1973). Quality problems usually arise when the end product is used or consumed much later (e.g. the effect of clenbuterol on human health). If the relationship still exists when the problems appear, the supplier receives feedback to solve the problems and may accept responsibility for the mistake. On the other hand, by selecting and working with the same suppliers, it is easier to develop similar coordination-enhancing routines to those developed in hierarchies. This resolves coordination problems, reduces many transaction costs and improves product homogeneity.

⁸ Quasi-integration is based here more on the duration and interaction of the transaction, as in Blois (1972) and Dietrich (1994), than on asset ownership, as in Monteverde and Teece (1982), and Masten, Meehan, and Snyder (1989). However, both refer to the hybrid form in Williamson typology (1991).

4.3. Geographical Indicators as Second-Level Mechanisms of Governance

Geographical indicators are a type of public brand name with a peculiar structure. We consider them as second-level mechanisms of governance. This idea is a generalization of James's (2000) argument of two part decision-making framework in the labor relationship. He argues that the first choice is the type of governance (hierarchy) and the second choice is regarding the specific characteristics of the contract (type of incentive system). In our case, geographical indicators (first choice) always complement other private brand names which have their own mechanisms of governance (second choice). We have placed this hybrid form (see Figure 1) closer to the market than quasi-integration because relationships among the economic agents do not require any degree of integration. In fact, the geographical indicators only establish the general "rules of game" for the brand, allowing the individual economic agents to operate by joining supply chains and using their own brand name in combination with the geographical indicator brand name (co-branding).⁹

The peculiarity of using this type of brand name is that they face the quality problem of collective decision-making, which is not present in either hierarchy or quasi-integration. A geographical name may become associated with distinctive features of a product (wine, cheese, meat, etc.) because of the product quality or because particular geographical conditions (humidity, temperature, soil, etc.) facilitate distinctive features that are valued by consumers. This develops through the ages a reputational capital associated with the area or place of origin.¹⁰ Producers and other related agents are therefore keen to use this name to signal some distinctive features to consumers.

Geographical indicators, as legal entities, may be understood a solution to a problem of externalities. Once the reputational capital has been developed for a particular geographical name, individual producers may find it optimal to reduce their quality. This issue of free-riding is similar to the one in franchising. Additionally, other producers may use this geographical name

⁹ See Blackett and Boad (1999) for an extensive overview on this topic, Saunders and Guoqun (1997) for an application to the food (confectionery) market, and Landon and Smith (1998) for the Bordeaux wine market. A review of the empirical findings on co-branding and an analysis of the different strategies of co-branding, based on the nature of the complementarity and the co-brand target market can be found in Leuthesser, Kohli and Suri (2003).

¹⁰ Consumers are ready to pay a premium for such products. See Loureiro and McCluskey (2000) for an empirical analysis of the Spanish beef market.

in their products even though they do not offer the same distinctive features nor produce accordingly to the “traditional” (and more costly) local specifications. This opportunistic behavior may destroy the reputational capital of the geographical names as the property rights on the local goodwill are in the public domain (Barzel 1989). The organizational solution proposed, mainly in Europe, was to allocate the property rights of the geographical name to the local or national government, which usually delegates the control to a committee in which all parties of the vertical chain are represented.¹¹ Therefore, the geographical indicator, acting as an independent legal entity, functions in a similar way to a cooperative because all parties vote in the decision-making process.

This “participative” internal organization creates an additional problem. The geographical label does not or, rather, cannot belong to individual firms but may be used by all firms within a vertical chain located in a specific area. This means that it is governed by a set of representatives, or agents, of each step of the vertical chain involved (e.g. farmers, slaughterhouses, dealers). Firms’ interests and objectives clearly differ within and between steps, and this may create conflicts. This raises the problem of the collective decision-making process. The classical fiat decision rule of a hierarchy is substituted by a “democratic” decision rule in which majorities win the right to make the decision. For instance, any proposals to modify the quality specifications of the product sold under a particular geographical indicator need the approval of a majority of representatives. Delays or failure to implement the proposal may result. As it is well-known from studies of common-pool resources, multilateral negotiations are costly, long and it is sometimes impossible to reach a decision approved by all members (see Wiggins and Libecap 1985, for examples in the oil industry). The problem is not the fact that geographical indicators are owned by the State but that several (heterogeneous and potentially opportunistic) agents have collective decision rights on use of the brand.¹²

¹¹ For instance, Geographical Indicators in France are owned by the Ministry of Agriculture whereas, in Spain, they belong to regional governments.

¹² This public ownership of geographical indicators may create a second additional problem that is out of the scope of this paper: the politicians’ motivation. Politicians play the role of the entrepreneur but without earning the residual income. This may mitigate their incentives to closely monitor quality and, instead, they may favor loose definition and control of quality in order to gain political support.

Given that producers are collectively interested in punishing those who do not abide by the quality standards, the initial solution is to improve coordination is to establish quality controls, usually based on inspection and grading of the products by independent supervisors or auditors (the State or authorized private auditing firms). This quality control reduces heterogeneity and protects the value of the geographic name from damage, enhancing the investments made by the associated producers in their own brand names (Fernández-Barcala and González-Díaz 2006). The problem is usually the independence of the supervisor. Since geographical indicators share some features with cooperatives, the supervisor is usually nominated by a council in which producers are in the majority. This reduces the effectiveness of the control.

4.4. Summary and Research Propositions

We maintain that there is a trade-off between coordination and motivation to efficiently solve quality concerns. Coordination is essential for offering good conformance quality, and motivation and initiative are essential for both conformance and design quality. Coordination problems are better solved by a hierarchy and motivation problems are better solved through either hybrid forms or markets. Then, our first research proposition is that, when we move from hierarchy to more market-oriented solutions to improve the motivation of agents along the vertical chain, more coordination-oriented safeguards should be introduced to compensate for the lower coordination performance of the new governance mechanism.

We also state, as a second research proposition, that this movement (more market-oriented mechanisms of governance complemented by coordination devices) yields to a more complex governance of quality but also generates an organizational form more suitable to produce high quality. The reason is, as stated above, that high quality products require both motivation and coordination. However, the former is very costly to obtain within a hierarchy because it is difficult to find the appropriate quality-enhancing estimator to develop an explicit incentive system. On the contrary, successive and overlapped quality devices introduced in more market-oriented solution almost equals the coordination performance of hierarchy.

5. METHODOLOGY

We used a case study research approach, following the model of Eisenhardt (1989:533). This is a valid approach and an appropriate tool, especially when we do not fully understand the problem (Coase 1972; Eisenhardt 1989; Yin 2003), as when we try to explain factors determining the relationship between quality safeguards and mechanisms of governance. Additionally, the literature contains hardly any theoretical transaction cost arguments about how brand names solve contractual hazards. These two considerations lead us to formulate *research propositions* instead of hypotheses based on consolidated theories because these do not exist.

The advantage of case analysis is that it allows us to understand small details that might explain the situation. However, the paradox is that, only if you have a large number of cases can you draw statistical conclusions; but, with a large number of cases, there are so many small details that it becomes very difficult to focus on the conclusions. We therefore tried to reach a mix solution by triangulating our twelve cases to check whether what we observe in a particular case can also be found in others.¹³

Regarding case selection, we followed case study methodology (Eisenhardt, 1989:533), selecting only theoretically useful cases. We set two requirements: a) they had to help provide a broad overview of the meat sector, and b) they had to involve well-known brand names. Thus, our research refers to different meat products produced in six EU countries (France, Germany, Greece, Italy, Spain and the United Kingdom). This heterogeneity partially guarantees that neither the product nor the country bias conclusions on quality governance.

