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**The Governance of Quality through Geographical Indicators:  
The Case of Fresh Meat**

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# The Governance of Quality through Geographical Indicators: The Case of Fresh Meat\*

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## ABSTRACT

We argue that the mechanism used for governing the supply chain is an essential factor in promoting quality. An integrated organization facilitates conformance quality but decreases efficiency in terms of incentives. A hybrid organization attenuates this incentive problem but may hinder conformance quality, making additional safeguards necessary. This results in more complex organization of the supply chain but enhances overall quality. We find evidence of this argument in a set of international cases of meat brands. First, market-oriented solutions in the supply chain employ more additional controls to improve coordination than more integrated solutions. Second, geographical indicators, being the most complex organization for the meat supply chain, seem to perform best in terms of overall quality.

**Key words:** Agrifood, brand name, supply chain, mechanisms of governance, quality, price premium, safeguards.

## INTRODUCTION

The economic 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/retailer). They do not consider what is beyond the seller, *i.e.* how brand name owners organize the supply chain for yielding a quality end product. This is a serious drawback because the final quality of most products largely depends on decisions made by suppliers and/or distributors at various stages of the supply chain (Krause, Handfield and Tyler, 2007). Incentive systems and monitoring devices implemented by different organizational forms affect the behavior of economic agents in these channels and, ultimately, final quality at the retail stores (Reyniers and Tapiero, 1995; Dyer, 1996). More research is needed about this point and how vendors solve this problem through strategic relationships with other channel members (Grewal and Levy, 2007, p. 449). Brown *et al.* (2005) maintain that “success in the Big Middle<sup>1</sup> is predicated on the efficiency and effectiveness of the *entire* supply chain, and therefore, no retailer can successfully ‘go it alone’ without the active cooperation of its channel partners” (p. 103).

The aim of this paper is to explore how different ways of governance in the supply chain affect the quality. Consumers usually consider two dimensions when assessing quality (Juran, 1989): the target or expected quality of a producer or brand, and the deviation of each product within a brand from that target. The former refers to qualities consumers may notice in the different attributes of the product and the value they place on them (Ishikawa, 1985). This is often called “subjective” or “design” quality and is related to the degree to which the attributes satisfy the customer’s preferences. 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).

Our argument is that governance mechanisms are essential for promoting final product quality. Reaching high quality requires an organization that offers both coordination and motivation devices. First, conformance quality ties in with what Milgrom and Roberts (1992, p. 91) define as a coordination problem with design attributes. Second, design quality depends on agents’ motivation and initiative along the supply chain because they should scrutinize consumer preferences to find out which attributes or combination of attributes are preferred at any one time. Consequently, an integrated firm should perform better in terms of conformance quality because it facilitates coordination.<sup>2</sup> However this results in lower motivation because it is costly to replicate high-powered

market incentives within the firm (Williamson, 1991). Moving towards hybrid forms is a motivation-oriented solution because several residual claimants share the supply chain, but such hybrid solutions may hinder conformance quality in that they do not achieve such efficient coordination as a single firm. We argue that hybrid governance mechanisms must be complemented by a “second-level” mechanism of governance (James, 2000), *i.e.* a set of additional safeguards designed to compensate for the loss of coordination capacity. The resulting organizational form will perform better in terms of overall quality (conformance plus design). These arguments accommodate the stylized fact that geographical indicators (GIs), as second-level mechanisms of governance in agrifood markets, overlap classic mechanisms of governance, improving coordination and motivation and, consequently, both conformance and design quality.<sup>3</sup>

There are three related 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. Second, Steven Michael (2000, 2002) adopts a closer approach, but focuses on a particular hybrid form—franchising—and on perceived quality. He observes that *i)* the proportion of franchised units in a chain negatively affects quality (2000), and *ii)* it is more difficult for franchise chains to coordinate the marketing mix (price, advertising and quality) than for corporate (*i.e.* non-franchising) chains (2002). He explains his findings using the different incentives yielded by each mechanism of governance. Franchisees have high-powered incentives to exert effort but are perversely motivated to coordinate each other’s efforts (externality problem). Recently, Díez-Vial (2007, p. 1037) also concludes about the meat industry that “*managers vertically integrate to [...] guarantee the quality of their goods*”. Her argument is that market transactions yield higher measurement costs than transactions inside the firm because it is very costly to assess quality attributes by just evaluating the final product (as is frequent in market transactions). Conversely, quality within the firm is evaluated according to the behavior and procedures employed, and this reduces the cost of assessing the quality attributes (Anderson, 1985). We consider that all these arguments about particular supply chain organizations may be generalized taking into account the different dimensions of quality and the different features of each governance mechanism.

This paper is organized as follows. First, we analyze the influence of the mechanism of governance (hierarchy, quasi-integration and GIs) on quality by emphasizing additional problems that may affect quality as perceived by consumers. Second, we explain the methodology. Third, 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 make a first attempt to assess perceived quality differences among types of organization. Finally, we draw our conclusions.

## MECHANISMS OF GOVERNANCE IN THE SUPPLY CHAIN AND QUALITY

Each mechanism of governance offers different features regarding coordination and motivation (Williamson, 1991; 1996). We analyze below the typical mechanisms of governance and how their features can affect quality, focusing only on organizational forms that are frequently observed in the foodstuff sector, particularly in meat retailing.