Case information was obtained from different sources. First, various kinds of secondary information (government statistics, industry reports, etc.) were collected in order to understand the structure of the industry and to assess the economic importance of the selected brand names. Second, the owners of each brand name were interviewed following a semi-structured survey on quality control, coordination mechanisms and brand name performance. We focused on owners because they had more information about the brand name than any other economic agent in the supply chain. Another set of interviews was conducted with the main suppliers, clients and

¹³ See more details about this triangulation technique in Easterby-Smith & Lowe, 1991.

quality controllers to check the owner information and to find out their problems and complaints. All the interviews took place from September 1999 to January 2001 in different towns and villages of France, Germany, Greece, Italy, Spain and UK. Interviews were conducted by local researchers who were previously trained in several coordination meetings. All this information was summarized in a report for each case based on a common structure. Despite great coordination efforts, it was difficult to obtain homogeneous data and it was necessary to frequently refer back to the owners to complete the data in the reports.

6. CASE ANALYSIS

6.1. An overview of the meat industry supply chain

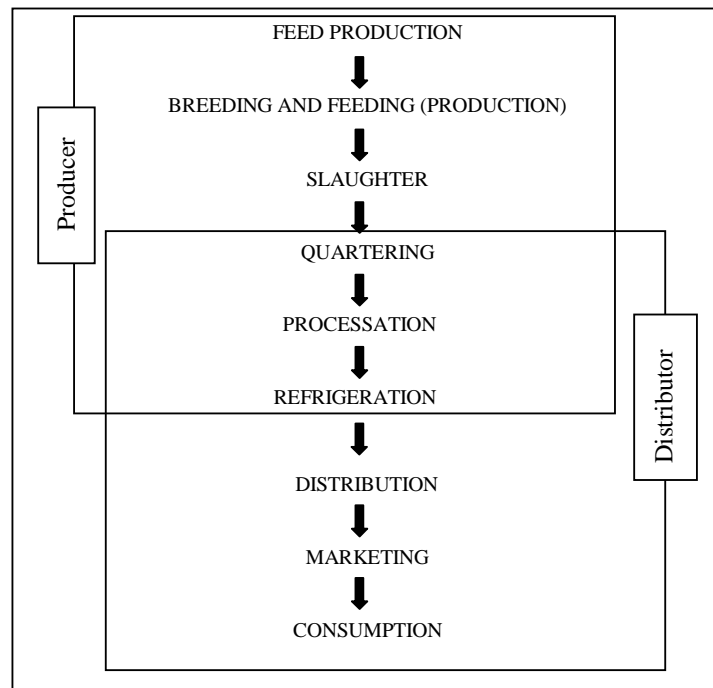
The production process of meat begins with the breeding of the different animal species and breeds, which are fed in farming enterprises until they reach the appropriate slaughter age for the species, breed and type of meat. After slaughtering in authorized slaughterhouses, the resulting carcass, is quartered and aged or ripened until the product has reached its optimum point of maturity. For fresh meat, the distributors carry out the final cutting and packaging. Processed meat is first processed in factories then distributed to the market. Figure 2 represents the different phases in the meat supply chain.

The aging period and the breed are probably the most important factors determining the organoleptic characteristics of fresh meat. According to some studies, the characteristic that consumers value most and that most determines future purchases is tenderness (Barton-Gade et al. 1988; Monin 1991 and Love 1994). Studies have shown that taste depends more on the aging period than on the breed. In fact, tasters do not appreciate differences among breeds when aging periods are long enough (more than 21 days).¹⁴ However, breed significantly affects tenderness in short aging periods. Color is another highly-valued characteristic for beef (Barton-Gade et al. 1988; Monin 1991) and breed is probably the main factor determining color. The problem is that there is no clear color preference: in France, red meat is higher valued than in Spain, where pink

¹⁴ See Campo *et al.* (1999, p. 387).

meat is associated with tender, fresh, natural meat.¹⁵ For processed meat, the production process is a key element in determining the organoleptic characteristics as, for example, in curing ham.

Figure 2: Supply Chain for fresh and processed meat



6.2. Description of Cases

We have stated that, when moving from hierarchy to more market-oriented solutions, more coordination safeguards should be introduced to compensate for the lower coordination performance of the new mechanism of governance. Consequently, the first step for checking this research proposition is to identify the governance mechanism used. We classified all cases in three categories. The criterion followed was, first, if all steps in the supply chain are taken by the same firm, we refer to this as integration or hierarchy. Second, when an organization (firm, cooperative or association of producers) is singly responsible for an important part of the supply chain but not all of it, we refer to this as quasi-integration. Third, when a company sells its product with the legal backing and prestige of a specific geographical area and/or production

¹⁵ See Fernández (1991) and Sañudo *et al.* (1999). According to these studies, the belief that older animals have more red meat is inaccurate.

method related to superior product quality, we refer to these brands as “geographical indicators” (PGI and PDO are the prime examples). This governance mechanism is more complex because it includes an additional organizational level —the public organization that supervises the geographical indicator. The cases studied are classified in the following section. Table 1 summarizes this variable.

Table 1. Case studies

Brand name	Product	Owner	Country	Mechanism of governance	Price Premium	Quality Dimension Emphasized
CAG (Melero and Palomeras 2000)	Varied meat products (pork, poultry, beef, lamb, rabbit...)	Cooperative Agropecuaria de Guissona for cattle breeding; Corporación Alimentaria de Guissona for the other activities	Spain	Hierarchy	No	Homogeneity
Creta Farm (Pantelidou 2000)	Sausages	Creta Farm (private firm)	Greece	Hierarchy	5%	Homogeneity
Vi.k.i (Notta, Pantelidou, and Vlachvei 2001)	Sausages	Vi.k.i (private firm)	Greece	Hierarchy	No	Homogeneity
Eichenhof (Kagerhuber 2000)	Beef and pork	Ego (cooperative)	Germany	Quasi-Integration	100%	Design
Filiere Qualite Carrefour (Mazé 2000)	Beef	Carrefour (private firm)	France	Quasi-Integration	10%	Homogeneity
Montana Fresco (Boccaletti 2000)	Beef and Veal	Inalca (private firm)	Italy	Quasi-Integration	20-30%	Design
Stolle (Kagerhuber 2001)	Chicken	Stolle (private firm)	Germany	Quasi-Integration	8% (green-land chicken)	Homogeneity
Prosciutto di Parma (Boccaletti 2001)	Ham	Consorzio del Prosciutto di Parma (association of ham producers)	Italy	Geographical Indicator	30%	Design
Specially Selected Scotch Beef (Valli and Loader 2001)	Beef	Scotch Quality Beef and Lamb Association	United Kingdom	Geographical Indicator	10% (PGI)	Design
Ternera Asturiana (Fernández-Barcala and González-Díaz 2000)	Beef	Spanish Ministry of Agriculture (PGI)	Spain	Geographical Indicator	39-62%	Design
Volaille de Challans (Raynaud 2000)	Chicken	The SYLAC (Syndicat des Labels Avicoles de Challans en Vendée) quality group	France	Geographical Indicator	80%	Design

Table 1 also includes other relevant features in each case based on careful tabulation of the information gathered. Following Aaker (1996:107), we consider the price premium to be a “reasonable summary of the strength of the brand”. We therefore chose this variable as the indicator of the company’s market success. We calculate the price premium by comparing the price of a substitute product—one without a well-known brand or sold in bulk—with the price of the selected brand. We repeat this calculation for each of the three biggest supermarkets in the area. Finally, we decided on the quality dimension that is emphasized in each case. This decision was based on the interviewer’s perception regarding a number of items, such as process industrialization, differentiation of the product’s organoleptic attributes and the quantity and intensity of controls (in both the deviation of each unit from the standards and the elimination of products with the lowest organoleptic attributes).

6.3. Mechanisms of Governance

Hierarchy

Figure 3 and Figure 4 summarize the vertical chains of cases organized as a hierarchy. Vi.k.i is a company which started out as a meat processor. Later it entered different stages of the vertical chain. First, it created one of the biggest pig farms (Vi.k.i Farm) in Epirus (Greece); second, it created a plant for specialized animal feed production (Laky), basically for supplying Vi.k.i Farm; and finally, it set up a large fleet of refrigerated trucks for proper transport and delivery. The company also owns two large distribution centers in Athens and Thessalonica. Consequently, only retail distribution and part of the fattening process are outsourced. Regarding the former, Vi.k.i. has signed exclusive agreements for special collaboration with 28 representatives, 14 supermarkets and several foreign representatives in Albania and Germany. Fattening is been subcontracted to about 30 firms when the company’s capacity is insufficient for producing the required quantities. These pig farmers have cooperated with Vi.k.i. for many years, on the basis of detailed contracts. Furthermore, Vi.k.i. provides them with selected sows for reproduction. We consider this organization to be very close to a hierarchy.

Figure 3: Hierarchy at Vi.k.i and Creta Farm

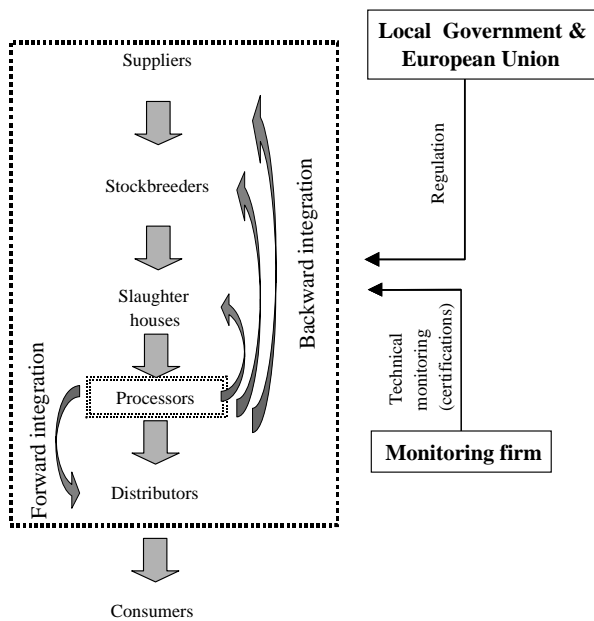
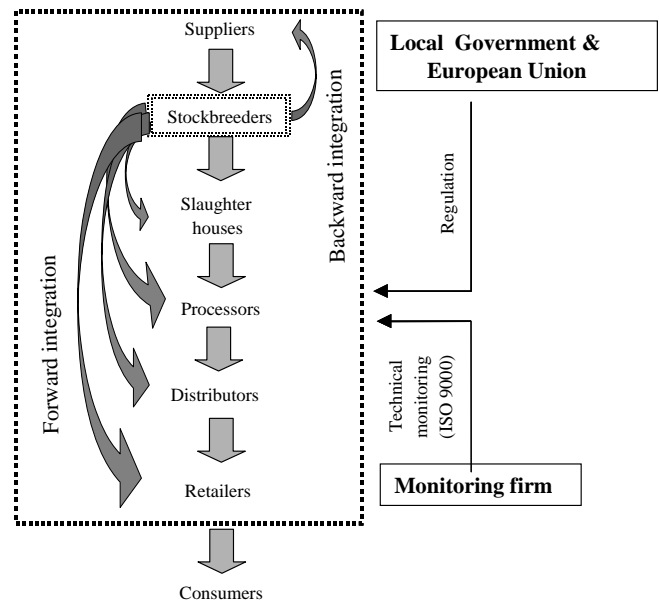


Figure 4: Hierarchy at CAG



Creta Farm is organised in a very similar way. Every stage in the supply chain is integrated, except for distribution and part of pig farming process, whenever the firm is not able to produce the required quantities (outsourced pig production was 33% in 1998).

CAG is also a company with a high degree of vertical integration and it also actively participates in the whole production process. The main difference is probably that CAG was initially a farmers' cooperative which moved on to become involved in all the production stages for different types of fresh meat. Today the cooperative partners produce feeds and reproduce and breed the livestock, following CAG's procedures and directions. Although these are its main areas of competence (specially fodder production and livestock breeding), the company also fattens young animals, slaughters them in its own slaughterhouses and obtain, after a transformation process in the company facilities, different meat products (fresh and processed) for distribution and sale through its franchised network of stores (BonÁrea). The latter represents an important novelty because franchising is unusual for butcheries. ¹⁶

¹⁶ In 1999, 116 outlets were franchises out of 124 and. The 2006 figures are 265 out of 273 (www.tormo.com, accessed on May 8th).

Quasi-integration

Figure 5 and Figure 6 summarize the organization of vertical chains as quasi-integration. We distinguished between two situations: a supply chain led by a distributor (Filière Qualité Carrefour), and another led by a slaughtering industry (Montana Fresco). The remaining supply chains are similar. The main difference relating to the mechanism of governance is the stage in the supply chain that is occupied by the leader: production, slaughtering or distribution.

Carrefour, originally a retailer in the supply chain, decided to backward quasi-integrate other stages of the production process for different fresh products. Participants in the supply chain are legally independent firms but Carrefour establishes long-term agreements with up-stream firms: cattle breeders, slaughterhouses and wholesalers. Although no exclusive agreements are signed, the relationship with the owner of the quality signal is a close one: the firms have to adapt their facilities to Carrefour's technical specifications as well as their fattening techniques, feeds, and slaughtering and aging conditions. In all cases, the owner of the brand is always at the center of the organization and figures in all contracts with each participant in the supply chain. For instance, transactions between retailers and slaughterhouses and between cattle breeders and slaughterhouses are governed by a trilateral contract involving the three parties. The relationship between a cattle breeder and a slaughterhouse is never direct but always through the brand owner.