### HIERARCHY

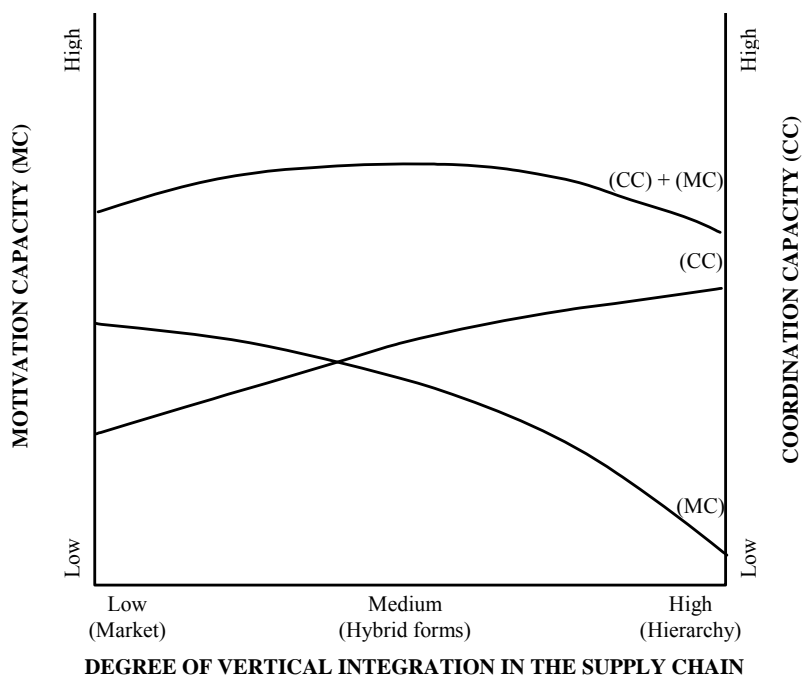
Hierarchy (integrated firm) is always the reference mechanism of governance in organizational studies (Barnard, 1938; Thompson, 1967; Williamson, 1996 and Kogut and Zander, 1996). Williamson (1991) argues that hierarchy facilitates the adaptation process when the needs for coordinated investments and for uncontested coordinated realignments are frequent and significant. 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. In fact, Milgrom and Roberts (1992: 88-119) also argue that hierarchy performs better than the market for coordination problems with design attributes. They define coordination problems with design attributes as those *a)* featuring "a great deal of a priori information" about the optimal solution and *b)* in which not reaching the optimal solution is the highest cost. The advantage of the hierarchy in this setting is twofold. First, the price system (market) does not offer an informative advantage regarding the use of fiat (hierarchy) because parties already have information about the optimal solution *ex ante*. Second, agents' reaction to prices is never certain because it depends on other changeable prices (e.g. opportunity cost at the time). In a hierarchy, agents' reaction also depends on relative prices (wages) but is less variable than in the market. This facilitates the arrangement and scheduling of agents' actions and tasks, which also justifies the rising shape of the coordination capacity curve (CC) in Figure 1, when moving from market to hierarchy.

Conformance quality of the end product refers to the degree to which the pre-established design conditions are observed (Crosby, 1979:15) and depends on the right actions being taken by all the agents along the supply chain. This means that, according to Thompson's terminology (1967), a sequential interdependence exists among the supply chain stages. This can therefore be considered a coordination problem with design attributes or, in Williamson's terminology, a situation in which cooperative adaptation seems essential for achieving homogeneous products. We can therefore conclude that hierarchy seems the most suitable governance mechanism for obtaining conformance quality. Empirically, this argument is supported by Michael (2000) in the restaurant industry and by Díez-Vial (2007) in the meat industry.

However, as pointed out by Williamson (1985, 1991), the benefits of hierarchy or, rather, deliberate coordination come at the cost of lower incentives. 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 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). This explains the downward shape of the motivation curve (MC) in Figure 1.

**Figure 1: Mechanisms of Governance, Coordination and Motivation Capacity**



## QUASI-INTEGRATION

Hybrid forms are intermediate mechanisms of governance between market and hierarchies. In other words, hybrids are organizations that are neither markets nor hierarchies (Menard, 2004). Their main advantage is that they share features of both, so they perform relatively well in both coordination and motivation (Williamson 1991).

Quasi-integration is a particular type of hybrid form frequently used in foodstuffs (Hobbs and Young, 2000). It features the legal disintegration of the hierarchy in which several independent companies share out the activities of the supply chain, with one of them acting as leader. The leader is usually the company with the highest reputational capital (well-known brand name) and each company specializes in a particular supply chain stage (or several of them) and maintains a market relationship with the others. However, their independence is more legal than economic because companies usually establish a long-term relationship with continuous renewal.<sup>4</sup> Such companies have been called *quasi-firms* in some situations (Eccles 1981) and allow market motivation without completely losing the coordination capacity of a hierarchy (see Figure 1). Each agent has high-powered motivation because he is compensated by the residual claim of his own businesses, and coordination is eased through

repetitive iterations among the same parties in what, in the end, are long-term relationships.

The main drawback is the misalignment of interests that is created by residual claimancy (Milgrom and Roberts, 1992, Williamson, 1991). This may result in a sub-coordination solution due to cheating problems like free-riding or dissipation of brand value. Each agent in the supply chain has incentives to encourage others to make the costly investment required to maintain quality while reducing his own efforts. This forces the introduction of additional safeguards to control this opportunism which does not exist in a hierarchy because there are no such “perverse” incentives.

Regarding product quality, quasi-integration offers a balanced solution in the two main quality dimensions. On the one hand, residual claimancy motivates the parties to search for new products and attributes which are valued by the buyer. This fits in with the idea of design quality, and quasi-integration probably results in better design quality than that offered by a hierarchy. On the other hand, such high-powered incentives harm the coordination of assets and the implementation of standardized marketing policies (Michael 2002). Residual claimants have more incentives to try to implement their self-interested marketing policies than employees. This directly affects conformance quality which critically depends on agents’ standard reactions. Hierarchy should therefore perform better than quasi-integration in terms of conformance quality because it achieves better coordination.

However the leader of the supply chain (usually the owner of the most highly-esteemed brand) may solve this sub-coordination issue because his brand name reputation is at stake. First, he quasi-integrates several stages of the supply chain because the features of this hybrid form help to overcome the problem. Long-term relationships and careful selection of suppliers might reduce cheating because quality is more easily appraised in the long run, particularly for credence and experience attributes (e.g. the effect of clenbuterol on human health) (Kay, 1993). Additionally, by selecting and working with the same suppliers, coordination improves because it is easier to develop similar coordination-enhancing routines to those developed in hierarchies (Spiller and Zelner, 1997). The participants know each other’s preferences, are familiar with the organizational routines and respond in the same way to operational problems, thus probably improving conformance quality.<sup>5</sup> Second, supply chain leader understand the problem and introduce additional safeguards to attenuate it (Williamson, 1996). Frequent quality audits and inspections each time intermediate products change hands are a typical example of such quality-related safeguards (Mayer *et al.*, 2004).

Summing up, final quality offered by quasi-integration could be higher than that offered by a hierarchy in terms of value added to the consumer because the loss of conformance quality seems easier (cheaper in terms of transaction cost) to recover with additional safeguards than the loss of motivation involved in a hierarchy. An incentive system is unlikely to generate the same high-powered incentives as a residual claim. Consequently, if design quality (motivation) is higher and conformance quality (coordination) is slightly lower, the total quality for the consumer is higher.