Figure 5: Quasi Integration at Carrefour

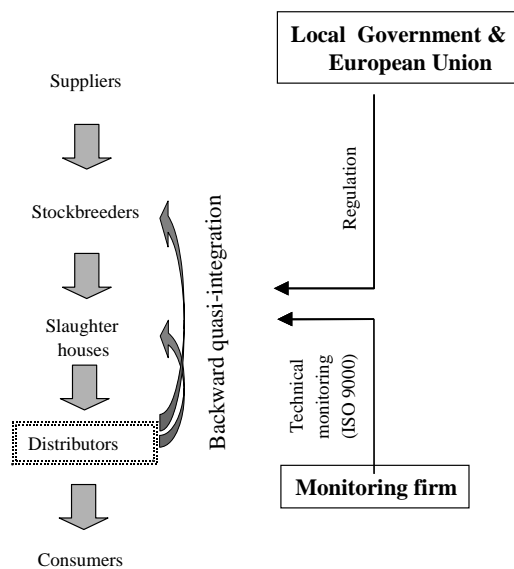
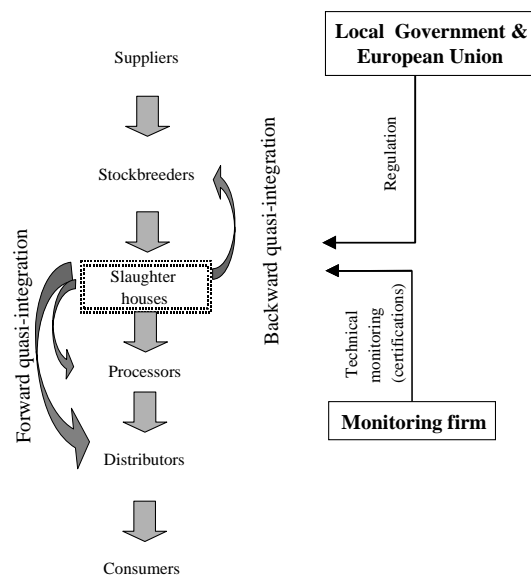


Figure 6: Quasi Integration at Inalca



Inalca, owner of the Montana Fresco brand name, is part of the Cremonini Group. This group operates in different, though related, sectors: meat processing, retailing (the Cremonini group owns a company that specializes in direct sales activities such as door-to-door and e-

commerce), and restauration. After starting out as a slaughtering firm, it later backward quasi-integrated some breeders. The firm directly owns half the slaughtered cattle and uses contracts to control an equivalent amount of live cattle. The breeders are formally linked to Inalca through medium or long-term agistment contracts whereby Inalca assigns its livestock to a farmer who fattens them following Inalca's specific requirements but using his own facilities and workers (even the fodder given to the animals is subject to specific prescriptions). Inalca pays the breeder according to the features of the fattened animal (usually per kg.). Given the difficulty of controlling for all the relevant quality variables, the farmers hardly ever change. The slaughtered animals are shipped to processing plants belonging to Inalca, which is thus able to assure the quality of its products (together with the choice of the most qualitative cuts and the control of the delivery system) right up to the retail shelf. The products of the plants (fresh meat and finished products such as hamburgers and canned meats) are transferred to other companies for further processing if necessary or for distribution through large retailers with which Inalca has agreements.

Stolle Bros., owners of the Stolle brand name, started out as a slaughterhouse and later integrated other stages. It is today one of the most important poultry-producing enterprises in Germany. Stolle produces the fodder, hatches the chicks and transports them to one of the two hundred poultry farmers that belong to a legally independent cooperative for fattening on the basis of agistment contracts. These farmers fat the chicks until ready for slaughtering. Stolle trucks then pick them up and transport them to the slaughterhouse, which is also owned by Stolle. The company packages and processes end products and also offers consulting activities to farmers.

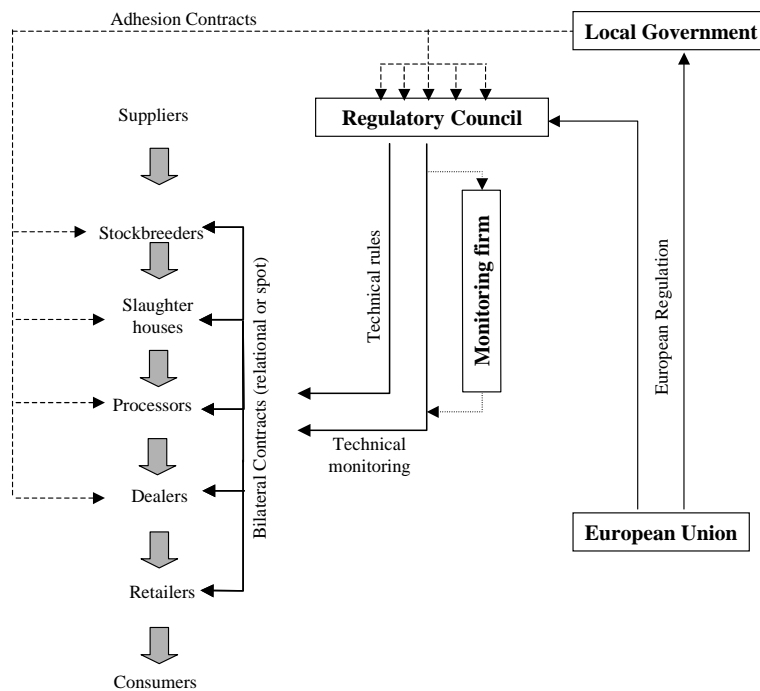
Finally, Ego the owner of the Eichenhof brand name, was originally a cooperative of beef and pork producers. Today it produces livestock and owns slaughterhouses. It has agreements with other producers of beef and pork, with two processing companies and with distributors. A peculiarity of the Ego system is that it uses a network of butcher shops (similar to franchisees and using the brand name Eichenhof) that sells 50 % of all pork and 30 % of all beef products slaughtered by Ego.

Geographical Indicators

Figure 7 summarizes the organization of the supply chain when the brand name is a geographical indicator (Prosciutto di Parma, Specially Selected Scotch Beef, Ternera Asturiana and Volailles de Challans). The main difference here is that the brand name owner is the local government (i.e. public ownership even if the holder is one or several associations of producers). This requires organization on two different levels. On one hand, the economic agents carrying

out meat production, distribution and marketing (the owners of the production factors) and, on the other, the companies and institutions regulate and carry out quality control of all the activities involved. So, while the owners of the production resources are independent entrepreneurs, brand control is carried out by separate institutions. The entrepreneurs that take part directly in the production process have to be authorized to use the geographical indicator by the control and regulation bodies. Authorization is conditional on fulfillment of the requirements laid down in the regulations on brand name usage, which focus mainly on technical and health aspects and on strict control of the livestock covered by the geographical indicator. Once those requirements are fulfilled, each company is allowed to apply its own experience to production and to sell intermediate products under its own brand name together with the geographical indicator (co-branding).

Figure 7: Geographical indicators in the meat sector



6.4. Safeguard Mechanisms to Improve Coordination

Having stated that more coordination-related safeguards are required to compensate for the lower coordination performance of the market-oriented governance mechanism, our second step is to analyze the different types of additional safeguard introduced and to ascertain whether they are more intense in market-oriented mechanisms. The Appendix summarizes the quality safeguards observed in each brand name. We do not include compulsory health controls.

In-House Quality Controls

The first column in the table at the Appendix shows internal controls, those that are carried out through a hierarchical system. This means that the quality controller is authorized to decide whether the product has the necessary hygiene, health and appearance attributes to continue in the production process. All products in our sample undergo this kind of control, regardless of the type of brand name owner. However, hierarchy-type products hardly introduce any additional controls. In the three cases that we classify as hierarchies, brand name owners (Vi.k.i, Creta Farm and CAG) are almost the only quality controller along their respective vertical chains. Other brand names, however, have more controllers. For example, although producers associated with Ternera Asturiana or Volaille de Challans develop similar quality controls to those applied in hierarchy-type organizations, they are also monitored by the owner of the geographical indicator (usually a regulatory committee). However, all hierarchy-type cases have been awarded quality certifications: ISO 9000 standards (CAG and Creta Farm) and GR IMP 21 (Vi.k.i and Creta Farm). This represents additional (external) controls because ISO certifying firms periodically check every stage of the process and a GR IMP 21 committee, authorized by the European Union, carries out inspections.

Taking the above three hierarchy-type cases, we observe that each quality department internally controls every stage of the production process covered by its brand name (foddering, livestock fattening, slaughtering and processing). For example, Vi.k.i carries out daily controls at the factory on hygiene (air quality, drinking water quality, chlorination of the cleaning water network, disinfection of equipment, and so on), color, “bonding” of the raw material after heat processing and the appearance of the cut surface after slicing. Similarly, Creta Farm monitors animal health before and after slaughtering through urine tests, fat composition, microbiological and pathological tests. Hygiene conditions are also continuously tested at both the production facilities and the slaughterhouse. Finally, CAG performs similar controls at every stage. For example, CAG’s analytical laboratory and experimental farms develop compound feed for providing all fatteners, as well as controlling animal health at several stages and the end product (e.g. filleting packing and labeling).

Summing up, all these controls are internal and they focus on compliance with specifications (conformance), aiming to guarantee the expected quality level. There is hardly additional controls, although the exceptions are the ISO certifying firms and those introduced when the hierarchy is not complete, i.e. the brand owner hires other economic agents (second column in the table at The Appendix..

Inter-Firm Quality Controls

The second column in The Appendix refers to a slightly different type of quality control. In this case, it is not an internal control but “transactional”, with the owner of the brand name monitoring the quality of any inputs introduced into his own production process. An agency problem exists because of the misalignment of interests among the parties involved. In all these cases, there are at least two controllers because two different companies are involved in the transaction. The seller controls his own production process as does the buyer because he probably does not totally trust the seller and is the residual claimant of the brand name.

First, brand owners in hierarchy-type cases also control the retailers. For example, both Creta Farm and Vi.k.i control the conditions of their products in supermarkets on a quarterly basis, and CAG evaluates each franchised butcher through surveys and analysis of any complaints.¹⁷ It is also interesting to note the monitoring effort that all these firms exert on all stages in which external agents participate in the production process. This is the reason, for example, why CAG controls fattening (fodder, farming and health) at the cooperative members’ facilities. This activity is critical for end products and, although cooperative members are not exactly external to CAG, the fiat system does not work well with them. Similarly, Vi.k.i and Creta Farm analyze meat coming in to their vertically integrated production process from independent pig farmers using their internal veterinary services (conformance, microbiological and chemical tests).

Second, we observe that almost all brand owners have an exhaustive list of specifications for raw materials, the production process and end products. These specifications must be observed by all the participants (cattle breeders, slaughterhouses, processors, wholesalers, retailers...), regardless of their relationship with the brand owner. The aim is to reduce product variability. Inalca, for example, works with about 30,000 independent breeders and, if there were no this coordination device, the product would be extremely heterogeneous given the influence of breed, feed, and farming conditions on the оргалепtic attributes of the end product. Monitoring of the specifications is performed either by the brand owner or by a hired specialist. The former is the case with Vi.k.i, Creta Farm, CAG or Inalca, which send their own staff to directly supervise suppliers.

However, other brands, such Filière Qualité Carrefour, Eichenhof or Stolle, hire certifying companies to perform field audits and usually have a coordination unit to direct and supervise their work. Carrefour, for example, controls all decisions on Filière Qualité Carrefour beef products through an internal department (Cellule Produits Carnés) that deals with all supply chain affairs. Similarly,

¹⁷ Since they are franchisees, the controls performed here do not differ from those carried out in franchise chains (Bradach, 1997).

Stolle directs the controls on hatching, feed, fattening and processing. The certifying controller adds independence to the monitoring process and performs the field work (i.e. visits, inspections, tests, reports, etc.). The two certifying firms involved in Filière Qualité Carrefour carry out three audits per year of the producer's association, slaughtering firms and local producer groups or associations; they also periodically monitor 3-10% farmers and 30-100% of private cattle dealers and feeding firms (depending on their size). In Inalca, the hired specialist must grant each farmer a certificate to allow them to supply the company. Additionally, the specialist checks and certifies feeding, raw materials, meat processing and delivery to retailers. Stolle's independent inspection bodies check compliance with the standards, examining every farm twice a year (biochemical analyses, animal welfare, analysis of the air in the animal house...) as well as the slaughtering, quartering and processing facilities. Similarly, Ego hires an independent inspection body which examines every farm twice a year, and the feed ingredients and slaughtering, carving, processing and retailing stages on a monthly basis.

Regarding this second type of quality control device, two comments should be made. First, we observe that many companies introduce market devices probably to solve moral hazard and improve the motivation attributes of hierarchy. The widespread use of agistment contracts for fattening is the best example. It is also relevant that, when brand owners outsource activities, they always retain management and outsource implementation (field work). Since it is cheaper to measure the performance of physical activities than mental activities, this might indicate that, when physical activities are available in the market, the company is better off outsourcing them because high-powered incentives are introduced. Second, the introduction of such hybrid solutions complicates quality governance. Although hybrid forms, such as quasi-integration, perform quite well as regards both motivation and coordination (see Figure 1), hierarchy overcomes hybrid forms in terms of coordination because brand owner fiat is not so effective with external suppliers. Although this is partially solved by the inherent features of quasi-integration (long-term contracts and reduced turnover of partners), additional coordination devices are needed. Examples of these are the requirement of ex ante certification for suppliers, a restrictive list of specifications (fodder, farming conditions, etc.), standardised feeding practices, periodical audits and so on. The presence of this type of quality control (in addition to the in-house quality controls) is totally consistent with our research proposition because these redundant quality controls help to improve the coordination in the supply chain.

Second Level (Public) Quality Control

The third column in table at the Appendix represents a parallel set of quality controls. We refer to these as secondary (public) controls because they are performed by a committee representing a local government. They are usually parallel to other controls because the geographical indicator is a second-level mechanism of governance in that it usually complements other private brand names

which also perform their own controls. In fact, each private brand name owner may organize its vertical chain either as a hierarchy or as a hybrid form, employing whatever quality controls are considered most appropriate. In addition, the geographical indicator owner sets up its own quality controls, usually through a monitoring committee (regulatory council), which plays a triple role. Firstly, it is in charge of the drafting and approval of the technical rules. Secondly, it ensures that all the agents protected by the brand name follow the regulations, guaranteeing that the product conforms to pre-established quality standards during every phase of the production process. Although this monitoring control is normally subcontracted to an independent, specialized firm, it may also be done by monitoring body staff. Finally, it deals with brand promotion and development.

The Regulatory Council for Ternera Asturiana hires a certifying firm to control quality. Its personnel inspect farms, retailers and slaughterhouses on a random basis and classify each carcass. The firm also checks sales and traceability—from birth to the butcher—to avoid any kind of opportunism or product substitution. Similarly, Prosciutto di Parma has created an independent control institution, Istituto Parma Qualità, whose control activity is random but very intense. In Volaille de Challans, regular audits are performed on raw materials, intermediate and end products by an independent certifying organization. Finally, the association in charge of Specially Selected Scotch Beef has subcontracted an independent certification body, Scottish Food Quality Certification Ltd, which plans the controls and designates the inspectors. The frequency of inspections varies depending on critical factors at each stage of the supply chain. Given that slaughtering and subsequent meat processing operations are the most delicate stages for product quality and healthy, they are inspected more frequently.