## **GEOGRAPHICAL INDICATORS (GIs)**

GIs cannot be directly compared with hierarchies or quasi-integrations because they are a second-level mechanism of governance. A GI is a hybrid form resulting from the combination of a classic mechanism of governance and a set of safeguards built around a public, geographical brand name. It appears when a place name becomes associated with distinctive features of a product (wine, cheese, meat, etc.), which are linked to the geographical location of the production / transformation process because of specific soil and climate conditions and/or traditional local knowledge. This gradually develops into reputational capital of special value to producers and other related agents who have to rationalize the use of the name.

EU (and local governments) allocated geographical name ownership to a legal entity that we have generically called geographical indicators (GIs). From a legal point of view, GIs were established in 1992, when the European Union created the systems known as Protected Designation of Origin (PDO) and Protected Geographical Indicator (PGI) to promote and protect food products (regulation EEC 2081/92 of July 1992). They extended and harmonized several EU members' existing laws and traditions. The European regulation on PDO products is similar to a trademark registration that protects property rights on brand names (here geographical names). 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) (Castillo, 2002 and Bureau and Valceschini, 2003). In the case of the PGI, the geographical link must occur in at least one of the stages of production, processing or preparation. GIs are common in Europe, where currently more than 700 products are registered as PDO or PGI and many more are pending registration (European Communities, 2006). Conversely, this kind of organization hardly exists in the US.

There are two types of participant in a GI: companies related to production and distribution, and institutions related to the control and regulation of these activities. Thus, ownership of the production factors and quality control of the intermediate and final products are separated, that is, while independent entrepreneurs are the owners of the production and distribution resources, brand and quality control is carried out by different institutions. Owners of the production resources nevertheless exert some kind of indirect control on these institutions through their representatives, as explained below.

The first group, that is, companies that take part directly in the supply chain, have to be authorized to use the GI by the second, particularly the regulatory council. Authorization is conditional on fulfillment of the requirements stipulated in the brand usage regulations, which focus mainly on technical and health aspects and on strict control of the products to be labeled with the GI. Each company applies its own experience to its production or marketing activities and its reputational capital to sell to other participants or final consumers.

Within the institutions in charge of the control and regulation of GIs, the regulatory council is the most important. The government, the real owner of the brand, delegates to it the rights of

admission, exclusion and penalization of its participants. The council 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 abide by the regulations, guaranteeing that the product remains in line with the pre-established quality standards in every phase of the supply chain. Finally, the regulatory council deals with all the brand promotion and development activities.

The main distinctive feature of GIs from an economic point of view is the overlapping of two mechanisms of governance (James 2000).<sup>6</sup> On the one hand, the supply chain may take the form of a hierarchy, a market or a hybrid yielding the coordination and motivation features discussed above. On the other, the GI governs the transactions mainly in terms of coordination, though it also attenuates motivation problems. First, it establishes the general “rules of the game” for the brand and the minimum attributes for all the products sold under the GI brand name. Second, it attenuates the problem for quality of free riding that any “shared-reputation” system might face by introducing a quality monitoring system to punish those who do not abide by the quality standards. Controls are usually based on inspection and grading of the products by independent supervisors or auditors (the State or authorized private auditing firms).

The resulting hybrid form is very complex but offers relatively good features in terms of the motivation and coordination capabilities required for overall quality. This is because the second-level mechanism of governance complements the first-level mechanism in terms of quality control. On the one hand, the GI facilitates coordination and homogeneity by first fixing the minimum (but not the maximum) features which are considered key for generating differential organoleptic attributes in the end product then checking them at each supply chain stage. This may also give rise to some economies of scale and information that may serve for research and new technologies, enhancing benchmarking techniques. On the other hand, the threat of contract termination and, consequently, the fear of losing the right to use or sell the geographical brand name, create appropriate incentives for complying with the quality standards. The incentive is stronger when the individual agents make GI-specific investments, which is not unusual (e.g. producer or retailer brand name, process innovations, storing spaces, etc.). All these aspects together improve the product homogeneity (conformance quality) and the level of organoleptic attributes (design quality).

## **RESEARCH PROPOSITIONS**

The literature maintains that there is a trade-off between coordination and motivation capabilities in the different governance mechanisms. When we move from hierarchy, which offers the best coordination, to more market-oriented solutions such as quasi-integration, we improve the agent’s motivation at the cost of coordination capacity (Williamson, 1991). We argue that in order to reach efficient agreements, parties should introduce extra safeguards to mitigate this deficiency in coordination. This raises the complexity of the resulting organizational form because different norms, rules and control devices overlap each other. Applying this idea to the organization of the supply

chain, we therefore state:

**RP1:** *When the supply chain mechanism of governance moves towards more market-oriented solutions (hybrid forms), it should be complemented with additional coordination-oriented safeguards (to mitigate the loss of coordination capacity) raising the complexity of the resulting hybrid solution.*

These additional safeguards along the supply chain improve the chance of achieving a homogeneous end product at the retailer store and should lead to improved conformance quality from the consumer point of view. GIs could maximize this improvement because they add complex sets of requirements and quality controls which raise the coordination and motivation capacity of the first-level mechanisms of governance they overlap. This also improves design quality which consumers can be expected to value positively. Although the resulting organization is very complex, we argue that the capacity of GIs to offer top-quality products is higher than in any other organizational form. Our second research proposition, therefore, is:

**RP2:** *The combination of two different level mechanisms of governance in a supply chain will result in a complex hybrid form which guarantees higher quality (design plus conformance) for consumers than a single mechanism of governance.*

## METHODOLOGY

We used a qualitative research approach based on the case study method. Two recent and successful applications of qualitative methodologies can be found in Beverland (2005) and in Haytko and Baker (2004). It is a valid approach and an appropriate tool, especially when we do not fully understand the problem (Coase, 1972; Eisenhardt, 1989) and we want to discover new variables and relationships to reveal and understand complex processes (Glaser and Strauss, 1967; Yin, 2003; Shah and Corley, 2006). In our case, we try to explain the relationship between product quality and the way supply chain is organized which has hardly been discussed in the literature. Our aim is not to econometrically test hypotheses based on consolidated theories but to formulate research propositions and to try to support them by qualitative evidence.

The advantage of case analysis is that it allows us to understand small details that might explain the situation. However, the drawback is that only with a large number of cases it is possible to draw statistical, objective conclusions but, with a large number of cases, there are so many small details that it becomes very complex to understand the relationships that the researcher is looking for. A solution could be a trade-off between different sources of data (Van Maanen, 1979; Shah and Corley, 2006).