Clearly, geographical indicators result in overlapping of quality control devices. This mechanism of governance involves motivation because each associated agent (producer, slaughterhouse and distributor) is remunerated with the residual claim. However, there is a problem of coordination because the authority of the regulatory council is even weaker than in the case of quasi-integration. The finding that all the geographical indicator quality controls are designed to achieve coordination of the production process (and also to guarantee the prevalence of some traditional attributes) is clearly consistent with our argument. They aim to guarantee that all producers use common inputs and processes, in order to reduce product heterogeneity. This is why more coordination devices are needed since the performance of this mechanism of governance is limited in terms of coordination skills.

6.3. A Tentative Assessment of Quality Performance

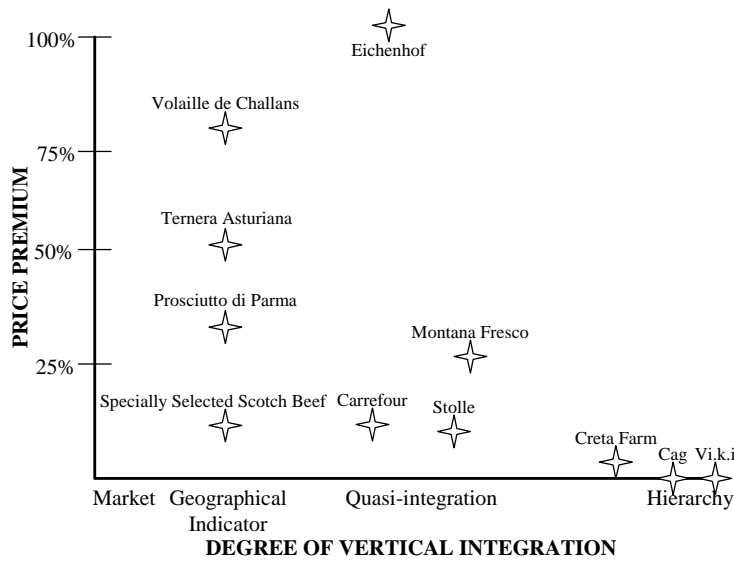
Our second research proposition establishes that the combination of market-oriented governance mechanism (high-powered incentives) with a set of coordination devices yields a hybrid

form more suitable to produce high quality products. We performed a preliminary test in which we compare price premiums granted by consumers to products bearing the brand names included in our sample. If the price premium in more complex (combination of market-oriented governance mechanisms with overlapped coordination devices) mechanisms of governance is larger than in hierarchy, we obtain an indication that consumers assess the organizational effort required for offering high quality.

The price premiums for all the brand names considered in our case study are located in Figure 8, where we can clearly observe that hierarchies have the lowest average price premium (1.67%), while the average price premium is higher for geographical indicators (42.63%) than for quasi-integrations (35.75%).

The heterogeneous nature of the data and the lack of sufficient observations justify the use of a qualitative technique to validate our assumption. More complex statistical or econometric techniques would require more observations and more thorough measurement of each concept. We did not try to extract formal conclusions using this qualitative technique, but we think it helps to strengthen our conclusions.

Figure 8. Price premiums in brand names for meat



We found statistically significant differences in price premiums among three groups (hierarchies, quasi-integrations and geographical indicators) (See Table 2). The Kruskal-Wallis test overall significance level is 0.042, which indicates that the price premium differs among them. This finding supports our assumption. Additional non-parametric statistical tests were performed to determine whether the differences in the price premium between each pair of groups were also significant. We compare *i*) price premium in hierarchies with quasi integrations price premium and *ii*)

price premium in hierarchies with geographical indicators price premium. Both comparisons present a statistically significant value in the Mann-Whitney U test (0.032), which supports our argument. However, the comparison of price premiums in quasi-integrations and in geographical indicators does not necessarily indicate the existence of significant differences. The explanation is that Eichenhoff presents a very high price premium despite being a quasi-integration. We also tried an additional Mann-Whitney U test grouping quasi-integrations and geographical indicators (with an overall average price premium of 39.19%) and comparing this new category with hierarchies. The significance value (0.014) once again supports our proposition that hybrid forms yield higher price premium.

Summing up, hierarchies present the lowest price premium and geographical indicators the highest. So, the higher the sophistication in the mechanisms of governance (sophistication in terms of being combining hybrid forms with additional coordination-type devices), the higher the quality. This suggests that the combination of high-powered incentives with a set of overlapped, well-design coordination-type safeguards solves problems related to high-quality products better than hierarchies. It is very costly for this latter form to implement quality-enhancing incentive system.

Table 2: Mean difference statistical tests

Average Price Premium	Test results
Hierarchies: 1.67% Quasi-integrations: 35.73% Geographical indicators: 42.63%	Kruskal Wallis Test = 6.342 Asymp. Sig. (two-tailed) = 0.042
Hierarchies: 1.67% Quasi-integrations: 35.73%	Mann-Whitney U = 0.000 Asymp. Sig. (two-tailed) = 0.032
Hierarchies: 1.67% Geographical indicators: 42.63%	Mann-Whitney U = 0.000 Asymp. Sig. (two-tailed) = 0.032
Quasi-integrations: 35.73% Geographical indicators: 42.63%	Mann-Whitney U = 5.500 Asymp. Sig. (two-tailed) = 0.468
Hierarchies: 1.67% Quasi-integrations and geographical indicators: 39.19%	Mann-Whitney U = 0.000 Asymp. Sig. (two-tailed) = 0.014

7. CONCLUSIONS

Given that quality problems may be understood as a consequence of the high transaction (measurement) costs, mechanisms of governance also affect end product quality. We argue that the mechanism of governance to organize the vertical chain must be chosen to promote high quality. Hierarchy emphasizes conformance quality through direct supervision of economic agents, monitoring compliance with the quality standards set by the organization. However this mechanism of governance fails in motivation because the market offers higher-powered incentives.

If we change towards hybrid forms as a solution to this problem, the incentive system is effectively improved because several residual claimants appear along the vertical chain. They automatically balance quantity and quality through the prices paid by consumers. However, hybrid solutions hinder conformance quality because they do not achieve such efficient coordination as hierarchy. Consequently, the mechanism of governance must be complemented with a set of safeguards designed to improve coordination amongst the parties involved. The resulting mechanism of governance deals with high-quality products better than hierarchy because it keeps high-power incentives and solves coordination problems with specific-purpose devices. Additionally, it is very costly for hierarchies to improve quality motivation because of the difficulty to find explicit estimators for quality-enhancing incentive systems.

We found empirical evidence of these arguments in an international case study of quality brand names in agrifood. We found that the most market-oriented mechanism of governance in our sample (quasi-integrations and geographical indicators) eject more effort in coordination than hierarchy. They need to introduce *i*) coordination-oriented mechanisms such as norms and routines to perfectly define standards and attributes and *ii*) a complementary (and sometimes redundant) set of quality control devices based on direct supervision. The quasi-integration-type cases present an intermediate situation between hierarchy and geographical indicators. They eject more effort in coordination than hierarchies but less than geographical indicators.

Finally, the average price premium paid by consumers for quality products is much higher in geographical indicators than in hierarchy-type cases. Again, quasi-integration-type cases present an intermediate solution. We take this finding as an indication that vertical chain can be more efficiently organized as a geographical indicator than as hierarchy to promote high-quality products.