The heterogeneous nature of our data and the lack of sufficient observations justify the use of a qualitative technique to validate our research propositions. We therefore triangulated our data in a cross-case pattern (Easterby-Smith and Lowe, 1991). First, we tried to show that our arguments predict the organizational patterns observed in each case. Second, we tried to illustrate the theoretical

relationship by plotting the cases and performing Mann-Whitney U and Kruskal Wallis tests for relevant variables.

Case selection followed a theoretical sampling (Eisenhardt, 1989: 533) because we were looking for polar types of supply chain organization in which we expected to highlight the differences according to our arguments or propositions (Shah and Corley, 2006). We identify the cases through the product brand name at the retail establishments. Our sampling followed two requirements:

- a) Cases had to help provide a broad overview of the meat sector in Europe. We therefore selected different meat products (pork, poultry, beef, veal, lamb, rabbit, sausages and ham) 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 the conclusions on quality governance.
- b) Cases had to involve well-known brand names. We therefore selected only brand names with a relevant market share that were well-known at a national level.

Data was obtained using several complementary methods. First, various kinds of secondary information (government statistics, industry and market reports, participants' web sites, etc.) were collected in order to understand the structure of the industry and the relevant market and to assess the economic importance of the selected brand names. Second, data was obtained in each case mainly through interviews and from internal company reports. The first step was to contact with the brand name owners to request their collaboration. They were considered key agents in the supply chain, having the most relevant information regarding quality and usually being interested in any aspect which might affect the value of their brand name. Interviews with them followed a semi-structured questionnaire on quality control, coordination and motivation mechanisms and brand name performance. Another set of interviews was conducted with the main suppliers, retailers, and quality controllers to check the owner information and to find out their problems and complaints. On average, five interviews were conducted to build each case, all of them following a standard, semi-structured survey. Each interview took about two hours and answers were taken down in writing. The interviews took place in France, Germany, Greece, Italy, Spain and UK and were conducted by a team of previously trained researchers. All the information on each case was summarized in a structured report. In the end, we obtained eleven cases (see Table 1).

**Table 1: Case studies**

<b>Brand name</b>	<b>Product</b>	<b>Owner</b>	<b>Country</b>	<b>Main mechanism of governance</b>	<b>Average price premium at retailers' outlets</b>
<i>CAG</i>	Varied meat products (pork, poultry, beef, lamb, rabbit...)	Cooperative Agropecuaria de Guissona for cattle breeding; Corporación Alimentaria de Guissona for other activities	Spain	Hierarchy	No
<i>Creta Farm</i>	Sausages	Creta Farm (private firm)	Greece	Hierarchy	5%
<i>Vi.k.i</i>	Sausages	Vi.k.i (private firm)	Greece	Hierarchy	No
<i>Eichenhof</i>	Beef and pork	Ego (cooperative)	Germany	Quasi-Integration	100%
<i>Filiere Qualite Carrefour</i>	Beef	Carrefour (private firm)	France	Quasi-Integration	10%
<i>Montana Fresco</i>	Beef and Veal	Inalca (private firm)	Italy	Quasi-Integration	20-30%
<i>Stolle</i>	Chicken	Stolle (private firm)	Germany	Quasi-Integration	8% (green-land chicken)
<i>Prosciutto di Parma</i>	Ham	Consorzio del Prosciutto di Parma (association of ham producers)	Italy	GI	30%
<i>Specially Selected Scotch Beef</i>	Beef	Scotch Quality Beef and Lamb Association	United Kingdom	GI	10% (PGI)
<i>Ternera Asturiana</i>	Beef	Spanish Ministry of Agriculture (PGI)	Spain	GI	39-62%
<i>Volailles de Challans</i>	Chicken	The SYLAC (Syndicat des Labels Avicoles de Challans en Vendée) quality group	France	GI	80%

## CASE ANALYSIS

Our first research proposition states that, when moving from hierarchy to more market-oriented solutions in the supply chain organization, additional 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 was to classify the supply chain organization under one of three main mechanisms of governance - hierarchy, quasi-integration and GI. The second step was to describe the quality safeguards established in each case and their consequences for improved coordination and the complexity of the resulting hybrid organization. The second research proposition required ascertaining if any one of the mechanisms of governance was better than others for obtaining a top- quality product from a consumer point of view. This required assessing the quality of the end products.

### MECHANISMS OF GOVERNANCE IN THE SUPPLY CHAIN

The criterion followed to identify the mechanism of governance was to take into account the details of the contracts governing the main relationships among the channel participants. First, if all steps (or a clear majority) in the supply chain are taken by the same firm, we refer to this as integrated firm or hierarchy. Second, when a company (retailer, wholesaler or producer) owns the brand name and leads the production process (even if it is not the legal owner *of all* assets), 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 method related to superior product quality, we refer to these brands as GIs (see Table 1).

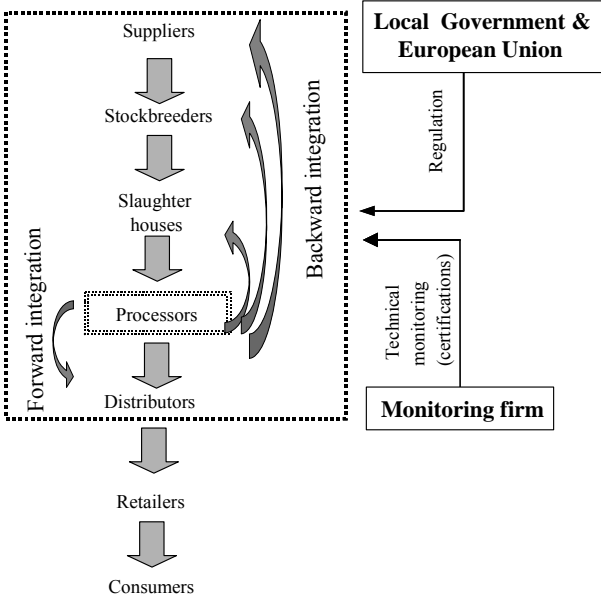
#### *Hierarchy as a reference*

The supply chains organized as hierarchies —Vi.k.i., Creta Farm and CAG— are summarized in Figure 2 and Figure 3. Vi.k.i is a company which started out as a meat processor and later entered different stages of the supply 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 the 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 the retail distribution and part of the fattening process are outsourced. Regarding the former, Vi.k.i. has signed exclusive agreements for special collaboration with twenty-eight representatives, fourteen supermarkets and several foreign representatives in Albania and Germany. Fattening is subcontracted to about 30 pig farmers when the company's capacity is insufficient for producing the required quantities. These firms 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. Creta Farm is organized 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

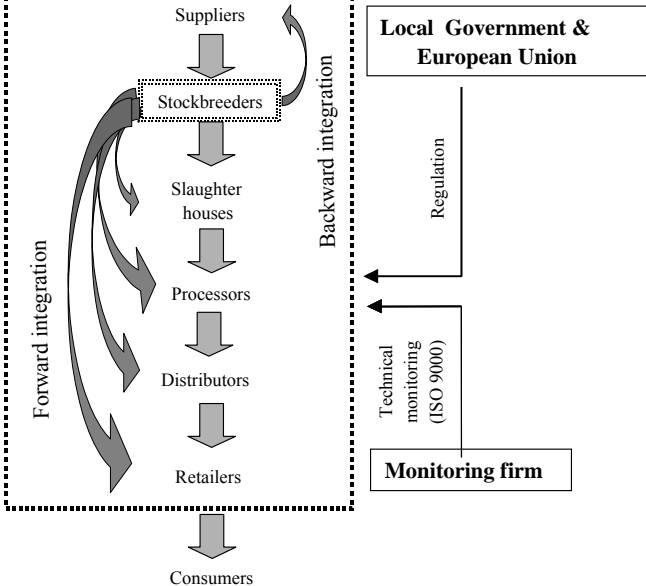
quantities (outsourced pig production is about 33 percent). We consider these organizations to be very close to a hierarchy.

CAG also has a high degree of vertical integration and it also actively participates in the whole production process. The main difference in comparison with Vi.k.i. and Creta Farm 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 instructions. 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 obtains, 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).<sup>7</sup> The latter represents an important novelty because franchising is unusual for butcheries.

**Figure 2: Hierarchy at Vi.k.i and Creta Farm**



**Figure 3: Hierarchy at CAG**



**Quasi-integration**

Figure 4 and Figure 5 summarize the organization of supply chains as quasi-integration. We distinguished between two situations: a supply chain led by a large retailer (Filière Qualité Carrefour) and another led by a slaughtering industry (Montana Fresco). The remaining quasi-integrations, Stolle and Eichehoff, are similar. The main difference is the stage occupied by the owner of the end product brand name in the supply chain: production, slaughtering or distribution. We should note that quasi-integration comes from a long-term, repetitive relationship and/or asset ownership in all cases.

Carrefour, the second largest retailer in the world after Wal-Mart, decided to backward quasi-integrate other stages of the production process for different fresh products.<sup>8</sup> 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 retailer is close: 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, Carrefour is always at the centre 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 Carrefour.

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 catering. 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 the livestock owner (Inalca) assigns its livestock to a farmer who fattens them following the owner's specific requirements but using his own facilities and workers (even the fodder given to the animals is subject to specific prescriptions). The livestock owner 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, from which the products (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. Inalca is thus able to ensure the quality of its products (and to choose the best cuts and control the delivery system) right up to the retail shelf.

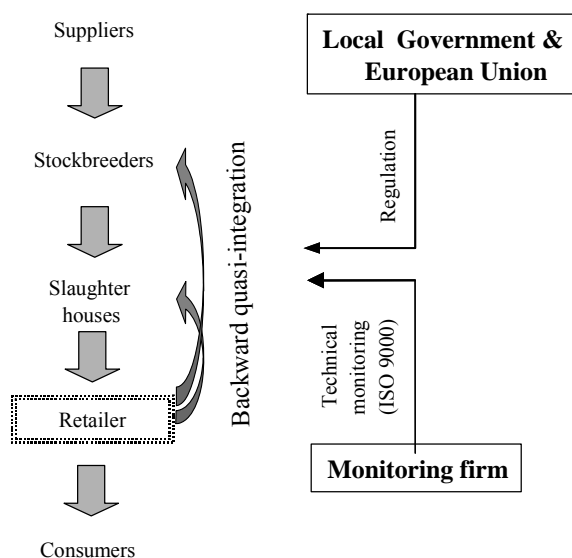
The remaining cases of quasi-integration are Stolle and Eichenhof. The former, owned by Stolle Bros., started out as a slaughterhouse and later integrated other stages. It is today one of the most important poultry-producing enterprises in Germany. Stolle produces the fodder, hatches the chicks and transports 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 fatten the chicks until ready for slaughtering, when Stolle trucks pick them up and transport them to the Stolle slaughterhouse. The company packages and distributes the end products to retailers 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

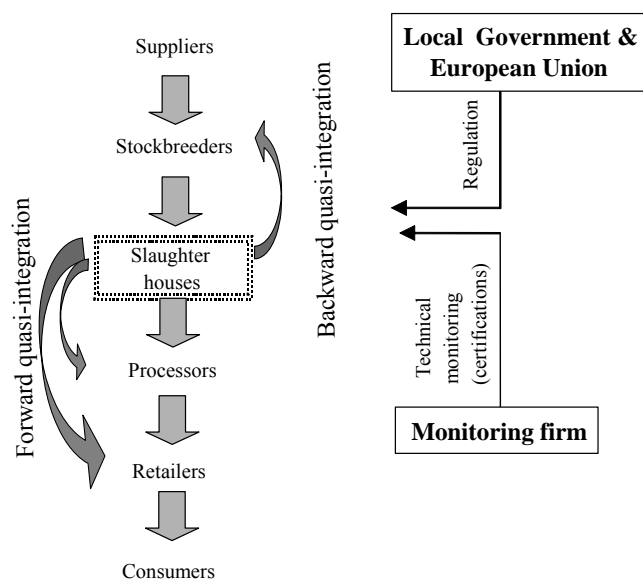


Eichenhof) that sells 50 percent of all pork and 30 percent of all beef products slaughtered by Ego.