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Appendix

Brand name	In-house quality controls	Inter-firm quality controls	Second Level (Public) Quality Controls
<i>Vi.k.i</i> (Notta, Pantelidou, and Vlachvei 2001)	<p>The Quality Control Department is in charge of quality controls assisted by others such as the Procurement Department. Every time pigs are slaughtered (once or twice a week) a county veterinarian has to be present in order to check the animals' health and to stamp the pigs that are about to be slaughtered; scientists at Vi.k.i are responsible for laboratory testing of slaughtered animals.</p> <p>Vi.k.i controls the production process on a daily basis to guarantee hygiene conditions in the factory. Tests relate to: interior air pollution, drinking water pollution, chlorination of the cleaning water network, disinfection of movable and fixed equipment, the personal hygiene of workers and technicians and pest control.</p> <p>Laboratory testing of the end products is carried out daily. Samples taken from each batch are subjected to various microbiological and chemical analyses.</p> <p>Natural characteristics of end product are also tested; color, «bonding» after heat processing and the appearance of the cut surface after slicing. Packages are tested for soundness of vacuum, modified atmosphere quota, sealing and moisture proofing of can seams.</p>	<p>Stringent tests are carried out upon receipt of delivered materials for processing as fodder in order to ensure quality, nutritional value and correct warehousing.</p> <p>Additional pork meat comes from local pork producers. Scientists at Vi.k.i are responsible for the macroscopic testing of animals upon delivery from suppliers as well as just before slaughter.</p> <p>Once every three months Vi.k.i controls the conditions of products in supermarkets. Every 20 days it also inspects the wholesalers.</p> <p>International customers are also controlled two or three times a year for the same purpose.</p>	

Brand name	In-house quality controls	Inter-firm quality controls	Second Level (Public) Quality Controls
<i>Creta Farm</i> (Pantelidou 2000)	<p>Several managers are in charge of quality assurance in different departments such as the Animal Breeding Unit or the Cured Meats Sector.</p> <p>Constant inspections in the first stage of production for animal feed. Creta Farm examines animal health using monthly urine tests and other fortnightly pathological tests.</p> <p>The Veterinary Service performs safety control every time pigs are slaughtered (three times a week). There are inspections for fat composition, microbiological, natural and chemical control, control of residual antibiotics and microbiological inspection of slaughterhouse surfaces which come into contact with the meat.</p> <p>Water is tested at least once a month to test quality (microbiological and chemical tests on the water used through all stages of slaughtering).</p> <p>The firm inspects the production conditions (temperature, air) and performs microbiological and chemical tests during sausage production (humidity, proteins, sugars, starches, fat additives, calcium, phosphorus, etc.).</p> <p>The firm has been granted ISO 9000 certification for reproduction, fattening, slaughtering of pigs, production, storage and sales of meat and sausages.</p>	<p>The company controls every time raw material is delivered (corn, cereals). Supplies come from specific, approved suppliers, chosen by the quality committee.</p> <p>When the firm is supplied by other pig producers, meat safety is also controlled.</p> <p>Wholesalers and retailers are inspected to check how products are stored and for their commercialization conditions.</p>	

Brand name	In-house quality controls	Inter-firm quality controls	Second Level (Public) Quality Controls
CAG (Melero and Palomeras 2000)	<p>The analytical laboratory and the experimental farms carry out tests to obtain compound feed for all types of animal.</p> <p>Farming conditions are also monitored (agistment contracts with cooperative members): animals are supplied for fattening and the products are collected by the cooperative. Control of yields and hygiene is carried out by CAG on farms.</p> <p>Animals are controlled in different phases of the slaughter process (microbiological and physical-chemical controls of raw and semi-finished meat products).</p> <p>The filleting, packing and labeling conditions are centralized and controlled by CAG.</p> <p>The firm has been granted ISO 9000 for hatcheries, slaughtering and quartering meat production, boning, filleting and packing, production of meat derivatives, drying of sausage products and hams, production of half-finished products, dispatch, transportation and sale</p>	<p>Origin of raw materials for fodder, fertilizers and phitosanitararies is controlled through different analysis and tests.</p> <p>Control of the “bonÀrea” shops is performed through surveys and analysis of complaints.</p>	
Filiere Qualite Carrefour (Mazé 2000)	<p>Sales conditions, the only stage of the supply chain carried out by the owner of the brand name, are controlled directly by Carrefour: hygiene conditions, temperature, filleting, packaging...</p>	<p>Two years after the BSE crisis, a new organization inside Carrefour was set up to improve control over FQC supply chains. Since 1998, the national Carrefour bureau specializing in meat products («cellule produits carnés») near Paris governs all decisions relating to FQC beef products.</p> <p>The FQC product specifications were initially drafted by two independent certifying organizations by means of a trilateral agreement with Carrefour.</p> <p>These certifying organizations perform quality controls on behalf of Carrefour: 3 audits each year for the FQC producer’s association, the slaughtering firms and the local producer groups or associations. Furthermore 3-10% farmers and 30-100% private cattle dealers and feeding firms are also periodically controlled.</p> <p>FQC producers’ associations perform annual control of local producers’ groups, and monitor the list of registered feeding firms and private cattle dealers.</p> <p>Local producer groups or associations carry out annual technical control of each farmer.</p>	

Brand name	In-house quality controls	Inter-firm quality controls	Second Level (Public) Quality Controls
<i>Eichenhof</i> (Kagerhuber 2000)	<p>An independent certifying organization (SGS Control) controls compliance with EGO standards through inspections of every farm in the cooperative twice a year. These inspections include biochemical analyses, use of antibiotics or hormones, animal welfare and analysis of air in the animal house. Lufa also controls the contents of feedstuffs at farm level.</p> <p>EGO veterinarians control each carcass at its own slaughterhouses. Hygiene controls are developed including microbiological examinations in order to monitor optimal cooling and maturation conditions of the meat. Meat quality is determined by examining parameters such as pH, and color of the meat during slaughtering and cooling. Additionally the EGO carries out salmonella monitoring. Meat quality is also guaranteed by analyzing pH to exclude PSE or DFD.</p> <p>Additionally SGS carries out a monthly bacteriological analysis of slaughtering and quartering.</p> <p>CMA certification (aimed to promote the production and marketing of high-quality German meat) was obtained in 1990 for Eichenhof.</p> <p>The firm was granted ISO 9000 certification in 2000.</p>	<p>Control of feed producers is run by Lufa, a national independent organization, on behalf of Ego. This certifying organization performs regular controls on the contents of feedstuffs at farm level and also at feedstuff production level.</p> <p>Another independent certifying organization (SGS) performs quality controls on behalf of Ego over the remaining stages of the supply chain. Independent farmers are controlled twice a year and processors are controlled every month by means of bacteriological analysis. Transport distances are limited to 80 km to avoid stress to the animals.</p>	
<i>Stolle</i> (Kagerhuber 2001)	<p>Stolle and independent inspection bodies on behalf of Stolle perform regular inspections of feed ingredients, residues and hatching and make regular bacteriological analysis in slaughtering, carving and processing stages.</p> <p>CMA certification has been obtained.</p> <p>The firm holds ISO 9001 certification.</p>	<p>Several independent inspection bodies control compliance with the Stolle standards through inspections of every farm twice a year on behalf of Stolle. Inspections include biochemical analyses concerning the use of antibiotics or hormones and also animal welfare and analysis of the air in the animal house. In addition to these external controls, Stolle also carries out its own analyses in order to obtain dual results.</p>	