**Figure 4: Quasi Integration at Carrefour**



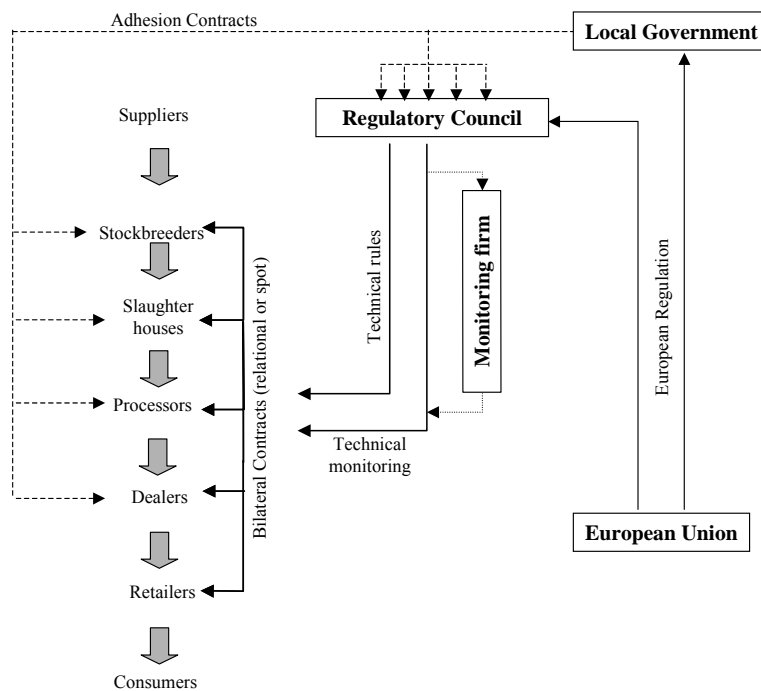
**Figure 5: Quasi Integration at Inalca**



### **Geographical Indicators**

Figure 6 summarizes the organization of the supply chain when a GI is present: Prosciutto di Parma, Specially Selected Scotch Beef, Ternera Asturiana and Volailles de Challans. The main difference in comparison with the previous cases is the overlapping of two mechanisms of governance. On the one hand, the agents carrying out meat production and distribution (the owners of the production factors) may be organized through any type of mechanism of governance (from the hierarchy to the market). Explicit, formal contracts backing transactions between firms associated to a GI are not frequent and are relational in nature, leaving basic aspects such as price and quantity to bilateral negotiation. On the other hand, the owner of the GI (*i.e.* public ownership even if the holder is one or several associations of producers) also governs the supply chain through a set of companies and institutions which regulate and carry out quality control according to minimum standards and specifications. Here the degree of formalization is higher, and the GI formalizes its relationship with all the participants in the supply chain. They have to comply with a written contract of association and with all the GI regulations.

**Figure 6: Geographical indicators**



## ACHIEVING QUALITY

Having identified the main mechanism of governance in the supply chain for each case, our second step was to analyze the different types of additional quality safeguards introduced and to ascertain whether or not they are more intense in hybrid forms. We do not include compulsory health controls in our analysis. We distinguish between in-house quality controls, inter-firm quality controls and quality controls directly linked to the second-level mechanism of governance (GI).

### *In-House quality controls as a reference*

Internal controls are mainly based on fiat. This means that the quality controller in the firm 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. The difference, however, is that hierarchy-type cases hardly introduce any additional external quality controls. In the cases we classify as hierarchies, brand name owners (Vi.k.i, Creta Farm and CAG) are almost the only quality controllers along their respective supply chains. Quasi-integration products have more different quality controllers because each independent firm (residual claimant) usually introduces its own quality controls. The same happens in GI because there is always an additional control by the regulatory council.

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 (fodder, livestock fattening, slaughtering, processing and retailing). 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 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 integrated stage.

In summary, the majority of the controls in hierarchies is internal and focus on compliance with internal specifications. There are hardly any additional controls, except for those introduced in the production phases where vertical integration is not complete and the brand owner hires external agents, these being potential points of entry for low-quality, non-standard inputs. This finding is totally consistent with the Díez-Vial (2007) empirical result that successive stages in the meat industry are integrated to guarantee input quality.

### ***Inter-firm quality controls***

A second situation is when vertical disintegration increases and most of the transactions in the supply chain are between independent firms instead of within a hierarchy. This implies that new inter-firm controls are added to the in-house controls carried out by each firm because of the inherent misalignment of interests among the parties involved when different residual claimants participate in a transaction. These controls are normally carried out by the owner of the brand name whose reputation is at stake on the final market although independent controllers may also be hired, for example, when a producer subcontracts part of the production process or buys inputs. These controls aim to guarantee a standard production process and to avoid opportunism. Inalca, for example, works with about 30,000 independent breeders so must apply such controls to ensure the organoleptic attributes of the end product.

The main type of inter-firm quality control used in the cases analyzed is the enforcement of detailed specifications. We note that almost all brand owners in quasi-integration-type products have an exhaustive list of specifications for raw materials, 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 and thus mitigate consumer uncertainty on product quality. Monitoring of the specifications is performed by the brand owner and/or by a hired specialist. Inalca, for example, sends its staff to directly supervise suppliers. Additionally, a hired specialist must previously grant each farmer a certificate to allow them to supply the company and he also certifies feeding, raw materials, meat processing and delivery to retailers. However, other brands, such Filière Qualité Carrefour, Stolle or Eichenhof, hire certifying companies to perform all 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 that deals with all supply chain affairs. Similarly, 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 on the producers' association, slaughtering firms and local producer groups or associations; they also periodically monitor three to ten percent farmers and 30-100 percent of private cattle dealers and feeding firms (depending on their size). 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 (Eichenhof's owner) hires an independent inspection body which examines every farm twice a year, and the feed ingredients and slaughtering, packing, processing and retailing stages on a monthly basis.

The above description suggests that the movement towards hybrid solutions complicates the governance of quality because additional inter-firm quality controls are observed. Although hybrid forms, such as quasi-integration, perform quite well with regards to both motivation and coordination, hierarchy overcomes hybrid forms in terms of coordination because brand owner fiat is not so effective with external suppliers. This is partially solved by the inherent features of quasi-integration (long-term contracts and reduced turnover of partners), but additional coordination devices seem to be needed. Examples of these are the requirement of *ex ante* certification for suppliers, a restrictive list of specifications (fodder, farming conditions, etc.), standardized feeding practices, periodic audits and so on. This means that a product is frequently verified in-house to guarantee that the company is fulfilling the requirements and later is inspected again by the buyer to ensure the same. The presence of both in-house and inter-firm quality controls is totally consistent with our first research proposition because these redundant quality controls reinforce the homogeneity of the production process and consequently the conformance quality. We should note that these controls are generally based on random sampling, which means that when we introduce several parallel and independent samplings we improve the estimations about the population (we reduce the sampling error). The drawback is that the resulting hybrid form is much more complex in terms of allocation of assets and decision rights. This probably raises the transaction costs.

### ***Second-level quality control***

GIs also use an additional set of quality controls. We refer to them as second-level controls because they are performed within a second-level mechanism of governance, usually in parallel with first-level controls. In other words, these are independent of the way the supply chain is organized or governed. In fact, participants in the supply chain may organize it either as a hierarchy or as a hybrid form, employing whatever quality controls they consider most appropriate. In addition, the GI sets up its own quality controls, usually through a monitoring committee (regulatory council). First, the regulatory council sets a detailed list of specifications to guarantee the traditional attributes which have given the firms in the geographical area the reputation of top-quality producers. It then checks

that the associated firms (producers, distributors, retailers, etc.) fulfil those requirements. Although this monitoring control is normally subcontracted to an independent, specialised firm, it may also be done by the regulatory council staff. Clearly, GIs result in an overlapping of quality control devices which provide additional coordination and motivation capacity.

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 retailer— 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 Volailles 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 appoints 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.

All these specifications and quality controls aim to guarantee the presence of the traditional attributes which theoretically constitute the essence of the product's success. This promotes both conformance and design quality. The former is achieved by requiring the use of common inputs and processes, which clearly reduce product heterogeneity, particularly amongst different producers. The controls do not ensure that all the production has the same level of distinctive attributes but they guarantee a minimum standard.<sup>9</sup> Design quality is promoted, first, by forbidding inputs that do not reach the quality threshold and, second, by small contributions made by associated agents. Each one investigates how he can improve the product from the consumer point of view or from an organoleptic perspective. The GI passes on such innovations after verifying that they do not affect the traditional attributes. Given that the majority of associated agents belong to the same, usually small area and share different resources (technicians, external controllers, suppliers, retailers, etc.), innovations can be adopted with relative ease, thus improving the technology, and the quality, of the whole GI.

In sum, the resulting governance of quality is more complex than any other previously analyzed form. While quasi-integration-type cases are complemented by inter-firm safeguards added *ad-hoc* by parties, GI adds to any traditional mechanisms of governance (market-hybrids-hierarchy) a whole set of norms and control devices in order to guarantee minimum conformance and design quality to consumers (even in situations in which the supply chain is just a sum of market relationships). This results in complex allocation of the quality decision rights because of the existence of so many, sometimes overlapping, quality controls. This increasing complexity is coherent with the first research proposition.

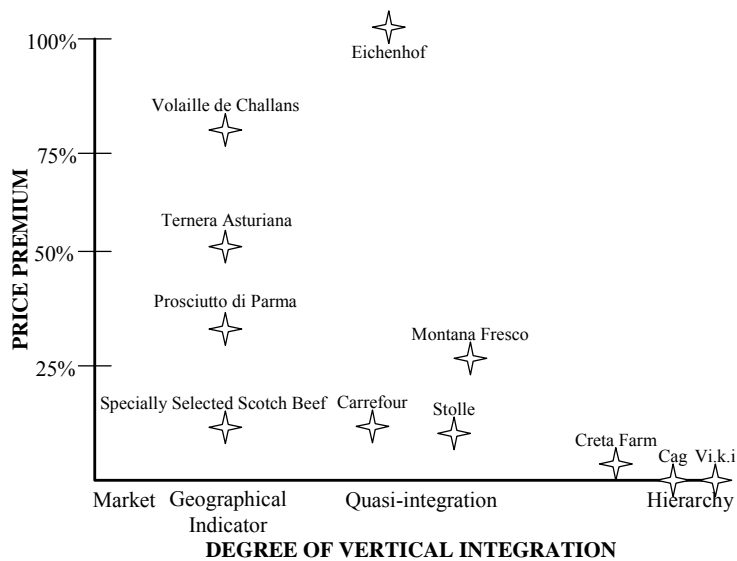
## **A TENTATIVE ASSESSMENT OF QUALITY PERFORMANCE**

Our second research proposition argues that the complexity in GI should be compensated for with a higher performance in terms of overall quality, otherwise this type of organization would be inefficient and would disappear. Checking this argument requires measurement of the level of quality from the consumer point of view. Following Aaker (1996:107), we consider the price premium to be a “reasonable summary of the strength of the brand” and a clue of high quality. We therefore chose this variable as the indicator of the organization’s market success. We consider the price premium can be divided into two components. A product with a high target quality (design quality) would imply that the consumer is willing to pay a positive “quality premium”, and a product with a low variance from that target attributes (conformance quality) would give rise to a “homogeneity premium”. The combination of high-powered incentives with a set of well-designed coordination mechanisms will reach the highest price premium. In practice, it is very difficult to separate the two components of price premium in the different brand names considered.

We calculated 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 repeated this calculation for each of the three biggest retailers in the area (see Table 1).<sup>10</sup> We then performed a preliminary test in which we compared price premiums granted by consumers to products bearing the brand names included in our sample. If the price premium in more complex mechanisms of governance (quasi-integration and GIs) 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 can be seen in Figure 7, where we can clearly observe that hierarchies have the lowest average price premium (1.67 percent), while the average price premium is higher for GIs (42.63 percent) than for quasi-integrations (35.75 percent). These results support our second research proposition, although we should check if these differences are statistically significant.

**Figure 7: Price premiums in brand names for meat**



We found statistically significant differences in price premiums among three groups (hierarchies, quasi-integrations and GIs) (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 theoretical arguments. 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 the price premium in hierarchies with that in *i*) quasi-integrations and *ii*) GIs. Both comparisons present a statistically significant value in the Mann-Whitney U test (0.032), which supports our arguments. However, comparison of price premiums in quasi-integrations and in GIs 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 case. We also tried an additional Mann-Whitney U test grouping quasi-integrations and GIs (with an overall average price premium of 39.19 percent) and comparing this new combined category with hierarchies. The significance value (0.014) once again supports our proposition that more complex forms yield higher price premiums than hierarchy.