Brand name	In-house quality controls	Inter-firm quality controls	Second Level (Public) Quality Controls
Montana Fresco (Boccaletti 2000)	<p>The functioning of the Quality System is guaranteed by a specific team and by a quality assurance manager.</p> <p>Inalca developed a meat traceability system that, using bar codes, allows tracing, at any step of the production process, of the animal from which the meat derives and all of the processing phases.</p> <p>The raw materials at the plant gate, not only animals to be slaughtered, but also a series of services and processing ingredients, and the meat processing phases, are all under an internal system of control that is verified and guaranteed by a certifying institution.</p> <p>Each animal's documentation is accurately checked at the plant gate. After this control the animal is classified following a European grid (reg. 1208/81), and finally undergoes a series of analyses and safeguard operations. The animal can be sent to the processing phase only after the evaluation of the scheduled controls. Within the processing phases, a specific division of Inalca supervises all manipulation of fresh meat.</p> <p>The Inalca system conforms to ISO 9002 and BRC (British Retail Consortium) standards.</p>	<p>Feeding of the animals and delivery to retailers are verified and guaranteed by a certifying institution. Control of suppliers involves evaluation of hygiene and health and verification of the traceability system.</p> <p>Random, unexpected controls on farms by Inalca's inspectors form the base of quality assurance system of this independent stage of the supply chain. All cattle originating from independent breeders arrive at Inalca factories equipped with an Official Delivery Certificate, passport and commercial delivery note</p>	
Volaille de Challans (Raynaud 2000)	<p>Low degree of vertical integration in the supply chains. Small firms are usually involved and each member supervises its own process based on its expertise.</p>	<p>The chain of transactions "hatcheries–feed manufacturers–farmers–abattoirs" is coordinated by the farmer's group (Sypravic) which negotiates contracts with hatcheries, the feed suppliers and abattoirs. At present, no quality control is carried out by Sypravic although it may supervise transactions in the supply chain.</p>	<p>The Quality Group Sylac, holder of the brand name, has a certification committee comprising 7 members (3 are representatives of the different members of the label and 4 are outside persons). Its theoretical function is certification and quality control within the label. However control in the production chain is entirely delegated to a certifying organization, which performs several controls to guarantee compliance with the brand name specifications imposed on agents in the production chain: breeds selected for slow growth, feed quality (minimum 75% cereal, no animal matter), size of poultry house (400m² maximum), density (11 birds per m² maximum), open air conditions (grass, with open air runs by at least 6 weeks), slaughter age (minimum 81 days), transportation distance between farm and abattoir (not to exceed 2 hours or a distance of 100 km). Periodicity of controls: Brooders 2 inspections per year and hatchery, breeders 1 inspection per year, feed manufacturers 2 inspections per year and 1 feed analysis per year and per formula, farmers 1 inspection per batch of label chicken, abattoirs 6 inspections per year and a sample per month for bacterial analysis, packaging/cutting 6 unexpected inspections per work station per year and 3 bacterial inspections per trimester, distribution and marketing 1 inspection per portion of 100.000 label chickens per year with a minimum of 6 inspections per year and per abattoir.</p>

Brand name	In-house quality controls	Inter-firm quality controls	Second Level (Public) Quality Controls
<i>Prosciutto di Parma</i> (Boccaletti 2001)	Each economic agent controls its own activities. Some of the economic agents, specially processing plants hold the ISO 9000 certificate.	Ham producers (processing plants) and some forward integrated slaughterhouses are usually the leaders of the supply chains. They develop control activities over the remaining stages in the supply chain (mainly breeders and pig selection)	<p>Instituto Parma Qualità is an independent control institution that runs quality control on behalf of Consorzio del Prosciutto di Parma (owner of the brand name). Inspectors act as Judicial Police Agents (in Italy). These inspectors may carry out any type of verification, inspection or control of whoever produces, packages, keeps or sells hams in any type of establishment including: farms, slaughterhouses and laboratories, wholesale and retail sales outlets, restaurants and stores. Each piglet is controlled twice (30 days after birth and 240 days after birth); each fresh ham is also controlled at slaughterhouses; in the processing plants, salting of each ham is controlled after prescribing aging (10-12 months).</p> <p>It is scientifically checked that the hams meet the quality requirements. Laboratory analyses are used to assess aged hams to ensure that the end product complies in the following values: amount of salt, degree of humidity and level of proteolysis.</p>
<i>Ternera Asturiana</i> (Fernández-Barcala and González-Díaz 2000)	Each economic agent controls itself. Frequency depends on each firm, is not random and is self-financing.	Inspection in each supply chain is performed by the firm that exerts the role of leader, usually butchers that select the carcasses to be sold in their butcher shops.	<p>The Regulatory Council subcontracted with an independent firm (EASA) for control activities. Farms are randomly visited by EASA technicians and urine and fodder tests are carried out. In addition, the hygiene and technical conditions of the installations are checked. Finally, the animal register is updated. Thus, from the birth of a new calf and till it is three months old, a first classification of the product type will be done together with the cattle-breeder, simultaneously with an ear-mark putting brand identification.</p> <p>EASA personnel classify each carcass in slaughterhouses and evaluate conformity and fat level. Moreover, also the samples of eye, thyroids and kidney are randomly taken to analyse whether prohibited growth stimulators have been used</p> <p>EASA also controls distribution and marketing since the end product quality depends on how it is treated during these stages. Cold storage rooms, quartering houses and retailers are periodically inspected to verify that all end products are perfectly identified and controlled. A data base of farms, slaughterhouses, distributors, calves and carcasses is kept to allow traceability. Sporadic DNA tests are conducted to verify that the information offered is correct and tallies with the original animal according to data base.</p>

Brand name	In-house quality controls	Inter-firm quality controls	Second Level (Public) Quality Controls
<i>Specially Selected Scotch Beef</i> (Valli and Loader 2001)	Each economic agent controls itself. Frequency depends on each firm, is not random and is self-financing.	Choice of the sales channel obviously depends on prices and on the fact that when selling through auction markets, livestock producers are paid on the basis of live weight, whereas sales to abattoirs are usually paid on the basis of the deadweight carcass grade. Inspection in each supply chain is performed by the firm that exerts the role of leader, usually the biggest.	<p>Scotch Quality Beef and Lamb Association (holder of the brand name) inspectors visit farms at least once a year and check that the records are kept and are accurate. The assessments address all main production standards of the scheme: Origin of stock, housing and handling facilities, feed composition and storage, medicines and veterinary treatments, movement record and medicine book, stockmanship and welfare, and staff assessment.</p> <p>Scottish Food Quality Certification (SFQC) is the third party contracted by Scotch Quality Beef and Lamb Association to monitor the quality assurance schemes and inspect the schemes' partners. The system of inspections by SFQC represents the main monitoring mechanism of the quality system and the product certification. SFQC designates the inspectors. Inspection may vary depending on the critical factors at each stage of the supply chain. Slaughtering and subsequent meat processing operations represent the most delicate stages that have an important impact on products' quality and safety, thus inspections are carried out more frequently during these stages (feed suppliers once a year, auction markets once a year, abattoirs/meat plants six times a year and independent butchers once a year).</p>