This result is not in contradiction with the previous literature but complements it. Díez Vial (2007) finds a positive relationship between quality and vertical integration in the meat industry but she only refers to conformance quality. Her arguments deal with measurement problems, which lie behind the idea of conformance quality. Improving product attributes (design quality) is not considered as this would be more of an entrepreneurial initiative and, as in hybrid forms, high-powered incentives are needed to motivate product improvement. Michael (2000) also finds a positive relationship in his study about the restaurant industry but considers perceived quality, which is not directly comparable with our work. He relates customer perceptions to the degree to which the restaurant is integrated in the chain (owned or franchised). His argument is that opportunism may

affect quality in franchised establishments (due to the classic free-riding argument) but not in owned ones. In our case, we could not observe this effect because a) a restaurant has much more influence on end-product quality than a retailer has in the meat supply chain; b), when we have a situation similar to franchising (with a brand name being employed by different non-owner users), as with GIs, we also face co-branding. This acts as a safeguard because it limits the problem: each individual producer (non-owner user) is also identified by its own brand name, and has its own clientele and reputation.

**Table 2: Mean difference statistical tests**

<b>Average Price Premium</b>	<b>Test results</b>
Hierarchies: 1.67% Quasi-integrations: 35.73% GIs: 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% GIs: 42.63%	Mann-Whitney U = 0.000 Asymp. Sig. (two-tailed) = 0.032
Quasi-integrations: 35.73% GIs: 42.63%	Mann-Whitney U = 5.500 Asymp. Sig. (two-tailed) = 0.468
Hierarchies: 1.67% Quasi-integrations and GIs: 39.19%	Mann-Whitney U = 0.000 Asymp. Sig. (two-tailed) = 0.014

## CONCLUSIONS

We maintain that the quality of end products largely depends on decisions made by economic agents at various stages of the supply chain. We argue that the mechanism of governance of the supply chain must be properly chosen to promote high quality. Hierarchy emphasizes conformance quality by directly supervising economic agents and monitoring compliance with the quality standards set by the brand owner. However this mechanism of governance fails in motivation because the market offers higher-powered incentives.

If we change towards more market-oriented organization as a solution to this problem, the incentive system can be improved because several residual claimants appear along the supply chain. However, this affects conformance quality because participants do not achieve such efficient coordination as in hierarchy. Consequently, these mechanisms of governance must be complemented with a set of safeguards designed, at least, to improve coordination amongst the parties involved. The resulting (hybrid) supply chain organization deals with high-quality products better than hierarchy because it retains the high-powered incentives of market-oriented mechanisms and solves coordination problems with specific overlapping devices. GIs are probably an extreme case of this situation because, as a second-level mechanism of governance, they add a whole set of quality control devices. This improves both motivation and coordination of channel participants resulting in the highest level



of quality.

We found empirical evidence of these arguments in an international case study of quality meat brand names. First, in our sample we found that both quasi-integration and GIs require a greater effort in coordination than hierarchy. They introduce *i*) coordination-oriented mechanisms to define standards and input attributes and *ii*) a complementary (and sometimes redundant) set of quality control devices. These efforts result in more complex organizations, particularly in terms of the governance of quality. Second, we found that the average price premium paid by consumers for end products in the retailers' outlets, as an estimator of product quality, is much higher in GIs than in hierarchy-type cases. Quasi-integration-type cases present an intermediate price premium. We take this finding as an indication that the supply chain can be more efficiently organized by using hybrid forms, particularly GIs, to produce high quality. This suggests that supply chain organization matters for end product quality and that consumers value the organizational effort to improve quality.

From the practitioner's point of view, these findings suggest that neither market nor integrated solutions are optimal. Hybrid forms based on reiterative and long-term relationships perform better in terms of overall quality. Practitioners should understand that this is because the safeguards introduced make up for the limitations of each polar governance mechanism (market and hierarchies), so they should benchmark the effects of such safeguards in their own supply chains. On the one hand, they should try to improve motivation capacity within their companies when they have integrated several stages of the supply chain, setting up incentive systems to promote the search for new opportunities, innovations and alignment with consumers' preferences. On the other, in market-oriented relationships they should improve the coordination capacity within their supply chains. One way of doing this is by introducing successive stages of coordination and control in the relationship, as in GIs.

Finally we are aware of several limitations. This paper tries to link the literature on mechanisms of governance in the supply chain with that on quality. This is a relatively new topic and more research is needed. First, our methodology should be complemented with quantitative techniques. We use a case analysis methodology which is not totally accepted amongst academics. We believe it helps clarify the relationship between the organization of the supply chain and product quality, but our findings should be corroborated by econometric analysis. Second, we have only dealt with the movement from hierarchy to hybrid forms, without going into the move from market-oriented solutions towards hierarchy. Our intuition is that the latter does not improve end product quality because it is very costly to maintain motivation within a hierarchy. This is possibly because it is difficult to find the appropriate quality-enhancing estimator to develop an explicit incentive system. Both aspects are on our coming research agenda.

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<sup>1</sup> The authors define the “Big Middle” as the marketspace in which the bulk of retailers compete for the majority of customers and the preponderance of expenditures occur.

<sup>2</sup> We use the term “integrated firm” referring to a firm which has vertically integrated the supply chain. In the organization theory literature are also frequent the terms “hierarchy” or just “firm”.

<sup>3</sup> We label as GIs two different legal forms: Protected Designation of Origin (PDO) and Protected Geographical Indicator (PGI).

<sup>4</sup> 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).

<sup>5</sup> There are several examples in the literature about how close co-operation (hybrid forms) between firms and their suppliers offers many advantages including better quality (Webster, 1992; Kalwani and Narayandas, 1995; Dyer, 1996; McCutcheon and Stuart, 2000; Spina and Zotteri, 2000; Goffin et al, 2006).

<sup>6</sup> This idea is a generalization of James’s (2000) argument of a two-part decision-making framework in the labour relationship: the first choice is the type of governance (hierarchy) and the second choice regards the specific characteristics of the contract (type of incentive system).

<sup>7</sup> In 2007, 285 outlets were franchises out of 292 ([www.tormo.com](http://www.tormo.com), accessed on Dec 30<sup>th</sup>, 2007).

<sup>8</sup> Nowadays, Carrefour has 245 dedicated supply chains (called “quality chains”) for various products (fresh meat, fruits and vegetable, fish...) in France and more than 350 worldwide. The beef chain was the first to be implemented.

<sup>9</sup> For instance, in the Challans case, the quality standard stresses that animals must be at least 81 days old before being slaughtered. But this does not prevent farmers from raising the chickens for a longer period.

$$^{10} \text{ Price premium} = \left[ 1/3 \sum_{i=1}^3 (P_{\text{selected brand}}^i - P_{\text{substitutive product}}^i) / P_{\text{substitutive product}}^i \right] \times 100$$